

ENCYCLOPEDIA OF COMMUNICATION and INFORMATION

POR-Z Index

Volume 3

Edited by Jorge Reina Schement

ENCYCLOPEDIA OF COMMUNICATION and INFORMATION

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ENCYCLOPEDIA OF COMMUNICATION and INFORMATION

Volume 1

Edited by Jorge Reina Schement

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Preface —

Studies of communication and information have engaged people since classical times, if not even earlier. Socrates, Plato, and Aristotle taught communication skills and considered the nature of ideas to be a mark of being human. Yet, although language emerged sometime between 300,000 and 30,000 years ago, words that represent the ideas of communication and information arrived only in relatively recent times. In English, John Wyclif introduced the word "communication" in his 1382 English translation of the Bible and used the word to convey a sense of transferring. In the same decade (1386?), the word "information" surfaced in the "Tale of Melibee" (in Geoffrey Chaucer"s Canterbury Tales), with the denotation of an instruction. Six hundred years later, most people could not get through a day without using the words "information" and "communication."

Since the late nineteenth century, psychologists, sociologists, anthropologists, biologists, neurologists, linguists, computer scientists, communication researchers, and information scientists, have expanded our understanding of communication and information. Today, social workers, clinical psychologists, psychiatrists, and speech pathologists comprise some of the professions that help people improve their communication skills. Other professionals, such as librarians, archivists, and information systems managers, organize information for storage and retrieval. Still others, including writers, journalists, broadcasters, television producers and directors, and screenwriters, contribute communication information through the mass media. Indeed, today, the United States, Japan, most European nations, and several countries on the Pacific Rim have work forces where the information and communication occupations account for the largest group of workers.

The Encyclopedia of Communication and Information brings together an assemblage of international experts in order to summarize what we know about communication and information in all of their manifestations. The entries in the Encyclopedia are written by specialists who are themselves active researchers in the study of communication, information, or both. Moreover, an important strength of this Encyclopedia is that it is interdisciplinary, drawing contributors from across academic disciplines. The many perspectives that guide the study of communication and information are represented here, complete with the controversies and disagreements that sway the progress of scholarship.

The 280 entries in the Encyclopedia cover eight general topics:

- 1. Careers (e.g., journalist, librarian, publicist, researcher, teacher),
- 2. Information science (e.g., human-computer interaction, information storage and retrieval),
- 3. Information technologies (e.g., broadband, computers, the Internet, radio, telephony, television),
- 4. Literacy (e.g., computer literacy, media literacy, traditional literacy,),
- 5. Institutional studies (e.g., elections, government policy, information society, law, media history),
- 6. Interpersonal communication (e.g., groups, organizations, relationships, rhetoric),
- 7. Library science (e.g., cataloging, library functions, text-based literacy),

8. Media effects (e.g., advertising, alcohol, dependence, interventions, opinion formation, public health campaigns).

The entries are organized in a strict alphabetical sequence, with cross-references to related entries provided where appropriate. Almost every entry includes a brief bibliography. Illustrations have been chosen and inserted to maximize effectiveness of the entries. Accordingly, the overall scheme balances familiarity of presentation and organization with originality in bringing communication and information subjects together in one encyclopedia.

The Encyclopedia of Communication and Information is a reference resource meant for people, especially students, who want full, up-to-date, trustworthy information about all aspects of communication and information. This includes readers who want more information about a "hot" topic, such as violence in media, or an important piece of legislation, such as the Telecommunications Act of 1996. Readers will find biographies on important individuals such as Thomas Edison, Marshall McLuhan, and Nellie Bly. Furthermore, they will find articles that describe a variety of communication and information occupations and professions. High school and college students who need material for class discussions and papers for courses will be able to turn to the Encyclopedia for relevant information. Finally, it will be of use to scholars, who can consult it as a handy state-of-the-art review about topics on which they are not expert.

This Encyclopedia is a necessary source for these lay readers, students, and scholars because communication and information form part of the foundation of human society. The evolution of human communication created the basis for sharing thoughts. The ability to describe, interpret, and imagine, when expressed to another, transports human potential beyond the necessary and immediate to a domain where abstractness can take root and grow. In this realm, the raw data of nature can be collected into information, transformed into a new idea, and communicated to people. Humans overlay the immutable facts of birth, life, and death with explanations, stories, and exhortations-which, in turn, leads to systemic actions. By communicating information, individuals coordinate actions beyond sight of each other and change actions in response to new information. When shared information becomes a group vision, social hierarchy results, collective acceptance of supernatural beings emerges,

and the satisfaction of self-interest through the exchange of goods spreads. Experiences interpreted and shared through communication form the norms of culture, and, when translated through the lens of absurdity, they even become funny stories that live on for generations. Thus, in the broadest sense, communication and information create society. For this reason, it is important that a reference source such as the *Encyclopedia of Communication and Information* be made available to help further human understanding of these topics.

As a project, the Encyclopedia brought together hundreds of people, who worked together to produce a compendium of the most up-to-date information. I thank the contributors for their dedication to conferring a high standard of quality on the content of the Encyclopedia. The associate editors merit special recognition and my gratitude, for without them there would be no encyclopedia. Their scholarly expertise in identifying topics, selecting contributors, and reviewing the submitted manuscripts ensured that this project would be successful. I want to thank Hélène Potter and Brian Kinsey of Macmillan for their encouragement and guidance. Hélène saw us through the design of the Encyclopedia and helped us to become a smoothly working editorial team. Brian's project management skills facilitated the work of editors at five distant universities. Indeed, his patience is legendary. Finally, the work conducted by colleagues, staff, and students here at the Institute for Information Policy contributed an essential ingredient to the project's success. Richard D. Taylor and Dennis Davis served as tireless sounding boards. Billie Young, the institute's staff assistant, kept paper and e-mail flowing. Graduate assistants Janice Ascolese, Scott Forbes, Sheila Sager, and Sharon Stringer spent many odd hours providing editorial support.

This project provides proof that a work of this sort requires the smooth cooperation of many experts who contribute their years of knowledge for scant compensation. These experts represent the many sides of the scholarly issues, and they share a commitment to the popular dissemination of materials related to communication and information studies. If this Encyclopedia adds to a reader's knowledge, introduces a student to a career, or enhances a teacher's course materials, then we will have fulfilled our purpose.

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ACADEMIA, CAREERS IN

A professor is a college or university teacher of the highest rank in a particular branch of learning. In Middle English, the word "professor" meant either one who had taken the vows of a religious order or a public lecturer. From the very beginning, a professor was an individual who had taken religious orders to defend and discover the truth. The distinctive task of a professor is the discovery and transmission of truth, just as the care and wellbeing of a patient is the task of the physician. Of course, the concept of truth is a very ambiguous one; its determination is a difficult matter. Truth is not static. It must be incessantly examined as truths are continuously challenged when new knowledge is discovered. The Middle English definition is also a reminder that professors are public lecturers or teachers. In other words, professors must share their knowledge and understanding of the truth with others. This sharing may be through teaching, writing, or community service. These underlying commitments of a professor have evolved into three interrelated and mutually reinforcing roles: (1) teaching and advising of students, (2) conducting research, and (3) providing public service.

Teaching and Advising

Within their particular areas of advanced training and knowledge, professors teach and advise students about academic and career issues. In the modern college and university, professors are expected to do a wide range of types of teaching, calling upon very diverse skills and abilities. The workload for a professor typically varies between conducting two and four group instruction sections a semester and leading a variety of individual instruction classes.

Group instruction sections are what students usually think of as classes. These are classes that meet at regularly scheduled times each week. There are small group instruction sections that usually range in size from twelve to forty students, where professors and students can discuss and debate the material in the course. In large institutions, a professor may teach a large group instruction course, which might involve teaching assistants, who are graduate students pursuing advanced degrees in the subject they teach. These large lecture classes often take the form of one or two weekly lectures followed by laboratory or small group recitation sessions. Professors are responsible for the complete design of the course, for the setting of the course standards and requirements, and for the training of the graduate student teaching assistants.

Many universities experiment with technology in these large group lectures. Students participate in web-based discussions and problem-solving exercises, try various experimental procedures, and sometimes watch lectures on video or on their laptop computers. In these technologically enhanced lectures, students may not need to attend a traditional class at a set time but may consult with the professor and other students over the Internet. Regardless of their field of expertise, professors are becoming versed in technology so they can design a number of learning experiences to supplement and even replace traditional classroom learning for their students. Individual instruction sections are highly specialized courses where a student may pursue a thesis, a set of readings, or a special project under the guidance of the professor. The individual sections are the one-on-one courses where a professor works with a student on a specific research project or a given area that the student wants to study. These classes are worked out individually between the student and the professor and mutually satisfactory expectations are set for the amount of guidance and help that the student will receive as he or she moves through the material.

Professors also advise students about specific courses, majors, and interesting directions in which to take their work. Professors are often a good source of information about career opportunities within their own fields. Career information, in this sense, does not mean that professors necessarily help the student find a job, but they can be a valuable source of information about the kind of training and experience that students might need to succeed in a field. Professors can organize two types of courses to help students find and develop their interests. First, there are internships or field experiences. These are opportunities (either paying or volunteer) to experience what entry-level work is like in a given industry. The other type of course experience is service-based learning. Here, students use their talents to help a nonprofit group to accomplish its goals.

Conducting Research

Professors are expected to conduct research. Most students tend to think this means that professors read a few books or write a few papers. However, research involves much more than that. Research is the creation, accumulation, and transfer of new knowledge. The range of topics is very broad. Communication scholars might add new knowledge on topics as varied as children's enduring fright reactions to media, patterns of conflicts in different types of marriages, the early influences on the rhetoric of George Washington, audience reactions to women's television programming, government regulation of broadcasting in different countries, and so on. Research can involve activities as diverse as bringing children into a laboratory to watch television, videotaping a couple in their home as they discuss a difficult issue, analyzing the fan mail and script development of a successful television show, and reading archived letters and primary sources about a famous historical figure.

Some research is motivated by theoretical considerations where the current use of the findings may not be obvious. Research may also be motivated by solving a practical problem for society. Many communication researchers are called upon to conduct applied research on persuasion or the marketing of prosocial goals and ideas. For example, some communication researchers investigate how children can be persuaded not to start smoking.

In many research universities, students can become involved in faculty research from the very start of their academic careers. They can find out the type of research that a faculty member does and then become part of the research team. This work involves students closely in learning how knowledge about a topic is generated, so it can be a valuable part of a college or university education.

Providing Public Service

The final role for the professor is service. A professor must help to run his or her university and academic discipline. Running the university means serving on and chairing various committees that oversee the curriculum, the budget, and the tenure and promotion of individuals within the system. Some professors also become academic administrators, serving as deans of their colleges and even university presidents. Running one's discipline means editing journals and books and serving as an officer of national or regional academic or professional societies.

Because of the major public investments in the colleges and universities, the public expects the knowledge generated in the universities to be rapidly diffused through public service. Although their first and most important job is classroom teaching and serving the students in their classes, professors must do more than classroom teaching. Public service and community outreach are very important parts of the job of a professor. Professors have a responsibility to the public to use their talents for the betterment of their communities. Serving on commissions and public service forums, giving speeches, being active in community and political groups, consulting with business and nonprofit organizations, and serving as stewards of their community are important roles. The job of a professor is to form relationships with

schools, government, businesses, and individuals across the nation, using their expertise to help solve the challenges that face society.

Career Stages

Professors are usually required to hold the highest degree in their chosen field of specialization. In most fields, this is the doctoral degree or the Ph.D. (Doctor of Philosophy), although the highest degree for artists can be the master's degree or the M.F. A. (Master of Fine Arts). These advanced degrees require many years of study beyond the four years that are spent in undergraduate school. The average doctoral degree usually takes at least five years of work beyond the baccalaureate degree, and it is not unusual for individuals to spend ten years in pursuit of that degree. The Master of Fine Arts degree requires an individual to develop a high degree of skill and proficiency in the chosen artistic field and demands that individuals produce acclaimed works (e.g., films, videos, paintings).

After completing the necessary education, individuals begin university employment as untenured assistant professors. As part of a probationary period that lasts six or seven years, assistant professors must work to develop a case for tenure. That is, the young faculty members must demonstrate that they can be effective and vital teachers and advisors, conduct excellent research, and serve their communities. Often, people outside of academia find the concept of tenure or "lifetime job security" hard to understand. Originally, however, tenure was not designed as a system for measuring performance; tenure arose out of a concern for political independence. In other words, tenure was designed to protect the academic freedom of the faculty. That is, with the sense that their basic position is protected, faculty members can feel much freer to teach and speak out about the important controversial issues of the day. Faculty members in communication departments, for example, often severely criticize the media and their content.

When tenure is granted, an assistant professor is promoted to the position of associate professor. Individuals usually remain at this rank for at least five years, and some remain their even longer. Promotion to the position of professor requires the individual to demonstrate significantly more accomplishments beyond those that were required to gain tenure. The typical time that elapses between entering graduate school and attaining the rank of professor in a university is seventeen to twenty years. Clearly, choosing a career in academia involves a serious commitment on the part of the individual.

See also: COMPUTER SOFTWARE, EDUCATIONAL;

EDUCATIONAL MEDIA PRODUCERS; INSTRUCTIONAL COMMUNICATION; RESEARCHERS FOR EDUCA-TIONAL TELEVISION PROGRAMS; TELEVISION, EDUCATIONAL.

MARY ANNE FITZPATRICK

ACADEMIC ACHIEVEMENT AND CHILDREN'S TELEVISION USE

The relationships between television viewing and the academic performance of children and teenagers have been the subject of great controversy. Popular opinion and some educators have held that television generally has had a detrimental effect—by taking up time that might be better spent acquiring basic skills or doing homework, by encouraging a preference for quick solutions and entertaining portrayals that is inconsistent with the sometimes frustrating demands of schoolwork, and by creating tastes and enthusiasms that draw young people away from intellectually demanding subject matter. In contrast, very sophisticated statistical analyses of amount of viewing and achievement scores among large samples seemingly have indicated that television has no effect when other contributing factors are taken fully into account. In fact, the actual findings of the many dozens of empirical research studies that bear on the topic do not conform perfectly to either of these perspectives.

Viewing and Achievement

There is absolutely no question that children and teenagers who spend greater amounts of time with television perform less well on standardized tests of achievement. This inverse relationship the greater the viewing, the lower the achievement—holds for the three basic skills (i.e., reading, writing, and mathematics) and for other subjects as well (e.g., science, social science, and history). The controversy centers on why this should be so.

This inverse relationship has been observed consistently and repeatedly in samples ranging from a few hundred to more than a half million subjects, which taken together can be said to be representative of American children and teenagers. There are several important qualifications, however. The relationship is most severe among young people from households that are higher in socioeconomic status (where parents score higher on education, income, or occupational standing) and among those from households where there are greater educational and cultural resources, such as books, magazines, newspapers, and encyclopedias. The relationship between household socioeconomic status and achievement scores is markedly stronger than the relationship between television viewing and academic achievement, with young people from households of higher status performing much better.

A good example is the data produced by the 1980 California Assessment Program, which was sponsored by the state department of education. Tests and questionnaires were administered to all pupils present on a given day in the sixth and twelfth grades (about 282,000 and 227,000 students, respectively). The pattern among these more than half million young people displayed the inverse relationship between television viewing and scores on standardized tests devised by the department for the three basic skills of reading, written expression, and mathematics. The inverse relationship was less pronounced among students in the sixth grade than among those in the twelfth grade. The inverse relationship was also less pronounced among students from households that had a lower socioeconomic status.

Another good example is the 1990 study by Steven L. Gortmaker (of the Harvard University School of Public Health) and his colleagues. These researchers uncovered a set of very-high-quality data that would allow them to explore relationships between television viewing and achievement scores. The data had been collected by the U.S. government's Health Examination Program from a sample of about 1,750 young people. A first set of data was gathered between July 1963 and December 1965, when the respondents were between the ages of six and eleven, and a second set of data was gathered from the same people between March 1966 and March 1970, when the respondents were between the ages of twelve and seventeen. The advantages of these data were (1) that the sample was very large and representative of the noninstitutionalized population of the United States for the ages covered, (2) that the design permitted the examination of changes in test scores over time, and (3) that the measures included three widely recognized standardized tests of intellectual aptitude as well as amount of television viewing and a variety of background variables. The three standardized tests were the Wechsler Intelligence Scale for Children (WISC), the Wide Range Achievement Test in Arithmetic (WRAT-A), and the Wide Range Achievement Test in Reading (WRAT-R). The fact that the data were collected in the 1960s and early 1970s was not a serious impediment to their use because, in the absence of very large changes in television or in the way in which young people use the medium, one would not expect large changes over time in the relationship between television use and achievement. Certainly, the data would reflect circumstances for young people of those ages at that time.

In this example, Gortmaker and his colleagues embarked on the conventional path of using survey data to investigate the likelihood of a causal link between two variables. The strength of survey data, unlike those produced by laboratory experiments, is that they represent real-world occurrences, and when the sample is representative of the population as a whole, any outcomes can be said with great confidence to apply to the population represented. The weakness for causal inference is that surveys describe what occurs rather than linking a subsequent outcome to a prior event or treatment, while such a link is provided by an experiment. The logic of making a case for a causal link from survey data is (1) a demonstration that there is a relationship between two variables and (2) the documentation that the relationship persists after as many other variables as possible are controlled statistically so that the possibility can be ruled out that the relationship is actually attributable to another variable. Then, by careful reasoning or statistical analysis, a case must be made that the ostensible cause preceded the effect in time, since the logic of causation insists that a supposed cause cannot occur subsequent to an alleged effect.

The first step of these researchers was to examine the data in the second measurement, when the young people were between the ages of twelve and

Surveys

The survey is a research method that seeks to describe a population by the use of questionnaires, tests, interviews, and other methods by which the attributes of those making up the population can be recorded. Most often, the population is made up of people, but anything that occurs in aggregates can be surveyed-businesses, housing, manufacturers, radio and television stations, and schools and universities. Usually, a sample is drawn to represent a much larger population because this makes the collection of information about the population much less expensive than if every member were examined. Best known are the opinion polls of presidential choices and other public preferences that receive widespread news coverage and often are sponsored by the media. However, thousands of surveys are conducted each year in the United States under the sponsorship of the federal government, political candidates, businesses, and other organizations, as well as the media.

In the case of academic achievement and television viewing, surveys often have been used to determine whether there is a relationship between the two. For example, both the 1980 California Assessment Program and the 1990 Harvard School of Public Health study by Steven L. Gortmaker and his colleagues matched data from questionnaires about television viewing and other attributes of students with their scores on tests of achievement or mental ability. Both studies produced reliable and valid data for reaching conclusions about the populations represented-California public school students (and particularly those in the sixth and twelfth grades, from whom the data were obtained, but one would expect the findings to be similar for other grades) and children and teenagers nationwide (because the sample of about 1,750 was statistically representative of U.S. children and teenagers).

The three principal criteria by which surveys are evaluated are (1) the sample, (2) the measures, and (3) the analysis. The sample is judged on representativeness and appropriateness for the purpose at hand. A random or probability sample gives every member of a population an equal chance of being included, and it is statistically representative of the population. This means that conclusions can be drawn about the larger population with precise margins of possible error (i.e., in only one out of twenty times would the actual percentage for the population vary from the survey by more than plus or minus a stated number of percentage points). Samples that are not random can still be useful if they are large and varied enough for the comparison of subgroups based on gender, age, socioeconomic status, or other attributes, such as beliefs, attitudes, or test scores of any sort. Measures must be reliable, in the sense that outcomes must not vary unless the variable being measured in fact has changed, and they must be valid, which means that they must represent accurately the intended variable whether it be demographic, a belief, an attitude, or something measured by a test. The analysis will become more useful with a greater effort to relate one variable (such as amount of television viewing) to another (such as achievement in written expression) and to examine the interrelationships of more than two variables at a time.

Surveys have three major uses in research. The first is simply to report on the attributes of a population (e.g., how many respondents come from households whose head is an unskilled worker, or how many respondents approve of the way in which the president is handling the job). The second is to explore relationships between variables (e.g., whether achievement test scores vary with amount of television viewing). The third is to detect evidence of causation by examining whether a necessary condition, an association between two variables, can be explained by the influence of another variable or variables and whether the time-order requirement that a cause must precede a consequence has been met (e.g., whether nontelevision factors explain the inverse association between viewing and achievement, or whether greater television viewing precedes lower academic achievement).

Even when a sample is not unambiguously representative of a much larger population, surveys are useful because their findings may be suggestive of what would be the case for such a population (and it is for this reason that academic researchers legitimately often pull a sample from a convenient population, such as the student body of their university, the enrollment of a nearby school, or the voters in a particular city). Surveys are thus one of the fundamental means of scientific inquiry. seventeen, to determine the relationship between television viewing and test scores. They found a substantial inverse correlation, with scores for all three tests declining in a linear fashion as the amount of viewing increased. The researchers next addressed whether television viewing should be considered a cause of the lower scores. They turned to the relationships between test scores at the time of the second measurement and the amount of television viewed at the time of the first measurement. This would establish whether the necessary condition was met for an inference that television had a causal role-a time order in which viewing preceded the outcome. Indeed, television viewing stoutly remained inversely associated with the three test scores. The researchers then controlled for the earlier scores on the same three tests, which meant they now would be examining only changes in scores since both the earlier viewing and testing. The inverse associations dropped to a fraction of their original values. Next, the researchers controlled for other variables, such as time of year, region and size of place of residence, race, and household socioeconomic status, all of which have well-documented long-standing relationships with average amounts of viewing. The inverse associations essentially vanished.

Gortmaker and his colleagues concluded that the data "indicate no significant causal relationship between the amount of television viewed and the mental aptitude and achievement test scores of adolescents." However, this conclusion is limited to the type of tests they employed. The three tests, the WISC, WRAT-A, and WRAT-R, are essentially measures of traits that remain quite stable over time, and, in fact, people who take the tests at one point in time usually score about the same when they take the tests at a later point in time. As a result, when the researchers controlled for the earlier test scores, they also reduced strongly the plausibility of any inverse association remaining. Thus, these data only unambiguously confirm that those who score lower on standardized tests of intellectual ability on the average will watch greater amounts of television.

Logically correct in every aspect of its execution, this study by Gortmaker and his colleagues thus does not definitively establish that there is no causal relationship between the amount of television viewing and academic achievement. First, it does not cover the possibility of the displacement of time that might be spent acquiring the three basic skills of reading, written expression, and mathematics, which would occur at earlier ages. Second, it does not employ measures reflective of and sensitive to behavior that might more realistically be negatively affected by greater viewing (e.g., school grades, scores on homework assignments, tests designed to measure progress over a semester or a year, or, outside the classroom, choice of reading matter).

Interpretation

Inverse associations between viewing and achievement scores would not necessarily represent the effects of television use, and there are several reasons for this. First, young people from households that are lower in socioeconomic status on the average watch greater amounts of television. Also, because of the strong positive relationship between socioeconomic status and scholastic performance, young people from households that are lower in socioeconomic status on average score lower on achievement tests. Second, mental ability has a strong positive relationship with achievement, but it is inversely related to television viewing, so that those who on average watch greater amounts of television also on average will score lower on achievement tests. Third, those who are under stress (e.g., with troubling personal, family, or social problems) on average watch greater amounts of television as a means of flight from their difficulties, and these same stress factors are likely to hamper scholastic performance. Similarly, those students who are not performing well in school might, in their frustration, turn to television as an escape.

Thus, there are very good reasons for concluding that those students who watch greater amounts of television have attributes or are experiencing circumstances that are likely to be associated with lower levels of achievement. The explanation suggested by these patterns is that greater television viewing is the outcome of influences that themselves contribute to or are associated with lower achievement, and greater viewing is not a cause of that lower achievement.

However, additional evidence indicates that this explanation is too simplistic. There are many documented ways in which television use may interfere with success at school. First, academic tasks, such as reading and problem solving, have been shown to be less effectively done in the company of television-reading comprehension is lower and right answers are fewer. Second, during the first through third grades when children are learning the basic skill of reading, some students will use time that could be spent mastering this skill for another, less frustrating activity-television viewing. The same applies to the two other basic skills, written expression and mathematics. Third, those students who watch a great deal of television are more likely to scoff at the value of books and are less likely to read outside of assignments, while those who do such reading are more likely to perform well scholastically. Fourth, those who habitually watch a great deal of television also are less likely to expend as much cognitive attention and thought when they do read and are more likely to prefer (to a greater degree) to read undemanding nonfiction about celebrities and light fiction-fare that resembles television programming. As George Comstock and Erica Scharrer conclude in their assessment of the evidence in Television: What's On, Who's Watching, and What It Means (1999), most of these outcomes occur among both children and teenagers.

Thus, the evidence points toward a number of adverse influences-interference with learning the basic skills, lowered quality of effort when reading or completing academic tasks in the company of television, and, among those who watch large amounts of television, desultory concentration while reading, low esteem for books, and the nurturing of tastes for reading matter that resembles television in substance and style. The most reasonable interpretation of the inverse relationships between amount of television viewing and scores on standardized achievement tests is one that incorporates both perspectives; they in part reflect greater attention to television by those who are less likely to do well academically for other reasons and in part reflect the detrimental effects of television viewing on academic achievement.

Effect Size and Who Is Affected

It is important to recognize that the inverse relationships are quite modest, amounting (on the average) to only about a 10 percent decline in scores between those who view the least amounts of television and those who view the most. The detrimental effects that television viewing has on achievement scores are thus quite small. The additional consequences for intellectual activity in general are probably more serious. These include the lowered esteem for books, the reduced concentration while reading, the preferences for undemanding entertainment, and lesser ability in the three basic skills—all of which, for some, may be a consequence of greater television use. Those people who are most likely to be affected adversely are (1) those who voluntarily allow television to displace time that might have been spent learning the three basic skills, (2) those for whom opportunities foregone would have been of greater academic value, and, of course, (3) those who watch television for a very large amount of time.

See also: Children's Attention to Television; Children's Creativity and Television Use; Parental Mediation of Media Effects; Television, Educational.

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George Comstock

ACCESS TO INFORMATION

See: Reference Services and Information Access; Retrieval of Information

ADDICTION

See: Dependence on Media

ADOPTION OF TECHNOLOGY

See: Diffusion of Innovations and Communication; Technology, Adoption and Diffusion of

ADVERTISING, CHILDREN AND See: Children and Advertising

ADVERTISING, SUBLIMINAL

The notion of subliminal advertising, that is, that advertisers can influence the desirability or even purchase of a brand through using hidden, undetectable advertising stimuli, is one of the myths of twentieth-century popular culture. Martha Rogers and Kirk Smith (1993) have noted that while professional advertisers scoff at the idea and virtually no members of the academic advertising community give it credence, the general public seems to assume that subliminal advertising is widely and effectively practiced. Apparently, the initial claims in the 1950s of subliminal advertising influence, the proponents of which produced not the slightest scientific documentation or evidence, nevertheless instilled the assumption that advertisers use subliminal messages to influence individuals without the individuals being aware of it. As far as the public is concerned, it is a story that is too good not to be true.

Absence of Evidence

Examples of research reviews that conclude against the effectiveness of subliminal advertising include those by Timothy E. Moore (1982), Joel Saegert (1987), and John R. Vokey and J. Don Read (1985). One academic review by Kathryn Theus (1994) affords subliminal advertising mild plausibility, without claiming evidence for behavioral influence. While there has been much psychological research pertaining to the possibility of subliminal perception and persuasion (see, for example, Dixon, 1981), the results remain controversial as to the existence of subliminal effects, especially regarding the ability of subliminal stimuli to influence behavior. In the realm of advertising, the few academic researchers who have claimed effectiveness for subliminal stimuli are vulnerable on methodological or logical grounds (e.g., Kilbourne, Painton, and Ridley, 1985). Moreover, after Sharon Beatty and Del Hawkins (1989) failed to replicate the widely cited early claim by Del Hawkins (1970) of subliminal effects in advertising-like conditions, the claim was retracted. In fact, no successful replication of any study offered as evidence in support of subliminal effects in an advertising-like setting has been reported. Finally, a meta-analysis by Charles Trappey (1996) of studies of subliminal effects in advertising-like contexts found that the amount of variability accounted for (i.e., differences between results for subliminal versus control conditions) is negligible.

Probably the earliest and most-cited claim of subliminal advertising influence was made by James Vicary, reported by *Advertising Age* in "Persuaders' Get Deeply 'Hidden' Tool: Subliminal Projection" (1957, p. 127):

Mr. Vicary, head of the motivation research company bearing his name, said the commercial messages are superimposed on a film as "very brief overlays of light." They are so rapid—up to 1/3,000 of a second that they cannot be seen by the audience.

Mr. Vicary reported that he recently tested the "invisible commercial" in a (Fort Lee) New Jersey movie theater. The tests ran for six weeks, during which time some 45,000 persons attended the theatre. Two advertising messages were projected—one urging the audience to eat popcorn, the other suggesting, "Drink Coca-Cola."

According to Mr. Vicary, the "invisible commercial" increased popcorn sales by 57.5% and Coca-Cola sales by 18.1%. Absence of details for such a provocative claim is, of course, highly unsatisfactory and, without further information, no social scientist or advertising practitioner would take Vicary's account seriously. For example, not only is there no mention of an unexposed control group, there is no reference to a baseline of historical data during periods where conditions matched those pertaining during the test (e.g., day of week, composition of audience, hour of day, weather conditions, season of year, and stocks of product on hand). Furthermore, the claimed demonstration has not been replicated.

Absence of a Systematic Framework

More substantively, what claim is Vicary, in fact, making? Is he claiming that people who never before, or rarely, had bought refreshments during a movie, were now doing so; that people who regularly purchase refreshments were doing so more often, or earlier; or that people who normally chose Pepsi or other soft drinks found themselves drinking Coke? The findings are so inadequately specified as to be uninterpretable from the viewpoint of marketing analysis.

Such weaknesses are not peculiar to the Vicary story among proponents of effects from subliminal advertising. If the phenomenon is to be taken seriously and developed, it should be discussed in the context of a view of how advertising is assumed to work. The absence of a plausible rationale for how subliminal advertising messages might have their effect leaves the phenomenon a conceptual orphan and leaves advertisers without guidance about how to implement the device for best return.

Perhaps the widespread (but unsupported) popular belief in subliminal advertising stems from public misunderstanding of the role of advertising. The ubiquitous presence of advertising reflects the need of advertisers to communicate the availability and special applications or features of their brands to prospective customers who are widely dispersed and with whom personal contact is impractical. In a cluttered environment, advertisers face a daunting task of registering their message with their targets. The essential advertising strategy is to rely on elements in the message finding a resonance in the target of the advertisement (i.e., those individuals in the population who experience the condition(s) for which the brand has been tailored). According to Moore (1982), attenuating the signal to a subliminal level offers no discernible advantage, given such an overriding strategy.

More likely, popular readiness to believe in the possibility, and even use, of subliminal advertising has an existence that is independent of the above critique. Without pausing to consider whether such influence is feasible, people doubtless abhor the idea of being made to act in the absence of the subjective experience of choosing to act. The depth of such distaste may explain the persistence of the belief, regardless of the absence of evidence for, or conceptual development of, subliminal influence or its relevance to the nature of the task of an advertiser.

Absence of Public License

However irritating the daily barrage of advertisements may be to some, especially those who are not "in the market" for the advertised brands, conventional advertising is largely accepted as unavoidable. Subliminal advertising, on the other hand, is not so accepted. Undoubtedly, if examples of effective or even attempted subliminal advertisements were to come to light, an outraged public would again demand that such practices be outlawed, as happened when Vicary first broached the concept. According to Rogers and Christine Seiler (1994), in general, industry professionals do not claim to use subliminal advertising and, when asked, deny that they do. Cynics who maintain that advertisers will, of course, keep successful subliminal campaigns secret fail to ask at what level and where such a decision is taken. Given the complex nature of the advertising business, the layers of approval through which an advertising campaign must pass, and the number of players (e.g., clients, advertising agency personnel, and network executives), such cynics will be hard pressed to suggest how subliminal advertising could be authorized and implemented. The chain from inception of an advertising strategy to its implementation in the broadcast medium is a long on. Presumably, the decision to insert a subliminal message would have to be made at the highest level, yet implemented down the line. The advertiser would likely have to include its corporate lawyers in the decision and then instruct its advertising agency to perform the necessary technical operations. Thus, there would be many opportu-
nities for discovery of what was afoot. The uproar over allegations of subliminal shenanigans in the 2000 presidential campaigns serves as ample evidence that the media are more than willing to expose any promotional attempts that are deemed to be newsworthy.

The Bottom Line

Businesses are in business to achieve return on investment and do not knowingly invest resources in an enterprise that fails to promise return. In this regard, subliminal advertising has no credible evidence that it will yield return; moreover, proponents provide no rationale to guide its effective use. Finally, even if successful return on investment were forthcoming from subliminal advertisements, advertisers would quickly be precluded from attempting to use such approaches because of public disapproval. The bottom line, however, is that subliminal advertising is a myth.

See also: Advertising Effects.

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JOEL SAEGERT

ADVERTISING EFFECTS

Advertising is paid, nonpersonal communication that is designed to communicate in a creative manner, through the use of mass or informationdirected media, the nature of products, services, and ideas. It is a form of persuasive communication that offers information about products, ideas, and services that serves the objectives determined by the advertiser. Advertising may influence consumers in many different ways, but the primary goal of advertising is to increase the probability that consumers exposed to an advertisement will behave or believe as the advertiser wishes. Thus, the ultimate objective of advertising is to sell things persuasively and creatively. Advertising is used by commercial firms trying to sell products and services; by politicians and political interest groups to sell ideas or persuade voters; by not-forprofit organizations to raise funds, solicit volunteers, or influence the actions of viewers; and by governments seeking to encourage or discourage particular activities, such a wearing seatbelts, participating in the census, or ceasing to smoke. The forms that advertising takes and the media in which advertisements appear are as varied as the advertisers themselves and the messages that they wish to deliver.

The word "advertise" originates from the Latin *advertere*, which means to turn toward or to take note of. Certainly, the visual and verbal commercial messages that are a part of advertising are intended to attract attention and produce some response by the viewer. Advertising is pervasive and virtually impossible to escape. Newspapers and magazines often have more advertisements than copy; radio and television provide entertainment but are also laden with advertisements; advertisements pop up on Internet sites; and the

mail brings a variety of advertisements. Advertising also exists on billboards along the freeway, in subway and train stations, on benches at bus stops, and on the frames around car license plates. In shopping malls, there are prominent logos on designer clothes, moviegoers regularly view advertisements for local restaurants, hair salons, and so on, and live sporting and cultural events often include signage, logos, products, and related information about the event sponsors. The pervasiveness of advertising and its creative elements are designed to cause viewers to take note.

The Functions of Advertising

Although the primary objective of advertising is to persuade, it may achieve this objective in many different ways. An important function of advertising is the identification function, that is, to identify a product and differentiate it from others; this creates an awareness of the product and provides a basis for consumers to choose the advertised product over other products. Another function of advertising is to communicate information about the product, its attributes, and its location of sale; this is the information function. The third function of advertising is to induce consumers to try new products and to suggest reuse of the product as well as new uses; this is the persuasion function.

The identification function of advertising includes the ability of advertising to differentiate a product so that it has its own unique identity or personality. One famous example of this is found in the long-running advertising for Ivory Soap. In the late 1800s, a soap maker at Procter and Gamble left his machine running during his lunch period and returned to find a whipped soap that, when made into bars, floated. The company decided to capitalize on this mistake by advertising Ivory Soap with the phrase "It Floats." This characteristic of Ivory Soap served to uniquely identify it and differentiate it from other bars of soap.

The information function of advertising can also be found in advertising for Ivory Soap. For more than one hundred years, advertisements for Ivory Soap have focused on such product characteristics as purity of ingredients, child care, and soft skin. These characteristics, in turn, were often related to key benefits that could be obtained from using Ivory Soap. Thus, various advertisements emphasized "That Ivory Look," which focused on



A 1917 advertisement for Ivory Soap features the famous statements that "It Floats" and indicates how "pure" the product is. (Bettmann/Corbis)

the relationships between product characteristics and the benefits of obtaining a fresh and healthy appearance.

The third and most important function of advertising, persuasion, is also evident in the long-running Ivory Soap advertising campaigns. The advertiser, Procter and Gamble, has linked Ivory Soap with obtaining benefits that are important to customers: a fresh and healthy appearance for women, a mild, nonirritating method for bathing babies, and a novelty for children in the tub (since it floats). The benefits of the product suggest reasons to buy and use Ivory Soap and thus provide a basis for persuading consumers. Different benefits are important to different customers. Thus, to realize its full potential as a persuasive tool, advertising must often be tailored to emphasize those benefits that are important and meaningful for a particular type of customer or a particular use of the product.

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Advertising has a very long history. It existed in ancient times in the form of signs that advertised wares in markets. In Europe and colonial America, criers were often employed by shopkeepers to shout a message throughout a town. Medicine shows, in which there was a combination of entertainment and an effort to sell a product, usually a patent medicine or elixir, presaged modern advertising by creating an entertainment context in which advertising was embedded. Advertising became especially important in the second half of the nineteenth century as retailers began to advertise products and prices that would bring customers to their stores. Advertising for patent medicines also played a prominent role in the development of advertising, and by the end of the nineteenth century, the firms that would become advertising agencies had already begun to form.

Advertising and Psychology

Although advertising has a very long history, serious study of advertising and its effects on consumers did not begin until early in the twentieth century. Psychologists began to recognize that advertising was an important form of communication and began to apply the theories and methods of psychology to its study. Individuals such as Harlow Gale began to conduct experiments designed to determine the power of individual advertisements to attract attention and persuade consumers to buy. Walter Dill Scott of Northwestern University wrote the book The Theory of Advertising (1903), which sought to build a theoretical understanding of advertising based on the principals of psychological science. Scott suggested that advertisers should develop certain fundamental principles on which to construct a "rational theory of advertising." The work of these psychologists was noted by such advertising professionals as Stanley Resor of the J. Walter Thompson Agency, who, in 1912, commissioned a study of the demographics and purchasing patterns of consumers to understand better both what motivated consumers to buy and how to persuade better those same consumers. Since this early work, psychologists and other social scientists have played an important role in both the study and practice of advertising.

The application of psychological theories to advertising provides an understanding of how consumers process advertising messages and make purchase decisions. Theories of attention, information processing, attitude formation, and decision making all have relevance to understanding how advertising affects consumers. Another important application of psychological principals is to develop an understanding of consumer needs so that products can be developed, designed, and communicated in a manner that reflects the relevant and important needs of consumers.

How Advertising Works

Advertising is a form of communication. Like all forms of communication, it has many different effects and these effects are often related to one another. The message in an advertisement, no matter how strong and persuasive, will have no effect if the consumer does not see the advertisement or pay attention to it. One useful framework for understanding these multiple effects and their interrelationships is called the hierarchy of effects model. The hierarchy of effects model identifies different stages in the communication process. Effective communication must begin by obtaining the attention of the consumer. Then, the consumer must process the information carried in the advertisement. Such processing of information may be followed by an evaluation of the information, the source of the information, and ultimately the desirability of any actions suggested by the communication. This evaluation process may, in turn, give rise to the formation of attitudes, the development of intentions for future action, and, eventually, an action. Different characteristics of an advertisement have effects at different points in this hierarchy.

Getting Attention

In the context of advertising, the first hurdle for an advertiser is to obtain the attention of the consumer. This involves two important actions. First, it is important for the advertiser to know where a communication should be place to increase the odds of reaching a particular type of consumer; this is the media decision. Careful analysis of the consumer use of various media (e.g., what television shows they watch, what route they take to work, and what magazines they read) allows the advertisers to identify those media to which target consumers are most likely to be exposed. Placing an advertisement in a place where relevant consumers are unlikely to see it assures that the advertising will be ineffective. However, just because a consumer happens to view a television show or read a magazine in which an advertisement is placed does not a guarantee that the consumer will see the advertisement. The consumer may have left the room when the television commercial aired or may not have read the particular part of the magazine in which the advertisement appeared. Advertisers solve this problem by repeating advertising in the same and in different media in order to increase the probability that a given consumer will actually be exposed to the advertising. Thus, a key task for the advertiser is to identify those media to which relevant consumers regularly attend and develop a schedule of repetition for the advertisement that maximizes the number of consumers who will be exposed to the advertising message. This is typically the responsibility of the media department in an advertising agency.

Exposure to an advertisement still does not mean that a consumer will attend to it. A consumer may simply turn the page of a magazine, look away from the television, or click on a banner advertisement on the Internet to make it go away without ever paying attention to the advertisement. Thus, obtaining the attention of consumers who are, in fact, exposed to an advertisement is a significant challenge for advertisers. Various characteristics of advertisements have been found to increase the likelihood that consumers will attend to an advertisement. Advertisements that include relevant information for the consumer, such as a product benefit that is important to the consumer, are especially likely to attract attention. Information that is new to the consumer is also likely to obtain the attention of the consumer. Various creative devices such as the use of humor, a well-known celebrity, or an especially entertaining presentation also tend to attract attention. The latter devices must be used carefully; if they are not well integrated with the primary message of the advertiser, the consumer may attend to the advertisement, but only focus on the creative device (the humor, the identity of the celebrity) rather the intended message of the advertiser. Advertisers often refer to characteristics of advertisements that gain attention but distract the viewer from the primary message as "creative clutter."

An especially challenging dimension of advertising revolves around balancing the repetition of

an advertisement, which is intended to increase the probability of a consumer being exposed to it, with the likelihood the consumer will attend to the advertisement when exposed. Consumers are less likely to attend to advertisements they have already seen, and the more often an individual consumer has seen an advertisement previously the less likely they are to pay attention to it when exposed again. This phenomenon is referred to as "advertising wearout." Wearout can be a particular problem when advertising in markets where the likelihood of advertising exposure varies considerably across consumers. The number of repetitions of the advertisement needed to reach some consumers may be so great that the advertisement wears out among other consumers who are more readily exposed to the advertisement. To combat such wearout, advertisers will often use multiple advertisements that vary in terms of execution or presentation but carry similar messages. Such variation tends to reduce advertising wearout by providing something new to the consumer that serves as the basis for attracting attention.

Processing Information

Consumers may attend to advertisements for a variety of reasons. Attention alone is not sufficient to make the advertising successful. Advertisements that are interesting, entertaining, and even irritating can attract attention; however, such advertisements may not result in the consumer attending to or understanding the intended message of the advertiser. Assuring that consumers attend to and understand the intended message rather than peripheral characteristics (such as a joke or song) requires careful crafting of the advertising message. Advertising research has demonstrated that the message must be clear and meaningful to the consumer; if the consumer does not comprehend the message, it will not have the desired effect. Thus, it is important when creating the advertisement to understand how consumers think about products and product benefits and to use language that the consumer will understand. It is also important that the product and the product message be the focal point of the advertisement. Most of the time or space in the advertisement should be devoted to the product and the product message should be well integrated within the advertisement. Advertising that consists primarily of creative clutter and does not focus on the product is unlikely to be effective.

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Spokespeople, such as supermodel Elizabeth Hurley for Estee Lauder, can be effective endorsers of products and can increase the likelihood that consumers will follow through by purchasing. (Mitchell Gerber/Corbis)

Longer advertisements tend to facilitate better information processing, but the benefit of a longer advertisement may not always be sufficiently large enough to justify the additional costs of a longer advertisement.

An especially important issue in the creation of advertising is related to understanding how much information consumers want about a given product. For some products, consumers may want a great deal of information and may wish to exert a great deal of effort in processing the information. In many cases, however, especially for products of relatively low cost, consumers do not want very much information and are unwilling to process more than a modest amount of product information. In fact, consumers may differ with respect to the amount of information processing they are willing to do even for the same product. Thus, the advertiser must understand how much information individual consumers desire and how much variability exists among consumers with respect to their willingness to process information. Such an understanding not only indicates how much information to put in an advertisement, it also suggests which media may be most appropriate for delivering the message. Complex messages are generally better delivered in print advertising, while simple messages can generally be delivered on television or radio.

Information Evaluation

After a consumer has processed information, there is a need to evaluate it. The consumers will need to determine how believable the information is and how relevant it is to their individual situation in life and to their behavior as consumers. This evaluation phase poses significant problems for advertisers. Most consumers tend to discount the information in advertising because they understand that the purpose of the advertising is to persuade. Making an advertising message believable is not easy; though often it is sufficient to make the consumer curious enough to try the product. Such curiosity is often referred to as interested disbelief. Advertisers use a variety of devices to increase the believability of their advertising: celebrities or experts who are the spokespersons for the product, user testimonials, product demonstrations, research results, and endorsements.

Attitude Formation

In some cases, the objective of the advertiser is immediate action by the consumer; this is typical of direct-response advertising where the goal is to have the consumer do something immediately (buy a product, make a pledge, and so on). In most cases, however, there is a lag between advertising exposure and any action on the part of the consumer. In such cases, an important communication goal of an advertiser is to create a positive attitude toward their product. Attitudes are predispositions or tendencies to behave or react in a consistent way over time. There is an affect, or feeling, dimension associated with attitudes, and there are generally various beliefs that provide justification for the feeling and predisposition. The goal of advertising is to have a positive impact on attitudes; these attitudes, in turn, influence future behavior. When the consumer next goes to the store to buy a particular type of product, these attitudes influence the choice of the product.

In some cases, the goal of advertising may be to create negative attitudes. For example, in various antidrug and antismoking public-service announcements, the objective of the communication is to reduce the likelihood that the viewer will use drugs or smoke.

Attitudes and attitude formation are among the most widely researched phenomenon in communication research. Various theories have been offered to explain how attitudes are formed and how they may be reinforced or modified. Advertising plays a role in attitude formation, but it is important to recognize that the advertised product itself is the most important determinant of attitude in the long term. A bad experience with a product will create a negative attitude that no advertising is likely to overcome. On the other hand, advertising can play an especially important role in inducing consumers to try a product for the first time, and if the product is satisfactory, a positive attitude will result. In addition, advertising can reinforce positive attitudes by reminding consumers of product benefits, desirable product characteristics, and positive product experiences.

Intentions and Behavior

Ultimately, the success of advertising rests on whether it influences behavior. Product advertisers want consumers to buy their product; political advertisers want voters to vote for their candidate; and sponsors of public-service announcements related to the harmful effects of smoking want the incidence of smoking to decline. While such effects are of primary interest for understanding the influence of advertising, advertising is only one of many factors that influence such behaviors. A consumer might want to buy an advertiser's product, but may not find it in the store, or another less-desirable product is so much lessexpensive that the consumer chooses it instead. It is possible, in some cases, to identify the direct effects of advertising on behavior, but in most cases, there are simply too many other factors that can influence behavior to isolate the effects of advertising. It is for this reason that most advertising research focuses on other effects in the hierarchy of effects. When measuring the direct effect of advertising on behavior is of interest, it is necessary to design carefully controlled experiments to control for all factors other than advertising.

What Advertising Does Not Do

Some writers have argued that advertising can create needs and stimulate unconscious and deepseated motives. This view has led some critics of advertising to argue that advertising is a persuasive tool with the dangerous potential to create consumer needs. John Kenneth Galbraith, in The New Industrial State (1985), suggests that the central function of advertising is to create desires-to bring into being wants that previously did not exist. It is certainly true that people frequently want things when they become aware that they exist and advertising does contribute to such awareness. It is also the case that people sometimes do not realize that they have a need until they become aware of a solution that meets this need. Advertising is not able to create needs that did not already exist, however. Indeed, advertising is a relatively weak persuasive tool. The evidence of this weakness is abundant and unambiguous. First, the failure rate for new products is very high (approximately 90%). This fact is not consistent with the claim that advertisers can actually mold people's needs. If advertisers could create needs, they should then be able to compel consumers to buy their products. Second, experts argue that advertising works best when it is working with, rather than counter to, the existing interests of the consumers. For example, for many years, lowcalorie beer had not been able to find a consumer need to address and the product had limited sales. When the Miller Brewing Company introduced its Lite brand of beer and positioned it as the beer with fewer calories (which "makes it less filling"), it became an instant success.

Advertising has the power to create awareness, inform, and persuade. It is a communication tool of enormous complexity, however. Much advertising does not have its intended effect. The reasons for this failure lie in the variety and complexity of the effects of advertising. Like all successful communication, effective advertising is guided by a thorough understanding of its intended audience and how that audience will receive the intended message.

See also: Advertising, Subliminal; Children and Advertising; Election Campaigns and Media Effects; Internet and the World Wide Web; Public Health Campaigns; Public Relations; Public Relations, Careers in; Public Service Media.

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DAVID W. STEWART SARAH E. STEWART

ALCOHOL ABUSE AND COLLEGE STUDENTS

One of the ways in which communication functions is in the creation and maintenance of the ways in which using and abusing substances, especially alcohol, are talked about and treated. When, for example, society considered the use of alcohol to be a social sin, its use was banned. "Prohibition" is the name given to the era during which it was illegal in the United States to buy, sell, and drink alcohol. After prohibition was repealed, alcohol once again became a legal substance, while other related drugs, such as marijuana, continued to be thought of as harmful. Words for the use of these substances and the meanings that are attributed to their use arise out of communication and are an area of study in health communication. Linda Lederman (1993) calls the ways of using and abusing alcohol on the college campus the "culture of college drinking." In the culture of college drinking, drinking to excess is considered to be an inherent part of the college years. Because of the attention that drinking on the campus receives, it is an important example of a broader subject: communication, health, and substance abuse.

While dangerous drinking concerns college health educators, administrators, and even some students and parents, most students (and their parents) consider drinking itself to be an integral part of college life. Because their perception is relative to those around them, students who drink dangerously often do not recognize that their drinking is problematic. Many of them think that no matter how much they drink, there are others who drink more.

This perception of a cultural norm of excessive drinking during the college years is created and/or reinforced on a daily basis by the media (including college newspapers that carry "All You Can Drink" and "Happy Hour" advertisements), major advertising that targets students (e.g., beer companies with Spring Break Drinking Campaigns), and interpersonal experience (e.g., sharing war stories about the "night before"; attending fraternity parties and other social events that encourage alcohol abuse). All of this occurs despite the fact that data consistently indicate that the percentage of students who actually drink excessively is far below the shared misperception that "everybody does."

Concern about dangerous drinking has led to a variety of studies and interventions on college campuses. Using focus group interviews, many researchers have explored the role that alcohol plays in the lives of students. While students articulate negative consequences (e.g., hangovers, vomiting, being taken advantage of physically and/or sexually), they report ignoring these factors because they see drinking as a rite of passage into adulthood (i.e., limits testing).

These qualitative analyses have also determined how alcohol consumption by undergraduates is used as a means of fulfilling social interaction needs. One focus group study conducted by Lederman (1993) centered on high- and low-risk female respondents. The study demonstrated how selfdestructive alcohol consumption has been negotiated as an acceptable risk for the sake of making friends and creating social circles among undergraduates who are new to vast, overwhelming, and alienating environments such as very large college campuses. Incoming students use the inhibitionlowering effect of alcohol, along with its aid to perceived interpersonal competency, to make contact with new friends, colleagues, and sexual partners.

If simply getting drunk helps students to achieve their social and interpersonal goals, then



Spring Break activities often can serve to increase the likelihood of a college student abusing alcohol, as is the case in this particular situation, where a student is encouraged to drink more alcohol before participating in a game while on vacation in Daytona Beach, Florida. (Patrick Ward/Corbis)

students can be expected to keep getting drunk. Even if severe intoxication causes illness, the downside of drinking can be endured as long as it is not worse than the rewards that are gained. However, it has been shown that alcohol is no longer abused when students gain the pleasure of social contact and friendship without having to drink (Cohen and Lederman, 1998).

One pervasive and powerful environmental factor that is influential in creating and maintaining this cultural image of drinking as a fundamental part of college life is the social interactions of students. The myth that dangerous drinking is pervasive is perpetuated by students who share war stories about the "night before," faculty members who make jokes in class about students' partying, and social events that encourage alcohol abuse. If drinking and talking about getting drunk help students to achieve their social and interpersonal goals, then the data suggest that students can be expected to continue these behaviors. The effect of these social situations is addressed by the socially situated experiential learning model. The model identifies three conceptual bases that can be used to understand the socially situated nature of college drinking: communication theory, social norms theory, and experiential learning theory.

Communication theory provides a basis on which to examine social behaviors on the college campus because communication is the process through which social institutions and the norms and customs embedded in those institutions are created and maintained. Using this understanding of communication to approach drinking-related behavior allows researchers to "enter socially situated scenes" in which the attitudes, beliefs, and behaviors of individuals can be examined both in relation to each other and as the product of the interpretive processes of the individual within the sociocultural community.

The basis of social norms theory is the assertion that students measure themselves against others in assessing the appropriateness or acceptability of their own behaviors. Often, these measures are based on false understandings of what is normative or misperceptions of the behavior of others. The notion that everyone drinks excessively in college, for example, is a misperception. Social norms theory is employed in prevention campaigns by (1) collecting data on the extent of misperceptions, (2) successfully communicating this information to a targeted campus population, (3) assisting them to understand the discrepancies that exist between fact and myth, and (4) making salient new behaviors and norms that are associated with the facts instead of the myths.

Experiential learning theory argues that learning is cyclical. A person has an experience, reflects on that experience, draws some conclusions about the lessons that can be learned from that experience, and then uses those lessons as part of his or her basis for reactions to future experiences. In terms of college drinking, for example, many students who engage in risky sexual behavior while drinking do not perceive themselves to be outcasts in their social circles because in their everyday "experience," their behaviors are the norm as they perceive them.

See also: Alcohol in the Media; Health Commu-Nication; Interpersonal Communication; Social Change and the Media; Social Cognitive Theory and Media Effects; Social Goals and the Media; Society and the Media.

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Linda Costigan Lederman

ALCOHOL IN THE MEDIA

The presentation of alcohol and other drugs in the media has received both scrutiny and criticism. As a result, researchers have started to explore the types of portrayals of, in particular, alcohol use in television programs and advertisements and the influence of those portrayals on adolescents.

Television Depiction of Alcohol Use

Multiple studies indicate an abundance of alcohol use in entertainment programming. In their review of prime-time television content from 1976 to 1982, Warren Breed and his colleagues (1984) found that in the television world, alcohol was the most consumed beverage, followed by coffee, tea, soft drinks, and then water. In reality, the pattern of consumption is the opposite. Alan Mathios and his associates (1998) looked at almost three hundred prime-time programs during the 1994-1995 television season. They found that alcohol use was portrayed on television more frequently than the use of any other food or drink. Even music television portrays a great deal of alcohol use. Robert DuRant and his colleagues (1997) reviewed more than five hundred videos shown on VH1 (Video Hits 1), MTV (Music Television), BET (Black Entertainment Television), and CMT (Country Music Television). More than 25 percent of the videos included alcohol use.

Characters who drink on television tend to be well liked, professional, and wealthy. Mathios and his colleagues (1998) reported that characters in the high socioeconomic category were much more likely to drink than were those in the low socioeconomic category. Breed and his colleagues (1984) reported that characters who drank on television were mostly professionals, including doctors, lawyers, executives, and detectives.

Lawrence Wallack and his associates (1990) found that very few young people depicted on television drink; in their study of fictional prime-time network programming in 1986, less than 5 percent of the characters under twenty-one years of age were involved with alcohol use. The most common age range for characters preparing or ingesting alcohol was thirty to thirty-nine years of age. Mathios's study (1998) reported a slightly higher use of alcohol by teenage characters on television; almost 10 percent of the alcohol incidents in their sample occurred among teenage characters.

Depictions of alcohol use on television are rarely negative. Wallack and his colleagues (1990) categorized portrayals of alcohol use as attractive, unattractive, or neutral. Under this categorization, 60 percent of all alcohol-related activities were neutral and more than 25 percent were considered attractive. When adolescent characters were compared to adult characters, however, the incidents of alcohol use that involved the younger characters were more likely to be coded as unattractive than were the incidents involving the older characters. Mathios and his associates (1998) rated the personality of the characters in the programs they reviewed. Among adult characters, those who used alcohol were portrayed as being more positive than those who did not. On the other hand, among adolescent characters, those who drank tended to receive more negative ratings than those who did not.

Advertisements and Alcohol

Correlational research indicates that media exposure is associated with the perceptions, attitudes, and behaviors of young people. A questionnaire study conducted by Larry Tucker (1985) and involving high school males indicated that viewers who watched a great deal to television had significantly higher levels of alcohol use per month than did viewers who watched comparatively less television. Gary Connolly and his colleagues (1994), who were also interested in the link between television viewing and alcohol consumption, conducted a study that followed participants over several years. Respondents were queried about their television viewing habits at ages thirteen and fifteen and their alcohol consumption at age eighteen. The researchers found that the more television the female subjects watched overall at ages thirteen and fifteen, the greater were their reported beer, wine, and liquor consumption at age eighteen. For males, there was no significant relationship between viewing at ages thirteen and fifteen and consumption at age eighteen.

An area more widely researched than entertainment portrayals of alcohol use is alcohol advertising. Joel Grube (1993) points out that the major themes associated with advertisements for alcohol are sociability, elegance, physical attractiveness, success, relaxation, romance, and adventure. Donald Strickland and his associates (1982) reviewed alcohol advertisements from almost five hundred magazines published between 1978 and 1982 in search of themes that dominated these advertisements. While most advertisements focused on the products, some included human models. They found that the models in the advertisements were predominantly between twentyfive and thirty-four years of age and that the activities depicted in the advertisements included primarily drinking by itself; however, drinking after work and drinking related to a sports event were also depicted.

Patricia Madden and Grube (1994) looked at both the themes and the frequency of advertising beer on television. They found more than two alcohol commercials per hour during major professional sports programs, about one per hour during college sports and one every four hours during prime-time fictional entertainment. One of the concerns emerging from this study was related to the content of the advertisements. Cars and other vehicles were present in more than 15 percent of the advertisements and water activities were present in 25 percent of the advertisements. Although alcohol use while operating vehicles is not advocated, it is interesting that the advertisements include these and other activities that might be hazardous for those who have been drinking.

There have been several studies concerning the effects of alcohol advertisements on young people. Lisa Lieberman and Mario Orlandi (1987) asked almost three thousand New York City sixth-grade students to recall and describe alcohol advertisements that they had seen on television. Eighty-five percent of the children could recall at least one advertisement. When asked what types of people were in the advertisements, the most frequently cited types were sports figures, celebrities, models and actors, and wealthy people. Almost 90 percent of the participants said the people in the advertisements were young adults.

Grube and Wallack (1994) interviewed fifthand sixth-grade students about their awareness of alcohol advertising and their perceptions, attitudes, and behavioral intentions regarding alcohol consumption. The researchers reported that the more aware students were of alcohol advertisements, the more positive their beliefs were about drinking. More positive beliefs about alcohol were associated with indications of likelihood to drink as an adult.

Because much of the alcohol advertising occurs during sporting events, some researchers have focused their attention on exposure to these events and attitudes toward alcohol. Paul Bloom and his colleagues (1997) surveyed individuals who were between thirteen and eighteen years of age. Those individuals who reported watching a large amount of professional football and professional baseball on television had greater intentions to drink than those who reported watching a smaller amount of these types of programs.

Conclusion

The research on the portrayal of alcohol use in entertainment programming and in commercial advertisements is fairly consistent. The image of alcohol use presented by the media is one that shows it as a relatively problem-free activity. This is enhanced by the fact that the individuals shown using alcohol are celebrities, wealthy, professional, successful, and attractive. The survey research, which provides correlational data, thus far points to an association between exposure to these portrayals and positive perceptions, attitudes, and behaviors regarding alcohol. Further investigations into the effects of portrayals should include experimental as well as survey research.

See also: TOBACCO AND MEDIA EFFECTS.

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ALPHABETS AND WRITING

This entry, in fact, this entire encyclopedia, would be a very different object if there were no alphabet. Although there are nonalphabetic writing systems and there are ways to communicate other than through writing, an alphabet is one of the most powerful tools for the easy expression of a diverse range of ideas.

An alphabet facilitates a print culture, one in which permanent records can be maintained and people can communicate with others across time and space. Even as people surf the World Wide Web for information in diverse media, they visit websites that are filled with displays of alphabetic characters. The source codes for these sites are even written in programming languages that rely on alphabets. What exactly is an alphabet? How did the first ones arise? What was it like to communicate prior to the invention of the alphabet? What are the differences between alphabets and other writing systems? How does the use of an alphabet relate to a print culture? Questions such as these have been explored for more than two thousand years and have led to heated debates, arduous archaeological expeditions, and massive treatises on the development of writing.

Development of the Alphabet

Although the details are the subject of active research and scholarly debate, there is a rough consensus on the general development of writing and the series of stages that were involved. However, many scholars disagree about the precise dates or sources of the changes that moved writing from one stage to the next.

In the earliest stage, any culture possesses a system of meaning; in fact, that is usually a key component of any definition of "culture." People communicate that meaning through verbal means, gestures, and physical markings. Cultures throughout the world have placed these markings in the sand, on rocks and trees, and on individuals' bodies. A palm print on the wall of a cave is not usually considered to be "writing," but it may



A Sumerian clay tablet from Ancient Mesopotamia features incised cuneiform characters that provide a tally of sheep and goats. (Gianni Dagli Orti/Corbis)

well qualify as such, given that it is an enduring representation of meaning.

Over time, these symbol systems evolve and begin to serve more complex functions in society. Denise Schmandt-Besserat (1989) has made the case that the use of tokens for accounting was a major precursor of writing in Sumeria. She presents evidence that simple tokens (e.g., spheres, disks, cones) indicating quantities of stored grain appeared with the development of agriculture in 8000–7500 B.C.E. More complex tokens representing manufactured goods appeared with elaborate markings at the time when cities and organized states developed, around 3500–3000 B.C.E. The earliest full-fledged writing systems then grew out of methods for representing these tokens in a linear form on tablets.

The early writing systems of Sumeria, Egypt, and neighboring countries were complex and difficult to learn. There were hundreds of distinct signs, or pictographs, to learn, each with multiple meanings. As a result, only a few scribes could read and write; literacy was essentially a monopoly of the rich and powerful. One might compare these systems to the Chinese writing, which originally developed around 1500 B.C.E. and now has thousands of characters.

It was once thought that the transition to alphabetic writing, to the forerunner of Greek, Hebrew, Arabic, and Latin alphabets that are in use today, occurred around 1700 B.C.E. in the Levant region, or what is now Syria, Lebanon, and Israel. However, in 1993 and 1994, John Darnell and Deborah Darnell made a discovery that changed previous thoughts. They were exploring in southern Egypt at a place called Wadi el-Hol (Gulch of Terror) when they discovered limestone inscriptions that appeared to be alphabetic. Returning in the summer of 1999, with early writing experts, they were able to show that the earliest known alphabet was probably invented around 1900–1800 B.C.E. by Semitic-speaking slaves who were working in Egypt. By reducing the set of symbols to a manageable thirty and by using these to represent consonants that appeared in the spoken language, the slaves had developed a system that anyone could learn relatively easily. This expanded greatly the possibilities for accumulating knowledge, manipulating it, preserving it, transmitting it to succeeding generations, and sharing it with others.

The Semitic alphabet then spread in various forms. Of most significance was its adoption by the Greeks (around 1000 B.C.E.), who eventually added symbols to the alphabet in order to represent vowels that appeared in their spoken language and to distinguish different words that might otherwise be represented by the same set of consonant symbols. Not long afterwards, this alphabet moved from the Etruscans (with influences from the Greek) to Rome, leading to the development of the Latin alphabet, which spread rapidly throughout the Western world.

The Origin of Print Culture

The shift to alphabetic writing made widespread literacy more attainable. It became easier to learn how to write and, perhaps more important, easier to learn how to read. With a writing system that could easily represent spoken language, it became possible to conceive of recording a lecture, a political speech, or a plan of action. Those permanent records led to many changes in society.

It overstates the case to mark the beginning of history by the beginning of an alphabet. Nevertheless, the movement from the oral narratives of Homer's day to the formal historical analysis of Herodotus and Thucydides depended on having the efficient, widely used writing system that the Greek alphabet provided. It is a similar overstatement to link the beginning of formal education, as in Plato's Academy, to the creation of an alphabet. Yet it is no accident that people speak of learning the ABCs; the modern educational system depends on alphabetic writing. Others have traced the origins of literature, philosophy, government, and science to the creation of alphabetic writing systems.

In the fifteenth century, the printing press was invented in Europe. Although a printing press had been developed in China, Johannes Gutenberg's innovation was to combine the press with typography, a technology that itself depended on an alphabetic system of writing. The possibility of wide dissemination of texts reshaped the church and the academy, extending a process of alphabetization that had begun more than twenty-five hundred years earlier.

A key aspect throughout this process of developing alphabets was the ability to represent knowledge in both permanent and mobile forms. As Bruno Latour (1988) argues, this made possible the development of both modern science and the Western European imperialist movement. The alphabet was a key element, facilitating typographic printing, which in turn allowed the easy reproduction of texts.

The great flowering of Greek culture appeared shortly after the adoption of alphabetic writing. Later, the Roman culture blossomed following its adoption of the alphabet from the Etruscans. Then, the full realization of the alphabet is observed through the printing press, which predates the Renaissance of these classic cultures. It is thus easy to adopt the innovation-driven view that the alphabet was necessary for, or even caused, these great changes in history. In The Literate Mind (1998), Jens Brockmeier cautions people about this kind of reasoning. He argues that before an alphabet can have the powerful effects attributed to it, there must be a literate mind ready to accept it and make use of it. More generally, that caution should lead people to be skeptical about any simple, one-step model of social change. Alphabets have certainly made a difference in the development of print culture, but it is necessary to look carefully at the processes of change to see the relations among literacy tools (such as alphabets), literacy practices, social organization, and literate modes of thought.

Alphabets Versus Other Writing Systems

It is impossible to ignore alphabets and their influence on the development of Western civilization. Alphabets can represent phonemes (i.e., units of speech that are distinguishable within a language) and, thus, alphabetic texts typically remain close to the familiar spoken language. This can make it relatively easy to learn to read and write. It also makes computing and printing easier. In contrast, nonalphabetic writing tends to represent concepts independent of their representation in speech. While there are a small number of phonemes in any language, there are thousands of concepts and, correspondingly, thousands of symbols. Thus, for example, in written Chinese there are thousands of characters to learn and remember. The huge number of symbols also makes printing and computer use more difficult.

The differences between alphabetic and other writing systems are important. On the other hand, one should be cautious in attributing too much to an alphabet. Consider, for example, its relation to

CLEFS CHINOISES. 馬隶赤色网皮片欠些山口丫。 龍骨雀走柳羊皿牙止心以土几 鼎商爾足虎羽百牛万小工士山」 鼓影青身虫老四大安戈已久刀 鼠門非車血而子二冊戸市叉力 鼻鬯面辛行未矢玉比手干夕力 齊局華辰衣耳石玄毛支多大已 齒鬼韋是西圭示瓜气支ナ女し 龍魚韭過~ 肉肉瓦氏支叉子亡 龜鳥音面見豆禾甘水斗井小十 俞鹵頁采角自穴生火斤七寸下 應風里言至立用 …方弓小卫 麥飛 谷白 田 爪 无 王 龙 丁 麻食金豆香竹正水日子尤ム入 黄首长豕好米广父日生元又八 黍香門多舟糸灰支月多戸 П 事具 民 街 百 并 木 彳 毋 日 Alphabets,

A nineteenth-century chart illustrates written Chinese, which is an example of a nonalphabetical writing system. (Historical Picture Archive/Corbis)

literature. Many would argue that alphabetic writing made possible literacy for everyone and mass distribution of texts through the printing press. Yet, a country such as China has achieved a high rate of literacy despite a writing system that few people, perhaps no one, can fully master. In fact, there are claims that the body of literature in Chinese is greater than that in European languages.

It is also argued that an alphabetic system is better because it is phonetic (i.e., the symbols can represent spoken sounds). This makes is easy to learn and easy to establish a connection between spoken and written language. However, linking the spoken and written language creates difficulties in multilingual contexts. In Europe, for example, there is no common written language in which one could write the charter for a European union. On the other hand, people throughout China, even though they speak very different languages, can all read Chinese writing. This is true across other countries in Asia as well. In a time in which people seek global understanding, nonphonetic writing systems can meet the needs of diverse speakers and alphabets can seem obstacle.

Some people also argue that alphabets make possible the permanent representation of meaning; indeed, that is a key ingredient of a print culture. However, because the alphabetic representation corresponds to the spoken sounds, it must change rapidly to accommodate inevitable changes in the way in which people speak. Thus, it is difficult to read some words that were written by William Shakespeare and nearly impossible for most people to read the original words written by Geoffrey Chaucer. Using an ideographic language, which makes no attempt to represent sounds, it would be much easier to turn to the texts of long ago. A person who is literate in Chinese can still read with ease those texts that were written long before the time of Shakespeare and Chaucer. The ability to transcend phonemic changes must certainly contribute to a sense of history and an understanding of the origins of ideas.

Finally, the straightforward simplicity of alphabetic languages comes at another price. As William Jenner (1992) points out, it may be easier to express laws less ambiguously in an alphabetic language, but the possibilities for poetry may be inherently greater in a language that is less tied to precise replication of spoken forms. Ideographic and pictographic languages offer multiple readings of both the sounds and visualizations of language that are not possible with alphabets.

The Mythical Story of Alphabets

The student of alphabets and writing might be forgiven for starting with what might be called the Homeric myth of alphabets. It goes something like the following. Someone in Ancient Greece invented an alphabet. This made possible writing, as it is known it in the West, and consequently, literature, history, philosophy, schools, laws, and the other trappings of modern civilization. As a result, there was one of the most dramatic shifts in all of human history, from an oral to a print culture and from illiteracy to literacy. The shift marks the divide between history and prehistory.

Several specific (although not necessarily correct) ideas follow from this legend. First, because alphabets developed long ago, their history is well established and noncontroversial; scholars know where and when the alphabets arose, and the unknown events that led to the development of alphabetic writing are lost forever in the desert sands. Second, the move to alphabetic writing represents the straightforward adoption of a useful new tool, and the origin of a print culture can be seen clearly as a consequence of the shift to alphabetic writing. Third, alphabets are clearly superior to other modes of writing. Fourth, alphabets and their use are fixed elements in the modern movements of technology and globalization.

As with any legend, there are elements of truth, but a long and continuing thread of scholarship has shown that the move to alphabetic writing, or what might better be termed a process of alphabetization, is far more complex, dynamic, farreaching, and current than this discrete shift model suggests.

Modern Alphabets

It is easy to think of the development of the alphabet as a historical curiosity, one representing an important event, but an event with little relevance to modern concerns. That way of thinking would miss seeing some fascinating events and issues.

First of all, the field of study of early writing systems is undergoing changes that are typical of a new or emerging field, rather than one wherein the major questions have all already been answered. As mentioned above, one of the most significant events in this area of inquiry was the finding of the first sample of alphabetic writing, which was reported in the mass media only at the end of 1999. As with similar discoveries, it has raised more questions than answers. What did that first writer say? Was he or she really the first? How was that alphabet invented? How did the ideas get back to the Levant and later to Greece and Rome?

To investigate questions such as these, centers have been established, such as the West Semitic Research Project at the University of Southern California. This project uses large-format cameras or high-resolution digital imaging to photograph objects and manuscripts. Various kinds of film, including those that record only infrared light, are employed as well. These new technologies transform the kinds of questions that scholars are able to ask about ancient texts and artifacts. Moreover, the actual processes of developing writing systems are continuing throughout the world. The well-known emoticons used in e-mail messages, such as the smiley face made up of a colon and a right parenthesis, are examples of people's continuing need to find better symbols for expression through writing. In some countries, this process is not so benign.

Toby Lester (1997) describes the situation in Azerbaijan. In 1991, the government had decreed that all Azerbaijan writing was to be in Latin letters instead of the Cyrillic alphabet, which had also been used for Russian. These changes are far more significant than, for example, the conversion to the metric system in the United States would have been. Changing alphabets in Azerbaijan is a traumatic process, but it happened before when they changed from Arabic to Latin in the 1920s, and then from Latin to Cyrillic in the 1930s.

Azerbaijan is not unique in this regard. Throughout the world, alphabets are a subject of politics, not just linguistics. They are also a way to express culture and social relations. Consider the ASCII system, which defines how computers encode characters. Few people may be aware of the fact that the system works perfectly well for the Latin alphabet but that it does not work at all for most of the languages in the world and that it requires more complicated coding for even the major European languages, such Spanish with its tilde, French with the cedilla, or German with the umlaut.

These issues are being played out in the World Wide Web. Major efforts have been devoted to building systems that can accommodate all writing systems, including even the nonalphabetic systems, but in practice, the user is still much better off if he or she can use the Latin alphabet. Will technologies be developed to permit communication across writing systems? Will the diversity in writing systems be preserved? Or, will participation in a global system lead to the dominance of a single alphabet? Will that alphabet itself change to meet new technological and political imperatives? These are questions that call for continued attention to the nature of the symbols that are used for writing.

See also: Animal Communication; Gutenberg, Johannes; Internet and the World Wide Web; Language Acquisition; Language and Communication; Nonverbal Communication; Printing, History and Methods of; Symbols.

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BERTRAM C. BRUCE

ANIMAL COMMUNICATION

While it is customary to think of humans as being unique among life forms, humans have a number of basic characteristics in common with other animals. Similar to other animals, humans are "open systems." Open systems are entities that are able to function and survive through ongoing exchanges with their environment. James G. Miller (1965) was one of the first scholars to observe that there are two general ways in which these systems interact with their environment. One involves a give-and-take of matter, and the other involves a give-and-take of information. The first process consists of an intake of food and oxygen, the processing of these materials for energy, and finally an outflow of wastes and carbon dioxide. The second activity involves attending to and acting on information. This second process can be termed "communication."

Viewed in this way, communication is one of the two basic processes of all living—human and animal—systems. Communication is the critical life process through which animals and humans create, acquire, transform, and use information in the form of messages to carry out the activities of their lives.

Forms of Animal Communication

Messages take a variety of forms-visual, tactile, olfactory, gustatory, and auditory. Visual messages are particularly important to humans, but they also play a necessary role in the lives of many other animals. Examples of visual messages that are useful in human communication include printed words or illustrations, a smile, a handshake, a tear, a new blue suit, or a stop sign. Movements, gestures, and colors have similar importance for animals. The color of birds and butterflies, the rhythmic light of fireflies, and the movement of head, ears, or tail by primates all serve as valuable sources of information. Types of visual messages include facial displays, movement of the body, spacing and position, dress, and other forms of adornment.

Tactile messages involve touch, bumping, vibration, and other types of physical contact. For humans, tactile messages are important from the time of conception to the end of life. This form of communication is at least as important for many other animals, for whom tactile messages play a role in biological as well as social development. Tactile communication is vital for many animal species in parent-young relations, courtship and intimate relations, social greetings and social interaction, and defense and aggression. Types of tactile messages include touch, vibration, stroking, rubbing, pressure, pain, and temperature-related information.

Olfactory and gustatory messages are chemical messages conveyed by smells and tastes. The technical term for these chemical messages is "pheromones." Pheromones are transported by water or air. Humans, of course, receive these messages by means of receptors that are sensitive to food and water-borne substances ingested by mouth and to air-borne scents that enter the nose. Insects receive these messages through sensors in their antennae, fish receive them through odorsensitive cells on the body or in the nose, and vertebrates receive them through the nose.

Auditory messages take the form of sounds produced by speaking, whistling, drumming, or striking a part of the body against an object, the ground, or another portion of the body. Auditory messages can also be created as an extension of human activity, such as the squealing of brakes on a car or the firing of a gun.

In addition to speech by humans and vocalizations by birds, primates, dogs, and various other animals, other auditory messages play an important role in human and animal communication. In the case of humans, auditory signals, such as alarms, are used to alert and to warn, and more complex auditory forms of communication, such as music, are also important.

As with other forms of communication, auditory messages become significant to animal and human systems when they are detected by receptors and then processed by the brain. In the case of lower-order living systems, the response is generally either one of approach or avoidance; that is, animals may respond to auditory messages either by approaching the source of a message or distancing themselves from it.

Some messages that are of importance to animal and human systems are created intentionally by utterances, written messages, or gestures. Others are not. For a human's tear and an animal's color are examples of messages that are not sent intentionally. Regardless of whether messages are sent intentionally or unintentionally, they can be of equal communicative significance to those who attend to them.

Functions of Animal Communication

Visual, tactile, olfactory, gustatory, and auditory messages serve a variety of essential communication functions for animal and human systems. Some particularly significant categories of these functions include courtship and mating, reproduction, parent-offspring socialization, navigation, self-defense, and territoriality.

Courtship and Mating

Differences between courtship and mating practices are substantial across different animal groups. Nonetheless, communication plays a basic role for all species. Some aspects are straightforward. For example, an essential part of courtship and mating involves the identification of an appropriate mate. Depending on the species, this identification process requires the processing of visual, tactile, olfactory, gustatory, and/or auditory messages. Courtship and mating also involve attracting potential mates, and sometimes persuasion and negotiation, each of which is a communication process.

The specifics of how these communication processes take place vary widely. For example, grasshoppers and crickets use song, moths use pheromones, and fireflies use the visual messages created by their flashing light.

Reproduction

The biological aspects necessary for reproduction can also be understood as a communication process—actually life's most fundamental such process. The reproductive process begins at the moment of conception with the joining of a sperm cell and an egg cell. These cells contain all the information needed for the creation of a new living being that bears a remarkable resemblance to its parents. Thus, through the union of these cells, and the development that unfolds thereafter, genetic communication assures the creation of new offspring and, in a broader sense, the continuity of the species.

Parent-Offspring Relations

Many offspring are quite dependent on adults for survival. For example, the survival of social insects, birds, and mammals depends on interaction with their parents. This interaction may take the form of food providing and physical guidance from one point to another. For many more complex social animals, extended contact between the offspring and adults is critical. In his classical studies, Konrad Lorenz demonstrated how birds and some other animals learn, or imprint, their identity through communication:

One of the most striking as well as pathetically comical instances . . . concerned an albino peacock in an Australian zoo, the lone survivor of a brood that had succumbed to a spell of bad weather. The peafowl was placed in the only warm room available. . . Although the peacock flourished in these surroundings, the peculiar effect of its reptilian roommates on the bird became apparent not long after it had



A male frigate bird inflates its red throat in order to attract females during the courtship process. (Wolfgang Kaehler/Corbis)

attained sexual maturity and grown its first train: Beginning then and forever after, the peacock displayed his magnificent plumes in the famous "wheel" position only to giant tortoises, eagerly if vainly courting these reptiles while ignoring even the most handsome peahens with which the zoo supplied him [Simon, 1977, p. 23].

This observation illustrates the fact that communication, in addition to providing support and instruction necessary for survival, can, in some cases, even provide the basic identity of the offspring.

Navigation

The term "navigation" refers to an animal's goal-directed movement through space. Whether the intention is to locate food, avoid an enemy, follow a colleague, or arrive at a particular destination, the activity involves the processing of messages of one form or another. Again, the ways in which these processes take place varies greatly from one species to another. Humans make extensive use of visual messages. Ants find their way by following an odor trail put in place by other ants.

Some animals navigate using echolocation, whereby they send out auditory signals and then guide themselves by processing information that comes from the echoes that are created as the signals



A leopard stretches and scratches a small tree to sharpen its long claws and to mark its territory on the Maasai Mara plains of Kenya. (Barbra Leigh/Corbis)

bounce off nearby objects. Among bats, these communication skills are so finely tuned that a bat can pass between two black silk threads placed less than a foot apart without colliding with the threads. Dolphins also use echolocation for navigation; they transmit clicking messages through their forehead and receive and "interpret" returning messages through their jaw and throat.

A most amazing navigational communication process is that used by social bees. Researcher Karl von Frisch (1971) found that when a worker bee identifies a desirable food source, it announces the discovery to other bees in the hive by performing a kind of dance. The distance to the food is conveyed by a rhythmic tail wagging, and the direction of the food is indicated by the path traveled by the bee as it performs its dance routine. If the dance points upward, the food lies in the direction of the sun. If the dance runs 90 degrees to the left of the sun, the food is 90 degrees to the left of the sun, and so on.

Self-Defense

The way in which animals defend themselves also frequently involves communication. For example, when an animal detects the presence of a predator, it reacts by mobilizing itself to flee the situation. Communication is basic to this detection-mobilizing-flight activity. Moreover, the departure of the animal may well become a message to other animals nearby—and to the predator—who may all respond based on the messages that they detect and process.

The communication dynamics associated with self-defense among humans are quite complex. Humans react to the sense that they are physically threatened, but they also react when they believe they are symbolically or psychologically threatened. The detecting-mobilizing-reacting process that occurs in response to events such as criticism, a failing grade, or rejection by a friend or romantic interest involves communication. These communication dynamics can then trigger communication responses in others who witness the initial detecting-mobilizing-reacting process.

Territoriality

Communication can also play a role in establishing and maintaining home territories. Many animals—humans among them—become attracted to particular places and spaces where they were born, spent their early years, or mated. This attachment also leads to a desire to mark, maintain, and sometimes even defend the territory against intruders. Communication is a process through which territories are marked, and it is also the means by which animals detect and respond to invasions.

Birds provide one of the best examples of the importance of territoriality and the way in which territories are defined, maintained, and defended. Some birds take possession of an area, a hedge, or a portion of a meadow. Once this has occurred, male birds go to great efforts of using songs to keep out other males. Some birds actually create songs with two distinct forms. They use one song to maintain communication with their partners, and they use another version to define and display their territory. Obviously, humans also go to great efforts to define and defend their territories homes, neighborhoods, communities, or countries against "outsiders."

Some animals, humans among them, establish temporary or transitory territories. Examples are

provided by fish and birds that travel or rest in groups. Temporary personal space is also a major issue for humans. Individuals, for example, claim temporary space at the beach by using towels and other miscellaneous items as messages to others that the space is already taken. Newspapers or a folded coat on an empty seat on a bus or in the movie theater similarly serve as messages about spaces being claimed. Perhaps most sacred is the "bubble" of personal space that exists around individuals. When this space is violated by someone who is standing or sitting "too close" to an individual, it results in discomfort and, generally, a physical response in which the individual moves away in a direction that reclaims the amount of space to which he or she feels entitled.

Summary

Communication plays a major role in the most fundamental life processes of animals. This perspective provides a reminder that communication is one of the two means through which all animals adapt to and survive in their environment. Communication takes many forms and serves a variety of functions, but amid all this diversity, there is still a good deal of commonality in terms of the basic communication dynamics and the functions they serve for living systems.

The study of animal communication, beyond being of interest in its own right, helps to further an understanding of human behavior and the role communication plays in human affairs more generally. It provides a source of reflection on human behavior and activities, and it provides a reminder that humans share a great deal in common with other animals. At the same time, these studies serve to highlight the complexity and special character of human communication, which involves the use of symbols. Symbols are messages that stand for things other than themselves, and their use is fundamental to human communication and human life.

Words are symbols, as are flags, dates on the calendar, dollar bills, and stop lights. Each message serves as a signal for a set of meanings that have been created, taught, and maintained through communication. To illustrate, a flag of a country has no inherent, natural meaning. It is simply a piece of colored cloth. However, through time and use, flags become symbols that are capable of conveying many rich meanings. Using symbols in communication allows humans to have much more flexibility than other animals, whose communication essentially involves signals with far more limited ranges of meaning. At the same time, human symbolic communication is far more complex than animal communication and carries with it possibilities for misunderstanding, error, and misinterpretation.

See also: NONVERBAL COMMUNICATION; SYMBOLS.

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ANTIVIOLENCE INTERVENTIONS

Concern over the harmful effects of televised violence on children has prompted the development of antiviolence interventions to prevent these negative outcomes. These interventions have taken many different forms, from formal television literacy curricula implemented by schools to smaller-scale research efforts designed by individual researchers.

Television literacy curricula were first developed in the late 1960s and early 1970s to provide systematic instruction in how to watch television. Since then, many different organizations and individuals have developed television literacy materials, including the major television networks and organizations funded by the U.S. Office of Education. Television literacy programs have been used with children as early as kindergarten and as late as high school. They have been implemented in many different locations around the globe, including the United States, Sweden, South Africa, Great Britain, France, Canada, and Australia.

Advocates of television literacy curricula argue that, just as children need schooling to learn how to read, children must be taught how to watch television so they can become literate television viewers. According to this perspective, children who lack television literacy are at a greater risk of misunderstanding television and experiencing negative effects from exposure to it. As a result, they require intensive instruction in television literacy.

To prevent negative effects (including the imitation of televised violence) from occurring, television literacy curricula involve teaching children a number of skills and lessons regarding television. For example, children are often taught about the technical and economic aspects of producing television programs, the purpose of televised commercials, and the difference between the fantasy world of television and the real world. Some curricula may also include units that address certain types of televised portrayals, such as those featuring stereotypes and violence.

Often, the effectiveness of television literacy curricula is not empirically tested. As a result, it is difficult to determine how well the various programs work in protecting children from the negative effects of television. However, as Dorothy G. Singer and Jerome L. Singer (1998) noted, the empirical assessments that have been made indicate that television literacy curricula do help in successfully teaching children about television. For example, children who have participated in these kinds of programs can identify special effects, more easily distinguish between reality and the fantasy world of television, know more about advertising, and understand more television-specific vocabulary (e.g., "sponsor," "animation") than other children. It is often assumed that children who have developed these kinds of critical viewing skills will be less vulnerable to experiencing negative effects from viewing harmful media content, such as violence.

Unfortunately, many of the television literacy programs do not assess whether participating children are less affected by the violent television they view. However, there is some limited evidence that children who receive in-school lessons about television violence are less likely to be affected by this content than other children. For example, Marcel W. Vooijs and Tom H. A. van der Voort (1993) found in their study that children who are taught about the seriousness of violence became more critical viewers of televised violence. Likewise, L. Rowell Huesmann and his colleagues (1983) found in their study that children who participate in television literacy programs that highlight the undesirability of watching and imitating violent acts shown on television have more negative attitudes toward television violence and are less aggressive than other youngsters. It could be, then, that curricula aimed at decreasing the negative effects of televised violence need to encourage teaching children explicitly about this content rather than simply providing instruction about television in general.

Other efforts to intervene in the media violence-aggression relationship among children have taken different forms. For example, some efforts target parents rather than children and involve workshops, brochures, and videos. These materials often seek both to educate parents about the potential negative effects of television and to teach parents strategies for promoting critical viewing skills among their children. The assumption is that by educating parents about the harmful effects of television and teaching them skills for mitigating these effects, parents will "mediate" their children's television viewing. Unfortunately, as Singer and her colleagues (1980) noted, many parents are not interested in this kind of instruction, perhaps because they perceive television to be a problem for other children, not their own.

Although relatively few of the major efforts at teaching television literacy have included specific instruction about television violence, smaller-scale interventions designed to combat the effects of this particular content have been developed. These interventions are typically implemented by individual researchers who have designed very brief messages that they believe will counteract the negative effects of violent television on children. During the experiment, one group of children usually watches a clip from a violent television program with an experimenter who makes negative comments during the program, and another group usually watches the clip with an experimenter who either does not make any comments or makes very neutral comments. In both cases, after the program has been shown, the aggression levels of all of the children are assessed. It is expected that children who hear the negative comments during viewing will be less aggressive after exposure than will be children who do not hear negative comments. The assumption of this research appears to be that children need an adult to condemn the glamorous depiction of violence on television so that they will not experience negative effects from viewing this content. It should be noted that many of these experiments are conducted with the goal of developing strategies that parents could use when they watch violent television with their children. As a result, this research is very relevant to the work conducted on parental mediation.

Although there have only been a handful of studies that evaluate the effectiveness of these smaller-scale interventions, the research that has been conducted has yielded promising results. For example, David J. Hicks (1968) found in his experiment that children who hear an experimenter make negative comments about the television violence they are watching (e.g., "He shouldn't do that," "That's wrong," and so on) have less-aggressive attitudes and display less-aggressive behavior than do other children. Further, Amy I. Nathanson and Joanne Cantor (2000) found from their experiment that asking children to empathize with the victims of televised violence is also successful in reducing the likelihood that children will experience negative effects from watching television violence. It seems, then, that children can benefit from hearing very simple, straightforward messages regarding television violence.

Overall, research on antiviolence interventions suggests that children can learn to resist the negative messages they receive from violent television. Although the effectiveness of many of the formal television literacy programs is unknown, the available research indicates that instruction whether it occurs as part of a formal curriculum or whether it occurs only as children view televised violence—should highlight the undesirability of the behavior that is being depicted. When faced with the often glamorous depictions of television violence, children may need adults to help them critically view this material and process it in a way that reduces the harmful effects.

See also: Children's Comprehension of Television; Parental Mediation of Media Effects; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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Vooijs, Marcel W., and van der Voort, Tom H. A. (1993). "Learning about Television Violence: The Impact of a Critical Viewing Curriculum on Children's Attitudinal Judgments of Crime Series." Journal of Research and Development in Education 26:133–142.

AMY I. NATHANSON

APPREHENSION AND COMMUNICATION

Communication apprehension (CA) is the fear or anxiety associated with either real or anticipated communication with another person or persons. Although some people desire to communicate with others and see the importance of doing so, they may be impeded by their fear or anxiety. People who do not have appropriate communication skills or whose communication is ethnically or culturally divergent may also develop communication apprehension. Most people who are communication apprehensive, however, are neither skill deficient nor different from others in the general culture. Typically, they are normal people who are simply afraid to communicate. Because it is natural for people to avoid things that they fear, communication-apprehensive people tend to be less willing to communicate. Therefore, they may be labeled shy by others around them. It is important to note, also, that many communicationapprehensive people do not feel restricted by their feelings about communicating-they can be as happy and as productive as nonapprehensive communicators. Most of the social problems that are experienced by these individuals stem from how they are perceived by others and how others respond to them.

This entry focuses on the discussion of communication apprehension on norms from the Personal Report of Communication Apprehension (PRCA) 24 scale. Completing the scale allows the user to know where he or she falls within the normative range of scores. Scores on the PRCA24 scale should range between 24 and 120 (if they are below 24 or more than 120, a computational error has been made). The PRCA24 scale is designed to measure a general trait of communication apprehension—how a person typically reacts to oral communication with others. The higher a person scores on the PRCA, the more apprehension that person generally feels about communicating.

Between 60 percent and 70 percent of the people who have completed the PRCA scale have scores ranging from 50 to 80. This is called the "normal" range. If one's score falls anywhere outside this range, the idea of communication apprehension may be especially relevant to that person. If one's score is between 24 and 50, that person is among those people who experience the least communication apprehension. This individual is apt to be higher talkers and may actively seek out opportunities to interact with others. Very few, if any, communication situations cause this individual to be fearful or anxious. If one's score is somewhere between 50 and 60, that person experiences less communication apprehension than most people. However, he or she is likely to feel some fear or anxiety about a few situations. If one's score falls between 60 and 70, that person's level of communication apprehension is similar to that of most people. There are some communication situations that may cause this person to feel anxious or tense; in others, he or she will feel quite comfortable. If one's score is between 70 and 80, that person experiences more communication apprehension than most people. Probably, many communication situations cause this person to be fearful and tense, but some do not. If one's score falls between 80 and 120, that person is among those who experience the most communication apprehension. This individual is likely a low talker, one who actively avoids many communication situations because he or she feels much anxiety and tension in those situations.

Those people who fall within the various score ranges on the PRCA scale will now be examined more closely. People in the "normal" range (50 to 80) tend to respond quite differently in different situations. They may be very tense in one situation (when giving a speech) but quite comfortable in another (when out on a date). Those who score in the "low" (below 50) and "high" (above 80) ranges tend to respond to most communication situations in the same way. Researchers consider both extremes to be abnormal. The "low" communication-apprehensive person is considered abnormal because this person is unlikely to feel any fear or anxiety about communicating, even in situations in which he or she should be anxious (e.g., when entering his or her very first job interview). Although it is often an advantage not to be bothered by oral communication, it is also normal

FIGURE 1. The PRCA24 scale.

Personal Report of Communication Apprehension (PRCA24)
Directions: This instrument is composed of twenty-four statements concerning feelings about communicating with other people. Please indicate the degree to which each statement applies to you by marking whether you (1) strongly agree, (2) agree, (3) are undecided, (4) disagree, or (5) strongly disagree. Work quickly; record your first impression.
 1 I dislike participating in group discussions. Generally, I am comfortable while participating in group discussions. I like to get involved in group discussion with new people makes me tense and nervous. I am calm and relaxed while participating in group discussions. Sengaling in a group discussion with new people makes me tense and nervous. I am calm and relaxed while participating in group discussions. Generally, I am nervous when I have to participate in a meeting. Usually, I am calm and relaxed while participating in meetings. I am very calm and relaxed while participating in meeting. I am very calm and relaxed while participating in meeting. I am very calm and relaxed when I am called on to express an opinion at a meeting. I am very calm and relaxed when a meeting. I am very relaxed when answering questions at a meeting. I am very relaxed when answering questions. I am very relaxed when answering questions. Ordinarily, I am very tense and nervous in conversations. Ordinarily, I am very tense and nervous in conversations. While conversing with a new acquaintance, I feel very relaxed. Ordinarily, I am very calm and relaxed in conversations. I am afraid to peak up in conversations. I have no fear of giving a speech. I face the prospect of giving a speech. I face the prospect of giving a speech with confidence. While giving a speech, I get so nervous I forget facts I really know.
 Scoring: To compute context subscores, begin with a score of 18 for each context and follow the instructions below: 1. Group discussion: Add scores for items 2, 4, and 6. Subtract scores for items 1, 3, and 5. 2. Meetings: Add scores for items 8, 9, and 12. Subtract scores for items 7, 10, and 11. 3. Interpersonal: Add scores for items 14, 16, and 17. Subtract scores for items 13, 15, and 18. 4. Public speaking: Add scores for items 19, 21, and 23. Subtract scores for items 20, 22, and 24.
To compute the total score for the PRCA24, add the four subscores (which should each range from 6 to 30). Total scores can range from 24 to 120. Scores above 80 = high communication apprehension; below 50 = low communication apprehension.

to feel some fear in response to a threatening situation. The person who experiences no fear in such situations usually makes poor decisions about when to communicate and when not to communicate. The "high" communication-apprehensive person is considered abnormal because this person usually experiences fear and anxiety about communicating-even in presumably nonthreatening situations such as calling a friend on the phone. Such people are likely to avoid communication in many, even most, situations. This avoidance can be quite costly when communicating would be advantageous. A common example is the student who never participates in class discussion even when participation is a criterion for a higher grade.

Communication Apprehension as a Trait

By the phrase "as a trait," it is meant that communication apprehension is a part of the personality of an individual. Such a trait is most important for those people who have either very high or very low levels of communication apprehension. It is this trait that the total score on the PRCA scale was designed to measure. An extreme score on this measure suggests that the behavior of an individual is influenced as much, if not more, by general fear or anxiety about communication as by any specifics of a communication situation in which the individual find him- or herself. At the extremes of the trait, an individual either experiences high degrees of anxiety in most communication situations or experiences very low degrees of anxiety in most communications.

From 15 percent to 20 percent of the population falls within each extreme category. Thus, if an individual scores very low or very high on the PRCA scale, that person is outside the normal range of scores where about two-thirds of the population score. At one end are the people who are called "high CAs" (those who have high communication apprehension), and at the other end are the people who are called "low CAs" (those who have low communication apprehension). The people who are called "moderate CAs" (those who have moderate communication apprehension) are those who fall in the normal range. All three of these terms refer to trait communication apprehension.

Communication Apprehension in Generalized Contexts

This view of communication apprehension recognizes those individuals who experience high levels of anxiety about communicating in a particular context or situation but have much less or even no anxiety about communicating in other contexts. The PRCA scale, besides giving a measure of trait communication apprehension, can be broken down to yield measures of communication apprehension in four generalized contexts: talking within small groups, speaking in meetings or classroom situations, talking in dyadic interpersonal encounters, and presenting public speeches.

The level of apprehension that a person experiences in each of these generalized contexts can be computed by using the following formulas that are based on how the individual completed the PRCA:

- Group CA = 18 + (Item 2 + Item 4 + Item 6 - Item I - Item 3 - Item 5)
- Meeting CA = 18 + (Item 8 + Item 9 + Item 12 - Item 7 - Item 10 - Item 11)
- Dyadic CA = 18 + (Item 14 + Item 16 + Item 17 - Item 13 - Item 15 - Item 18)
- Public Speaking CA = 18 + (Item 19 + Item 21 + Item 23 - Item 20 - Item 22 - Item 24)

For these scales, a score above 18 is high, and a score above 23 shows an extremely high level of communication apprehension about that generalized context. It is quite possible for a person to score very high in one context but relatively low in another or even all of the others. If this is the case, it indicates that the person is highly apprehensive about some but not all generalized contexts.

Some people score high on the measure for group communication but low on the others. Here, a person would feel apprehensive about communicating in situations that involve a small group. Two types of groups are important here. One type is the task-oriented group. This type of group is one in which the participants meet for solving one or more problems (e.g., a group of students who meet to study for an exam). The other type of small group is the social group. This type of group formed for enjoyment, amusement, and/or sharing friendship.

A person could feel apprehensive about communicating in either type of group for many reasons. Perhaps the person feels that other group members are too critical of her or his ideas or suggestions. Perhaps the person feels that her or his own contributions are not important to the other members. Alternatively, the attitude of the person could be "More than two people cannot carry on a meaningful and effective oral exchange, so why get involved?" For the person who is highly apprehensive in small-group contexts but not in others, there is simply some aspect of small-group situations that causes the individual much discomfort when participating in them.

Some people have a higher level of communication apprehension in a meeting than in other situations. Meetings are similar to the group situation. Here the group is larger, and communication among participants is relatively formal and stylized. A good analogy is the typical college classroom. A person may be very talkative when with friends, when on a date, or even when meeting a new acquaintance. However, the formal structure of the classroom, combined with the pressure of having to display knowledge orally, may cause much anxiety. Most people can communicate quite openly and easily when they feel free to say what they want when they want to say it. When they confront a context such as a classroom or committee meeting where communication is restricted by explicit rules, they can become very apprehensive.

If one's level of communication apprehension is higher for dyadic interpersonal contexts than for the others, that person experiences anxiety when interacting with others on a one-on-one basis. There are several interpersonal contexts in which one might feel highly apprehensive about communicating. One context is when someone is interacting with a peer. The person may be so concerned with trying to make a good impression that it leads to much tension and anxiety. Another interpersonal context in which many people feel anxious is in interacting with a teacher. The individual may be very talkative in class. However, when facing a teacher one-on-one, the person experiences anxiety because of uncertainty about how to react to the teacher or about how the teacher might respond. A third anxiety-producing dyadic context is that involving encounters with the opposite sex. Some people approach communication with the opposite sex with confidence. Others, however, because of past negative experiences or anticipated negative consequences, find communicating with the opposite sex to be quite traumatic.

Feeling some anxiety about interpersonal situations such as a job interview is common to the majority of people. A job interview, particularly the first one, is a very strange and novel experience, and few people really know how to deal with it. Communication is the key to a successful interview. Being uncertain and fearful about what to say in a job interview and how to respond to the interviewer can result in high levels of communication apprehension. Many people feel apprehensive when communicating with their supervisors at work. This feeling may stem from a need to make a good impression on the supervisor. Perhaps it stems from a fear of having the ideas that one puts forth to the supervisor explicitly rejected. Conversely, many supervisors have a high level of anxiety about communicating with subordinates. Their apprehension could stem from anticipating complaints about how matters that involve subordinates are being handled. Their apprehension could stem from not having the information that subordinates want or need to carry out their jobs in an effective way. Whether the situation is formal or informal, whether it involves friends or strangers or people of equal or different status, many individuals find dyadic interpersonal contexts to be anxiety-producing situations.

Public speaking is the generalized context that causes the most problems for the most people. In fact, several national studies have indicated that the fear of public speaking is the number one fear of Americans. Public speaking places a person in a conspicuous position in front of others who will be critically evaluating both the person and what the person has to say. Many people have little experience and little or no training in effective speech making. Thus, it is not surprising that so many people find this context threatening.

Communication Apprehension with a Given Individual or Group

Nearly 95 percent of the American population has felt apprehension at least once when communicating with some specific person or group. It is not the communication context that triggers the problem; it is the other people. Some people simply cause others to be apprehensive. It may be a parent, a teacher, a certain salesperson, the IRS agent, the principal, or the boss. This anxiety may be a function of how others behave toward one (e.g., "Bring home an F, and you're on your own.") or perhaps the role they play in one's life (e.g., "Hello. I'm here to audit your tax returns for the past five years"). For most of people there is someone, such as a friend or relative, who makes them feel totally relaxed during interactions. It also is quite normal for individuals to find talking with some specific person or group, such as a police officer or a doctor, to be anxietyproducing.

Virtually all people experience communication apprehension with a given individual or group in a given situation. Most examples of this seem extreme-such as a person who is forced to apologize to a friend for offending that person, a person who arrives home to find a message that a date has had a last-minute change of heart, or a person being confronted by a teacher after class with the accusation of cheating. What separates communication apprehension in these situations from the other forms of communication apprehension is that these situations are unique encounters with a specific individual. Thus, although one generally would not be apprehensive about communicating with the other person, the specific situation arouses anxiety. Most people can communicate quite easily with their mothers, but forgetting their mother's birthday can lead to quite a hair-raising communicative event.

Communication apprehension, therefore, is a fear or anxiety about communicating that can stem from one's basic personality, from the type of communication expected, from the person or persons with whom one anticipates communicating, or from the unique circumstances that surround a given interaction. No matter what its source is, communication apprehension causes people discomfort, it may lead people to avoid communication, and it can result in people being ineffective in their communication with others.

Causes of Communication Apprehension

Trait-like communication apprehension is thought to be a matter of personality. Thus, the causes of this type of communicative anxiety are much like those of any personality variable; namely, it is a function of either the environment or genetic factors, or most likely a combination of the two. The discussion that follows focuses on potential environmental causes of generalized apprehension. As for situational communication apprehension, many causes are possible. Some of these have to do with the nature of specific interactions, the relationships between the participants in the interaction, and past experience—all functions of the environment.

Generalized Communication Apprehension

Research has failed to find out with absolute certainty the causes of trait-like communication apprehension. Research has been able to show statistical correlations between communication apprehension and theoretically proposed "causes." One particular theory, however, does permit a causal explanation of generalized communication apprehension because it takes into account both personality traits and situational constraints. The theory is expectancy learning, or, more specifically, a type of expectancy learning known as learned helplessness.

The underlying assumption of expectancy learning, as applied to communication apprehension, is that people develop expectations about other people and situations and about the probable outcomes of communication with those people and/or in those situations. A person develops confidence in his or her communication to the extent that such expectations are fulfilled. When expectations are not met, the individual develops a need to form new expectations. If expectations continually are not met, the person may develop a lack of confidence. Anxiety is produced when no appropriate expectations can be formed. Fear is produced when expectations lead to negative outcomes that are difficult or impossible to avoid. These two occurrences, according to expectancylearning theory, are the foundation of communication apprehension.

An example will illustrate this point. Heather had recently made a new acquaintance, Mike. At their first meeting, Heather was quite attracted to Mike and felt that the interest was reciprocal. After crossing paths a few more times, she was certain that Mike liked her and that he would soon call. At this point, Heather had formed two expectations: (1) Mike liked her and (2) he was likely to ask her out. After many more meetings, Heather began to wonder why Mike had not called her. Later, at a movie, Heather saw Mike with another woman and discovered that the couple had been dating for several weeks. At this point, Heather developed a lack of confidence in her predictions about Mike and his feelings for her. Having failed to form any appropriate expectations about their actual and potential relationship, Heather became anxious about her interactions with the opposite sex. If this happens to Heather with several different male acquaintances, she could very well develop a fear of interacting with men and experience communication apprehension when placed in that type of situation.

The example of Heather is greatly oversimplified and perhaps overdramatized. The process portrayed would require a great amount of time and more than one relationship and situation. It does help to illustrate, however, how expectations can serve to heighten apprehension about communication. Regularity of appropriate expectations is the key. One of the most general expectations in life is to have regularity in one's environment. People expect to be reinforced for some behaviors and not reinforced for others. Reinforcement, or the lack of it, is the outcome that people learn to expect by continually engaging in certain behaviors over time and across situations. From this process, three things can happen: (1) people develop new positive expectations, (2) people develop new negative expectations, or (3) people become helpless.

When a person engages in communicative behaviors that work i.e., when he or she receives reinforcement for the communication), that person develops positive expectations for those behaviors. The behaviors become a regular part of the person's communicative "storehouse." Had Mike called Heather for a date, she would have developed positive expectations for her communicative behavior that led to the date. She would have continued engaging in them since Mike reinforced them. Neither anxiety nor fear is associated with such positive expectations. Negative expectations are developed in much the same way as positive expectations. People discover that some communicative behaviors lead to punishment or lack of reinforcement, and they tend to reduce those behaviors. This is what happened to Heather in the above example. Mike offered no reinforcement for how Heather communicated with him (at least as she saw it). Thus, Heather began to question the appropriateness of her behavior. The next time that she meets a new potential date, having no other behaviors readily available from which to choose, Heather's fear will be her natural response.

Learned helplessness results from irregular or inconsistent reward and punishment. Perhaps the last young man whom Heather met was very responsive to her and they had a good relationship for quite some time. Now Mike comes along and offers no reinforcement for her behaviors. If this inconsistency were to occur through several relationships for Heather, and if she were unable to determine the appropriate (reinforced) behaviors from the inappropriate, she would become literally "helpless" in her relationships with males. Learned helplessness and negative expectations are the primary components of communication apprehension. The more general the helplessness or negative expectations, the more trait-like the apprehension. In other words, if an individual constantly forms negative expectations about and becomes helpless in her or his communication with others, then he or she is more likely to have communication apprehension as a trait.

Situational Communication Apprehension

The causes of situational apprehension may be generated by the following eight elements: novelty, formality, subordinate status, conspicuousness, unfamiliarity, dissimilarity, excessive attention, and evaluation from others.

The first day of a new class or a new job can be a difficult situation to deal with initially. It is the novelty of the situation that causes the anxiety. In fact, such novel situations may prevent people from being comfortable communicating with others.

Formal situations are associated with highly prescribed behaviors. In these situations, the prescribed behaviors are deemed appropriate and there is little latitude for deviation from them.

The same is true for subordinate status. In this situation, the person holding the higher status



Apprehension can increase in relation to an individual's shyness, which, in the case of Leilani Tassillo, resulted in her covering her face in an awkward moment during a White House media event held in August 1999 to address the issue of youth violence. (Reuters NewMedia Inc./Corbis)

(e.g., an instructor to a student) defines what is appropriate behavior.

Being conspicuous can increase a person's communication apprehension. For example, when a person is put "on the spot," such as when giving a speech or introducing a speaker to an audience, the person can experience heightened anxiety.

Unfamiliarity is involved when a person attends a social gathering and only know one or two other people. Generally, the more unfamiliar the people and situation around one, the more apprehensive a person feels.

In much the same way, dissimilarity of those around one causes communication apprehension to increase. For the most part, talking to people who are similar to oneself is easier than talking to people who are different. For example, if an individual is an English major, he or she may find it hard to carry on a conversation with a person who is a diehard engineering major. There are exceptions. Some people are less comfortable when they are talking to people who are like themselves than when they are talking to people who are very different, or even strangers. This happens because the former is more likely to make evaluations that may prove threatening.

Most people do not like others staring at them. Neither do they care to be ignored by others. A moderate degree of attention from others is usually the most comfortable situation. Excessive attention, such as staring or having someone probe into one's private thoughts, can cause the level of communication apprehension to rise sharply.

Many students have little trouble conversing with their teachers—until the teacher begins evaluating the student's classroom performance. The same holds true for workers in relation to their supervisors. When people are evaluated, they tend to become more anxious than they would otherwise be. As the intensity of the evaluation increases, so might the level of apprehension.

Of all of the causal elements of communication apprehension that have been discussed, the most important may be previous failure. When a person fails at something once, he or she will probably fear failing again. It is a case of expectations. If one expects to fail and does so, the negative expectations are reinforced. If a person is unable to decide the successful behavior to engage in, he or she is quite apt to develop apprehension. Of course, success causes confidence, which leads to more success, which reduces apprehension.

Effects of Communication Apprehension

The most obvious effects of communication apprehension are internal discomfort, avoidance or withdrawal from communication situations, and communication disruption. People experience communication apprehension internally. That is, the experience of communication apprehension is a mental one—it is felt psychologically. Thus, while some individuals may experience communication apprehension to greater or lesser degrees than other individuals, or only with certain people or in certain situations, the one thing that people all share when they are anxious about communicating is an internally experienced feeling of discomfort. Typically, the lower the communication apprehension, the lower the discomfort. People tend to differ in their individual responses to communication apprehension. Some handle it well and can communicate effectively despite their internal discomfort. However, most people who experience communication apprehension, particularly those who experience high levels of it, communication is a problem. Three typical response patterns emerge when communication apprehension is experienced: communication avoidance, communication withdrawal, and communication disruption.

When people are confronted with a situation that they expect will make them uncomfortable and they have a choice of whether or not to enter the situation, they can decide either to confront the situation and make the best of it or to avoid it and thus avoid the discomfort. An analogy is the student who receives poor midterm grades and decides not to go home for spring break. By not going home, the student avoids the discomfort of having to face his or her parent's wrath about the grades (this assumes, of course, that the student has a choice of whether to go home). Frequently, people who have high communication apprehension will avoid situations that require them to communicate orally with others.

It is not always possible for a person to avoid communication. Sometimes there is no reason to expect a situation to cause discomfort, so a person may enter it with her or his psychological guard down. When situations such as these arise, withdrawal is the typical response for the person who is experiencing communication apprehension. The withdrawal may be total (e.g., absolute silence) or partial (e.g., talking only when absolutely necessary). An example of possible withdrawal is the student who speaks in class only when directly called on by the teacher. Another is when a person in a one-on-one interaction only answers questions and gives responses but never initiates conversation. When unable to avoid a communication situation, the communication-apprehensive person usually will, if possible, withdraw from interaction.

A third typical response to communication apprehension is communication disruption. This disruption can take two forms. One form is disturbed or nonfluent communication. Examples include stuttering, stammering, speaking too softly, increased pauses, use of inappropriate gestures and expressions, and poor choices of words and phrases. The other form of disruption is overcommunication. This is an overcompensation reflected in one's attempt to succeed in the situation despite the internal discomfort it causes. An example is the person who, in spite of her or his apprehension, attempts to dominate interactions with others, refuses to acknowledge cues that others want to leave, or tries to answer every question a teacher poses in a class. Thus, the highly communication-apprehensive individual is likely to use inappropriate behaviors in a discomforting communication situation. It is important to note, however, that disruption is also characteristic of people with inadequate communication skills and that overcommunication is often mistaken for low apprehension.

Perceptions about Quiet People

As noted earlier, society places a great deal of importance on communication. It is no surprise, then, that low talkers are usually perceived as being unfriendly. Low talkers are also viewed as being less attractive than talkative people. Moreover, even low talkers perceive other low talkers to be less attractive than talkative people. Low talkers are perceived as being less competent than talkative people. Research has found people to have a stereotype of a quiet person as being less competent and less intelligent. Fortunately, this is only a stereotype (i.e., a generalization that generally does not hold true for all members of a group). There are just as many intelligent low talkers as there are intelligent high talkers. Nevertheless, the general perception of low talkers is that they are less competent and less intelligent.

A frequently accurate perception of low talkers is that they are generally more anxious than talkative people. Although not all low talkers are apprehensive about communication, many are apprehensive. Their tendency for apprehension is generalized to other low talkers. This leads to another stereotype: that low talkers are anxious people.

The role of leader in most situations requires at least a moderate degree of communication with other people. Thus, low talkers are perceived to be poor leaders. This perception is very often correct. There are, of course, instances in which quiet people provide leadership functions. For example, they might provide some necessary information that helps a group reach a decision. However, even in these situations, the low talker is unlikely to be perceived as a leader. Perceptions such as the ones just presented are important for several reasons. How people perceive others determines the nature of the relationship between them. In addition, how people perceive others will have a significant effect on interactions in certain settings. Three of these settings are school, social environment, and the workplace.

School

The perception of low talkers as less competent and less intelligent than talkative people greatly affects how they are responded to in school. For example, since teachers tend to expect low talkers to do less well in school, they treat low talkers as if they were less intelligent. Low talkers are less likely to be called on in class, receive less attention from teachers, and ask for help less frequently than do talkative people. Therefore, with so little interaction, the low talker has fewer opportunities to correct mistakes and to receive reinforcement.

Does this affect their achievement? Research suggests that it does. Take, for example, the classroom in which much of the final grade depends on "participation": the low talker is less likely to participate in class activities, and this student's grade is apt to be lower than that of talkative students. As this type of evaluation affects the achievement of the low talker throughout school, it ultimately has an effect on the student's general learning. Lack of opportunity and even discrimination lead to less learning for the low talker in the long run, although the low talker is no less intelligent than the talkative person. In short, low talkers tend to fare poorly in school while talkative people tend to fare well.

Social Environment

Social relationships require communication for their establishment and maintenance. Typically, when someone does not want to talk, people disregard that person and move on to someone else. As noted earlier, low talkers are perceived as being both less friendly and less attractive than talkative people. Low talkers have fewer dating relationships than talkative people, and, to some extent, they have fewer people whom they can call "friends."

In one study that asked high communicationapprehensives and low communication-apprehensives to indicate how many people they knew that they could classify as "good friends," the high apprehensives indicated a range from zero to two, with more than one-third indicating none. More interesting was the finding that, when asked to list the names of their good friends, the high apprehensives most often named relatives while the low apprehensives seldom listed relatives. Just as in school, then, it seems that low talkers tend to fare less well in the general social environment than do talkative people.

Workplace

The many perceptions that people have of low talkers are perhaps most felt in the work setting. Low talkers are less likely than talkative people to be given job interviews, especially when their qualifications are equal. Even when an interview is granted, the low talker will garner negative perceptions from the interviewer because of her or his likelihood of engaging in dysfunctional communication behaviors. This is not to suggest that low talkers never get job interviews or obtain employment. Most do, but it is much harder for them than it is for talkative people.

Similarly, low talkers and talkative people are not equally successful once employment is gained. Research in a variety of occupations has found low talkers to be less satisfied with their jobs than are talkative people. The most dramatic work-related difference between low talkers and high talkers, however, appears at promotion time. Not only are low talkers less frequently promoted than talkative people, but they often report not anticipating or even wanting to be promoted. This is because promotions to higher positions typically require greater communicative responsibilities. In short, then, as in the school setting and social environments, life at work seems much more difficult for low talkers than it is for more talkative people.

People have perceptions about low talkers being incompetent and, therefore, being in a highly undesirable condition. Is this necessarily true? Fortunately, it is not. Many quiet people are most happy and content with their lives, and they are successful at what they do. When offered help to overcome communication apprehension, many quiet people decline. Many have adjusted well to their lifestyle and have no desire to change. Nevertheless, people who are highly willing to communicate and happily engage in communication with others generally have a major advantage over those who are less willing to communicate.

Conclusion

Willingness to communicate can be a dominant force in a person's behavior. This is particularly true when the person's low willingness to communicate is generalized, or trait-like. In such cases, any communication situation may cause discomfort. As a result, the person is likely to avoid the situation or withdraw from it if he or she cannot avoid it. Perhaps, at worst, an inability to avoid or withdraw will lead the source to engage in dysfunctional communication. Essentially, if communication is dysfunctional for the person, it will be dysfunctional for the person with whom he or she is trying to communicate, thereby resulting in an ineffective encounter.

The willingness to talk is central to the outcomes of communication. Through talk people realize the fulfillment of their expectations for a given communication situation. Through talk people reduce the uncertainties that they have about various situations, other people, and themselves. Through talk people establish, maintain, and, when necessary, terminate relationships. Too little talk is usually an inappropriate form of communication. Too much talk can be too, but if the quality of that talk is high, it probably will not be perceived as being too much. The effective communicator is one who knows when to talk, when to be silent, and what are the appropriate responses to communications from another person.

See also: Group Communication; Group Communication, Conflict and; Group Communication, Decision Making and; Group Communication, Dynamics of; Group Communication, Roles and Responsibilities in; Interpersonal Communication; Interpersonal Communication, Conversation and; Interpersonal Communication, Listening And; Intrapersonal Communication; Public Speaking.

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ARCHIVES, PUBLIC RECORDS, AND RECORDS MANAGEMENT

Archives have existed since ancient times. According to James O'Toole (1990), the term "archives" was originally used to "designate all collections of written records" (p. 28). In the modern world, however, the word "archives" is commonly used in three different senses. First, archives are documents that are created or accumulated by an individual or an organization in the normal course of business. Second, archives are the independent agencies or programs within institutions that are responsible for selecting, preserving, and providing access to archival documents. Finally, archives are the buildings or repositories that house collections of archival documents.

To understand the nature of archival documents in the first sense of the word, it is helpful to make a distinction between records and archives. Records are all information, regardless of format, that is produced or accumulated in the normal course of affairs by an individual or an organization and is maintained in order to provide evidence of specific transactions. Archives are those records that are deemed to have continuing value and are therefore retained beyond the period in which they are actively used. (The archives of individuals are sometimes referred to as "personal papers" or "manuscripts.") Thus, archives constitute a smaller portion of the entire documentary universe than do records.

Like records, archives can exist in any format on which information has been recorded. Archival collections frequently consist of a wide variety of media. In addition to traditional textual materials, archivists care for materials such as photographs, films, videotapes, sound recordings, and magnetic tapes and disks. The many issues posed by archival materials recorded in electronic format are among the greatest challenges facing the archival profession.

Archival materials, like library materials, are important cultural resources. Several characteristics, however, distinguish the types of materials generally held in library collections from those found in archival collections. Alternate copies of the materials housed in a given library can often be found in the collections of other libraries. Archival materials, in contrast, are often unique and are found only in a single repository. Sue McKemmish (1993) provides an overview of the key distinctions between library and archival materials. She describes the materials held in libraries as information products, which have been consciously authored for dissemination or publication "to inform, perpetuate knowledge, convey ideas, feelings, and opinions; to entertain, [and] to provide information about their subject" (p. 7). She characterizes materials found in archives, on the other hand, as information by-products of activity, which are accumulated or created in the course of doing business in order to facilitate the business process of which they are a part. McKemmish further notes that while library materials are often discrete items, archival materials are usually part of a larger group of related records.

Importance of Archival Materials and Archival Institutions

Archival institutions select, preserve, and make their records accessible for a number of reasons, including legal, financial, and administrative purposes. Government archives (at the federal, state or local level) that administer public records, for example, maintain records as evidence of the government's policies and operations. Thus, public archives help ensure that the government is held accountable to the public by preserving records that enable citizens to monitor the conduct of government agencies and public servants. In addition, the records that are held by public archives document the rights of citizens, such as entitlement to social security benefits or ownership of property. Private organizations, such as businesses, churches, universities, and museums, also establish institutional archives to care for their records. The archival records that are maintained by these repositories document the organizations' origins, structures, policies, programs, functions, and vital information over time.

In addition to the legal, fiscal, and administrative purposes for which records are originally created and used, archival records are useful for historical or research purposes. Archives provide a key with which to examine past and present events. In addition to the administrative users of archives, a variety of researchers take advantage of archival sources. These researchers may include scholars, genealogists, students at all levels, local historians, biographers, independent writers, and documentary filmmakers. Since archival documents can be used for many purposes by diverse audiences, the records of organizations that do not have their own institutional archives, as well as the personal papers of individuals, are often actively sought by archival programs such as collecting repositories or historical societies. These types of institutions, rather than documenting the activities of a parent organization, focus on collecting records that document a particular topic (e.g., a person, subject, or geographical area).

Records Management and Archives

Records management and archives are closely related. Indeed, the existence of strong archives relies on the implementation of sound records management techniques. In the United States, most records professionals credit the National Archives with originating records management in the 1940s. While the National Archives was indeed influential in the evolution of modern records management in America and was responsible for much of the development of modern records management techniques in the United States, it is important to note that, historically speaking, records management is hardly a new development. Records management, in various forms, has been a concern across many cultures for centuries.

In 1989, the National Archives and Records Administration produced *A Federal Records Management Glossary*, which offered the following definition of records management: "The planning, controlling, directing, organizing, training, promoting, and other managerial activities related to the creation, maintenance and use, and disposition of records to achieve adequate and proper documentation of . . . policies and transactions and effective and economical management of agency operations" (p. 32). A core principle of records management is that of the life cycle of records. This concept holds that all records have a common life cycle, which is often divided into three phases: active, semi-active, and inactive.

During the active life of records, employees or records managers within an agency create and use records. In the semi-active phase, during which records are used less frequently but are occasionally necessary for the conducting of business, records may be transferred to a central records management office or an off-site facility for storage. When those records are no longer needed by the agency, they enter an inactive phase, at which time archivists are called in to make judgments about the disposition of records. Depending on the form of disposition that is selected, records may be retained for a designated period of time (in which case they are generally transferred to a records storage center), they may be retained indefinitely (in which case they are transferred to an archives), or they may be destroyed.

Ironically, while the modern records management profession in the United States emerged from the archival profession, a schism soon developed between the two fields. The roots of this rift may well lie in the very concept of the life cycle, which essentially makes the active phase of a record's life the domain of the records manager and the inactive phase the domain of the archivist. Perhaps in consequence of this distinction, records managers and archivists have often taken antagonistic attitudes toward each other rather than developing cooperative relationships to ensure the documentation of organizations and of society. As Terry and Carol Lundgren (1989) point out, "[In] records



The Central Intelligence Agency uses a robotic arm to handle magnetic tapes that are part of the information storage system. (Roger Ressmeyer/Corbis)

management circles, archivists are sometimes unkindly referred to as pack rats, since their primary concern is the permanent preservation of all records that have or may have historical value" (p. 153). In archival circles, on the other hand, records managers might well be seen uncharitably as philistines who are devoid of any sense of history and whose primary concern is ensuring the economy and efficiency of their parent organizations by disposing of as many records as possible.

The rapid proliferation of electronic media has caused archivists and records managers alike to rethink the concept of the life cycle and the division between their closely related professions. The Australian archival community in particular has been especially active in advocating the replacement of the concept of the life cycle with that of a records continuum that recognizes the interconnectedness of managing a record at all phases of its life, from its creation to its disposition. Indeed, the continuum concept recognizes that, with electronic documents, it is necessary to plan for records management prior to the creation of records. This can be accomplished through the development of adequate recordkeeping systems that will ensure the continued preservation of and access to electronic documents. Thus, in order to manage documents effectively in electronic format, archivists and records managers need to work together and they need to collaborate closely with other information professionals, such as computer specialists and systems analysts.

The 1990s saw the emergence of the knowledge management field, which is another information field that is related to records management. Knowledge management is most prevalent in corporate, rather than government or nonprofit, settings. Bruce Dearstyne (1999) offers the following working definition for this emerging area: "Knowledge management is an evolving set of strategic approaches, management skills, and technologies to enhance the application of information resources and individuals' knowledge to the business purposes of an organization and to strengthen its capacity to improve its operations and services" (p. 2). This articulation of knowledge management suggests that this field differs from records management in at least two significant ways. First, knowledge management incorporates implicit knowledge, such as people's expertise, experience, and insights, as well as the explicit knowledge, in the form of recorded information, that is the realm of records management. Second, the primary goal of knowledge management is to enhance business operations and services, while the primary objectives of records management are to provide adequate documentation of an organization's policies and transactions and to demonstrate effective management of organizational operations.

Archival Management

The management of archival materials can be roughly categorized into the following functions: appraisal, accessioning, arrangement, description, preservation, access, outreach, and advocacy. Although these functions will be discussed separately here, in practice they overlap, since the decisions that are made at each stage necessarily affect management of the materials in other stages.

Appraisal

The initial step in the management of archival materials is appraisal, in which the archivist makes a judgement as to whether particular records should be acquired by the archival repository. Appraisal is the process of determining the value, and thus the disposition, of records. During this process, decisions are made about whether and for how long records should be preserved based on criteria such as their current administrative, legal, and fiscal use, their evidential and informational value, their arrangement and condition, their intrinsic value, and their relationship to other records. Archivists often use the terms "appraisal" and "selection" interchangeably to describe this process. It is important to note that when used in the archival context, appraisal does not have anything to do with monetary value.

The Society of American Archivists' Task Force on Goals and Priorities (1986) emphasizes that an archivist's first responsibility is the selection of records that have enduring value. The other responsibilities of an archivist depend on wise selections being made at this stage. Despite the centrality of this function to archival management, archivists continue to debate the role of the archivist in appraisal and the best criteria on which to base appraisal decisions. Archivists have adopted various criteria for appraisal based on the value of the records, the use to which the records might be put in the future, the policy of the archival repository, and the goal of creating an image of the institution or the society to which the records pertain.

The writings of Theodore Shellenberg (1949, 1956) with regard to appraisal represent a codification of appraisal practice at the National Archives, and they designate various types of values that are found in records as the basis for selection decisions. Shellenberg postulated that records possess primary values that are related to the purposes for which they were originally created (e.g., administrative, legal, fiscal, research, or historical). In addition, records have secondary value when they are used for any purpose other than that for which they were originally created. This secondary value may be informational (i.e., related directly to the data found in the records) or evidential (i.e., related to the degree to which the records reflect an organization's functions and policies over time).

The potential use to which archival materials may be put has also been advanced as a criterion on which to base, and test, appraisal decisions. The application of this criterion is particularly problematic, however, because it requires the archivist to become a soothsayer, predicting the research needs of the future users of archives. Nonetheless, use has been accepted by many archivists as a strong qualifier for the selection and appraisal of records.

During the 1980s, a new approach to the appraisal of archival materials began to emerge. Drawing on the library literature about collection management, archivists began to argue that selection decisions should be made within the context of a clearly defined collecting policy. While, in practice, many archival repositories had been guided in their appraisal choices by institutional policy for some time, Faye Phillips's 1984 article "Developing Collecting Policies for Manuscript Collections" provided a detailed model policy that different types of archives could adapt to their needs.

Subsequent discussions of appraisal in the archival literature have focused on documentation strategies, institutional functional analysis, and macro-appraisal. Collectively, these approaches adopt a "top down" rather than a "bottom up" ori-

entation to appraisal. More traditional approaches, based on value, use, and policy, have focused on records themselves. Advocates of the emerging methods of appraisal argue that careful research and analysis of the records creators and the records creating processes should precede the examination or appraisal of any actual records. By approaching appraisal in this manner, archivists can identify the most important records creators and records producing functions within an organization, thereby placing themselves in a better position to create a more complete image of the institution or society that is being documented.

Accessioning

Once archives make the decision to acquire a collection of records, the next step in the management process is for the archival institution to accession the records. Accessioning is the procedure through which an archival repository takes administrative, legal, and physical custody of a group of records. The means by which archives acquire administrative and legal control of records is slightly different for institutional archival programs than it is for collection repositories. Within institutional archives, records are generally transferred by means of a transmittal form, in which the office that created the records grants custody to the archival program of the same institution. For collecting repositories, which acquire records not from a parent organization but from private donors or external institutions, a deed of gift is the primary instrument by which the archives gain legal and administrative control over the records.

During accessioning, the archivist collects basic information about the records on the basis of a preliminary examination. Generally, an accession form is created, which includes data such as the creator of the records, the quantity, condition, and current location of the records, any restrictions on the records, a list of contents and brief descriptions of the records. The information that is gathered during the accessioning process provides essential information about the newly acquired records and later serves as the basis for the arrangement and description functions.

Arrangement and Description

The arrangement and description of archives serve the dual functions of preserving records and making them available for use. Collectively, arrangement and description are often referred to as the "processing" of archival collections. Fredric Miller (1990) notes that "[by] making possible the use of records, processing gives meaning to their acquisition and preservation. At the same time, processing is the key method by which archivists control and administer the records in their custody" (p. 3). In the arrangement of archival records, archivists organize and order their collections, thereby bringing archives under physical control. In the description of archival collections, archivists bring together information that provides a context for the records, thereby bringing them under intellectual control.

The arrangement of archival collections is governed by two key concepts: provenance and original order. According to the principle of provenance, which emerged from nineteenth-century European archival practice, records are maintained according to their creator or source, rather than by subject or classification systems. Records produced by different creators are not intermingled, even though they might share a common subject. The second important concept for archival arrangement, original order, holds that whenever possible, records should be maintained according to the filing structures that were used by their creators. In some cases, however, records come to archives in such a state of disorganization that to maintain them in their original order would be a detriment to subsequent use. In these cases, the archivist may choose to arrange the records in a logical way (e.g., alphabetically, chronologically, or topically) in order to facilitate access. By arranging archival collections according to the principles of provenance and original order, archivists maintain important contextual information about how the materials were initially created and used.

Archival materials can be arranged (and subsequently described) at a variety of levels. Ranging from the broadest to the most specific, these levels include the following: the repository, the record group or collection, the series, the file unit, and the item. Professional practice holds that archives should gain physical and intellectual control over all of the records at a broad level before proceeding to progressively refined, more specific, levels of arrangement and description.

Unlike library materials, which are generally cataloged at the item level, collective description of groups of records is the norm for archival
description. Collective description emerged in the organization of archival materials for practical as well as intellectual reasons. Many archival collections are quite large, composed of hundreds, thousands, or even millions of items. To create individual records for each item in these collections would be an overwhelming, if not an impossible, task. Moreover, archival documents can generally be used more effectively in the aggregate, since the value of an archival record is often enhanced by the relationships that connect it to other records within the collection. There are of course, situations in which an individual item (e.g., the Declaration of Independence) possesses an intrinsic value and therefore merits description at the item level, but these cases are the exception rather than the rule.

Archives produce a variety of information surrogates to represent their holdings. These surrogates range from guides to the collections of several institutions in an area, to guides to the holdings of a single institution, to guides to a particular subject area, to inventories of specific collections, to brief catalog records. The primary descriptive tool that is produced by most archives is the inventory, or finding aid, which provides a detailed, narrative account for a collection of records that is held by a repository. Finding aids typically consist of two types of information: explanatory notes and an inventory. The description of the records might include the creator, the dates covered by the records, the quantity of the records, the title for the collection or series, the location of the records, the restrictions to access of the records, the information about the arrangement of the records, a narrative account of the records creator, information about the contents, and information that notes the existence of related materials. The inventory portion of a finding aid includes a brief list of the contents of each container, file, volume, or item, depending upon the level to which the collection is processed.

Since archival materials are so diverse, archival institutions have not been able to take advantage of standards for the exchange of information about their holdings in the same way that libraries have. However, the archival profession has begun to explore more standardized methods by which archival programs can exchange information with other archives and with other cultural institutions. There have been two promising advances in this area. The first was the development in the 1980s of an archival format for Machine Readable Cataloging (MARC), by which archivists can enter brief descriptions of their collections into national bibliographic utilities. The second, Encoded Archival Description (EAD), was introduced in 1993 and has slowly begun to be accepted by the archival community. EAD defines common elements that are found in finding aids and prescribes an order in which they should appear. It designates a few elements that are required for providing a minimally acceptable level of information about a collection, but it is flexible enough to be applied in a wide variety of archival settings. Since EAD is still in its infancy, relatively speaking, its long-term effect on archival description remains to be seen.

Preservation

Records on all forms of media located in archives need protection in order to minimize the wear and tear that are inherent in handling, copying, loaning, and exhibiting them. Preservation refers to the management activities that are associated with maintaining materials in their original form or other format. Preservation of archival materials encompasses a number of technical and administrative processes that should be comprehensive and integrated within the overall archival program. Archivists are concerned with a number of preservation issues, including the following:

- environment (i.e., temperature, relative humidity, light, dust, mold, pests, and gases),
- storage space,
- disaster preparedness (i.e., preparing contingency plans for use in case of fire, flood, storms, and other natural or man-made disasters),
- assessing the scope and nature of deterioration and damage to records (i.e., brittle paper and/or technological obsolescence), and
- use (i.e., establishing policies about the use of holdings by patrons and staff and about the public display of holdings).

A well thought out archival preservation program would consist of installing equipment to monitor and stabilize environmental conditions, maintaining the physical facilities routinely, enforcing security procedures for staff, patrons and others, and implementing routine holdings maintenance actions, including removing or replacing damaged or deteriorated items.

Access

If people are to use archives, then they must have intellectual, legal, and physical access to them. The term "access" encompasses all three concepts. Intellectual access is provided through the arrangement and description of records and reference assistance from an archivist. Archivists create and rely on finding aids as reference tools to assist users. Finding aids help users locate needed records and information.

Access is also related to whether or not users have permission or authority to use archives. Records created and maintained for personal or internal use may include private or confidential information. Archivists are legally and ethically bound to ensure equitable access to records that are in their care. Maintaining fair use, however, is a problem because archivists have to deal with such issues as privacy, confidentiality, copyright, preservation, and freedom of information.

Repositories provide physical access by maintaining standard operating hours that allow users to visit the archives to study and copy records for private or educational purposes. The World Wide Web, however, has redefined physical access to records. Repositories are making many of their records available online. Thus, users can access finding aids and records from their personal computers. Users have the opportunity to examine finding aids and to exchange e-mail messages with reference archivists before deciding if a visit to the actual archives is necessary.

Outreach and Advocacy

Outreach and advocacy represent the culmination of archival work. Archivists use advocacy and outreach to help the general public understand archives and build support for archival programs. Outreach is any effort to generate or gain public interest in the archives through a variety of mechanisms such as lecture and film series, fundraisers, brochures, media coverage, exhibits, and publications. Advocacy builds on outreach. It involves archivists, records professionals, and manuscript curators engaging in activities, such as lobbying on behalf of specific legislation or influencing public policy, that affect some aspect of archives or records. Outreach and advocacy are crucial functions because archivists have to vie with other information providers and because technological changes have transformed delivery methods for archives and historical records.

Conclusion

Archives are vital to society for many reasons. Among the most important functions that archival records fulfill is that they serve as instruments of accountability and as building blocks of collective memory. John McDonald (1998) succinctly expresses the relationship between records and accountability as follows: "Without records, there can be no demonstration of accountability. Without evidence of accountability, society cannot trust in its public institutions." In addition to providing for accountability, archival collections constitute an important part of society's cultural and intellectual heritage, thereby contributing to the formation of a nation's collective memory. To ensure the preservation of this valuable legacy and to provide for democratic accountability, archivists and records managers (including public records officers) from diverse organizations must work together to administer the records that they hold in trust for future generations.

See also: Archivists; Cataloging and Knowledge Organization; Conservators; Curators; Knowledge Management; Knowledge Management, Careers in; Libraries, Functions and Types of; Museums; Preservation and Conservation of Information; Reference Services and Information Access; Standards and Information.

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ARCHIVISTS

Archivists, people who look after the records of businesses, organizations, or governments, probably have been around since the fourth millennium B.C.E. At that time, cuneiform clay tablets and hieroglyphics on papyrus came into use in the Middle East and Egypt, and with the creation of such records came the need for people to look after them. As civilization developed and advanced in Greece, Rome, and China, more records were produced in a variety of formats and these records required care.

This early recordkeeping continued and accelerated during the rise of nation-states, which in turn brought their recordkeeping practices to their colonies. As early as 1626, the English colony of Jamestown in North America had systematic land records. And records were so important to the rebellious colonists during the American Revolution that they were mentioned in the *Declaration of Independence*.

But in the new United States of America, archives and the archival profession did not grow rapidly. To be sure, recordkeeping developed apace with the new federal government, but the care of these governmental records was largely unsystematic and lacking any real archival identity. Fortunately, by the eighteenth century, records of special historical value began to be systematically preserved by privately supported state and local historical societies—an archival movement that eventually took many forms and steadily expanded in the nineteenth and early twentieth centuries.

The establishment in 1934 of the National Archives of the United States gave great impetus to archival growth and defined more clearly the archival profession. This was a major step, albeit a rather tardy one if compared to similar development in other countries. Nonetheless, this new governmental institution quickly proved to be a major force in promoting archives and what was to become the archival profession.

Initially, the National Archives drew heavily from the history profession. Most early National Archives staff members had master's degrees or doctorates in history. Gradually, the archivist developed a separate professional identity that led to the establishment of the first professional organization of archivists. Founded in 1936, the Society of American Archivists continues to this day and is supplemented by many regional, state, and local archival organizations.

The years of the New Deal and World War II (approximately 1932 to 1945) sparked a vast expansion of records in both the public and private sectors, leading to the creation of a new discipline known as records management. Records managers did not come from either the historical or the archival profession; they were in essence people who were more interested in the efficient and economical arrangement of documents than in their historical value. These new records managers inherited an ancient tradition of efficient custodial care of records. Reflecting this new discipline closely allied with that of archivist, the National Archives became the National Archives and Records Service.

In the postwar years, the archival movement accelerated, and in the late 1950s, a national study showed that there were about 1,300 archives and archival-related agencies in the United States. In 1988, a successor survey reported the existence of 4,200 such agencies. As the agencies grew, so did the number of people staffing them. The Society of American Archivists has grown from its original membership of 125 in 1936 to a membership of 3,600 in 1999. This figure still falls far short of the actual number of people who are employed in archives or archival-related agencies.

Archivists perform a wide variety of professional assignments in a broad range of settings. They seek out and acquire historical and/or current records, including electronic records. They devise systems to bring records into the archives, a process known as "accessioning." They must then decide what records to save and how to fit them into the overall plan, a process known as "appraisal." They then must preserve the original arrangement of the records or organize them systematically, a process known as "arranging the records." After the newly acquired records are accessioned, appraised, and arranged, they must then be described through the creation of catalogs, finding aids, or computer-based access systems. And finally, the acquired, accessioned, appraised, arranged, and described records must be preserved by a variety of methods that range from simple repairs to complex laboratory preservation procedures. It should be kept in mind that paper records, traditionally the major concern of



An archivist in New York City looks through files that are part of a print archive. (Timothy Fadek/Corbis)

archivists, have become but one part of modern archives, which commonly include photographs, motion pictures, microfilms, videotapes, sound recordings, and other electronic media products. All of these records, in no matter what form, must be acquired, accessioned, appraised, arranged, described, and preserved.

Archivists perform their activities in widely varied institutional settings, ranging in size from a one-person single operation to the National Archives and Records Administration (NARA) with its two major buildings in Washington, D.C., its ten presidential libraries, its twelve regional archives branches scattered across the country (usually located in NARA records centers), and its additional centers that are used for records-management functions. Archivists may find themselves working in federal, state, or local governmental units or in archives that are connected with colleges or universities, public or private libraries, churches and religious organizations, corporations, or other business enterprises. A single archivist in a small unit may be responsible for all of "archiving" functions in addition to administrative duties, which might include developing budgets, overseeing expenditures, perhaps even fund raising, as well as hiring and overseeing staff. People working in larger units will see a division of labor among all of the functions traditionally

ascribed to archivists. As a result, the larger the archival staff, the higher the degree of specialization (and usually the higher the salaries).

How do people become archivists? In the nineteenth century and the early years of the twentieth century, archivists in the United States came primarily from a history background, a not-surprising development considering that historians were the primary users of archives and historical manuscript collections. It was historians who took the lead in establishing many state archival agencies, and it was historians who provided the leadership in the movement to create the National Archives. It was historically oriented personnel at the National Archives who pioneered the earliest formal training of archivists in their own archival institutes and in conjunction with American University. In time, a scattering of universities throughout the United States offered formal courses in archival management, often as components of a master's degree program in history or in library science. These courses were usually introduced and taught by archivists who saw the need for more formal training for those entering the profession. These meager attempts at formal archival education lagged far behind the archival training programs in a number of European nations.

In the 1990s, a few archival educational ventures evolved into multicourse archival programs generally culminating in a master's degree. Some of these programs are still a part of history departments, although as a result of the new technology they are more commonly associated with schools of library and information studies. Schools of librarianship changed dramatically in the 1980s and 1990s. Archivists and librarians were brought closer together by new technology. Two professions that were quite different were brought into closer alignment. Two professions that formerly differed in their practices and procedures began to share common preservation problems and the new world of information technology. Archival programs that lead to a master's degree are in operation at the University of Michigan, the University of Pittsburgh, the University of Maryland, the University of Texas, Wayne State University, the University of California at Los Angeles, and New York University. The Society of American Archivists, which has its headquarters in Chicago and itself conducts many short-term seminars and workshops that focus on continuing education for

archivists, provides information about the programs offered by these universities, as well as other education programs in the field.

Clearly archivists, along with librarians and records managers, play an important role in the fast-changing, interrelated information world. Archivists are handling an increasing volume of computer-generated record material. Paper records will continue to occupy their attention, but the profession must now use the new information technology to control and make accessible the archival holdings. This new dimension of archival practice is requiring revised theories, practices, and education to ensure the survival of the records of modern civilization and those of future societies. Archivists hold the records of the past and the future in their hands.

See also: Archives, Public Records, and Records Management; Cataloging and Knowledge Organization; Librarians.

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ARMSTRONG, EDWIN HOWARD (1890-1954)

Millions of radio listeners each day tune in their favorite FM (i.e., frequency modulation) stations to hear crystal clear, high-fidelity music and other programming. FM radio offers clarity and a dynamic range that cannot be matched by AM (i.e., amplitude modulation) broadcasting. Many people cannot explain how the signals reach their radios or why the FM stations sound so much better than their AM equivalents. However, if people enjoy the programming that FM stations provide, then they owe a debt of gratitude to the inventor of the technology that made it all possible: Edwin Howard Armstrong.

Armstrong was born on December 18, 1890, in New York City, the first child of Emily and John Armstrong. Young Edwin grew up in a family that was well to do, well educated, and a cornerstone of their Yonkers, New York, community. A quick mind was highly valued in the Armstrong household, as well as a strong body. John Armstrong taught his children the game of tennis, which Edwin would retreat to later in life as a reprieve from his struggles in the laboratory.

Armstrong developed his interest in wireless telephony from books that his father brought back from annual business trips to London. He was fascinated by the tales of inventors such as Guglielmo Marconi and his efforts to send wireless signals across the Atlantic. Soon, with the help of a family friend, Armstrong was building his own wireless apparatus in the attic and communicating with other young boys who were bitten by the wireless "bug."

The long hours in his attic continued throughout his childhood and through adolescence. Upon graduation from Yonkers High School, Armstrong set out for Columbia University and its prestigious program in electrical engineering; however, the tinkering in the attic never ceased. Armstrong's professors recognized his brilliant mind, but his dedication to coursework paled in comparison with his love of the laboratory.

In 1912, with the help of Professor John Morecroft, Armstrong began investigating the properties of the audion tube, a tri-element vacuum tube invented by Lee De Forest that was used to detect an electromagnetic signal. Even De Forest himself, however, was unclear as to how the audion worked. Armstrong discovered, according to Tom Lewis (1991, p. 70), that "[the] audion was essentially a device that relayed electrons. . . . Acting on this discovery, Armstrong then thought of feeding the oscillating current from the plate back into the grid circuit to have it amplified over again." The result, in September 1912, was Armstrong's first invention: the regenerative circuit.

As was often the case in this era of invention, Armstrong's invention was challenged in the courts. De Forest claimed to have invented the regenerative circuit in 1912, a year before Armstrong had applied for his patent. After several early convincing victories for Armstrong in the courts, many felt that De Forest was "throwing in the towel" when he requested a license to manufacturer the regenerative circuit. However, convinced that De Forest had attempted to steal his invention, Armstrong blocked the request. While Armstrong's focus and determination had served him well as an attic inventor, his stubbornness in his dealings with De Forest cost him dearly. De Forest continued his interference application in the U.S. Patent Office, won a few key victories, and finally, in 1934, had his claim as the inventor of the regenerative circuit upheld by the U.S. Supreme Court. Although the courts named De Forest the victor, most of the radio engineering community maintained Armstrong as the true founder of regeneration. At the 1934 meeting of the Institute of Radio Engineers (IRE), Armstrong attempted to give back a Medal of Honor that he had received years earlier from this organization for his work in relation to regeneration. The board of directors of the IRE refused to take back his medal and instead publicly affirmed the spirit of their original citation.

Armstrong's greatest accomplishment, however, was yet to come. For years, radio engineers had struggled with the static associated with an AM signal. Attempts at solving this problem included increased amplification (increasing noise at the same time) and restricting the frequency range of the signal (resulting in a loss of fidelity). All of these attempts, however, were made with the existing transmission method of amplitude modulation. Armstrong's approach to this significant problem typified his innovative style. He broke from traditional theory and experimented with an entirely new system of broadcasting: frequency modulation.

In brief, radio signals are piggybacked on a carrier wave, which is an electromagnetic signal that is characterized by consistent wave height (amplitude) and cycles per second (frequency). From



This amplifier was invented by Edwin H. Armstrong to reduce static, tube noises, fading, and interference in radio broadcasts. (Bettmann/Corbis)

the beginning, radio stations were transmitting their information by amplitude modulation, wherein the frequency is kept constant while the height of the wave is adjusted. Armstrong thought that frequency modulation (adjusting the cycles per second rather than the height of the wave) might hold the key to the elimination of static.

Others had experimented with frequency modulation as a transmission method; however, none had attempted to change the whole system, from transmitter to receiver. Some, including noted theoretical mathematician John Carson, thought static would always be a part of radio. Armstrong, with help of assistants Thomas Styles and John Shaughnessy, set about creating this new system by confronting one of the key principles of traditional AM broadcasting: narrow bandwidth.

Bandwidth is the space a signal occupies when it is imposed upon a carrier wave. A wide bandwidth can carry a better signal, but it also is more susceptible to interference. The solution to this interference, in the AM model, was to narrow the bandwidth, thus reducing the noise in the transmission. When early experiments with frequency modulation applied this commonly held principle of narrow bandwidth, static was not reduced. The result was that many scientists abandoned FM as a viable transmission method, but Armstrong believed that widening the bandwidth could dramatically improve the signal-to-noise ratio.

The key component of Armstrong's system was his ingenious receiver that captured the FM signal, amplified it, strained out amplitude variations, converted the signal to amplitude modulation, and prepared it for conversion to acoustic energy through a loudspeaker. Armstrong received multiple patents for this new system in 1933 and it was publicly demonstrated for the first time at the Institute of Radio Engineers meeting in New York City on November 5, 1935. According to Lawrence Lessing (1956), the demonstration went off without a hitch, transmitting music and other sounds at fidelity not heard before. Not only did the "wide band" FM system offer improved quality, it operated with much less power than a typical AM transmitter. Business reality, however, kept Armstrong's innovation from being adopted immediately.

In 1935, the Radio Corporation of America (RCA) was heavily invested in the existing AM broadcasting system, owning every major patent. In addition, they were also spending millions of dollars to develop what they believed to be the next great innovation in broadcasting: television. Both FM and television were completely new systems and RCA was reluctant to ask the public and broadcasters to invest in two new technologies at once. Nevertheless, it was not only industry powers that halted the advance of FM. The Federal Communications Commission (FCC) waited until March 1940 before they authorized FM broadcasting. Armstrong was further thwarted by World War II, which delayed the construction of new FM stations until 1946.

The final blow for Armstrong came from his former friend, David Sarnoff, and RCA. In the early 1950s, RCA, in an attempt to circumvent Armstrong's patents, claimed to have invented an FM broadcasting system superior and markedly different from Armstrong's. This set in motion litigation that lasted more than a decade and led to the ultimate unraveling of Edwin Armstrong's life. His fortune, amassed from royalty payments from his previous patents, dwindled during this court battle. His marriage of some thirty years to his wife Marion was crumbling while he obsessed with professional redemption. Finally, after rejecting a settlement proposal from RCA, and with his wife away with her sister in Connecticut, Armstrong committed suicide on January 31, 1954, by jumping from the window of his thirteenth-floor apartment in New York City.

Unfortunately, Armstrong did not live to see the fruits of his greatest invention and his final victory in the courts. FM listenership expanded greatly in the 1960s and 1970s, in large part because of the demand for the high-fidelity stereo sound that only FM broadcasting could deliver. By 1980, the audience for FM stations was larger than the one for AM stations, and by the end of the 1990s, FM stations were attracting more than 80 percent of the radio listeners.

Possibly because of the tragic nature of his death, Armstrong's fame has never been commensurate with the influence that he had on the communication industry. However, while he may never be a household name, the effect that he had on the radio industry will last forever.

See also: MARCONI, GUGLIELMO; RADIO BROADCAST-ING, HISTORY OF; RADIO BROADCASTING, TECH-NOLOGY OF; SARNOFF, DAVID.

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AROUSAL PROCESSES AND MEDIA EFFECTS

"Arousal" refers to a state of physical excitation that accompanies all emotions that are linked to action. The biological function of such excitation is to energize the organism for a bout of activity. According to the classic fight-flight theory, arousal occurs when someone is confronted with danger and readies the person for escape (flight) or attack by vigorous action (fight), thereby increasing the chance for survival in either case. In modern times, arousal in response to signs of danger (or incentive opportunities) may prove largely nonadaptive (i.e., fail to serve safety and wellness), or even foster counterproductive reactions, because vigorous action often does not lead to an advantageous resolution. Although the fight-flight response is generally an outdated reaction, the tendency to become aroused is nonetheless triggered when people are faced with numerous situations that relate to coping with danger (or the attainment of incentives)-or when exposed to media representations of such situations.

Cognition-Excitation Interplay

Stanley Schachter (1964) focused attention on the unique interplay of cognition (i.e., thought) and arousal in the experiencing of emotion. He proposed that arousal is essentially the same in all emotions and that cognition, by furnishing instant appraisals of circumstances, lets individuals understand the emotions that are being experienced. In this conceptualization, arousal (or excitation) is blind to the hedonic valence of emotions (i.e., to their degree of pleasure or displeasure) and simply intensifies each and every emotion. Through intero- and exteroceptive feedback (e.g., muscle tension, heavy breathing, heart pounding, palm sweating), individuals have some cognizance of the intensity of their various emotions.

Excitation Transfer

Based on the premise that arousal is not emotion specific, Dolf Zillmann (1996) developed an excitation-transfer theory that considers summations and alternative integrations of sympathetic excitation. In this theory, he suggests that excitations caused by different sources combine to intensify both the feelings and the actions that are cognitively determined and directed by circumstances in the immediate environment of an individual. For example, a person who steps on a snake in the grass is bound to get excited and appraise the reaction as fear, possibly intertwined with disgust. Recognizing that the snake is a rubber dummy planted by a mischievous child, the person is bound to experience a quasi-instantaneous reappraisal of the emotional reaction as anger that, after a while, is likely to turn into amusement. These later reactions, due to the fact that chemically mediated excitation (i.e., mediation by the systemic release of catecholamines that function as neurotransmitters and whose effect diminishes only slowly) cannot decay instantly and lingers for some time, are intensified by residual excitation from the initial fear reaction. In principle, residual excitation from any kind of prior emotion will "artificially" intensify the experience of any kind of subsequent emotion.

The transfer of residual excitation into subsequent emotional reactions is particularly relevant for the emotional experience of fictional and nonfictional events of audiovisual media presentations. The reason for this is the compact presentation of emotion-inducing scenes. Because the material that is not immediately relevant to the emotional core of the presentation is eliminated by editing, the elicitation of different emotional experiences comes closer together. This condition is ideal for the intensification of emotional reactions because of the transfer of residual excitation from preceding arousal-inducing events.

Dramaturgy of Transfer

Excitation-transfer theory has been used to explain the seemingly paradoxical enjoyment of drama that predominantly features distressing events. For example, the enjoyment of satisfying resolutions of suspenseful drama has been found to be more intense when the preceding events of the drama are more torturous. It also has been observed that the more frightening the preresolution portions of drama, the more it is likely to be enjoyed in the end. Even tragic drama tends to be more enjoyed when the initially featured suffering is more severe. Residual excitation from hedonically negative (i.e., displeasing) experiences is thus capable of intensifying subsequent enlightenment and euphoric experiences. This relationship, moreover, has been ascertained for the enjoyment of competitive sports. Suspenseful, close contests tend to trigger more intense enjoyment than lopsided contests. Hedonically reversed emotion intensification is in evidence as well. Residues from exposure to pleasant erotic scenes, for example, have been found to intensify experiences of anger and hostile inclinations. However, emotion

facilitation also can occur within hedonically compatible conditions. The interspersion of pleasant sexual imagery in music videos, for example, has been found to intensify the enjoyment of the music. The excitation-transfer theory thus can be seen as a dramaturgic script for the manipulation of emotional reactions to drama and other media presentations by specific arrangements of narrative elements (cf. Zillmann, 1996).

Outside fiction, transfer effects have been observed in advertising. Residual excitation from pleasant and unpleasant experiences was found to enhance the appeal of products and activate purchase intentions. Regarding news programs, highly arousing images of catastrophes like famine and epidemics are known to move viewers to various civic actions.

Arousal Seeking

Marvin Zuckerman (1979) examined individual differences in excitement seeking and attempted to explain them as a result of varying needs for neuroendocrine stimulation. People who had a self-proclaimed high need for excitement were found to be drawn more strongly than others to sex-laden and violent, even morbid, media entertainments. They also showed a stronger preference for contact sports and hardrock music, whether live or featured in the media.

Mood Management

Zillmann (1988), in the context of mood-management theory, proposed that media content is selectively used to maximize arousal that is pleasantly experienced (eustress) and to minimize arousal that is unpleasantly experienced (distress). This implies that the content selections serve to move from distress to eustress, rather than to maximize arousal regardless of hedonistic considerations (i.e., pleasure-displeasure). Consistent with this proposal are findings showing that stressed persons, compared to relaxed ones, are drawn to media programming that holds a promise of cheering them up, such as comedies, while avoiding programming that does not hold this promise, such as conflict-laden news reports.

Considering arousal specifically, it has been observed that understimulated, bored people prefer exciting programs over relaxing programs, whereas overstimulated, stressed people prefer relaxing programs over exciting programs. Such choices, by bringing "down" people "up" and "up" people "down," serve excitatory homeostasis (i.e., the return to excitatory normalcy).

Habituation of Arousal

Excitatory habituation refers to the waning of arousal reactions that results from repeated, extensive exposure to particular stimuli. Media portrayals of violent and sexual events, for example, may initially evoke strong emotions, but as the excitatory response habituates (i.e., diminishes) with repeated and potentially massive exposure, emotional reactions become shallow and may vanish altogether. This phenomenon is often discussed as desensitization.

There is no doubt that habituation to violent and sexual media presentations occurs. It has been demonstrated, for example, that prolonged exposure to erotica diminishes arousal reactions until they become negligible. On occasion, desensitization is intended. For example, adolescents seek it in response to horror in order to prove their toughness (i.e., emotional insensitivity) to peers. As a rule, however, strong emotional reactivity is the object of most entertainments, often also of informative, nonfictional programs.

Arousal Retention

On the premise that both curiosity about, and the enjoyment of, media presentations tend to increase with the degree to which these presentations are emotionally engaging, techniques are sought to counteract the excitatory habituation to media offerings. As self-imposed media abstinence is not an option, the remedy lies in the employment of novel and potentially stronger material. A habituation-based shift to unfamiliar material has been demonstrated for erotica. It was found that consumers, after excitatory habituation to common fare, selected exposure to depictions of unusual sexual behaviors, apparently in efforts to sustain the intensity of pleasurable reactions (cf. Zillmann, 1991). More generally, this shift is prominent in the escalation of dramatic media content toward increasingly graphic displays of increasingly uncommon violent and sexual behaviors. It is also evident in the growing success of reality programs with extreme, shocking content. Reality programs ensure strong arousal reactions because the depicted events cannot be dismissed as fictional.

See also: Advertising Effects; Mood Effects and Media Exposure; Pornography; Television Broadcasting, Programming and; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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DOLF ZILLMANN

ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) is a scientific field whose goal is to understand intelligent thought processes and behavior and to develop methods for building computer systems that act as if they are "thinking" and can learn from themselves. Although the study of intelligence is the subject of other disciplines such as philosophy, physiology, psychology, and neuroscience, people in those disciplines have begun to work with computational scientists to build intelligent machines. The computers offer a vehicle for testing theories of intelligence, which in turn enable further exploration and understanding of the concept of intelligence.

The growing information needs of the electronic age require sophisticated mechanisms for

istlock A ristlock B

In 1980, John McCarthy explained the pictured equation that represented the process of extended logic with the following: "The computer must be able to jump to the conclusion that the only blocks on the table are the ones it knows about." (Roger Ressmeyer/Corbis)

information processing. As Richard Forsyth and Roy Rada (1986) point out, AI can enhance information processing applications by enabling the computer systems to store and represent knowledge, to apply that knowledge in problem solving through reasoning mechanisms, and finally to acquire new knowledge through learning.

History

The origin of AI can be traced to the end of World War II, when people started using computers to solve nonnumerical problems. The first attempt to create intelligent machines was made by Warren McCulloh and Walter Pitts in 1943 when they proposed a model of artificial networked neurons and claimed that properly defined networks could learn, thus laying the foundation for neural networks.

In 1950, Alan Turing published "Computer Machinery and Intelligence," where he explored the question of whether machines can think. He

also proposed the Turing Test as an operational measure of intelligence for computers. The test requires that a human observer interrogates (i.e., interacts with) a computer and a human through a Teletype. Both the computer and the human try to persuade the observer that she or he is interacting with a human at the other end of the line. The computer is considered intelligent if the observer cannot tell the difference between the computer responses and the human responses.

In 1956, John McCarthy coined the term "artificial intelligence" at a conference where the participants were researchers interested in machine intelligence. The goal of the conference was to explore whether intelligence can be precisely defined and specified in order for a computer system to simulate it. In 1958, McCarthy also invented LISP, a high-level AI programming language that continues to be used in AI programs. Other languages used for writing AI programs include Prolog, C, and Java.

Approaches

Stuart Russell and Peter Norvig (1995) have identified the following four approaches to the goals of AI: (1) computer systems that act like humans, (2) programs that simulate the human mind, (3) knowledge representation and mechanistic reasoning, and (4) intelligent or rational agent design. The first two approaches focus on studying humans and how they solve problems, while the latter two approaches focus on studying real-world problems and developing rational solutions regardless of how a human would solve the same problems.

Programming a computer to act like a human is a difficult task and requires that the computer system be able to understand and process commands in natural language, store knowledge, retrieve and process that knowledge in order to derive conclusions and make decisions, learn to adapt to new situations, perceive objects through computer vision, and have robotic capabilities to move and manipulate objects. Although this approach was inspired by the Turing Test, most programs have been developed with the goal of enabling computers to interact with humans in a natural way rather than passing the Turing Test.

Some researchers focus instead on developing programs that simulate the way in which the human mind works on problem-solving tasks. The first attempt to imitate human thinking was the Logic Theorist and the General Problem Solver programs developed by Allen Newell and Herbert Simon. Their main interest was in simulating human thinking rather than solving problems correctly. Cognitive science is the interdisciplinary field that studies the human mind and intelligence. The basic premise of cognitive science is that the mind uses representations that are similar to computer data structures and computational procedures that are similar to computer algorithms that operate on those structures.

Other researchers focus on developing programs that use logical notation to represent a problem and use formal reasoning to solve a problem. This is called the "logicist approach" to developing intelligent systems. Such programs require huge computational resources to create vast knowledge bases and to perform complex reasoning algorithms. Researchers continue to debate whether this strategy will lead to computer problem solving at the level of human intelligence. Still other researchers focus on the development of "intelligent agents" within computer systems. Russell and Norvig (1995, p. 31) define these agents as "anything that can be viewed as perceiving its environment through sensors and acting upon that environment through effectors." The goal for computer scientists working in this area is to create agents that incorporate information about the users and the use of their systems into the agents' operations.

Fundamental System Issues

A robust AI system must be able to store knowledge, apply that knowledge to the solution of problems, and acquire new knowledge through experience. Among the challenges that face researchers in building AI systems, there are three that are fundamental: knowledge representation, reasoning and searching, and learning.

Knowledge Representation

What AI researchers call "knowledge" appears as data at the level of programming. Data becomes knowledge when a computer program represents and uses the meaning of some data. Many knowledge-based programs are written in the LISP programming language, which is designed to manipulate data as symbols.

Knowledge may be declarative or procedural. Declarative knowledge is represented as a static collection of facts with a set of procedures for manipulating the facts. Procedural knowledge is described by executable code that performs some action. Procedural knowledge refers to "how-to" do something. Usually, there is a need for both kinds of knowledge representation to capture and represent knowledge in a particular domain.

First-order predicate calculus (FOPC) is the best-understood scheme for knowledge representation and reasoning. In FOPC, knowledge about the world is represented as objects and relations between objects. Objects are real-world things that have individual identities and properties, which are used to distinguish the things from other objects. In a first-order predicate language, knowledge about the world is expressed in terms of sentences that are subject to the language's syntax and semantics.

Reasoning and Searching

Problem solving can be viewed as searching. One common way to deal with searching is to develop a production-rule system. Such systems use rules that tell the computer how to operate on data and control mechanisms that tell the computer how to follow the rules. For example, a very simple production-rule system has two rules: "if A then B" and "if B then C." Given the fact (data) A, an algorithm can chain forward to B and then to C. If C is the solution, the algorithm halts.

Matching techniques are frequently an important part of a problem-solving strategy. In the above example, the rules are activated only if A and B exist in the data. The match between the A and B in the data and the A and B in the rule may not have to be exact, and various deductive and inductive methods may be used to try to ascertain whether or not an adequate match exists.

Generate-and-test is another approach to searching for a solution. The user's problem is represented as a set of states, including a start state and a goal state. The problem solver generates a state and then tests whether it is the goal state. Based on the results of the test, another state is generated and then tested. In practice, heuristics, or problem-specific rules of thumb, must be found to expedite and reduce the cost of the search process.

Learning

The advent of highly parallel computers in the late 1980s enabled machine learning through neural networks and connectionist systems, which simulate the structure operation of the brain. Parallel computers can operate together on the task with each computer doing only part of the task. Such systems use a network of interconnected processing elements called "units." Each unit corresponds to a neuron in the human brain and can be in an "on" or "off" state. In such a network, the input to one unit is the output of another unit. Such networks of units can be programmed to represent short-term and long-term working memory and also to represent and perform logical operations (e.g., comparisons between numbers and between words).

A simple model of a learning system consists of four components: the physical environment where the learning system operates, the learning element, the knowledge base, and the performance element. The environment supplies some information to the learning element, the learning element uses this information to make improvements in an explicit knowledge base, and the performance element uses the knowledge base to perform its task (e.g., play chess, prove a theorem). The learning element is a mechanism that attempts to discover correct generalizations from raw data or to determine specific facts using general rules. It processes information using induction and deduction. In inductive information processing, the system determines general rules and patterns from repeated exposure to raw data or experiences. In deductive information processing, the system determines specific facts from general rules (e.g., theorem proving using axioms and other proven theorems). The knowledge base is a set of facts about the world, and these facts are expressed and stored in a computer system using a special knowledge representation language.

Applications

There are two types of AI applications: standalone AI programs and programs that are embedded in larger systems where they add capabilities for knowledge representation, reasoning, and learning. Some examples of AI applications include robotics, computer vision, natural-language processing; and expert systems.

Robotics

Robotics is the intelligent connection of perception by the computer to its actions. Programs written for robots perform functions such as trajectory calculation, interpretation of sensor data, executions of adaptive control, and access to databases of geometric models. Robotics is a challenging AI application because the software has to deal with real objects in real time. An example of a robot guided by humans is the Sojourner surface rover that explored the area of the Red Planet where the Mars Pathfinder landed in 1997. It was guided in real time by NASA controllers. Larry Long and Nancy Long (2000) suggest that other robots can act autonomously, reacting to changes in their environment without human intervention. Military cruise missiles are an example of autonomous robots that have intelligent navigational capabilities.

Computer Vision

The goal of a computer vision system is to interpret visual data so that meaningful action can be based on that interpretation. The problem, as John McCarthy points out (2000), is that the real world has three dimensions while the input to



The final prototype of the Mars Pathfinder, a six-wheeled vehicle controlled remotely by NASA technicians, was tested in a large sandbox at the Jet Propulsion Laboratory in February 1993. (James A. Sugar/Corbis)

cameras on which computer action is based represents only two dimensions. The three-dimensional characteristics of the image must be determined from various two-dimensional manifestations. To detect motion, a chronological sequence of images is studied, and the image is interpreted in terms of high-level semantic and pragmatic units. More work is needed in order to be able to represent three-dimensional data (easily perceived by the human eye) to the computer. Advancements in computer vision technology will have a great effect on creating mobile robots. While most robots are stationary, some mobile robots with primitive vision capability can detect objects on their path but cannot recognize them.

Natural-Language Processing

Language understanding is a complex problem because it requires programming to extract meaning from sequences of words and sentences. At the lexical level, the program uses words, prefixes, suffixes, and other morphological forms and inflections. At the syntactic level, it uses a grammar to parse a sentence. Semantic interpretation (i.e., deriving meaning from a group of words) depends on domain knowledge to assess what an utterance means. For example, "Let's meet by the bank to get a few bucks" means one thing to bank robbers and another to weekend hunters. Finally, to interpret the pragmatic significance of a conversation, the computer needs a detailed understanding of the goals of the participants in the conversation and the context of the conversation.

Expert Systems

Expert systems consist of a knowledge base and mechanisms/programs to infer meaning about how to act using that knowledge. Knowledge engineers and domain experts often create the knowledge base. One of the first expert systems, MYCIN, was developed in the mid-1970s. MYCIN employed a few hundred if-then rules about meningitis and bacteremia in order to deduce the proper treatment for a patient who showed signs of either of those diseases. Although MYCIN did better than students or practicing doctors, it did not contain as much knowledge as physicians routinely need to diagnose the disease.

Although Alan Turing's prediction that computers would be able to pass the Turing Test by the year 2000 was not realized, much progress has been made and novel AI applications have been developed, such as industrial robots, medical diagnostic systems, speech recognition in telephone systems, and chess playing (where IBM's Deep Blue supercomputer defeated world champion Gary Kasparov).

Conclusion

The success of any computer system depends on its being integrated into the workflow of those who are to use it and on its meeting of user needs. A major future direction for AI concerns the integration of AI with other systems (e.g., database management, real-time control, or user interface management) in order to make those systems more usable and adaptive to changes in user behavior and in the environment where they operate.

See also: COMPUTER SOFTWARE; COMPUTING;

HUMAN–COMPUTER INTERACTION; LANGUAGE Acquisition; Language Structure; Symbols.

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ATTACHMENT TO MEDIA CHARACTERS

The many forms of mass media that were developed during the twentieth century have challenged the assumption that relationships occur only between "real" people who know each other personally. Mass media creators, as well as researchers, have long recognized that media consumers are drawn to compelling media characters and personalities. In 1956, Donald Horton and R. Richard Wohl wrote a seminal article entitled "Mass Communication and Para-Social Interaction." They coined the term "parasocial interaction" to describe the imaginary interactions between television variety show hosts and their home audiences, as well as the "seeming face-toface relationship" that viewers developed with these personalities. Horton and Wohl argued that a sense of "interaction" was conveyed to viewers because hosts appeared as themselves and often directly addressed the audience. In fictional programming, performers rarely "break the fourth wall" and speak directly to the audience. Yet viewers still typically feel as though they are involved to some extent in fictional events that are depicted on screen, and they sometimes have the sense that they are participating in imaginary interactions with the characters.

Horton and Wohl's article did not stimulate much research until the late 1970s and early 1980s, when media scholars showed renewed interest in the topic. In 1985, Alan Rubin, Elizabeth Perse, and Robert Powell developed a selfreport parasocial interaction scale to measure the perceived bond that viewers have with local television news personalities. Many researchers now use the term "parasocial relationship" to describe the affective bond that individuals develop with characters and personalities in a variety of media genres, including news programs, talk shows, soap operas, dramas, and situation comedies.

Theoretical Approaches

Parasocial relationships have often been examined from the perspective of motivations. The "uses and gratifications" perspective contends that people are not passive recipients of media messages; rather, they seek out particular media content because they are motivated by goals, needs, desires, and/or preferences. Parasocial relationships have been conceptualized as a form of audience involvement that provides social and emotional gratifications, motivates further viewing, and may help to satisfy the affiliative needs of audience members.



Star Trek, with its movie and television spin-offs, has demonstrated the possibility of character attachments that endure over long periods. This feat was rewarded with the issuing of a special postage stamp in 1999, more than twenty years after the original television series was first aired. (AFP/Corbis)

The study of parasocial relationships has also been guided by efforts to explore the "interface" between mass communication and interpersonal communication. Early research on parasocial relationships recognized that these relational bonds were similar in many ways to the social relationships that people develop through face-to-face contact with others. Calls to synthesize theory in mass and interpersonal communication escalated in the 1980s, motivated in part by changing communication technologies that markedly altered the nature of mediated communication. For example, Robert Hawkins, John Wiemann, and Suzanne Pingree edited a volume in 1988 that was entitled Advancing Communication Science: Merging Mass and Interpersonal Processes. Individual chapters in this book addressed such issues as the similarities and differences between face-to-face and mediated communication, the activity and interactivity of media audiences, and the role of mass media in interpersonal relationships. Consistent with these efforts toward creating a synthesis,

theoretical approaches from interpersonal communication and psychology (e.g., implicit personality theory, theories of interpersonal attraction, attribution theory, uncertainty reduction theory, attachment theory, and social cognitive theory) have been applied to the understanding of parasocial relationships. Consequently, much of the research on parasocial relationships has used terms and concepts that have traditionally been associated with interpersonal relationships, and it has furthered researcher's understanding of the nature of the psychological bonds that individuals form with others.

Components of Attraction

In the initial stages of any relationship, including parasocial relationships, individuals engage in the process of impression formation. In forming impressions of others, people use a wide range of observable information, including physical appearance, behaviors, and emotional reactions. Media creators often rely on particular physical attributes, such as attractiveness, physique, or manner of dress, to convey certain impressions quickly. Impressions also develop over time, as audience members learn more about the background, personality, behavioral tendencies, and emotional makeup of media characters and personalities. Although all individuals are responsive to physical appearance cues, the weight that is given to these cues in relation to other information changes developmentally. Young children rely heavily on appearance when they are evaluating others, but older viewers rely to a greater extent on less visually salient cues such as personality and behavior.

As a function of forming impressions of others, viewers are attracted to media characters and personalities to varying degrees. Research confirms that media characters and personalities whose personal attributes and behaviors are perceived favorably are generally liked more. Viewers also tend to be more attracted to characters and personalities who (they perceive) are similar to themselves. Perception of similarity is enhanced by shared characteristics such as sex, ethnicity, social class, and age, but it may also be influenced by other factors such as personality traits, feelings, beliefs, and experiences.

Many media characters and personalities, however, are extremely good-looking, unusually talented, or highly successful in their endeavors, and they are undoubtedly dissimilar in important ways to most audience members. Viewers are attracted to such individuals, but rather than feeling similar, they often view them as being role models—people they want to be like. The desire to be like another individual has been referred to as "wishful identification." This process is promoted during media exposure by the tendency to identify with or share the perspective of a media character and by vicariously participating in his or her experiences.

Most of the research that is related to wishful identification has been conducted with children. It is not surprising that the television characters children want to be like possess a variety of desirable attributes. Children often wish to be like successful characters, regardless of whether they approve of the behaviors of the characters. On television, good characters are not necessarily popular or successful, and violence is often used successfully or for prosocial ends. In general, the positive or negative consequences that are experienced by the characters may be more important than their social behavior *per se* in determining wishful identification. There is also evidence that a certain subgroup (mostly males) identifies strongly with violent characters.

The character attributes that are associated with wishful identification vary based on both the sex of the viewer and the sex of the character. Although there are some differences across studies, boys tend to prefer same-sex role models that are perceived as being strong, active, and intelligent. In contrast, girls choose role models of both sexes, but the traits that influence their choices differ for male and female characters. Girls choose male role models that they regard as being intelligent and funny, whereas their choice of female role models is based primarily on the physical attractiveness of the characters. These results may reflect both gender-role stereotypes in society and the nature of male and female portrayals on television.

Parasocial Attachment

There is much evidence that audience members form strong affective attachments to mass media characters and personalities and that these relationships tend to be stronger for individuals who are active, involved viewers. Researchers have used the term "parasocial relationship" to describe this type of affective bond, which develops over time. While viewing a media presentation, audience members often feel as though they are involved in the events, and they respond in some ways as if they were witnessing or participating in real interactions with people they know. Over time, they may come to feel that they know these individuals as well as they know their real-world friends or neighbors. This type of involvement and familiarity leads to the formation of emotional attachments or parasocial bonds. Many viewers become so emotionally tied to fictional characters in television series that the disappearance of these characters-either through the plot of the program or because the series ends-is emotionally upsetting. Audience members also develop close emotional ties to real people who appear in the mass media, such as actors, talk show hosts, and other celebrities. The death of Diana, Princess of Wales, in 1997 provided a vivid example of the power of parasocial bonds. Millions of people whose only contact with the princess had been through the mass



One of the most prominent media celebrities of the 1990s was Princess Diana, which was illustrated by the fact that her death led to a worldwide public response that included the gathering of crowds and the leaving of floral tributes outside the gates of Kensington Palace, which had been her home in London. (Jeremy Horner/Corbis)

media apparently had felt a deep emotional attachment to her, as exemplified by worldwide public displays of mourning.

Researchers have likened the development of parasocial relationships to the process by which people form interpersonal relationships. Communication to reduce uncertainty and to increase knowledge of another person has been shown to play an important role in this process. In parasocial relationships, uncertainty may be reduced through passive strategies, such as observing media characters or personalities in a variety of situations, and through active strategies, such as talking with others about the characters. Studies suggest that initial attraction to media characters motivates further efforts to "get to know" them, leading to increased confidence in predicting their behaviors, greater intimacy or parasocial attachment, and an increased sense of relationship importance. Although most research on parasocial relationships has been done with adults, there is

evidence that children and adolescents also develop affective attachments to characters.

Audience Characteristics that Affect Parasocial Attachment

The social relationships and personal characteristics of audience members have been examined in relation to their parasocial attachments. Initially, it was believed that parasocial relationships compensated for a lack of social connections. Jan-Erik Norlund, for example, advanced this argument in 1978. However, evidence regarding this hypothesis has been mixed. Some research suggests that individuals who have less social involvement are more likely to use television for companionship and parasocial relations. Several other studies, however, have found no association between chronic loneliness and the tendency to form parasocial relationships. However, evidence does indicate that the interpersonal attachment style of an individual influences his or her formation of parasocial relationships. A study by Tim Cole and Laura Leets (1999), for example, found that individuals who had an anxious-ambivalent attachment style were most likely to form parasocial bonds, possibly as a way of fulfilling their unmet emotional needs. Individuals who had an avoidant attachment style were least likely to form parasocial bonds, and those who had secure interpersonal attachments fell in the middle.

Individual differences in empathy are also important. Although there are many definitions of empathy, it has been defined broadly as an individual's responses to the observed experiences of another person. Empathy plays an important role in interpersonal relations and contributes to shortterm emotional responses to media characters. There is some evidence that empathy also facilitates the development of long-term affective attachments to characters. Empathy increases a viewer's tendency to recognize and share a character's perspective and emotional experiences, which in turn should facilitate knowledge and understanding of the character and lead, over time, to the sense of a close parasocial bond. A study by John Turner (1993) has found that self-esteem was related to the development of parasocial relationships, but the nature of this association depended on the role of the media performer. For example, individuals who had difficulty communicating with others because of low self-esteem formed strong parasocial bonds with soap opera characters, but not with real media personalities. Finally, many studies have found that females tend to develop stronger parasocial attachments than do males.

Media Characteristics that Affect Parasocial Attachment

As Joshua Meyrowitz argued in 1979, formal aspects of television and film productions can shape the viewers' responses and their tendency to develop parasocial relationships with media characters or personalities. Camera angles, close-ups, and editing techniques influence the viewers' selection and interpretation of information, and they may affect the sense of closeness between the viewer and a character or performer, in much the same way as spatial distance affects interpersonal relations. Several studies indicate that parasocial relationships are enhanced when media characters or performers directly address the audience, thereby simulating the process of face-to-face interaction.

The content of media presentations may contribute to uncertainty reduction, and in some cases, it may resemble the process of self-disclosure. For example, the information that viewers receive about a fictional character is scripted and designed to reveal quickly the key aspects of the character's background and personality. Programs depict characters' interactions with others in a variety of contexts, their solitary activities, and even their innermost thoughts and feelings (e.g., via dream sequences). This type of information permits viewers to know more about media characters than they may know about the people with whom they have close interpersonal relationships. Similarly, celebrities, such as the hosts and guests on talk shows, often reveal personal information about themselves and share emotional experiences. Perhaps one of the factors that contributes to people's intense attachments to celebrities such as Princess Diana or Oprah Winfrey is the public's access to their so-called backstage behaviorsbehaviors that reveal how these individuals act in their private lives. Furthermore, audience members can obtain extensive information about media personalities and fictional characters from many sources, including print and television interviews, magazines that are devoted to particular series or genres (e.g., soap operas), and Internet chat rooms and message boards.

Long-Term Consequences of Parasocial Attachment

Parasocial relationships can be emotionally gratifying, they can provide viewers with a sense of companionship and pseudo-friendship, and they may enable viewers to participate vicariously in relationships as preparation for real-life social roles. Research also shows that parasocial relationships foster reliance on media characters and personalities for personally relevant information such as how to behave or how to cope with problems. Dependence on individuals who are known only through the media for behavioral guidance has the potential to affect people's lives positively or negatively, depending on the nature of the media portrayals. For example, fictional characters and celebrities who successfully confront personal problems may encourage safe and socially appropriate behaviors, but those who act antisocially, with few sanctions or adverse effects, may promote the acceptance of such behaviors.

See also: Children's Preferences for Media Content; Gender and the Media; Interpersonal Communication; Relationships, Types of; Soap Operas; Social Cognitive Theory and Media Effects; Talk Shows on Television; Violence in the Media, Attraction to.

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CYNTHIA A. HOFFNER

ATTENTION TO TELEVISION

See: Children's Attention to Television

AUDIENCE RESEARCHERS

"Research" in a media organization can mean checking sources for news programs, and it can mean conducting market research for advertisers. "Audience research," however, means only one thing: research that seeks to answer questions about the size and nature of the audience of television programs, radio stations, newspapers, magazines, and Internet websites. Because of the size of the television business and the important role of audience measurement, most audience researchers work at broadcast and cable networks and at local television stations. Therefore, this entry will focus on television audience research. (Audience research at the various media companies differs somewhat, but there are many similarities.)

The Famous "Nielsen Ratings"

Most people outside of the media business have some idea about audience research at the television networks because of the so-called Nielsen ratings, which are widely reported as measures of television program popularity. However, these ratings are frequently misunderstood and misinterpreted. For example, it is often said that Nielsen data shows that Americans watch seven hours of television each day. They do not; that is, Nielsen does not say that, and Americans watch much less. Nielsen finds that, in the average home, television sets are turned on for seven hours, but that does not mean that any one person in the average household watches that many hours of television programs.

Nielsen data are quite complex and not always easy to interpret. There are a variety of measures: household data (which are most widely reported, even though they are quite unimportant); "PUTs" (persons using television); "ratings" and "shares" (a share is a rating relative to the overall viewing level at the time); and "demo ratings" (demographic ratings, such as "18-49"). All of these provide information that is very important to most advertisers.

The complexity of the measures and the skills needed to interpret them accurately are not the main reasons why an audience researcher has a very important job. Audience research data are the "currency" of the commercial television business. While the Nielsen ratings are important measures of program popularity and help programmers decide which shows to keep on the air and which to cancel, their main function is to provide information for advertisers. For most networks and stations. advertising revenue is the main source of income, and that revenue depends on the size and quality of the audience. The more people watch a program, and the more those people watching the program are likely customers of the advertiser, the higher the revenue the broadcaster can expect to receive from commercials shown during that program. And since there is no other objective measure of the value of the programs to the advertiser, the Nielsen ratings are the currency of the television business. In a way, the audience numbers-and not the programs-are the products of television. (This is also true of radio and, to a large extent, the Internet. Magazines and newspapers also have circulation numbers that indicate how many "eyeballs" may have been reached by an advertisement.)

In short, audience researchers analyze the numbers that have a huge influence on television programming and determine the placement of billions of advertising dollars each year. A change of one point in the rating of a program can make a difference of \$20,000 in the price of one thirtysecond commercial; a change of one-tenth of a rating point for a television season could mean \$30 million more or less revenue for the networks.

Becoming an Audience Researcher

When television was in its infancy, most audience researchers learned on the job. Today, many colleges and universities offer courses and degrees related to the business of the media; some have programs specifically designed to prepare students for a career in this field. Not very many institutions, however, have courses on audience measurement, and there is no up-to-date textbook on this topic.

Essential skills for this job include research methods, statistics, and familiarity with computer programs. Just as important is an interest in and knowledge of television, advertising, and marketing. To supplement the college curriculum, students may want to try spending some time as interns at a television station and/or with media planners of an advertising agency. (The latter might provide an understanding of all media, not just television.) The more knowledge and the deeper the understanding of those areas, the greater the opportunities a person will have to advance beyond the level of an analyst (who conducts important, but more routine and repetitious analyses of data), to a level where he or she gets involved in all aspects of audience measurement. This might include preparing reports that decide the fate of a major television program, conducting an analysis that might help the sales department bring in an extra \$50 million of advertising revenue, working with Nielsen on methodological issues, or analyzing Internet usage in relationship to television usage.

On the Job as Audience Researcher

What does the day of a media researcher at a network look like? The first ratings are released each morning. Many programming executives get up quite early and want to find out immediately how their programs performed on the previous night. These clients also want trend analyses and other special reports that are geared toward their specific needs.

The other group of clients are the marketing and sales people who need the audience numbers to use in selling advertising time and making presentations on the quality of the audience. They may want information about the same programs as the programmers, but from a very different perspective. For example, they are primarily interested in positive data and information that will be useful for specific advertisers.

Beyond these daily, "normal" aspects of these kinds of jobs, there is an ever-changing array of special circumstances that often involves changes in Nielsen procedures or computer programs. Of growing importance is the arrival of new technologies—from high-definition television (HDTV) to digital video recorders (such as TiVo), and WebTV—that are difficult or impossible to measure with current hardware and methods. Thus, the job of an audience researcher will evolve, but it will continue to challenge and offer great opportunities to those who continue to learn on the job.

See also: Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, Programming and.

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HORST STIPP

AUTOMATION

See: Library Automation

B

BAKER, AUGUSTA BRAXTON (1911-1998)

Augusta Braxton Baker, an African-American librarian, storyteller, and activist, was born on April 1, 1911, in Baltimore, Maryland. Her schoolteacher parents put strong emphasis on the importance of education and the joys of reading, and after high school graduation, Baker began attending the University of Pittsburgh in 1927. At the end of her sophomore year, she married fellow student James Baker, and together they moved to Albany, New York. She attended New York State Teacher's College, from which she earned a B.A. in education (1933) and a B.S. in library science (1934). Soon afterwards, the couple moved to New York City, where Baker worked briefly as a teacher, and her son, James Henry Baker III, was born.

In 1937, Baker was hired by Anne Carroll Moore, formidable supervisor of youth services for the New York Public Library, to be a children's librarian at what was then the 135th Street Harlem Branch (now the Countee Cullen Regional Branch). The library had a sizable collection of books on African-American history and culture; unfortunately, Baker found the fiction not only inadequate but insulting, and her career as a velvet-gloved revolutionary began. In 1939, an inspired if exasperated Baker began assembling a special collection of titles that would fairly represent African-American culture and give children of all races a realistic picture of African-American life. To draw attention to the need for accurate portravals of African Americans in literature for young people, and to promote the visibility of the

slowly burgeoning collection, Baker wrote letters and gave speeches to publishers and editors at professional meetings. Her influence motivated several leading publishers to identify authors and illustrators who could produce stories with positive images of African Americans. Baker inspired a number of distinguished authors and illustrators, including Julius Lester, Ezra Jack Keats, Maurice Sendak, John Steptoe, and Madeleine L'Engle. Baker's recognition of a deficit in juvenile library collections and her professional and personal responsibility to fill that gap resulted in what was ultimately christened The James Weldon Johnson Memorial Collection. Baker published the first edition of her groundbreaking bibliography, Books about Negro Life for Children, in 1946, and a number of revised editions followed. In 1971, the bibliography was updated, and the title was changed to The Black Experience in Children's Books.

It was during the 1940s that the dynamic Baker began to gain a reputation as a spellbinding storyteller. A traditional mainstay of programming for young people at the New York Public Library, storytelling became for Baker a lifelong journey. In 1953, she was appointed storytelling specialist and assistant coordinator of children's services. She was the first African-American librarian to have an administrative position in the New York Public Library. Her love of traditional folktales and her desire to promote them among both children and other storytellers spurred Baker to compile four collections of stories: The Talking Tree (1955), The Golden Lynx (1960), Young Years: Best Loved Stories and Poems for Little Children (1960), and Once Upon a Time (1964). Two of these titles,



Famed storyteller Augusta Baker reads a book to a group of children. (Granger Collection)

The Talking Tree and *The Golden Lynx*, are recognized by library professionals as classic world folktale collections.

In 1961, Baker became the first African-American coordinator of children's services for the New York Public Library, a position that put this gifted librarian in charge of both programming for young people and policies governing that programming in all eighty-two branches of the library. Baker seized the opportunity to improve the quality of the youth collections in the library, emphasizing culturally inclusive books and audiovisual materials. Her growing influence did not stop at the library walls, but spread to schools, community groups, and professional organizations. She taught courses, gave workshops, spoke at conferences, and lectured on storytelling and children's literature. She was a consultant for the television program Sesame Street; an advisor to Weston Woods Media Company; and a moderator of the weekly radio program The World of Children's Literature. Baker participated in high-profile professional activities, serving the Children's Services Division of the American Library Association in various capacities, including president of the Association for Library Service to Children (ALSC) and chair of what was then the combined Newbery/Caldecott Awards Committee. Throughout a productive and respected career, the indefatigable Baker told stories, influenced public library policy, and altered the course of American publishing for children.

In 1974, after thirty-seven years with the New York Public Library, Baker retired as children's coordinator, but she did not retire from storytelling, libraries, or professional life. She was a sought-after speaker, and continued to lecture at universities, conduct workshops, and tell stories. In 1977, with coauthor Ellin Greene, Baker published *Storytelling: Art and Technique*, an authoritative handbook on storytelling in libraries.

In 1980, Baker was offered a position as storyteller-in-residence at the University of South Carolina, the first such position at any university. In 1986, the University of South Carolina College of Library and Information Science and the Richland County Public Library established the annual "A(ugusta) Baker's Dozen: A Celebration of Stories" in her honor. Among Baker's many additional awards are two honorary doctorates, the Grolier Foundation Award, the Regina Medal from the Catholic Library Association, the Constance Lindsay Skinner Award from the Women's National Book Association, and the Circle of Excellence Award from the National Storytelling Network.

Baker retired from her University of South Carolina position in 1994 and died on February 23, 1998. Her son donated her papers to the University of South Carolina. The Augusta Baker Collection of African-American Children's Literature and Folklore is located at the Thomas Cooper Library of the University of South Carolina. The Baker Collection contains more than 1,600 children's books (many inscribed), together with papers and illustrative material that provide an in-depth, microcosmic look at the history of children's literature and librarianship in the United States.

See also: LIBRARIANS; MOORE, ANNE CARROLL; STORY-TELLERS; STORYTELLING.

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JANICE M. DEL NEGRO

BELL, ALEXANDER GRAHAM (1847-1922)

In 1876, Alexander Graham Bell was granted U.S. patent 174,465 for the telephone. Bell's developments in telephony, however, were a consequence of his research and devotion to the hearing impaired.

"Alec" Bell (as he was known to family and close friends) was born in Edinburgh, Scotland, to Eliza Grace Symonds Bell and Alexander Melville Bell on March 3, 1847. Bell's paternal grandfather, also named Alexander, had worked as an elocution teacher and had published several books, including *The Practical Elocutionist* (1834), *Stammering and Other Impediments of Speech* (1836), and *A New Elucidation of the Principles of Speech and Elocution* (1849). Bell's father continued the family's work in this area, and the efforts of Bell and his father to teach speech to the hearing impaired was greatly influenced by the fact that Bell's mother was deaf.

In London in 1863, Bell and his father met with Charles Wheatstone, who had patented an electric telegraph in England in 1837 and made improvements to a mechanical speech-recording device. One consequence of the Bells' study of Wheatstone's device was an improved understanding of the physiology of speech. In 1864, Bell's father began developing the first universal phonetic alphabet, which eventually led to the publication of Visible Speech: The Science of Universal Alphabets (1867). Bell began studying phonetics by himself in 1865 and then physiology at London University in 1868. Alec also began teaching in 1868 at Susanna Hull's school for the deaf in South Kensington. The lackluster reception of *Visible Speech* in Europe and the deaths of Bell's brothers due to tuberculosis motivated his father to move the family to Canada in 1870.

Bell began teaching at Sarah Fuller's school for the deaf in Boston in 1871. It was there that he met Gardiner Hubbard, who shared similar interests with Bell since Hubbard's daughter, Mabel, was deaf. She and Bell were married on July 11, 1877, and they eventually reared two daughters together.

Bell lived in Salem, Massachusetts, at the home of one of his students, George Sanders, while he taught in Boston. Bell developed his idea for a "musical telegraph," a device based on the principle of sympathetic resonance, while living with the Sanders family. From this research, Bell concluded that a telegraph wire could carry several different tones at one time, thus leading to his experiments in multiplex telegraphy.

In 1874, shortly after he began teaching elocution at Boston University, Bell began working with Clarence Blake on experiments to replicate the effects of sound on the human ear. Bell intended to teach the deaf by re-creating exact visual representations of speech learned from these experiments. One by-product of the experiments of Blake and Bell was the phonautograph, a device that recorded the vibrations of sound and that led to Bell's development of the membrane, or diaphragm, telephone.

Also in 1874, Elisha Gray, an employee of Western Electric Company, was working on his own version of a telephone. Bell was being encouraged by both Hubbard and Thomas Sanders to file for patents for his ideas. Hubbard and Sanders became financiers and founding members of the Bell Telephone Company, as did Thomas Watson. Bell began working with Watson in January 1875 while preparing to patent the harmonic telegraph. Bell filed for three patents for his invention on February 25, 1875, but he lost the first two, in part to Gray, who had filed two days earlier for a similar device. Bell and Gray filed for legal rights to similar inventions again on February 14, 1876. Gray filed for a caveat, and Bell filed for a patent for the telephone on the same day. There remains



Alexander Graham Bell speaks into the Centennial telephone around 1876. (Bettmann/Corbis)

speculation that the patent officer, Zenas Fisk Wilber, may have allowed Bell to view Gray's caveat, which had been filed earlier that day.

Bell was granted the telephone patent on March 7, 1876. Watson was the first to hear a human voice via the telephone three days later, and the message generally is accepted to have been, "Mr. Watson, come here, I want you!" Bell's first significant public demonstration of the telephone was at the 1876 Centennial Exposition in Philadelphia, which provided the national and international exposure needed for marketing the telephone.

The first of more than six hundred lawsuits that challenged the Bell telephone patent began in March 1878. Peter Dowd, representing Western Union, challenged Bell's claim to the telephone. The Dowd lawsuit was settled in 1879 with the Bell Company acquiring Western Union's networks, customer base, and several enhancements to the device. Bell appeared in court to defend his patent on two other occasions. The second case took place in 1883 and dealt with Daniel Drawbaugh's claims of inventing the telephone. The third case, especially taxing to Bell, was initiated by James Rogers of Tennessee. Rogers anticipated tying up the Bell patent in litigation until its expiration, at which time Rogers assumed he could freely enter the telephone market. Rogers encouraged the U.S. government to file a suit against Bell

in January 1887, a case that took nine years before a settlement was reached in Bell's favor.

After the telephone, Bell continued his research, inventing both the telephonic probe and photophone. Legal battles over the telephone, however, discouraged Bell from seeking patents for his work. Bell's wife urged his reluctant patent application for the tetrahedral space frame, which was a concept he developed as a by-product of his interest in flight but which became more valuable in the fields of architecture and structural engineering.

Bell's advocacy led to better treatment of the hearing impaired, which drew the admiration of many of Bell's acquaintances, including Helen Keller. Bell's own Volta Bureau was merged with the American Association for the Promotion of the Teaching of Speech to the Deaf in 1956 to form the Alexander Graham Bell Association for the Deaf.

Bell died at his Beinn Breagh estate in Nova Scotia, Canada, on August 2, 1922. The patent for the invention of the telephone went to Bell in 1876, and the U.S. legal system upheld that decision throughout years of patent litigation. While several individuals, including Gray, deserve credit for inventing much of the technology of the telephone, it was Bell's conceptual development of the transmission of speech that best represents his achievement. Nevertheless, Bell's developments in telephony represent one period only of a career that was devoted to understanding the physiology of human speech.

See also: RECORDING INDUSTRY, HISTORY OF;

TELEPHONE INDUSTRY, HISTORY OF; TELEPHONE INDUSTRY, REGULATION OF; TELEPHONE INDUSTRY, TECHNOLOGY OF.

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BENNETT, JAMES GORDON (1795–1872)

When James Gordon Bennett Sr. died on June 1, 1872, his old rival Horace Greeley's *New York Tribune* eulogized: "He developed the capacities of journalism in a most wonderful manner, but he did it by degrading its character. He made the newspaper powerful, but he made it odious."

Bennett founded the *New York Herald* on May 6, 1835, with five hundred dollars and a cellar office. In the ensuing thirty-seven years, he guided the *Herald* into one of the world's most powerful newspapers, with circulation and advertising revenue second only to the *London Times*. Along the way, he helped create the modern newspaper. Bennett's credits include being the first Washington correspondent; first to publish a direct news interview (with a brothel madam); and first American editor to use news illustrations, print weather reports, cover sports regularly, and hire foreign correspondents.

Born September 1, 1795, in Keith, Banffshire, Scotland, Bennett was the son of one of the area's few independent farmers. At fifteen years of age, he attended seminary in Aberdeen to prepare for the priesthood. He was an eager student but experienced a crisis in faith and left college in 1814. During the next five years he traveled and read extensively and sold his first freelanced article. Fascinated by Benjamin Franklin's *Autobiography*, he decided on impulse to visit America.

On New Year's Day 1820, Bennett arrived in Boston, Massachusetts. A fellow Scot hired him to clerk for booksellers/publishers Wells and Lilly. Though he worked hard, his appearance, accent, and sarcasm annoyed customers. One contemporary described Bennett as "so terribly cross-eyed that when he looked at me with one eye, he looked out at the City Hall with the other." Wells and Lilly moved him to proofreading, a job he excelled at, but which may have exacerbated his eye problems.

He soon moved on to New York and worked at odd jobs until Aaron Smith Willington, editor of the Charleston, South Carolina, *Courier*, hired him. Bennett spent ten months translating for *Courier* readers the French and Spanish newspaper articles that were brought by ships into Charleston's harbor. Returning to New York, he freelanced, failed in an attempt to found a com-



James Gordon Bennett. (Bettmann/Corbis)

mercial school, bought and sold the unprofitable *Sunday Courier*, and in 1827 obtained a job on Mordecai M. Noah's *Enquirer*. Like the *Courier*, the *Enquirer* was a mercantile newspaper primarily offering news for merchants. Also like its fellows, the *Enquirer* had a political position—it supported the Democratic party and Andrew Jackson—and in turn was supported by party members. Bennett actively entered party politics and rose to member of the Democratic Ward Committee in 1831, but his attempts to secure higher positions failed.

Though Bennett and Noah were both strong Jackson supporters and Noah appreciated Bennett's talents, he did not like Bennett personally. When Bennett proposed writing from Washington, Noah obliged and Bennett became New York's first Capitol Hill correspondent. He soon earned a national reputation for breezy, witty reporting as other Jacksonian papers picked up his stories. In 1832, he started his own newspaper in New York, the *Globe*, but it failed. He bought shares in and edited the *Pennsylvanian* in 1833. He applied to Martin van Buren for a \$25,000 loan but was turned down. After a year, he returned to New York, professing disillusion with the "hollowheartedness and humbuggery" of politicians.

While Bennett was in Pennsylvania, Benjamin H. Day had founded the New York Sun, an apolitical paper aimed at the newly literate masses. At that time, the twelve New York City dailies had average circulations of around two thousand each. By 1835, the Sun, which sold for a penny, had a daily circulation of nearly twenty thousand, more than the London Times. Bennett made overtures to Day but was not hired. He next tried to interest Horace Greeley in a partnership but was turned down. Then at forty years of age, after a string of political, business, and publishing failures, he launched the New York Herald, declaring, "We shall support no party . . . and care nothing for any election or candidate from president down to constable" and boasting that through "intelligence, good taste, sagacity, and industry," the Herald would soon have a circulation of "twenty or thirty thousand."

The *Herald* had something for everyone: concise news summaries; local stories emphasizing the humorous and tragic, especially police court; lively accounts of sporting events; reviews of plays and musicals; and economic news, including a financial feature, "Money Market," that brought Wall Street news to a general audience for the first time. Even advertising was checked daily to maintain its reader appeal. Unlike the *Sun*, the *Herald* from the beginning covered world and national news and economic developments as fully as its four pages allowed. It went after not only the bluecollar readers of the *Sun*, but also the middle- and upper-class readers of the mercantile press.

Bennett wrote about events vividly, intimately, and controversially. His sensational journalism did attract readers, but it also attracted enemies. From Wall Street businessmen to society *doyennes*, the upper crust resented having their private bankruptcies and dinner parties laid out for the *hoi polloi*. Bennett took advantage of his enemies, especially editors, by attacking them in the *Herald*, hoping they would print counterattacks, thereby publicizing the *Herald* to their own readers. Benjamin Day obliged, writing that Bennett's "only chance of dying an upright man will be that of hanging perpendicularly from a rope." In 1836, Bennett's former employer, James Watson Webb, responded by severely caning him one day on Wall Street. Bennett regaled the next day's *Herald* readers with an account of the attack, noting Webb had "cut a slash in my head about one and a half inches in length. . . . The fellow, no doubt, wanted to let out the never failing supply of good humour and wit . . . and appropriate the contents to supply the emptiness of his own thick skull."

Bennett accumulated powerful enemies, from politicians (he once wrote that his crossed eyes came from watching "the winding ways of Martin Van Buren") to clergymen (New York's Roman Catholic bishop excommunicated him for dubbing transubstantiation "religious cookery"). In 1840, these leaders declared a "Moral War" on him, organizing boycotts and attacking him viciously in the press. The war did not drive away Herald advertisers, but it did pull perhaps one-third of the readers; the paper took five years to regain its pre-1840 circulation. It also forced Bennett to promise publicly to improve the tone of the Herald. Never again was the paper quite so impishly egotistical, so crudely defiant. As Greeley later sneered, it gained some decency if not principle.

A consummate newsman, Bennett spent whatever it took to scoop others in reporting the day's events. He deployed the fastest boats to relay news from ships in New York Harbor, made early and frequent use of the telegraph, and organized a consortium of newspapers to pay for a pony express from New Orleans that regularly beat the post office by as much as four days. Bennett had long championed the South editorially, but when the U.S. Civil War came, he strongly supported the Union. The *Herald* sent sixty-three correspondents to cover the war and often published news from the front before it had reached the U.S. War Department.

By 1865, the *Herald* had a circulation of 110,000 with an annual revenue of \$1,095,000. Bennett officially handed the *Herald* over to his son James Gordon Bennett Jr. in 1867. While the son had Bennett's nose for news—he sent Henry M. Stanley to Central Africa to find Dr. David Livingstone—he lacked his business sense and capacity for hard work. After his death in 1918, the *Herald* was bought by the owners of the *New York Tribune*, who merged the papers of rivals and enemies Bennett and Greeley into the New York Herald Tribune in 1924.

See also: Greeley, Horace; Journalism, History of; Newspaper Industry, History of.

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Ellen Williamson Kanervo

BIBLIOGRAPHY

Bibliography is the study of books as conceptual content and as physical objects. The books in question, once limited to hardbound objects available in bookstores, are today generally defined more broadly. The term "book" is now generally applied to all texts (be they published or in manuscript) that are meant to be permanent, including periodicals, maps, music, pictures, and ephemera, as well as materials preserved in the audiovisual and electronic media. The conceptual and physical aspects of these objects involve the two specialties of reference bibliography and analytical bibliography.

Reference Bibliography

Lists, inventories, footnotes, and prose essays are all ways in which readers and books can be brought together. To make these tools more useful to the reader, standard citations have been formulated for each situation. These citations emphasize content, even though the physical embodiment is inseparable. A bibliographical citation typically consists of an entry that names

- 1. the creator of the text,
- 2. the title of the text, either as formally presented or in common usage,
- 3. a source where the text is available (i.e., an imprint statement that names the publisher or a statement that identifies the larger work, such as a periodical, in which the text appears), and
- 4. other specifics (such as date and place of publication, volume number, and pagination) that can be fitted into an established formula.

In some cases, an annotation or abstract, describing the content in a free-form prose statement, is appended to the above elements in a bibliography citation.

Systematic bibliography is the study of the compiling of lists; enumerative bibliography is the study of the use of those lists. The lists themselves, generally referred to as bibliographies, are often qualified by adjectives that designate a topic, genre, or approach. Examples of this include subject or national bibliographies (e.g., French bibliographies), author bibliographies (e.g., Milton bibliographies), and critical bibliographies. Among the offspring of bibliographies are discographies, for sound recordings in whatever physical form, and filmographies, for motion pictures in whatever physical form. Archival finding aids and calendars, museum inventories, and many merchandise displays are often closely modeled on bibliographical lists. Although bibliographies are usually thought of as things to be consulted, people do read them as well. For example, browsers who are in search of perspectives on a topic would read through complete bibliographies, as would browsers who are interested in surveying a topic's literature in its entirety.

Lists may be organized either in linear sequence on paper or randomly in computers. With printed lists, additional access often needs to be provided through the inclusion of indexes, classified lists, and tables of contents. With online lists, access depends on the vocabulary of searchable terms. Printed lists have the advantage of a structure that is visible to the reader. Online lists, however, may provide more current information. Each type depends on establishment of its credibility. Inevitably, bibliographies reflect their compilers' conceptions of the unity, totality, and structure of the topic they cover; along the way, the compilers define the topic itself and aspire to canonize their literature. Bibliographies at once both describe and prescribe—their statements inevitably promote the texts in the process of referring to them. At the same time, the precise uses of bibliographies are inevitably determined by their readers.

The difference between a catalog and a bibliography is still widely seen as one of function. While catalogs identify specific copies (e.g., of a book held by a library), bibliographies refer to writings in general (e.g., all books published on a topic). This distinction is now becoming obsolete, thanks to union catalogs that bring together writings or other media from many different library collections. These new types of catalogs can then work as bibliographies.

Bibliographic control (a concept that underlies the concern of the librarian for universal bibliographic control), along with its counterpart, bibliographical organization, involves strategies for making the entire world of books better available to readers. In the study of citation analysis, bibliometrics employs statistics to evaluate bibliographical references and measure the patterns involved in the use of texts. As it offers gateways to the written literature of society, reference bibliography is obviously crucial to the communities of readers and to the use of books.

Analytical Bibliography

Books, in addition to being studied for their content, can be studied as physical objects, in terms of both the materials used in them (paper, type, ink) and the activities involved in producing them (type design and composition, illustration, house practices of layout and presswork, printing processes, as well as binding and preservation). Among its interrelated specialties, textual bibliography (sometimes considered to be the same as textual criticism) is the study of the relationship between the content of the text and the physical form of the text as it is envisioned by those who create its conceptual and physical artifacts. The physical presentation of a book-its typeface, paper quality, and overall design, for examplesubtly affects the way the message is read. In overt ways, the text itself thus often comes to be distorted through misreadings, editorial changes, or printing errors. Descriptive bibliography then formulates in scrupulous detail the statements that identify the physical book. This type of bibliography allows the user to compare a particular copy of a book with other copies of the same title in order to spot the differences and to determine what the ideal copy was meant to look like.

The study of physical evidence ranges from the work of historians who confirm what exactly the text consisted of to the work of forensic specialists who uncover evidence of either authenticity or of tampering. Increasingly, this latter activity involves the scientific laboratory. The graphic arts, concerned with the visual presentation of words and/or pictures, are generally not seen as a branch of bibliography, although they are nonetheless essential to bibliography. Emphasizing printing as it does, physical bibliography has counterparts in the disciplines of paleography, which is concerned with manuscripts (those from the eras before printing in particular), and epigraphy, which is concerned with inscriptions and other writings on hard surfaces.

The study of physical bibliography has long been the specialty not only of printing historians but also of bibliophiles and antiquarian book dealers, whose concerns for authenticity are closely related to the use of books as historical evidence. The work of these individuals is of basic importance in the study of the historical role of communication in society, and the interrelationships between its written, electronic, and oral forms. Historical bibliography, since it recognizes names, places, titles, and events, involves the study of the tastes and cultural dynamics of physical books to uncover the relationships between books and history. The term "book history" is also coming to be used for this field of study; a fascination with French annales historians has also inspired the term "histoire du livre." Recorded knowledge, in its iconic and symbolic forms, is abundantly in evidence today, thanks in large part to physical bibliography.

See also: Cataloging and Knowledge Organization; Library Automation; Printing, History and Methods of.

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BLY, NELLIE (1864–1922)

"Nellie Bly" was the pen name of Elizabeth Jane Cochrane Seaman, a pioneer of "stunt" journalism (an early form of investigative reporting). Bly's most important investigative pieces included detailing the miserable conditions of a mental asylum, exposing corruption in New York state government, and publicizing the plight of the families of workers during the Pullman Palace Car Company strike of 1894. She is perhaps most famous for her dash around the world in seventy-two days, a feat that boosted the circulation of Joseph Pulitzer's *New York World* and made "Nellie Bly" a household name. She was the first woman to report from the Eastern Front in World War I, and she wrote an advice column chronicling her charitable efforts.

In 1885, *The Pittsburgh Dispatch* ran a series of columns by Erasmus Wilson decrying "restless dissatisfied females" and longing for women who make "home a little paradise." Among women across the city chastising Wilson, one signed herself "Lonely Orphan Girl." The *Dispatch* advertised for the writer to present herself, and the next day Nellie Bly's career was launched. During the next year, Bly wrote pieces on divorce, working girls, and factory conditions—before being moved to cover fashion, society, gardening, and arts. Bly disliked these softer stories and, when she failed to break out of women's news, quit the *Dispatch* in December 1885.

On February 24, 1886, she reappeared in the *Dispatch* under the headline "Nellie in Mexico." This article was the first installment in a series of more than thirty articles chronicling her adventures south of the border. Bly later turned these pieces into her first book, *Six Months in Mexico*, but when she returned to Pittsburgh, the editors at the *Dispatch* again assigned her to cover the arts. She chaffed under these assignments, the last of which appeared March 20, 1887. Soon after, she left the staff this note: "I am off for New York. Look out for me."

Four months and her life savings later, she was desperate. After borrowing cab fare from her landlady, Bly talked her way into the private office of the managing editor of Pulitzer's *New York World* and into an assignment to get herself committed to the Women's Lunatic Asylum on Blackwell's Island. The resulting story ran as the lead Sunday features on October 9 and 16, 1887. Bly's byline appeared at the end of the first story, an honor rarely accorded veteran writers, and her name made the headline of the second installment, indicating that Bly had catapulted to journalistic stardom. Two months later, her book, *Ten Days in a Mad-House*, was published.

For the next two years, Bly became the leading "stunt girl" for the World, posing as a sinner needing reform to investigate the Magdalen Home for Unfortunate Women, pretending to be a patent medicine manufacturer's wife to uncover corruption in state government, and getting herself arrested to spend the night in a co-ed jail. While many of her stunts were titillating and sensational, she often took the role of reformer, pointing out the needs of the downtrodden, unmasking con artists, and exposing legal and political biases. She was not a polished writer, but she had good instincts for framing questions to elicit powerful quotes and for telling compelling stories. Bly also usually managed to inject herself into her stories, frequently including quotes (provided by those people whom she interviewed) about her own winsome smile, pluck, and bravery.

On November 14, 1889, Bly set out to beat the fictional record of Jules Verne's Phileas Fogg by circling the world in less than eighty days. Along the way, she charmed the French novelist-and the rest of the world-with accounts of danger, frustration, and exotic adventures. She completed her trip on January 25, 1890, in seventy-two days, six hours, eleven minutes, and fourteen seconds, arriving back in New York City amid cheers from thousands of well-wishers. On the Saturday that she returned, the World sold ten thousand more papers than it had on the previous Saturday. However, Bly thought that the newspaper failed to acknowledge her contribution to its popularity. She signed a three-year contract with Norman L. Munro to write serial fiction for his weekly New York Family Story Paper. No known record exists of Bly's stories or their reception, but Bly's letters to Erasmus Wilson indicate that she battled depression over the next three years.

On May 10, 1893, the *World* celebrated its tenth anniversary with synopses of its most memorable stories. The accounts mention only one reporter by name, Nellie Bly. Perhaps this retrospective caused the editors of the *World* to seek out Bly. On September 17, 1893, under the front-



The success of Nellie Bly's record-breaking trip around the world was given full front-page coverage upon its completion. (Bettmann/Corbis)

page headline "Nellie Bly Again," she returned to the stable of stunt reporters for the *World*. Among her best reporting was her coverage of the Pullman Palace Car Company strike of 1894, in which she sympathetically outlined the plight of workers who were living in company towns and at the mercy of company salaries and prices.

By 1895, still battling depression, Bly left the World for a five-week stint at the Chicago Times-Herald, and on April 5, 1895, Bly secretly wed Robert Livingston Seaman, a seventy-year-old New York industrialist. She was thirty-one. The couple's first year together was stormy. His relatives opposed the match and caused enough trouble over money that Bly decided to reenter journalism, interviewing political figures about their views on marriage, covering the National Woman Suffrage Convention in Washington, D.C., and, in March 1896, proposing to recruit a regiment to fight for Cuba against Spain. The last story may have shaken Seaman enough to save her marriage. Her plan faded into oblivion, and by August, the Seamans had sailed for Europe, where they remained for the next three years, with Bly nursing her husband through deteriorating eyesight and Seaman changing his will to make her sole beneficiary. They returned to the United States in 1899 and lived quietly until Seaman died in 1904. By that time, Bly was immersed in running Seaman's Iron Clad Manufacturing Company. By 1905, she held twenty-five patents in her own name. She designed, manufactured, and marketed the first successful steel barrel produced in the United States in a factory she strove to make a model of social welfare for her fifteen hundred employees. But she failed as a financial overseer. The Iron Clad Manufacturing Company fell prey to employees who embezzled perhaps as much as \$1.6 million. In 1911, Bly faced a bankruptcy fight that would last for three years. To make ends meet, she worked intermittently for William Randolph Hearst's New York Journal.

In 1914, four days after Austria declared war on Serbia, Bly set out for Vienna, seeking financing for her Iron Clad offshoot, American Steel Barrel Company, from wealthy Austrian friend Oscar Bondy. While her mission began as business, she recognized her journalistic opportunity and covered the early part of the war for the *Journal*. She became an Austrian supporter and stayed in Vienna until the end of the war, working for the welfare of widows and orphans.

In 1919, she returned to New York, where she wrote, for the *Journal*, an advice column that publicized her efforts to help unwed mothers and their children. By 1921, she told readers she had placed thousands of children in happy homes and provided thousands of unwed mothers with new chances. Bly died January 27, 1922.

See also: Hearst, William Randolph; Journalism, History of; Newspaper Industry, History of; Pulitzer, Joseph.

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BODY IMAGE, MEDIA EFFECT ON

According to Judith Rodin, Lisa Silberstein, and Ruth Striegel-Moore (1984), the concern American women have with weight has become "a normative discontent." Consider the mother, sister, or friend who is perpetually on a diet to lose "those last five pounds." Such widespread concern with body shape (or "body-image disturbance") is a relatively new historical development that mirrors the increasing tendency for media outlets to feature dieting information and images of extremely thin characters and models.

Eating disorders such as anorexia nervosa and bulimia nervosa are less common than bodyimage disturbances, but they too are increasing in prevalence. Rates of occurrence of eating disorders among females in the United States range from as little as 1 percent (for anorexia) to more than 20 percent (for bulimia). Rates of occurrence of eating disorders among males in the United States are smaller (about one-tenth that for females), but they are growing too. As these numbers increase, the population of people with eating disorders is becoming more diverse. Early research suggested that young, white, upper-middle-class, college-educated women were at highest risk for developing eating disorders, but more recent research shows that eating disorders are quickly becoming an affliction of equal opportunity, affecting women of color, children, men, older people, and, as research by Anne E. Becker (1991) suggests, people in countries that previously had little problem with eating disorders until they began importing American media.

Trends in Media Depictions of the Ideal Body

Some feminist theorists have argued that when women gain ground politically, thinness as a female ideal becomes fashionable because American society is uncomfortable with voluptuous women in powerful positions. This is meant to explain why the long, lean "flapper" style was popular during the women's suffrage movement, why British model Twiggy gained fame during the women's liberation movement of the 1960s and 1970s, and why the "heroin chic" waif look became appealing when the Clinton administration began in the early 1990s.

Whatever the reason for these trends, it is clear that the women depicted in the U.S. media have steadily grown thinner since the 1950s. A 1980 study by David M. Garner, Paul E. Garfinkel, Donald Schwartz, and Michael Thompson reported a significant decrease in the body measurements and weights of Playboy centerfold subjects and Miss America Pageant contestants from 1959 to 1978. Updates of this study show a continued trend toward the slimming of both centerfold subjects and pageant contestants. Dozens of other analyses of magazines, television, and movies show that there are more dieting and exercise articles being published than ever before and that the models and characters-especially females-featured in these media are disproportionately skinny when compared to the population at large.

Media Effects on Body Image

Given that the slimming trend in the media parallels the increasing obsession with thinness in real life, researchers have been compelled to study the effects of exposure to thin-ideal media.



Many people object to beauty pageants, including the Miss Universe competition, because the pageants foster the image of an "ideal" body type that many, if not most, young women cannot attain. (AFP/Corbis)

Research here is split into two domains: (1) media effects on body image and (2) media effects on disordered eating.

Research generally shows that exposure to the thin-body ideal leads to temporary decreases in self-esteem and increases in body and weight dissatisfaction, depression, and anxiety. But which audience members are most vulnerable? In a 1993 study by Kate Hamilton and Glenn Waller, research participants who did not have eating disorders were not affected by viewing a set of thinideal photographs, but when participants who did have eating disorders viewed the photographs, they subsequently overestimated their own body size by an average of 25 percent. These results are echoed in a study by Heidi D. Posavac, Steven S. Posavac, and Emil J. Posavac (1998), which showed that the adverse effects of exposure to thin-ideal media were especially strong for young women who were initially more dissatisfied with their bodies, as compared to women who were less dissatisfied with their bodies.

Much of the research on media effects on body image has been guided by the social comparison theory of Leon Festinger (1954), which holds that people are driven to evaluate themselves through comparison with others. This is a risky business, because unfavorable comparisons can make individuals feel inadequate and worthless. A study by Mary C. Martin and Patricia F. Kennedy (1993) showed that the tendency to compare the self to thin models was strongest for participants who initially felt the least personally attractive and who had the lowest self-esteem. In addition, a study by Renée Botta (1999) showed that the tendency to compare the self to thin media personalities (a tendency she calls "body-image processing") is important in predicting internalization of the thin-body ideal. These studies, as well as those summarized above, suggest that people who have the most to lose as a result of comparison are, unfortunately, those most likely to compare themselves to thin-ideal models and characters.

Media Effects on Eating Disorders

Research has shown convincingly that thinideal media exposure is related not only to bodyimage disturbances but also to disordered eating. Kristen Harrison and Joanne Cantor (1997) have shown that this correlation exists even for people who say they have no interest in dieting and fitness as media topics. Like body-image disturbance, disordered eating as an outcome of thin-ideal media exposure is dependent on the audience members' individual differences, such as sex (females exhibit stronger correlations than males) and interpersonal attraction to thin media personalities (people who are attracted to thin media personalities exhibit stronger correlations than people who are attracted to average or heavy media personalities). Several possible mediators of the media-disorder link include negative affect, thin-ideal body stereotype internalization, and body dissatisfaction.

Researchers including Michael P. Levine and Linda Smolak (1998) have been working on media literacy campaigns to arm vulnerable children against the onslaught of thin-ideal messages they encounter through media exposure. It is hoped that these campaigns, informed by continued work on individual differences in vulnerability, will help researchers develop prevention programs that can be tailored to audience members based on their own particular vulnerabilities.

See also: Feminist Scholarship and Communication; Gender and the Media; Nutrition and Media Effects.

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KRISTEN HARRISON

BROADCASTING, GOVERNMENT REGULATION OF

The system of broadcast regulation by the U.S. government evolved from the early twentieth century into an intricate web of influences that include government agencies, courts, citizen groups, and the industry itself. These entities work in concert to shape the regulation of broadcast content, networking, technology, advertising, ownership, public-interest obligations, community relations, and other aspects of the broadcast business.

Entities Involved in Broadcast Regulation

Operating under the Communications Act of 1934 as amended by the Telecommunications Act of 1996, the Federal Communications Commission (FCC) is the major independent regulatory agency that sits in the heart of the regulatory web. The FCC is primarily responsible for issuing operating licenses, managing the use of the airwaves, and creating rules and regulations that all nongovernment broadcasters must follow, both commercial and noncommercial. The FCC holds rule-making proceedings and inquiries to gather information needed to create, change, or abolish regulations. It also enforces existing rules and regulations using such measures as consent orders, forfeitures (fines), conditional license renewal, denial or revocation of license, or letters and other "raised eyebrow" actions. However, despite its position as the main regulatory agency for the broadcast medium, it must listen to the demands of the U.S. Congress, the president of the United States, the courts, the broadcasting industry, the general public, and other regulatory agencies.

Because Congress was responsible for creating the FCC as part of the Communications Act of 1934, Congress holds substantial power over the agency, including appropriation of the budget, approval of the five FCC commissioners, and reauthorization every two years of the agency's very existence. Congress can also appoint special committees to investigate FCC decisions or operations if it so chooses. However, the greatest power that Congress has over the FCC is that Congress may amend the Communications Act of 1934 at any time, thereby changing the rules, regulations, or organization of the agency.

Like Congress, the president of the United States also has some control over the FCC. The president nominates each of the five FCC commissioners, although they must be approved by Congress. Furthermore, the president may select which commissioner will become the FCC chairman. Other powers of the president include control of the airwaves during wartime and assignment of frequencies for government use.

In order to keep abreast with telecommunication matters, the president must have telecommunication advisors. The National Telecommunications and Information Administration (NTIA) fills this capacity. The NTIA advises the president on domestic and international communication policy and competitiveness, conducts telecommunication research, and encourages the development of various educational and public services. In addition, the NTIA promotes presidential policy to the FCC, Congress, and the general public.

The Federal Trade Commission (FTC), another independent regulatory agency, enters the web of broadcast regulation as a watchdog for false advertising and antitrust violations. The FTC, for example, may declare an advertisement to be misrepresentative or deceptive, and then charge the respective broadcaster and advertising agency to either cease, alter, or correct the faulty ad.

The Equal Employment Opportunity Commission (EEOC) enforces federal discrimination laws as well as affirmative action for all businesses in the United States. The broadcasting industry is not exempt from scrutiny by the EEOC. Therefore, all broadcast stations, networks, and affiliated offices must follow the equal employment opportunity guidelines and record their compliance in public inspection files.

Whenever an FCC decision is appealed, that appeal is taken to the federal courts. The U.S. Court of Appeals for the District of Columbia usually hears FCC-related appeals, reviews the various FCC decisions in question, and declares its findings. In certain situations, the U.S. Supreme Court may review a lower court's decision. Depending on the outcomes of the court decisions, the FCC must take the appropriate action, whether it is to abandon an initiative or try again.

The general public gained some influence over broadcast regulation during the twentieth century. For example, citizen groups and public-interest organizations took broadcasters to court, pressured local broadcast stations with petitions to deny license renewal, and negotiated settlements. Citizen groups also influenced the FCC directly by petitioning the agency to enforce its existing policies or to create new policies that would further broaden the scope of broadcast regulation.

Broadcast Industry Self-Regulation

In order to keep outside regulation at a minimum, the broadcasting industry undertakes measures of self-regulation, including voluntary programming ratings; voluntary screening of violent, indecent, and otherwise inappropriate program content; and refusal to accept advertising selling such items as cigarettes and hard liquor. These actions, like those taken under the Codes of Practice of the National Association of Broadcasters in the mid-1900s, have served to restrain the government from regulating what the industry has already been self-regulating.

Historical Development of Broadcast Regulation

The first official attempt by the United States to regulate broadcasting occurred in 1910, when Congress enacted the Wireless Ship Act to ensure maritime safety. The Wireless Ship Act required a radio and an accompanying skilled operator to be on board every passenger vessel. However, the legislation did not require the operator to be on duty


The original members of the Federal Radio Commission, which first met on April 2, 1928, to begin the task of unscrambling the air lanes according to the Radio Act of 1927, were (left to right) Sam Pickard, Orestes H. Caldwell, Eugene O. Skyes, Harold A. Lafount, and Ira E. Robinson; Carl H. Butman, secretary of the commission, is standing. (Underwood & Underwood/Corbis)

twenty-four hours a day, an oversight that became tragically evident when an operator on a nearby ship was not on duty to receive distress calls from the *Titanic* on April 14, 1912. Consequently, Congress tried again.

The Radio Act of 1912 followed the Wireless Ship Act and introduced the idea of assigning frequencies and issuing operating licenses to potential radio operators. Now, anyone wishing to transmit could apply for a broadcast license, and many people did. The result was an overcrowding of the airwaves and problems with signal interference. Unfortunately, the 1912 act gave the government no authority to reject license applications or fix the interference problems. Therefore, in an attempt to control the burgeoning field of broadcasting, Congress created a new act.

This new act was the Radio Act of 1927. This act solved the interference and licensing problems and provided the foundation on which the Communications Act of 1934 would be built. First, the 1927 act created a five-member Federal Radio Commission (FRC) to govern licensing, frequency assignments, and station operations, as well as to oversee network broadcasting and prohibit monopolization. Second, licensing standards became more stringent. An applicant had to meet certain criteria to be granted a license. Furthermore, licensing periods, which were indefinite under previous legislation, were now limited. Third, and perhaps most important, broadcasting was redefined and reconceptualized. For example, broadcasting was considered interstate commerce, which Congress had the authority to control under the U.S. Constitution (Article I, Section 8), and broadcast messages were granted First Amendment protection. Fourth, broadcasting was recognized as a unique form of communication that would require a different regulatory framework than that of common carriers such as telephony and telegraphy. All of this was then packaged with the philosophy that the broadcast media

should serve "the public interest, convenience, and necessity."

Many of the changes, both operational and conceptual, that resulted from the Radio Act of 1927 were soon challenged in court by various broadcasters. At the heart of many challenges was the commission's authority to deny or revoke a license. These challenges eventually led to the birth of the Communications Act of 1934.

The Communications Act of 1934 became the first comprehensive legislation to regulate both wire and wireless communication. It enhanced the concepts introduced in the 1927 act, including the principles that the public owns the airwaves and that broadcasting is a legally unique form of communication. The 1934 act also created the FCC, which was charged with ensuring that broadcasters acted "in the public interest, convenience, and necessity."

In 1941, the FCC initiated the chain broadcasting rules, which limited the programming power and economic influence that radio networks could have over affiliated local stations. Later, the FCC responded to the introduction of television by applying similar limitations to television networks.

It was not long after its action limiting network influence over local affiliates that the FCC sought to clarify its public-interest standard for broadcasters. In 1946, the FCC issued its *Blue Book*, which suggested that stations should air certain types of programs in order to serve the public interest. Specifically, the 1946 *Blue Book*, officially titled *Public Service Responsibility of Broadcast Licenses*, urged stations to serve the public interest by airing nonsponsored programs, local live programs, and programs that discussed public issues. The *Blue Book* also called for the elimination of advertising excesses.

Three years later, in 1949, the broadcast industry was confronted with a document titled *In the Matter of Editorializing by Broadcast Licensees*. This document created a ban on station editorializing and produced the Fairness Doctrine, which required stations to devote a reasonable amount of time to the discussion of controversial issues of public importance and to present contrasting views on such issues. The 1960 Programming Policy Statement (officially Report and Statement of Policy re: Commission en banc Programming *Inquiry*) further defined the public-interest programming obligations of broadcasters by requiring stations to ascertain the needs and interests of their communities and then demonstrate how those needs were being met. However, broadcasters did get relief in 1959 and 1960 when two amendments to the Communications Act of 1934 were passed.

The 1959 and 1960 amendments applied to section 315 of the Communications Act of 1934. This section required that if broadcasters allowed a political candidate to express views on the air, then the stations had to provide an equal opportunity for opposing candidates to present their views. The 1959 amendment exempted *bona fide* newscasts, news interviews, news documentaries, and on-the-spot news coverage from this requirement. The 1960 amendment, a reaction to the Nixon-Kennedy debates, included coverage of debates as another type of exempted program.

The 1960s also saw the influence of new technologies on legislation. The Communications Satellite Act of 1962 was created to control the long-term commercial use of satellites. The 1962 All Channel Receiver Law added section 303 to the 1934 act, requiring all television receivers sold in the United States to be capable of receiving both VHF and the new UHF signals. In public broadcasting, the Educational Television Facilities Act of 1962 provided a monetary jumpstart for the construction of educational television stations, and in 1967, the Public Broadcasting Act was passed, which created the Corporation for Public Broadcasting and provided direct appropriations for noncommercial programming. Also, citizens gained the means to influence station licensing and renewal directly when the U.S. Court of Appeals for the District of Columbia Circuit established—in Office of Communication of the United Church of Christ v. Federal Communications Commission (1966)-the right of the public to participate legally in broadcast licensing proceedings.

The 1970s began with stricter rules on networks. The first of three tries at Prime-Time Access rules was introduced in 1970 and limited network programming to three hours per day between 7:00 P.M. and 10:00 P.M. Central Time. The Financial Interest and Syndication Rules, also known as the Fin-Syn Rules, were also passed in 1970. These rules prohibited networks from holding any financial interest in syndication or from syndicating their own programs. By the end of the decade, regulation began to relax, with such repeals as the 1977 elimination of the chain broadcasting rules for radio.

The 1980s carried the wave of deregulation to new heights. This can be attributed to the FCC's adoption of a marketplace philosophy, which advocated that a station's service to the public could best be determined by that station's performance in the marketplace. Under President Ronald Reagan and the new marketplace philosophy, the FCC repealed a number of rules, including the community ascertainment requirements of the 1960 Programming Policy Statement (eliminated in 1984) and the Fairness Doctrine (repealed in 1987). License terms and renewal periods were extended from three years to eight years. Ownership rules were also relaxed, a trend that carried into the 1990s. Another deregulatory measure was the repeal of the Fin-Syn rules in 1993.

In 1990, the U.S. Congress passed the Children's Television Act. This act limits advertising time and usage during children's programming, and it places requirements on the amount and type of children's programming that a station must broadcast.

The Telecommunications Act of 1996 was enacted to amend the Communications Act of 1934. It included regulations for new technologies and public-service requirements for communications. Most important, however, the Telecommunications Act of 1996 provided new initiatives for the United States as it began to enter a digital era where future technologies and possibilities would once again reshape the history of broadcast regulation.

Rationales for Broadcast Regulation

Broadcast regulation, despite basic First Amendment protection for the press, grew and evolved as each succeeding act of legislation attempted to shape and control the burgeoning industry. Five rationales for regulating broadcasting introduced in the Radio Act of 1927 and carried forward in the Communications Act of 1934 have endured.

The first rationale for broadcast regulation is the notion that the public owns the airwaves. Therefore, the public, represented by its government, is entitled to demand that the airwaves be used in the public interest. The second rationale, consequently, is that a licensed broadcaster is merely a trustee of the publicly owned airwaves and therefore must act as the public's proxy while using the public resource.

The third rationale, scarcity of the airwaves, suggests that the government must regulate the assignment and use of the airwaves because there are a limited number of useable frequencies in the electromagnetic spectrum. From this, it follows that government has the right to deny or revoke a broadcaster's license to use a frequency, so long as that action is in the public interest.

Media uniqueness, the fourth rationale, claims that the broadcast media have a more "captive" audience than do print media. Behind this rationale is the assumption that users of broadcast media will be less likely to actively select and scrutinize the messages that are received via broadcasting. Therefore, it is important that the government ensure that these unique media are programming in the public interest.

The fifth rationale for broadcast regulation addresses the very nature of the airwaves. It states that the airwaves do not have the traditional physical boundaries that other, more tangible means of communication share. Consequently, because broadcast messages are more pervasive, their potential for social influence is great. It is this potential that allows the government to regulate broadcasting and limit, to some extent, its First Amendment protection.

See also: Broadcasting, Self-Regulation of; Cable Television, Regulation of; Communications Act of 1934; Federal Communications Commission; First Amendment and the Media; Public Broadcasting; Radio Broadcasting; Telecommunications Act of 1996; Television Broadcasting.

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BROADCASTING, SELF-REGULATION OF

As with many other industries, the broadcasting industry practices a form of self-regulation in addition to following the regulations imposed by the government. Self-regulation is attractive for several reasons. First, an industry that regulates itself in certain areas can avoid potentially harsher regulations by the government because the government will often refrain from entering the realm that is already being adequately controlled by the industry itself. Second, self-regulation can expedite the development of standards and practices that can be voluntarily accepted by the industry. Third, and perhaps most valuable, industries that practice self-regulation can gain more public favor than do industries that only rely on government regulation. Therefore, self-regulation can be a good image builder as well as good business practice. This is why the broadcasting industry created the now-defunct National Association of Broadcasters Codes of Practices in the early 1900s and continues to follow many of its tenets.

The National Association of Broadcasters Codes of Practices

In 1929, the National Association of Broadcasters (NAB), the major professional and political organization of the broadcasting industry, created the radio Codes of Practices, which it expanded in 1952 to include television. These codes, inspired by previous court decisions, government urging, and public opinion, were completely voluntary—so much so that fewer than half of the radio stations and two-thirds of the television stations subscribed to them. However, the codes had a great enough presence to gain the attention of the U.S. Department of Justice and eventually be dissolved in 1982.

Among the code provisions were advertising limitations and programming standards. For example, limits were placed on the total amount of advertising time a station could sell, especially during children's programming times. Limits were also placed on the amount of medical-product advertising and the number of contest and other promotional offers that could be accepted. The programming standards suggested by the codes encouraged educational, cultural, children's, and news programming. Alternately, the codes discouraged editorializing as well as the sale of airtime for controversial issues. A third provision was the Family Viewing Time block, which allotted certain evening hours for family-friendly programming that, consequently, contained fewer advertisements.

Several of these provisions, though seemingly altruistic, were questioned by the U.S. Department of Justice. Family Viewing Time, for example, was considered in Writers Guild of America v. Federal Communications Commission (1976) to be a violation of the broadcasters' First Amendment rights because its existence was the product of government pressure. The discouragement of selling time for the presentation of controversial viewpoints was also questioned because of possible intentions to bypass the Fairness Doctrine (as officially outlined in the 1949 document In the Matter of Editorializing by Broadcast Licensees, issued by the Federal Communications Commission). The Fairness Doctrine, created in 1949 and repealed in 1987, required broadcasters to deal with controversial issues of public importance in a fair and even-handed manner; in other words, they had to grant airtime to all sides of a controversial issue if one side of that issue received airtime. By discouraging the sale of airtime for controversial viewpoints, it was presumed that broadcasters were seeking to avoid controversial issues, and thus the provisions of the Fairness Doctrine altogether. However, this presumed avoidance was not the most controversial point of the codes.

The most controversial point of the codes concerned the advertising limits. Broadcasters were accused of limiting their advertising time to increase demand artificially, which would therefore raise the price of that advertising time. This was seen in *United States v. National Association of Broadcasters* (1982) as a violation of section 1 of the Sherman Antitrust Act. It was the ultimate downfall of the NAB codes.

These threats of legal action by the U.S. Department of Justice put tremendous pressure on the NAB and those stations that subscribed to the codes. The resulting action was the dissolution of the Codes of Practices for both radio and television in 1982 and the end of an industry-sponsored code of ethics. However, the ideals of the codes and, indeed, some of their practices would remain, absorbed in the standards and practices departments of the networks.

Broadcast Standards and Practices

Among the many departments of a major television network is the department of broadcast standards and practices. This department houses censors who judge potential programs and advertisements in order to determine which program and advertising content is appropriate to air as well as when it is appropriate to air. A hypothetical example of this might be the approval of a made-for-television movie on the condition that it airs only after 9:00 P.M. and that two scenes are eliminated.

In addition to specific program evaluation, the department establishes, alters, and implements network policies regarding programming content, and it ensures that other network departments and production affiliates acknowledge or comply with the various policies. Another arm of the standards and practices department collects comments, complaints, and other feedback from the general public. This enables the department to monitor public opinion and review or change its policies accordingly.

Industry-wide standards also exist, the most visible of which are advertising practices and television content ratings. For example, regarding advertising practices, television stations continue to refrain from airing commercials for hard liquor or cigarette products. It is necessary to note that the Federal Trade Commission has regulations that address the advertising of alcoholic beverages on television. However, this regulation is lenient enough to allow the broadcasting industry to place further restrictions on itself regarding the acceptance of alcohol advertisements. Therefore, this practice is included as a voluntary commitment by the industry, a commitment that has thus far succeeded in circumventing a harsher government regulation. Television content ratings are also voluntary, although their establishment was caused by government pressure. The pressure came in June 1995, when the U.S. Senate voted to add a provision to the Telecommunications Reform Bill (later the Telecommunications Act of 1996) that would create a Television Ratings Commission to rate television programming in the absence of an industry-crafted system. Naturally, the industry crafted a system.

The industry system for rating television programs contains six labels (TV-Y, TV-Y7, TV-G, TV-PG, TV-14, and TV-MA) with accompanying descriptions of specific content. TV-Y indicates that the program is appropriate for young children. TV-Y7 indicates that the program is suitable for children over the age of six. TV-G indicates that the program is suitable for a general audience. TV-PG indicates that parental guidance is suggested because of inappropriate language, violence, or sexual situations. TV-14 indicates that the program is inappropriate for children under age fourteen because it contains mature language, violence, or sexual situations. TV-MA indicates that the program is unsuitable for anyone under age seventeen. These voluntary ratings, compatible with V-chip technology, enable parents to evaluate programming for their children-without government regulation.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Radio Broadcasting; Radio Broadcasting, Station Programming and; Ratings for Television Programs; Telecommunications Act of 1996; Television Broadcasting, Programming and; V-Chip.

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BUSH, VANNEVAR (1890-1974)

Vannevar Bush was born March 11, 1890, in Everett, Massachusetts, son of Universalist minister Richard Perry Bush and Emma Linwood Paine Bush. As a boy, he loved to tinker. He received bachelor's and master's degrees in engineering from Tufts University in 1913, earning the first of his many patents while he was still in college. In 1913, he was employed by General Electric in Schenectady, New York, but returned to Tufts in 1914 as an instructor in mathematics. He earned a doctorate in engineering from the Massachusetts Institute of Technology (MIT) and Harvard University in 1916 and became an assistant professor of electrical engineering at Tufts. He married Phoebe Davis in 1916, and they had two sons. In 1919, he joined MIT as associate professor of power transmission, became a full professor in 1923, and served as vice-president and dean of the School of Engineering beginning in 1932. His most notable research achievements in this period involved advances in analog computing which greatly facilitated the solution of complex mathematical problems using the differential analyzer, a machine for solving differential equations. In 1939, he moved to Washington, D.C., as president of the Carnegie Institution. He subsequently became director of the federal Office of Scientific Research and Development, where he was responsible for coordinating the work of scientists who were involved in the war effort. Following the end of World War II, he advocated continuing national support for basic scientific research, which eventually led to the establishment of the National Science Foundation. He retired from the Carnegie Institution in 1955 and returned to Massachusetts, where he died on June 28, 1974. He was the recipient of numerous awards including the National Medal of Science and was named a member of the National Academy of Sciences in 1934.

The most persistent line of Bush's inventive endeavors involved technology for processing information. The differential analyzer, an analog computer, was the most important product of this activity. Other, less successful efforts included a decoding machine for the U.S. Navy and the Rapid Selector, both limited by the state of available technology at the time of their invention. The latter device employed 35-mm film, on which microphotographed texts could be made quickly



Vannevar Bush examines one of his inventions in 1927 at the Massachusetts Institute of Technology. (Bettmann/Corbis)

available by the use of photoelectric cells scanning a coded index.

Bush is best remembered by information scientists for the visions of devices that were described in his 1945 essay "As We May Think." This was first published in Atlantic Monthly, followed by a summary of the major points in a brief article in Time and a condensed and illustrated version in Life. Reflecting on what direction science and technology might take following the end of World War II, Bush indicated ways in which existing photographic, controlling, and electronic techniques and their reasonable extrapolations might be applied to recording, transmitting, and reviewing the results of research. Devices described included a compact cyclops camera for capturing images, high-capacity microfilm for compact storage, a machine that could type when talked to, and high-speed computational devices. Writing in his autobiography, Pieces of the Action (1970), Bush commented in particular on his concept for the memex, the most notable device proposed in his groundbreaking essay. It would be "a machine that should be an extension of the personal memory and body of knowledge belonging to an individual, and should work in a fashion analogous to the working of the human brain-by association rather than by categorical classification"; essentially, "a memex is a filing system, a repository of information, and a scheme of searching and speedily finding a desired piece of information" (p. 190).

The analog technologies of Bush's day made it impossible to turn the memex idea into a functioning machine, but memex is often cited by others as an inspiration for their subsequent work in information retrieval and hypertext development. Memex suggested both the possibility of a device that could serve as a personal tool in support of information work and the potential value of trails connecting pieces of information. In the conclusion of his 1945 essay, Bush forecast that "wholly new forms of encyclopedias will appear, readymade with a mesh of associative trails running through them, ready to be dropped into the memex and there amplified" (p. 108).

Bush remained more comfortable with analog devices and made no technical contribution to modern digital computers. However, his analysis of the problem—that existing ways of handling information were inadequate—and his solution a device that stored and organized information that was of value to an individual—were widely accepted. It took more than fifty years for Bush's vision of memex to become fully realized with the development of personal computers, the World Wide Web, and search engines. Bush's widely read and reprinted essay made him for decades the best-known advocate in the United States for information retrieval systems that both responded to and expanded on human inquiries.

See also: Internet and the World Wide Web; Retrieval of Information.

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CABLE TELEVISION

The cable television industry provides multichannel video services to approximately two-thirds of all television households in the United States. In addition to offering different tiers of programming, many cable systems offer ancillary services, such as high-speed Internet access and local telephone services. There are approximately 10,700 cable systems in operation in the United States. Many companies own more than one system, and are known in the cable industry as multiple system operators (MSOs).

Major Players in the Cable Industry

Ownership of cable television systems has changed considerably since 1980, resulting in a rapidly consolidated industry. Five companies dominate the cable industry. AT&T, Time Warner, Comcast, Cox Communications, and Adelphia are the leading MSOs. These companies account for 70 percent of all cable television customers. There are a number of smaller companies that serve the remainder of the cable audience. Several companies also hold ownership interests in cable television service in foreign markets.

While large media companies dominate cable ownership at the national level, cable is in reality a local service. Cable operators are awarded a franchise to serve a specific community or geographical area. The local governing board (e.g., city council) actually awards a franchise for cable service, usually for a ten- to fifteen-year period. In exchange for the right to provide service to the community, the operator normally pays a franchise fee equal to a maximum of 5 percent of the revenues derived from operating the system. In many cases, the operator also agrees to provide a number of public, educational, or governmental access channels (also known as PEG channels) as part of the franchise agreement. The operator, often in consultation and negotiation with the franchising body, sets rates for cable service.

In September 1999, the Federal Communications Commission (FCC) revised its limit on the number of households a single cable operator could serve at the national level. The FCC had previously established 30 percent of all television households as the benchmark, but the commission revised its definition to include households also served by various satellite carriers. The new ruling thus increased the ownership limit to 38 percent, allowing industry operators to engage in further consolidation.

Industry Organization

The cable operator offers packages of broadcast (i.e., over-the-air) channels and satellite-delivered channels—such as the Cable News Network (CNN), Music Television (MTV), ESPN, and the USA Network—to customers in the franchise area. Services range from basic cable (usually broadcast signals in the market, along with PEG channels) to expanded basic (the basic package plus an offering of satellite-delivered channels). Additionally, operators provide a number of subscription or pay channels, such as Home Box Office, Showtime, Cinemax, and Encore, for an additional monthly fee. Finally, the operator offers unedited movies and special events (e.g., concerts, sporting events, and

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A view of the Atlanta, Georgia, newsroom of the Cable News Network (CNN) gives a glimpse inside the workings of what was the first all-news channel to be broadcast on cable television. (Mark Gibson/Corbis)

other types of entertainment) through a number of pay-per-view channels. The customer pays for each of these items on a per-event basis, in addition to the payment for basic and expanded service.

In building different packages of services to attract customers, the cable operator negotiates carriage fees with local broadcast stations and other program suppliers. The FCC's "must carry" provision requires that cable systems carry local, over-the-air television broadcast signals, but operators must still obtain the rights to carry these local signals. Broadcasters usually negotiate for another cable channel on the system as part of granting retransmission consent; in rare cases, the station may ask for cash compensation. Among the broadcast networks, Fox, NBC, and Disney (ABC) have successfully launched several cable channels (FX, MSNBC, ESPN2) through retransmission consent negotiations using their owned and operated broadcast stations.

National program suppliers such as CNN, ESPN, MTV, and Nickelodeon charge local cable

operators fees based on the number of subscribers to the system. The operator pays these fees to the program supplier in exchange for permission to carry their programming. Consolidation helps negotiations with program suppliers, as it limits the number of potential agreements in which an MSO must be involved. By owning large numbers of cable systems, an MSO can realize greater efficiency in program negotiations and, ultimately, economies of scale. Programming is the greatest expense of any cable system operator. According to the National Cable Television Association (NCTA), program expenses in 1998 totaled \$7.46 billion.

Cable systems also draw revenues from the sale of national and local advertising, and Internet and telephone services. Local advertising varies from market to market, but overall local advertising accounts for about 24 percent of cable television advertising revenues, according to data compiled by the Cable Advertising Bureau. Internet connection services, available through the rental of highspeed cable modems, is a growing revenue stream for cable operators. Many systems are planning to offer local telephone service in hopes of bundling voice, video, and data services in a single package to consumers.

Ultimately, all of the expenses charged for programming are eventually passed on to consumers in the way of monthly subscriber fees. Subscriber fees represent the primary source of revenue for cable operators. The cable industry is unique in that it derives revenues from a number of sources, whereas broadcast stations depend primarily on advertising revenues.

Industry Evolution

The cable television industry has experienced considerable change over the years. Originally, cable television service was initiated as a retransmission service for broadcast television signals in the 1940s and 1950s in areas where television signals were difficult to receive due to complications related to surrounding terrain. In fact, in its infancy, cable was known as CATV (community antenna television), reflecting the fact that it brought television signals to households in a specific geographical area.

Broadcasters, fearing the loss of audience, fought the introduction of cable television in urban markets. The broadcast industry was able to delay the diffusion of cable for several years, arguing that the presence of cable would cause economic harm to over-the-air broadcasting. The industry was most concerned with the possible importation of signals from outside the local market, which would provide competing programming that might siphon off some of the television audience available for local stations.

Following a series of court decisions, the industry was finally able to offer cable service in urban areas. In the 1970s, a number of different program services began to emerge. Home Box Office (HBO), originally conceived as a regional pay service in 1973, went national in 1975, becoming the first channel to offer unedited movies to television audiences. The introduction of HBO became a bellwether of change for the industry, providing qualitatively different content from regular television channels.

Other channels that debuted during the late 1970s and early 1980s further promoted interest in cable television among consumers. The USA Network became the first national advertisingsupported cable channel in 1977. A year later, ESPN began operation. In 1980, CNN was launched by Turner Broadcasting to become the first all-news channel on cable. On August 1, 1981, MTV appeared.

In 1984, Congress passed the Cable Television Act, which deregulated many industry policies, especially in regard to rate regulation. Rates for services mushroomed between 1986 and 1990, prompting outrage from consumer groups and policymakers. The 1984 act also prohibited cable ownership by the broadcast networks and limited telephone companies to ownership of cable services that were outside of their regions of telephone service.

Despite the controversy over rate deregulation, cable systems and subscribers grew at an unprecedented rate. Not only did the audience enjoy a growing number of programming services, cable service also provided a higher quality picture than most television antennas. The evolution of cable television had drastic effects on broadcast television audiences, especially during the lucrative evening or prime-time hours when audience levels are the highest. Network television programming prior to the advent of cable would routinely draw 80 percent to 90 percent of the available television audience. As cable matured, audience shares for the networks would fall into the 45 percent to 50 percent range by the 1990s.

Rate regulation has not been the only subject of customer complaints. Customer service has been an ongoing complaint, especially with regard to service technicians missing or being late for appointments. Customers have also had concerns over the quality of service and unannounced "switchouts" of one channel for another. In a switchout, one channel is replaced by another at the discretion of the operator. During the 1990s, the industry worked hard to improve customer service and become more responsive to complaints.

In 1992, Congress reestablished rate regulation in the cable industry with the passage of the Cable Television Consumer Protection and Competition Act. The legislation required a rollback of rates for basic service in an effort to limit the monopoly power of cable operators. The results were shortlived; the Telecommunications Act of 1996 wiped out rate regulation at the federal level and opened the industry to competition from other industries. The cable industry began to experience competition from the emerging DBS (direct broadcast satellite) industry during the 1980s. Satellite services primarily attracted rural customers who could not receive cable television. The early home satellites required large dish-type receiving antennas, which were bulky and considered by many to be eyesores. By the 1990s, technology enabled the diffusion of smaller home dishes, which could receive digital transmissions. Companies such as DSS, EchoStar, and the Dish Network were able to lure away cable customers, and together they accounted for approximately fifteen million subscribers by the end of the 1990s.

The 1996 act stimulated interest in cable system ownership among the various telephone companies ("telcos"). Freed from restrictions barring ownership of cable services within regions of telephone service, the telcos were interested in acquiring cable systems as a way to expand their base of telephone customers and to achieve the goal of providing multiple services (e.g., voice, data, video, broadband) to businesses and consumers. Several acquisitions happened within a few months. Southwestern Bell (now SBC) became one of the first telcos to acquire cable systems. Bell Atlantic and Tele-Communications Inc. (at the time the largest cable operator in the country) announced plans to merge, but the deal never happened. U.S. West acquired all the holdings of Continental Cablevision and renamed its cable unit Media One.

Following the 1996 act, the cable industry began a heavy period of consolidation. AT&T shocked the cable industry with its acquisition of TCI in 1998, followed just a few months later by another key acquisition, Media One. In less than a year, AT&T had moved from its position as the number one long-distance telephone company in the United States to also being the leading cable operator. Other competitors to cable include wireless telephone services, "wireless cable" services such as multichannel multipoint distribution services (MMDS) and satellite master antenna television (SMATV), and utility companies (power companies).

Issues Facing the Cable Industry

The cable industry faces a number of challenges. One key issue of concern among operators is the continual upgrading of the system's physical plant. With the conversion to digital transmission, many systems are investing millions of dollars in converting their analog transmission systems to a hybrid coaxial-fiber optic system. Fiber optic cable provides a much larger carrying capacity than coaxial cable, enabling the bundling of different types of services (e.g., voice, data, broadband). Furthermore, fiber is easier to maintain and provides greater reliability of service.

Upgrading of systems will result in faster deployment of cable modems that can provide high-speed Internet access to homes. However, competition for Internet service is extremely intense, with America Online, Earthlink, and Microsoft's MSN service already holding dominant shares of the ISP (Internet service provider) market. The cable industry will have to market cable modems aggressively as an alternative to traditional types of Internet service.

Controlling costs is another key issue for the cable industry. The costs to maintain and upgrade the physical plant pale in comparison to the rising cost of program services. Every year, new programming services continue to be introduced in the marketplace. As consumers learn of new services, they expect their cable operator to carry those services they deem most important. Every new program service added results in increasing program costs. In time, the industry may be forced to move to providing services on an *a la carte* basis, allowing subscribers to choose the specific services that they want and pay only for those services.

Competition will continue to be a concern in the cable industry. DBS services have already shown they are capable of luring existing cable subscribers. DBS services can now offer local broadcast signals as part of their program packages, placing further competitive pressure on the cable industry. No one is certain how the Internet will affect competition for multichannel services. Clearly, the Internet is capable of delivering video, but watching streaming video on a computer display is not the same experience as watching television programming on a large screen.

In addition to competition for services, competition for advertising remains intense. As an industry, cable television has done very well at attracting national advertising on the most popular cable channels (e.g., CNN, MTV, ESPN). Locally, competition for advertising is typically very strong, in that cable competes with newspapers, local radio and television, outdoor (e.g., billboards and transit media), and other advertising vehicles for revenues. Local revenues are important, and the industry recognizes more growth is needed at the local level.

Ancillary revenue streams in the form of Internet services (cable modems) and telephone service are also needed for the industry to maintain a strong competitive position. The latter will be much more difficult to obtain, especially with regard to local exchange or local telephone service. Most customers are not used to competition for local phone service, and they may be apprehensive about switching service to a provider that has a limited history. There are also questions concerning how responsive customers will be in accepting the bundling of voice, data, and broadband services from a single operator.

See also: Broadcasting, Government Regulation of; Cable Television, History of; Cable Television, Programming of; Cable Television, Regulation of; Cable Television, System Technology of; Federal Communications Commission; Satellites, History of; Satellites, Technology of; Telecommunications, Wireless; Telecommunications Act of 1996; Television Broadcasting; Television Broadcasting, History of.

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Alan B. Albarran

CABLE TELEVISION, CAREERS IN

The National Cable Television Association reported in 1999 that there was a 500 percent increase in the cable industry workforce between 1975 and 1998—from 25,000 full-time employees to more than 125,000 (Lacey et al., 1999). This major trade organization predicts further expansion of employment opportunities as a result of the need to rebuild and upgrade systems and as new service offerings such as digital video, data delivery, and high-speed cable Internet access are made available across the country.

Most of these jobs will be within one of the three segments that serve as the primary employers of the cable industry. The local cable system directly provides cable service to homes and communities. Multiple-system operators (MSOs) own and operate more than one cable television system. Cable networks provide some of the programming offered by the cable system. Joseph Dominick, Barry Sherman, and Gary Copeland (1996) report that cable is a decidedly blue-collar industry with most jobs falling into the technical or office/clerical category. The number of subscriber households basically determines the size of the staff needed. The vast majority of workers are employed by the thousands of operating systems around the nation.

Local cable systems require the combined efforts of a variety of skilled persons in providing subscribing customers with a clear television signal delivered directly to the home via cable. In smaller systems, one person may perform more than one function. These functions fall primarily into five areas: management, technical staff, administrative staff, marketing/public relations and advertising staff, and programming and production staff.

Management oversees all aspects of the operation. The general manager, as head of the cable system office, is responsible for conducting the operational affairs, interpreting and applying the policies of corporate management, and coordinating all functions of the system. The general manager's duties include recommending policies for system growth, overseeing budget and fiscal procedures, and developing employment and personnel policies. Department heads from the other four divisions report directly to the general manager and comprise the upper-level management of the local cable system. Qualifications for the position of general manager include a college degree in business administration and industry management experience.

The chief engineer is the head of the technical department, a position that requires superior management skills as well as first-rate technical knowledge. The chief engineer oversees all technical aspects of the cable system and supervises all the activities of the engineering staff. These responsibilities include equipment planning and installation, construction of facilities, specification of standards for equipment and material, proposing new technical services and developing new products for use by the system, directing construction activity, and giving technical advice to the various staff system-operating managers. Because the majority of the capital outlay and operating expense of a cable system involves the purchase and installation of costly equipment, the chief engineer also assists in preparing the capital budget and general development plans of the system. Qualifications for the position of chief engineer include a degree in electrical engineering and/or equivalent experience.

A number of technicians serve in the technical department under the direction of the chief engineer. Among these are the chief technician, trunk technician, service technician, and bench technician. The chief technician is the most highly skilled member of the technical staff and supervises all of the other technicians. This person is primarily responsible for maintaining equipment at the headend, that point at which all program sources are received, assembled, and processed for transmission. In addition to technical duties. some administrative chores such as setting performance standards, conducting salary reviews, and handling personnel matters are required. The trunk technician is responsible for the trunk line or main artery of the cable system. The service technician works more directly with the customer, either in the home or on the poles, lines, and amplifiers. The bench technician operates the repair facility of the cable system. Qualifications for the position of chief technician include an industrial background and electronic training plus extensive hands-on experience. All of the other positions require some electronic training, and a strong electronics background is certainly helpful.

Generally, the position of installer is considered the entry-level step for a cable technician's career. This person prepares a customer's home for cable reception. At least some trade school background with demonstrated mechanical aptitude is desirable.

The office manager heads the administrative staff and is responsible for the smooth operation of daily business activities. This person monitors the customer service department and supervises office staff training, hiring, and work assignments. Experience in office administration and personnel management is a plus for this position.

The customer service representative and the service dispatcher provide a direct link between the technical staff and the customer by monitoring and coordinating communication between the two. These positions may require no more than a high school diploma and good communication skills.

The same person may fill the accounts payable, accounts receivable, and billing clerk positions in a smaller cable system. Regardless, these positions are fundamental to the successful financial operation of a system. Qualifications include two years of college with a strong bookkeeping and business background. Some larger systems hire a full-time accountant/bookkeeper, while smaller systems often use an outside accounting firm.

Cable systems often have a public-affairs director and a marketing director as part of the upperlevel management. The public-affairs director represents the cable system within the community, working with local government officials and civic groups. The marketing director is responsible for increasing the number of subscribers to the system. Qualifications for these positions include a degree in public relations or marketing and related experience. Research is a valuable component of many marketing departments. The person holding the position of researcher should also have a degree in marketing.

Sales representatives work on two levels within a cable system. The first is to sell the services of the cable system to homes, apartment complexes, and hotels and motels. The advertising sales representatives market the cable system as an effective medium for advertising the products and services of other businesses. Qualifications for these positions include at least a high school diploma and a public relations, advertising, or sales background.

The fields of programming and production have shown substantial growth within many cable systems. The areas of local origination, public access, and governmental or educational access provide career opportunities for persons with a degree in communications and hands-on experience in production. In those systems that produce their own programming, a staff is usually necessary to handle the production. This staff would likely include a producer, assistant director, and various studio technicians to handle audio, lighting, and editing. Qualifications would include a degree in communications and/or an electronics background and hands-on experience in the respective fields. Some large cable systems maintain their own construction crew for ongoing work on new systems or expanding and upgrading existing systems.

Multiple system operators (MSOs) own and operate more than one cable system, sometimes as many as several hundred. For the most part, but on a much bigger scale, their personnel structure is quite similar to that of the individual cable system. On a corporate level, these larger systems consist of various department heads and staffs in administration and management, engineering, sales and marketing, public affairs, human resources, finance, and legal affairs. The qualifications for these positions, while similar to those in the individual cable system, do tend to have higher requirements in terms of educational background (in some cases an advanced degree) and in terms of more related experience in the respective field of employment.

One of the fastest growing segments of cable television is production and programming. Career opportunities with cable programming networks (such as basic cable, pay-TV, and pay-per-view) include many technical positions, as well as positions in the sales, legal, communications, and administration divisions. There are two types of programming: original and purchased. Original programs are those that are produced either inhouse or contracted to an independent production company. The purchased programs include feature films that have already had a theatrical release and television series that have previously been aired on broadcast television. Again, personnel requirements are very similar to those in local cable systems and in MSOs. Qualifications tend to include college degrees and job-related experience, often garnered in an individual cable system.

The number of American households being served by cable television is more than 70 percent and growing daily. It is, therefore, no surprise that career opportunities in this exciting industry continue to expand at an equal pace.

See also: Cable Television; Cable Television, History of; Cable Television, Programming of; Cable Television, System Technology of; Educational Media Producers; Public Broadcasting; Public Relations, Careers in; Television Broadcasting, Careers in.

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HAL HUGHES

CABLE TELEVISION, HISTORY OF

Cable television has its roots in community antenna television (CATV), which was developed to bring television to communities that did not have their own channels in the early days of television broadcasting. Just as television was starting to grow in popularity, the Federal Communications Commission (FCC) pulled the plug. In 1948, the FCC initiated a television broadcast license freeze in an effort to cope with the demand for frequencies. For four years, no new television stations were authorized to begin operation, and with only 108 stations already established, many communities were left without stations. The solution was CATV.

Early Development of Cable Television

One of the first CATV systems was established in 1950 by Robert J. Tarlton in Lansford, Pennsylvania. Because they were cut off by the Allegheny Mountains, the community had extremely weak signals from Philadelphia-based stations. Tarlton, an appliance salesman who was looking for a way to cash in on the television business, convinced some friends to invest in his company, Panther Valley Television. At the top of a mountain, he erected a master antenna that was able to receive the television signals from Philadelphia and amplify them. Signals were distributed to subscribing households via coaxial cable. Subscribers paid an initial \$125 hook-up fee and a \$3 monthly charge.

Industry experts did not expect CATV to survive long after the FCC licensing freeze was lifted in 1952. Interference remained problematic, however, so the FCC limited the number of stations that could operate in a community. As a result, cable suddenly served a dual purpose; it became a service that would both provide clear reception of stations for communities that did not have stations, and it increased the number of stations that could be received in a community that already had stations.

In 1952, when the FCC lifted the license freeze, seventy CATV systems were serving close to fourteen thousand subscribers across the country. Cable had been the answer for many appliance dealers who were missing out on the booming television business because their communities were not serviced by local channels. By 1961, there were approximately seven hundred cable television systems across the United States.

At first, broadcasters welcomed the CATV systems; after all, cable extended their service area, and a larger audience could justify increased advertising rates. The FCC was also pleased since cable helped expand the audience of the fledgling television industry. In fact, the FCC declared in its decision in *Frontier Broadcasting Company v. Collier* in 1956 that the commission had no jurisdiction over CATV systems (because they were not broadcasters or common carriers).

By the 1960s, however, opinions began to change. Cable television services began to enter larger markets, providing channels from other markets to subscribers using microwave transmission. These imported channels sometimes duplicated the programming of local network affiliates, and neither affiliates nor independent stations wanted the additional competition. In 1962, the FCC stepped in with regulations for cable systems that brought in distant signals. By 1966, the FCC declared regulatory control over all cable systems. In 1972, the commission enacted its first comprehensive regulations of the cable industry, which were designed to protect broadcasters from competition from cable.

The Growth of Cable Television

Despite legal complications, cable continued its slow growth. Cable had about 2 percent of U.S. household penetration in the early 1960s and had grown to about 8 percent in 1970. Most early cable systems had a limit of twelve channels, but Ronald Mandell patented a converter in 1967 that was placed on the subscriber's television set and broke the twelve-channel barrier. This set-top converter also solved the interference problems that plagued many of the systems.

Still, industry experts began to question the further growth of cable, especially when they considered the potential infrastructure costs in urban areas. How could cable companies hope to attract the necessary subscribers to justify financially the massive start-up costs in an area that received clear local signals?

The answer was a rented transponder on a geostationary satellite named *Satcom I* that was launched in 1975 and was used to transmit a new television service to cable systems across the country. This service, Home Box Office (HBO), did nothing less than change the face of cable and spark unprecedented growth in the industry. (Time, Inc. had introduced HBO as a pay service on the cable system in Wilkes-Barre, Pennsylvania, in 1972, but its satellite delivery and potential national distribution were new developments.)

On September 30, 1975, HBO launched its service (on only a handful of cable systems) with coverage of a boxing match between Muhammad Ali and Joe Frazier. The new program service also offered commercial-free motion pictures that were not edited for television. HBO started slowly because cable systems had to buy an expensive satellite receiving dish to pull down signals that were transmitted by satellite, but HBO soon revolutionized the industry. Finally, cable television could provide something other than retransmitted broadcast signals. In addition, HBO was a pay-TV service (i.e., a premium service), which meant a new source of revenue for cable companies.



This 1975 fight between Joe Frazier and Muhammad Ali for the middleweight championship served as the launching point for Home Box Office (HBO). (Bettmann/Corbis)

To further improve matters, the FCC had also realized that its 1972 regulations were severely limiting the growth of the cable industry. As a result, the FCC essentially reversed its earlier thinking and decided to encourage competition between cable and broadcast stations. In 1984, the U.S. Congress passed the Cable Communications Policy Act, which gave cable system operators fewer regulations regarding rates and programming. Local communities were given clearer control over cable through the franchise process.

Cable companies cannot simply decide to build a system in a particular city; the company must be awarded a cable franchise by city officials. Usually, systems must pay a monthly franchise fee to the municipality and often negotiate other concessions, such as community studio facilities, free cable for local schools and government agencies, and a government information channel.

The combination of satellite program distribution and less regulation led to a period of explosive growth in cable. Within twelve years, from 1975 to 1987, the number of cable systems tripled and the percentage of U.S. homes with cable jumped from 14 percent to 50 percent. The booming industry attracted big-business investors, and the cable television landscape became dominated by multiple system operators (MSOs). By 1988, the five largest MSOs serviced more than 40 percent of cable subscribers in the nation. In the wake of the success of cable, as well as the increased popularity of videocassette recorders (VCRs) and independent stations, broadcast networks watched their audiences erode.

Expanding Cable Channels and Programming

In 1983, HBO's *The Terry Fox Story* was the first made-for-cable film, while Showtime ran original episodes of *The Paper Chase*, a critically acclaimed drama that had been dropped by the broadcast networks. Cable-originated programming became eligible for Emmy Award consideration in 1988 and has since become a regular contender. Original series and films, though not

always of award-winning caliber, are common on both cable networks and premium services.

HBO's successful use of satellite delivery opened the floodgates for premium services and cable networks, many of which continue to remain popular. Of course, not every new cable service was a national network. In 1976, Cablevision Systems Corporation founder Charles Dolan created the first regional cable sports service, SportsChannel New York (now FOX Sports Net New York). Several regional sports channels still service selected markets across the country.

Ted Turner launched his Atlanta-based independent station (WTCG, later WTBS) as a "superstation" in 1976, using satellite distribution to reach a national audience. As president of Turner Broadcasting Systems, Turner continued to paint the cable network landscape with a number of national networks. For example, his Cable News Network (CNN), the first live, all-news channel, was launched in 1980. Less than two years later, CNN was followed by CNN Headline News, which provided highly structured thirty-minute newscasts around-the-clock.

Many industry executives predicted a quick death for CNN, which was referred to as "Chicken Noodle News" in its early days. The network, however, proved early critics wrong. Its twentyfour-hour schedule and continuous coverage of breaking news provided unparalleled coverage of several events, including the assassination attempt on President Ronald Reagan in 1981, the *Challenger* space shuttle disaster in 1986, and the Gulf War in 1991. Its extensive coverage of these and other "big" stories has helped make CNN a popular and respected source for news.

CNN also gained the respect of broadcast and cable networks through its budgetary efficiency. After almost ten years on the air, CNN and CNN Headline News shared an annual budget of approximately \$100 million for around-the-clock coverage, while ABC, CBS, and NBC were each spending two or three times as much for only thirty minutes of news per day. The discrepancy resulted in layoffs and reorganization at the broadcast networks in the late 1980s.

While CNN was redefining television news, Music Television (MTV) was redefining television itself. The music video cable network debuted in 1981, essentially re-creating the album-oriented rock (AOR) radio format for television. It was a radical concept; MTV was programmed more like a radio station than a television network, and it had few regularly scheduled shows.

Filled with rock music videos, unique contests, and a generous helping of rebellious attitude, the channel was designed to appeal to males who were between eighteen and thirty-four years of age. MTV not only made music videos popular (and some say legitimized music video as an art form), it quickly spawned imitators, with more than three hundred music video programs on broadcast and cable networks competing for its audience in 1983.

Rock performers such as Rod Stewart and Journey were typical early MTV stars. Artists such as Michael Jackson, who would become a huge influence in music video, were not part of MTV's original play list. Jackson's videos, in fact, did not debut on MTV until 1983. Later, MTV's play list would become more diversified, welcoming rap, hip-hop, and alternative music. In the 1990s, the network became more structured, with "realitybased" original series and other regularly scheduled programs. MTV reaches more than 200 million households worldwide and is available in dozens of countries on every continent but Antarctica.

Most early cable networks employed a programming concept called narrowcasting, targeting their content to specific niche audiences. The Christian Broadcasting Network (CBN) began its national cable network in 1977. Viacom followed the movie formula in 1978 when it created Showtime, another premium service. A year later, the first network targeting children, Nickelodeon, debuted. Chicago's WGN and New York's WOR became superstations, and sports took center stage on the Entertainment and Sports Programming Network (ESPN).

From 1979 to 1985, more new networks established additional choices for viewers. In 1980, Bravo gave voice to high culture, while the Home Shopping Network (HSN) provided viewers with an alternative to the mall in 1985. Other additions to the cable network ranks included American Movie Classics (AMC), Arts & Entertainment (A&E), Black Entertainment Television (BET), The Discovery Channel, The Disney Channel, Eternal Word Television Network (EWTN), Lifetime, The Nashville Network (TNN), the Playboy Channel, USA Network, and The Weather Channel. The 1990s saw the launch of several more successful cable networks, including the Sci-Fi Channel and Cartoon Network in 1992. Many of these channels have expanded their programming for international audiences.

As new cable networks were being developed in the early 1980s, smart executives learned to follow the "rule of one." Due to limited channels and advertising dollars, if two cable networks tried to narrowcast to the same target audience, one was doomed to fail. Turner's Cable Music Channel (CMC), for example, tried to duplicate the success of MTV with adult contemporary music, but it was shut down after only thirty-four days of programming in 1984. Even MTV's sister station, Video Hits One (VH1), took years to build a respectable audience after its 1985 debut. Increased channel capacities and viewership have made the rule of one obsolete and allowed cable networks to include multiple choices for music, sports, and news.

Cable also expanded its services to include event programming, also known as pay-per-view (PPV). Addressable converters allow subscribers to order specific, one-time programming without a technician visiting the premises. Warner Amex's Qube system in Columbus, Ohio, was the first to offer PPV to its subscribers. The system featured five interactive channels but failed to generate a profit from 1977 to 1984. Still, national PPV services began to appear by 1985, and more than seventeen million homes were equipped with addressable converters by 1991.

The Cable Television Consumer Protection and Competition Act of 1992

After years without government regulation, cable rates had increased swiftly in some areas, prompting Congress to approve the Cable Television Consumer Protection and Competition Act of 1992. The law reintroduced rate regulation for the industry and provided a new wrinkle with local broadcasters.

While the FCC's 1972 rules required cable systems to carry local channels, the U.S. Court of Appeals for the District of Columbia threw out the rule in 1985. Most cable systems, however, kept local channels in their lineup, since clear reception of local channels was (and remains) a major draw for many subscribers. The Cable Act of 1992, however, provided the option of "must-carry" or "retransmission consent" to local broadcasters. As a result, broadcasters could either choose guaranteed carriage on a cable system or demand compensation from the cable system to carry their signal. Some local channels had to be dropped from cable lineups because agreements could not be reached.

Conclusion

The new cable systems of the 1980s had offered thirty-five or more channels, and operators were experimenting with fiber-optic technology. By 1995, the cable industry was looking to integrate high-speed Internet access into their services, as cable modems can provide data transfer rates thousands of times faster than conventional phone lines. Six of the ten largest MSOs launched cable modem services in limited areas in 1996. Within a year, nearly 100,000 customers across the country subscribed to the service. Cable telephony service was also launched in limited communities in 1997.

Despite increased competition from direct broadcast satellite (DBS), the cable industry remains prosperous and ratings continue to rise. In 2000, the cable landscape featured more than eleven thousand cable systems across the country serving more than seventy-three million homes. The industry has also begun preparations for digital television (DTV).

See also: Broadcasting, Government Regulation of; Cable Television; Cable Television, Careers in; Cable Television, Programming of; Cable Television, Regulation of; Cable Television, System Technology of; Federal Communications Commission; Television Broadcasting; Television Broadcasting, History of.

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CABLE TELEVISION, PROGRAMMING OF

One of the more challenging tasks faced by cable operators is selecting programming services that meet the particular needs of their cable systems. It is an ongoing concern, one that affects nearly every aspect of a cable system's business operations. The majority of cable subscribers in the United States have fifty-four or more channels from which to choose (NCTA, 2000). This means the cable operator must make fifty-four or more well-reasoned business decisions concerning how best to use a cable system's channel capacity. Channel capacity for the operator is very much like shelf space in the supermarket. It is a finite, limited "good"; once it is dedicated to a product, all other possibilities for uses of that space are eliminated. The cable operators generally seek to use that channel capacity in a way that helps to maximize company profits, adds quality to the overall programming mix, and delivers programming services that are at once desired and enjoyed by cable subscribers.

For the most part, when subscribers buy a multichannel television service, they are primarily concerned with the content or programming that it brings; they are largely indifferent to the technology that is used to deliver it. Cable television has introduced a strong measure of consumer sovereignty into the television programming equation, which means that the consumer has a greater range of choice and influence and that cable companies must respond to this. Unlike "free" local over-the-air broadcast television, cable subscription requires a conscious decision by the consumer to "renew" the cable service each month through a direct payment. When television programming falls short of consumer expectations, this invites the subscriber to begin questioning the wisdom of keeping the cable service. Disconnection then becomes a more attractive option. In cable industry terms, the problem of cable disconnects is referred to as "churn." Developing a quality programming mix is essential for keeping the cable subscriber from churning away from cable.

From the cable operator's perspective, the most important concerns surrounding information and entertainment program selection include: (1) using cable system channel capacity to help maximize returns, (2) creating a proper programming mix for service in their franchise area, (3) obtaining a fair price from programmers for their cable programming networks, (4) promoting a local identity and meeting requirements of the franchise agreement, (5) maximizing company profits on a per channel basis, and (6) maximizing company profits on an overall channel lineup basis.

Programming Tiers

The world of cable programming is divided into separate tiers of service on the local cable system. The basic cable tier generally consists of retransmissions of local over-the-air (broadcast) channels and Public Education Government (PEG) Access channels, along with whatever other channels the operator may wish to include. The extended or enhanced basic tier generally consists of a mix of advertiser-supported, cable-delivered network services (e.g., Lifetime, ESPN, MTV) and other services that may not rely on advertiser support (e.g., American Movie Classics, C-SPAN, Disney). By the end of the 1990s, there were around 150 basic cable channels for operators to choose from; this number continues to change periodically as new networks both appear (e.g. Oxygen) and disappear (e.g., The Military Channel).

In addition to the basic and extended services, there are premium or pay services that require an additional monthly subscription fee. There are more than forty-three premium or pay services, including Home Box Office (HBO), Showtime, and Encore, from which a cable operator may choose. Another type of service is pay-per-view (P-P-V), where viewers pay a separate fee for the one-time viewing of a program. This may involve a motion picture, a concert by a featured performer, or a sporting event, such as a championship-boxing match.

The Economics of Cable Programming

All cable networks have affiliation agreements with cable operators. Cable operators generally compensate the programmer from subscription revenues that come from their customers. In 1999, the average monthly rate for basic cable was \$28.92 per month (NCTA, 2000). Income from basic and expanded basic cable accounts for nearly 63 percent of cable's revenue. It is important to remember that cable operators have two separate revenue streams: subscription fees from subscribers and revenue that comes from the sale of advertising.

Until the early 1980s, programmers actually paid cable operators to carry their networks. This circumstance changed as popular, branded networks became key features of cable services in a maturing industry. In addition, as the costs of obtaining and producing more desirable, higher quality programs rose, programmers needed a reliable revenue stream to offset the higher production costs. Some new cable channels still offer cable operators a fee to obtain a channel position on the cable system; a portion of these channels also continue to pay reduced fees for a prescribed time period. This is all done as an incentive to get operators to commit to new, untested program networks in hopes of the programmer acquiring enough cable affiliates to make the new network viable.

A cable operator pays the programmer on a cost-per-subscriber basis for each cable network that is received. These fees can range from a few cents a month for some channels to more than \$1 for other channels. Cable systems' programming expenditures in 1999 topped the \$8 billion mark (NCTA, 2000). The sports channels (e.g. ESPN, Fox Regional Sports) typically tend to be the most costly because of the high rights fees that must be paid to sports leagues (e.g., Major League Baseball, National Football League).

Deals struck between cable operators and premium service networks usually involve a negotiated split of revenues between the programmer and the operator. For example, if the subscriber cost for a premium service is \$12 per month and the negotiated split is 50/50, the operator gets \$6 and the programmer gets \$6. Certain incentives aimed at increasing the marketing efforts of the operator and increasing the number of subscriptions may also be negotiated between the parties and result in an increased percentage of the "take" for the operator. Around 13 percent of cable's revenues come from pay cable or premium cable (NCTA, 2000).

The larger multiple system operators (MSOs), such as AT&T, Time Warner, and Comcast, can get more favorable terms from programmers in relation to the fees that are paid for affiliation. Large MSOs' program costs tend to be around 10 percent to 20 percent lower than those of smaller operators. MSOs carry clout because in some cases they may deliver ten million or more subscribers/potential viewers for the programmer's network in one fell swoop. This can substantially reduce the transaction costs of the programmer in selling a network service, while it adds to the potential viewer base that the network advertising will reach.

Discounts in affiliation fees are usually granted if the cable operator agrees to carry multiple programming services from the same programmer. For example, an operator that signs on for CNN, CNN Headline News, and Turner Network Television (TNT) from Time Warner Entertainment is likely to receive a "volume discount" that reduces the cost-per-channel amount that is paid. This then becomes part of the programming equation for the cable operator.

In addition, some large media/communications companies are vertically integrated, which means that they are involved in two or more stages of the cable industry. These stages include production, distribution, and exhibition. Production includes those entities that are responsible for producing the television programs (e.g. Paramount Pictures). Distribution includes the programmers, those networks that are responsible for distributing the programs (e.g. Nickelodeon, Lifetime, HBO). Exhibition includes the local cable operation (e.g. Time Warner Cable, AT&T, Cox Communications).

If the company owns cable systems (the exhibition stage) and programming networks (distribution), it is vertically integrated. Vertically integrated companies have obvious incentives for carrying their own programming networks on their own cable systems. These program selections are sometimes referred to as "corporate must carry" channels.

The Windowing Concept

Cable programming categories, especially for pay services, are very often related to the "currency" of the programming (Baldwin, McVoy, and Steinfield, 1996). The windowing process in the case of motion picture products provides a good illustration. Motion pictures are the principal content of premium cable services and P-P-V.

A motion picture is first released to theaters; this is considered to be the initial release window. The home video window, which involves the release of the videocassette and the DVD for the movie, follows the initial release window. Sixty to ninety days after the home video window, the motion picture enters the pay-per-view release window for cable and in-home satellite viewers. The next release window is premium or pay cable services. Later, the same motion picture will move to the broadcast television window and eventually into the syndication market window. As a film moves through each window, time advances and the likelihood of an interested viewer having already seen the motion picture increases.

Premium or pay services are increasingly producing their own original content for use on their networks. These programs supplement the traditional offering of motion pictures. For example, HBO, the first and largest of the pay cable services, produces not only feature films but also regularly scheduled television series such as *The Sopranos* and *Arliss*.

There are two distinct kinds of basic cable networks. There are general interest cable networks, which tend to appeal to more broad ranging audience tastes, and there are specialty networks. The general interest programming approach includes movies, drama, off-network reruns, and sports. The USA Network and TNT are two examples of general interest programmers. Specialty networks, as the name suggests, deal with more specialized forms of content. For example, Animal Planet programs mostly animal and pet-related content, and ESPN supplies sports and sportsrelated programming.

Where do the basic cable channels get their programming content? Programmers have two choices when it comes to obtaining programs: acquire material or produce it themselves. In the acquisition marketplace, networks shop around for content ranging from off-network broadcast reruns (e.g., *The Cosby Show*, E.R.) to original programs (e.g., *South Park*) or motion pictures (e.g., Lifetime's movies) from outside producers. Selfproduced material involves "in-house" production done by the programmers themselves. For example, MTV uses its production resources to produce such shows as *The Real World* and *Road Rules*. Most basic cable networks use a combination of acquisition and self-production to fill program schedules.

The Major Cable Programmers

According to National Cable Television Association figures, the basic cable channels that reached the greatest number of subscribers in the year 2000 are the following:

- 1. TBS (78,000,000 subscribers)
- 2. Discovery Channel (77,400,000 subscribers)
- 3. USA Network (77,181,000 subscribers)
- 4. ESPN (77,181,000 subscribers)
- 5. C-SPAN (77,000,000 subscribers)
- 6. CNN (77,000,000 subscribers)
- 7. TNT (76,800,000 subscribers)
- 8. Nickelodeon/Nick at Night (76,000,000 subscribers)
- 9. Fox Family Channel (75,700,000 subscribers)
- 10. TNN (75,000,000 subscribers)

The largest pay service programmers in 1999 (according to *Cablevision Magazine*) were the following:

- 1. HBO (26,659,000 subscribers)
- 2. Cinemax (14,820,000 subscribers)
- 3. Showtime (13,554,000 subscribers)
- 4. Encore (13,170,000 subscribers)
- 5. Starz! (9,160,000 subscribers)

In the P-P-V marketplace, In-Demand is the largest programmer and claims more than twenty million subscribers and seventeen hundred affiliated cable systems.

Programming Through the Years

Cable television's earliest programming consisted largely of retransmissions of over-the-air television stations in rural areas that were unable to receive adequate signals. Early on, cable had difficulty making inroads into large, metropolitan areas because of a lack of programming that could substantially differentiate it from already available broadcast television. A series of restrictive regulations from the Federal Communications Commission (FCC) and a number of court rulings that were adverse to the cable industry made it difficult to provide different programming that would attract new subscribers. Eventually, cable was allowed to bring distant independent television stations into certain markets, thereby bringing something "unique" to the market.

The first critical event in creating a unique programming identity that would propel cable to new heights occurred with the creation of HBO in 1972. The service was unique to cable and provided feature films and other programming. The network at first used a series of microwave repeater towers to distribute its signal, but this system was later replaced by satellite distribution via Satcom I in 1975. The use of satellite distribution was a technological breakthrough that pioneered the distribution of cable programming services on a national basis. The costs associated with networking fell precipitously because distance was no longer a major barrier.

Another important milestone occurred when Ted Turner made WTBS in Atlanta a "superstation" in 1975 by putting its signal on the satellite. This made the signal retrievable by cable operators on a national basis. Cable was gaining its own programming identity.

In time, other programming services would be formed. ESPN was launched in 1978, at a time when many people questioned the viability of an entire network dedicated to sports. However, the success of ESPN highlighted the ability of cable to service specialty or niche markets. In 1980, USA Network, a general interest programmer, was created. Black Entertainment Television (BET) was launched, and CNN went on the air as the first twenty-four-hour news channel. CNN had a profound effect on the way in which television news was gathered and presented. It led the way for other news services such as MSNBC (the result of a partnership between NBC and Microsoft) and Fox News (created by the News Corp.). MSNBC and Fox News were both launched in 1996. MTV. aimed at a younger generation, and often cited as the epitome of demographically targeted, specialty cable, began in 1981. It has since evolved from a video music service into a varied programming network that has added youth-oriented original programming. Shopping channels (e.g., QVC, Home

Shopping Network) also represent a programming service that grew largely out of cable initiatives.

The range and depth of basic cable programming has grown dramatically since the early 1980s. As channel capacity increases with new digital technologies, the need for even more programming content is likely to create a boom in new networks. Already, familiar brand name networks have cloned new "branded" versions of themselves. For example, the Discovery Channel has created Discovery Kids, Discovery Science, and Discovery Health, further segmenting and targeting its programming strategy to reach new viewers in different ways. The same sort of "multiplexing" has taken place in the pay cable market as well. Each of the major players in that market space has multiplexed their offerings. For example, HBO has HBO Family, HBO Comedy, and others, while the Starz Encore Group offers a Super Pak made of twelve channels.

Cable Programming and the Future

The technology that makes true video-ondemand (VOD) possible exists and will be increasingly deployed as cable systems are upgraded and digital services flourish. This will mean that subscribers will be able to order entertainment or informational programming from vast libraries. Programming will be delivered when and in what manner the customer wants. The viewer at home will have videocassette recorder-like functionality, allowing him or her to edit, store, and retrieve programs at will. The television viewing experience will be changed, but the need for program content will remain.

Cable will be forced to deal with greater competition on all fronts, including direct broadcast satellite. It is likely that the Internet will evolve in some fashion to offer video-streamed content on its own. It could be that the programmer services will evolve into new digital forms across new platforms. The cable industry has created a programming culture of its own, one that will likely serve the varied interests of future information/entertainment seekers quite well.

See also: BROADCASTING, GOVERNMENT REGULATION OF; CABLE TELEVISION; CABLE TELEVISION, CAREERS IN; CABLE TELEVISION, HISTORY OF; CABLE TELEVISION, REGULATION OF; CABLE TELE-VISION, SYSTEM TECHNOLOGY OF; DIGITAL

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CABLE TELEVISION, REGULATION OF

Television has proven to be one of the most powerful media of all time. Newspapers, magazines, radio, and the Internet have made substantial contributions to the sharing of ideas and providing entertainment, but none was so immediately pervasive and hypnotic as "the tube," which is able to deliver breaking news and weather, movies, concerts, and sporting events directly into people's living rooms.

Beginnings of Cable Television

When television began to be widespread in the late 1940s and early 1950s, one only had to put up an antenna (after purchasing a television) to receive the free, over-the-air broadcasts. However, not everyone could receive a clear signal. Living in hilly regions, the mountains, or dense cities could all lead to poor signal reception, as could living too far away from a major city that had a television station. In response, people set up antennas in areas that had good signal reception and then sent that signal over cables into those areas where signal reception was poor. Thus began cable television. Cable has also been called community antenna, or community access, television (CATV). The history of cable is intertwined with television and broadcasting, which provide the basis for understanding government regulation of the cable industry. By passing the Communications Act of 1934, the U.S. Congress created the Federal Communications Commission (FCC) to regulate the then-expanding world of radio broadcasting. The FCC was mandated to regulate all radio-wave communications "in the public interest, convenience, and necessity." Although no clear definition exists for what is or is not in the "public interest" (the debate has raged since then), the public interest doctrine is a pillar upon which all FCC regulations stand.

As discussed by Daniel J. Smith (1997), two other ideas are fundamental to the regulatory philosophy of the commission: scarcity and localism. Scarcity refers to the portion of the electromagnetic spectrum (the "airwaves") that is used by broadcasters to send signals. The airwaves are considered to be owned by the public, so regulating their use is in the public interest. Because only so many frequencies physically exist for use by radio and television stations, they are said to be scarce. The FCC plays "traffic cop" and chooses who is able to use them and sets technical standards. The second concept, localism, refers to the distribution of broadcast stations around the United States. Unlike most European nations, which chose to have fewer but more powerful (and therefore more far-reaching) regional broadcast stations, the FCC maintains that it is preferable to have more numerous but less powerful local broadcast stations. The commission claims that this will allow a given station to reflect better the flavor and opinions of those in the local community of a broadcaster. Together, the ideas of public interest, scarcity, and localism have guided how and why the commission has made certain regulatory decisions and refused others.

In general, the legal rationale for regulating cable has never been clear, because cable does not neatly fit any of the known regulatory models. Print communication, such as books and newspapers, had existed for centuries; by the time that television was developed, the rights of journalists and authors were fairly well defined, but cable was very different from a newspaper or magazine. Cable could be considered to be closer to a telephone system because both have networks of wires to send their signals. However, telephone systems such as Bell Telephone and AT&T, were "common carriers," which means that they had no control over what was sent out over their systems. Cable operators, on the other hand, chose what went out on their systems, so they were not common carriers. Cable had much in common with broadcasting, but cable did not use over-the-air spectrum space. Therefore, it was not a perfect match because scarcity was not an issue for cable. Since cable did not fit into the existing models, a new regulatory model was needed for cable.

During the last half of the twentieth century, the FCC, Congress, the courts, broadcasters, cable operators, and the public all participated in forging this new path for the popular and promising communication medium. As the following discussion will illustrate, regulation of the cable industry has been dominated by the need to protect traditional over-the-air broadcasters from the growing influence of cable and by the desire for local governments to maintain some control over what was essentially considered a public utility.

The History of Cable Regulation

According to Robert W. Crandall and Harold Furchtgott-Roth (1996, p. 1), the first cable system was "either in Mahoney City, Pennsylvania, in 1948, or Astoria, Oregon, in 1949. The first subscription cable system was established in Lansford, Pennsylvania, in 1950." When the 1948 FCC-imposed freeze on new broadcast television stations ended in 1952, the number of television stations rapidly increased, and cable had been established (see Table 1). At first, broadcasters liked the idea of cable, because it increased the reach of their signals and, most important, the size of their audience, which determined how much they could charge advertisers. By the mid-1950s, cable operators could use a new technology, microwave transmission, to beam signals from distant television stations to their subscribers. Anything that involved communications fell under the jurisdiction of the FCC, and in 1954, the commission authorized cable operators to build such microwave transmission facilities so long as the general public could also use them.

Local broadcasters feared that viewers would prefer these out-of-town stations to their local stations. However, the FCC had not established jurisdiction over cable. In *Frontier Broadcasting Company v. Collier* (1958), the first major FCC rul-

TABLE 1.

Cable Statistics for Selected Years Between 1952 and 2000

Year	Number of Systems	Total Subscribers
1952	70	14,000
1954	300	30,000
1956	450	300,000
1958	525	450,000
1960	640	650,000
1962	800	850,000
1964	1,200	1,085,000
1966	1,570	1,575,000
1968	2,000	2,800,000
1970	2,490	4,500,000
1972	2,841	6,000,000
1974	3,158	8,700,000
1976	3,681	10,800,000
1978	3,875	13,000,000
1980	4,225	16,000,000
1982	4,825	21,000,000
1984	6,200	29,000,000
1986	7,500	37,500,000
1988	8,500	44,000,000
1990	9,575	50,000,000
1992	11,035	53,000,000
1994	11,214	55,300,000
1996	11,119	60,280,000
1998	10,845	64,170,000
2000	10,400	66,500,000

ing to involve cable, broadcasters argued that cable was a common carrier, which meant the FCC could regulate it. The FCC ruled that cable was not a common carrier, but the commission also ruled that cable was officially not like broadcasting. The following year, the commission said it could find no authority with which to regulate cable.

The Beginnings of Regulation

Although cable could not be defined, it was a different matter if the success of a local broadcaster was directly threatened by cable, especially if it was the only station in the area. When this happened in *Carter Mountain Transmission Corporation v. FCC* in 1962, the FCC denied a cable operator a permit to build a microwave station. This set a precedent for supporting local television stations in conflicts between local stations and cable operators.

The first substantial cable regulation began in 1965 and established a policy that would affect the industry into the twenty-first century. The FCC outlined rules for those cable operators who used microwave systems (which were almost all of them), since FCC jurisdiction over microwave was already established. Cable was ordered to carry the signals of local broadcast stations, termed "mustcarry," and was restricted from importing the same program as a local broadcaster, termed " nonduplication." Therefore, local broadcasters were always represented on their community's cable system, and they did not face competition from distant stations. The FCC also mandated that distant signals could not be imported into the top one hundred television markets. (There are about two hundred such markets, ranked by population. The two largest markets are New York and Los Angeles.)

Arguing that cable was interstate communication by wire, the FCC extended these regulations to all cable systems in 1966. In the public interest, cable outlets were also expected to offer "local origination," or the capacity for the general public to produce television programs and air them on special access channels. In the first cable-related U.S. Supreme Court case (United States v. Southwestern Cable Company, 1968), a cable company questioned the authority of the FCC to limit the signals that company could carry. The Court affirmed FCC authority over cable, but not directly, calling such authority "reasonably ancillary" to the tasks of the FCC. In United States v. Midwest Video Corporation (1972), the Court upheld must-carry and local origination. These new regulations limited the growth of cable and, accordingly, investment in the new industry.

By 1970, concerns existed with regard to the cross-ownership of various media and the number of media outlets that were owned by any one person or company. The FCC had already established limits on radio and television station ownership and forbidden a telephone company from owning a broadcast outlet. The commission extended this ruling to cable and prohibited a telephone network or local television station from owning a cable outlet. In 1975, the FCC decided not to impose a cross-ownership ban on cable and newspapers because a problematic situation did not exist. However, there was no restriction on companies that owned several cable outlets-multiple-system operators (MSOs)-to prevent them from buying interest in cable channels on their systems; this is known as vertical integration.

Concerns were also raised about cable's use of copyrighted programming, which prompted the commission to detail their regulations in 1972. Must-carry was extended to all local and educational television stations within thirty-five miles of the cable operator. Depending on the market size, cable was expected to carry a minimum of three network stations (there were only three television networks then) and one independent station. The nonduplication rule was also extended to syndicated programs, termed "syndicated exclusivity." As a result, cable was regulated as it had never been regulated before.

Cable operators were especially frustrated about the new and complex rules for premium (e.g., movies) and pay (e.g., sporting events) programming. Such shows had the potential to bring in substantial profits beyond just subscriptions, and new satellite technology could deliver signals all over the country much easier than microwave networks. However, the regulations made it almost impossible, and certainly unprofitable, to offer such fare. This changed in 1977 with Home Box Office, Inc. v. FCC. The U.S. Court of Appeals for the District of Columbia struck down the programming restrictions and adopted a standard to apply to future FCC cable regulations. This paved the way for some of the most popular and profitable pay services in cable history, such as Home Box Office and Showtime. That same year, the commission eased a technical requirement, which made "superstations" such as WTBS and WGN available to more cable outlets.

By the end of the 1970s, cable had more programming to offer, but there were also many more regulations to follow. In the 1979 decision FCC v. Midwest Video Corporation, the U.S. Supreme Court said that the commission had gone too far with local origination, but by then the FCC had already eased the rules. Foreshadowing the deregulation of the next decade, a 1979 FCC study found that, contrary to popular opinion, cable did not have an adverse effect on the growth and incomes of local television broadcasters. Partially based on that study, the FCC decided to drop all syndicated exclusivity regulations in 1980, in the interest of delivering more programming to the public. However, another version of the rules was instituted in 1988.

Deregulation and Re-regulation

With the administration of President Ronald Reagan came overall deregulation, and the cable industry was no exception. The Cable Communications Policy Act of 1984 stands as one of the most wide-sweeping regulatory efforts in cable television; it addressed several aspects of the industry, including subscription rates, service delivery, and programming. Up until that time, the local community that granted the cable franchise also regulated cable rates. With the 1984 act, if a cable company faced "effective competition," they decided basic cable rates. As defined, this effectively included all cable systems. Rates for pay services were also left to their discretion. Cable operators were ordered to provide service to their entire service area, not only the more profitable neighborhoods. Local governments could require channels for public, educational, and government use (PEG channels) to carry city council meetings and the like; however, franchises could only request broad categories of programming, not specific channels. The 1984 act also banned the entry of telephone companies into the video-delivery business.

Although the 1984 act gave cable operators authority in assigning rates, they resented being forced to dedicate channels to local stations under the must-carry provisions. Turner Broadcasting had asked the FCC to abolish the regulations as early as 1980. In *Quincy Cable TV, Inc. v. FCC* (1985), cable operators challenged must-carry as a violation of their First Amendment rights by restricting and forcing speech. The U.S. Court of Appeals for the District of Columbia said the FCC failed to justify the regulation and ordered it dropped. The same court struck down the commission's revised must-carry rules in *Century Communications Corporation v. FCC* (1987).

Increasing the presence of cable in households was an objective of the Cable Communications Policy Act of 1984. As seen in Table 1, this was apparently achieved, with a 186 percent increase in total subscribers from 1984 to 1992. However, as cable rates increased, so did public pressure on Congress to do something about it. The result was the Cable Television Consumer Protection and Competition Act of 1992. The definition of effective competition was again changed, this time such that almost all systems would be regulated. A crucial goal was to lower rates, but this did not occur. The 1992 act mandated regulating basic cable, but in response, operators created a la carte pricing by offering channels that used to be part of basic in packages. Generally, after the 1992 act, people paid more for the same number of channels than they had paid before.

The 1992 act included much more specific must-carry provisions and introduced an option for broadcasters: every three years they could either demand must-carry or they could negotiate to be paid for their programming under "retransmission consent." Many cable operators said they would never pay cash for something available for free, but they often did arrange trades of promotional time on other cable channels. Retransmission consent did not apply to educational stations or superstations. From 1993 to 1997, must-carry was again challenged, this time in *Turner Broadcasting System, Inc. v. FCC* (1993). In a reversal, must-carry was upheld as constitutional.

The 1992 act also addressed ownership issues, especially vertical integration. By that time, many MSOs owned all or large portions of many programming channels carried on their systems. Industry analysts worried that cable channels that were not owned by cable operators would not be carried and, thus, not survive. This legislation prevented the owners of any video-delivery system, such as cable, from taking such financial and business interests into consideration as a condition for carriage.

Heralded as an overhaul of the original Communications Act of 1934, the Telecommunications Act of 1996 deregulated aspects of the entire communications industry, including radio, television, and cable, in an effort to introduce increased competition and, hopefully, market-driven high-quality service. For the first time, telephone companies were allowed to enter the video-delivery market, although the ban on telephone-cable cross-ownership was retained. It was the hope of the FCC that the 1996 act would give a competitive boost to developing video technologies, such as direct broadcast satellite (DBS). Rate regulations for all cable programming tiers were eliminated after March 1999, as was the need for a uniform rate structure. This time, effective competition for cable meant the presence of any other video provider. This applied to almost all systems and, therefore, gave rate-setting authority back to cable operators.

Cable Franchises

Unlike broadcast television stations, which transmit over the air, cable systems use networks of wires to deliver signals. This involves miles of cable and assorted technical gadgets, as well as facilities to coordinate transmissions. It takes the cooperation of the local government to install and maintain this equipment successfully.

In the franchising process, municipalities choose among bids from cable-system operators who wish to build in the area. Bids often include promises of maximum channel delivery and public-service projects in exchange for a negotiated fee to the government. Typically, only one cable operator is selected, essentially granting a natural monopoly. Through the late 1950s and early 1960s, state courts generally ruled that because cable systems used public right-of-ways to install cable, they were public utilities and could, therefore, be regulated. In 1978, the FCC was given authority to regulate telephone-pole attachments that were used by cable operators.

The FCC did not mandate formal franchise processes until the Communications Policy Act of 1984. Before then, local franchise authorities regulated rates and often dictated programming, including channel selection. With the 1984 act, basic cable rates were deregulated, and franchises were limited to specifying only broad categories of programming. Franchise authorities were also limited in how much they could charge cable systems, not to exceed 5 percent of gross revenues. This act also addressed franchise renewal, which became a concern as the importance of cable increased and thirty-year-old franchise agreements were ending. Basically, cable operators could not assume automatic renewal.

The U.S. Supreme Court became involved with the franchising process in *Los Angeles v. Preferred Communications, Inc.* (1986). Los Angeles refused to authorize another cable system on the grounds that it was too disruptive. Ultimately, franchising was supported, but in a competitive situation, a city could not limit the number of systems to one.

With the Cable Television Consumer Protection and Competition Act of 1992 and a return to regulation, local franchises regulated with the cooperation of the FCC. Cable operators were also mandated to provide written notice to initiate renewal proceedings. At that time, franchising authorities could consider the efforts of a cable operator to expand cable and community services. Rates were again deregulated under the Telecommunications Act of 1996. By the end of the twentieth century, concern had switched from the building of cable systems to overbuilds, where capacity exceeds demand. See also: Broadcasting, Government Regulation of; Broadcasting, Self-Regulation of; Cable Television; Cable Television, History of; Cable Television, Programming of; Communications Act of 1934; Federal Communications Commission; First Amendment and the Media; Satellites, Communication; Telecommunications Act of 1996; Television Broadcasting.

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CABLE TELEVISION, SYSTEM TECHNOLOGY OF

In its concept, the technology of cable television is relatively simple. It is a system of wires and amplifiers used to gather television and radio signals from a variety of sources and deliver them to the homes in a given geographic area. It is sometimes compared with the water system of a city, which takes water from one or two primary sources and distributes it to customers throughout the city. Cable television similarly distributes a roster of television channels to all the residents of an area who connect to its wire. Cable systems are expanding their services to include high-speed Internet access and traditional telephone service as well. The fundamental components of a cable system include the main office of the local system, called a "headend," where the various signals are gathered, combined, and fed out into the system; fiber-optic lines and coaxial cables, the wires that carry the information; amplifiers that boost the signal at regular intervals and maintain signal strength; and often set-top boxes, which translate the cable signals into electronic information that the home television set can use.

The Headend

The process of getting programming to the home begins far from the headend of the local system. National and multinational corporations such as AOL-Time Warner and Disney create the programming and operate familiar channels such as CNN, ESPN, HBO, Discovery, and MTV. These companies distribute the program signals, usually by satellite, from a few main origination points, beaming the material to the more than ten thousand individual cable systems in the United States, as well as to cable systems around the globe. Large dish antennas at the headend of the local system receive these signals. The programming companies simultaneously feed their signals to other multichannel television providers such as direct broadcast satellite (DBS) companies (e.g., DirecTV).

In addition to the basic and premium cable packages, systems carry local and regional broadcast television stations, radio stations, and national audio services. Often, they also produce their own programming or carry programs that are produced by others in the community. Local radio and television stations are picked up by powerful



Large dish antennas have been used by local systems, such as Bethel Cablevision in Bethel, Alaska, to receive the signals from the major cable systems. (Yogi, Inc./Corbis)

versions of home television antennas, or they are sometimes sent to the headend via microwave link (a specialized broadcast technology) or wire. Typically, these local broadcasters will be affiliated with and carry the major national networks (e.g., NBC, CBS, ABC, PBS, Fox, WB, and UPN). Broadcast stations that are not affiliated with national programmers, including religious stations, will also be included in the package. National audio services that feature scores of digital music channels are fed by satellite in the same manner as national video programming.

Signals from television and radio stations that are outside of the normal reception range of the system, such as stations from another part of the state, can be picked up near that station's transmitting antenna and imported by microwave or landline. Programs that are created in television studios (usually small ones) at the headend are videotaped for later playback using professionalgrade videotape machines. Those machines can



The adoption of fiber optic cable, with its ability to transmit information through laser-generated light, was a major advancement for the cable industry in the 1980s. (Charles O'Rear/Corbis)

also play back tapes that are created by others in the community to be carried on the public or governmental access channels of the system. Sometimes, programming will be fed by wire to the headend from a local government television facility or a television studio at an area high school or college. Many modern cable television systems also store and play back programming, usually commercials, using high-capacity digital servers.

All of this program material is electronically organized, and each signal is then imposed on a separate carrier wave, or channel. The combined signal is then sent out onto the system toward the subscriber's home.

The Wired System

There are three types of wire that are used in modern telecommunications: the so-called twisted pair, the fiber-optic cable, and the coaxial cable. The twisted pair is the familiar wire that is used by telephone companies to carry voice and data. Compared to fiber-optic and coaxial cables, twisted pair, without special conditioning, is quite limited in the amount of information that it can carry, and it is far too narrow an electronic pipe to transmit multichannel television programming. Cable operators therefore use coaxial and fiberoptic cables. The cable television industry derives its name from the coaxial cable. Prior to the adoption of fiber optics in the 1980s, a cable system consisted almost entirely of "coax." The term "coaxial" refers to the two axes of the cable, a solid copper center wire (the first axis) surrounded by a metal sheath or tube (the second axis). The two axes are separated with either donut-shaped spacers or a solid, plastic-like material that is transparent to radio waves. A durable, plastic outer layer covers the cable.

Fiber is basically a thin glass thread that is about the width of a human hair. Instead of carrying information in the form of radio waves, fiber optics transmits information on beams of lasergenerated light. Because it is made primarily of glass (the raw ingredients of which are plentiful) instead of copper, fiber is cheaper than coaxial cable. It can also carry significantly more information than coax and is less prone to signal loss and interference.

Both fiber and coax can carry a large number of television channels, along with other information, in part because of the way they harness the electromagnetic spectrum. The electromagnetic spectrum is the medium through which and within which television and radio signals are transmitted; it is an invisible part of the natural environment and includes such things as visible light, x-rays, gamma rays, and cosmic rays. A large portion of this natural spectrum can be employed to transmit information, and the U.S. government has allocated certain parts of it for many different types of wireless communication. This includes military communications, two-way radios, cellular telephones, and even garage-door openers. Commercial broadcasters, such as the hometown television and radio stations, therefore share this limited resource with other users.

Wired systems such as cable television, on the other hand, replicate the natural spectrum in an isolated and controlled environment. They can use all the available spectrum space that is created by that system without having to share it with other services. The amount of spectrum space that is available in a given system or for a particular application is called "bandwidth" and is measured in hertz, or more commonly, kilohertz (kHz) and megahertz (MHz). The phone line into a home is slightly more than 4 kHz, and it is termed "narrowband." A broadcast television signal requires 6 MHz, and most modern "broadband" cable systems operate at 750 to 860 MHz, or 110-plus analog television channels.

Amplifiers

As the television signal passes through the cable lines, both fiber and coaxial, that signal loses its strength. Resistance in the coaxial cable or impurities in the fiber cause the signal to deteriorate and fade over distance. The signals, therefore, have to be amplified at regular intervals. In contemporary cable systems, these amplifiers are placed about every two thousand feet for coaxial lines; a series of amplifiers is called a "cascade." The superior carrying power of fiber means that fewer amplifiers are needed to cover the same distance. The total number of amplifiers that can be used in a cascade or in a system is limited because every amplifier introduces a small amount of interference into the line. This interference accumulates and, with too many amplifiers, will reach a point of unacceptable distortion. The number of amplifiers that are used and the spacing between them in an actual system is depends on the system bandwidth and the medium (i.e., coaxial or fiber). A given cable system can have hundreds, even thousands, of miles of fiber and coax and hundreds of amplifiers.

The sophistication of the amplifier is also chiefly responsible for the exploitable bandwidth in the system, or the number of channels that a system can carry. The earliest cable television amplifiers could retransmit only one channel at a time, and a three-channel cable system had to have a separate set of amplifiers for each channel. Modern broadband amplifiers carry scores of channels simultaneously.

Network Architectures

The pattern in which a cable system is arranged (i.e., the configuration of wires from the headend to the subscriber's home) is the system architecture. From the earliest days of cable in the late 1940s, the classic architecture for a cable system was known as "tree and branch." Picture a family-tree diagram, with ancestral branches of the family coming off the trunk, and those large branches dividing and spreading out into finer and more numerous offshoots. The classic cable system is designed in this fashion. Signals leave the headend over high-capacity "trunk lines," usually fiber optic, which wind their way through the main arteries of the community, down city streets toward local neighborhoods. "Feeder," or distribution, cables branch off from the fiber trunk, or backbone, and spread down neighborhood streets toward hundreds, sometimes thousands, of homes. Finally, smaller coaxial "drop lines" sprout off the feeder cables to link to individual houses. All of the lines are either buried underground or strung on poles that are usually rented from the local telephone or power company. Because the trunk and feeder lines cannot support their own weight, they are lashed to heavy steel wires called "strand," which also carry the weight of the amplifiers.

With the development of cost-effective fiberoptic technology in the 1980s, cable systems began replacing much of their coaxial line with the new, higher capacity technology, starting with the trunk lines and moving toward the feeder lines. With the change in the hardware came a change in the system architecture. Use of fiber meant reduced costs over the long term, a decrease in the number of amplifiers needed, and an increase in the overall quality of the signal. Fiber could be run directly from the headend to hubs, or nodes, serving large clusters of homes. From these fiber hubs, mini tree and branch coax systems would service area customers. This combination of fiber and coaxial cable is the hybrid fiber coax (HFC) architecture.

Set-Top Boxes

Many cable subscribers, even those who have contemporary "cable-ready" television sets, have additional cable set-top boxes, or converters, that are sitting on or next to their sets. Set-top boxes perform several important tasks for the cable system. For some television sets, especially older or non-cable-ready sets, they act as the television tuner, the device that selects the channels to be viewed. Because the wired spectrum is a closed universe, cable operators can place their channels on almost any frequency that they want, and they do so to make the most efficient use of the space and technology. Operators, for example, carry the broadcast VHF channels 2 through 13 in their "normal" place on the dial, but the UHF channels 14 through 69, which in the open spectrum are higher than and separate from the VHF channels, have been moved in "cable space." The full cable

spectrum is, in fact, divided into its own bands. Channels 2 through 6 are carried in the low band, channels 7 through 13 in the high band, and other cable network programming is distributed across the midband, superband, and hyperband channels. Part of the low band (i.e., 0 to 50 MHz) is often used to carry signals from the consumer's home "upstream" and back to the cable company headend. Television sets that are not set up to receive the many special bands of cable require set-top boxes for the conversion.

While cable-ready television sets have taken over most of the simple functions of signal reception in modern systems, converters remain a staple in the industry for the provision of more advanced services such as premium programming and "payper-view" movies. The boxes help control the distribution of such programming to subscriber homes. Many cable systems are "addressable," which means that each subscriber has an electronic address, and operators can turn a signal to that home on or off from the headend. The technology that helps make addressability possible is often housed in the set-top box. Finally, as cable moves into the digital era, set-top boxes are being used to convert the digital channels and services to signals that the standard analog television set can use.

Cable Interactivity and Advanced Services

While most cable systems are addressable, true interactivity remains limited in most systems. Interactivity has no set definition and can take many forms, including ordering movies when the customer wants to view them (video on demand) or having the cable system monitor the home smoke alarm. In all cases, it requires some means of getting a signal from the home back to the headend. Cable television systems were originally configured for the efficient delivery of large amounts of programming from one point (the headend) to multiple users—a point-to-multipoint distribution scheme. The arrangement has been very successful for one-way mass distribution of content, but it is limited in its two-way capacity. As noted, cable television systems designate a small portion of their spectrum space for upstream communication, but that bandwidth has been historically underexploited by the cable industry.

In contrast, telephone systems, despite their limited bandwidth, are configured for full two-way, point-to-point communication. Unlike cable, telephone companies use a switching system to create a dedicated line between two callers. Traditional cable systems do not have the architecture or the switch to provide such service. Cable companies are seeking to overcome this technical handicap by developing techniques, using both hardware and software, to make their systems more interactive. The conversion to digital technology is especially seen as a way to provide additional and enhanced services, including interactive television, telephone service, and Internet access.

An early example of this effort is the cable modem. By distributing computer data, such as Internet web-pages, over the cable system, cable operators are able to exploit their broadband capacity and dramatically increase modem speeds. Customers who hook their computers to a cable system instead of using a standard telephone modem can download pages in seconds instead of minutes, and the cable modem is on all of the time—so there is no waiting for the computer to "dial up" an Internet connection.

Cable operators are also developing techniques that will allow them to offer telephone service using their cable plant. Ultimately, the broadband capacity of cable will provide one of the major distribution platforms for the highspeed interactive digital era—the information highway—and help create a seamless integration of video, voice, and data.

See also: Cable Television; Cable Television, Careers in; Cable Television, History of; Cable Television, Programming of; Cable Television, Regulation of; Digital Communication; Internet and the World Wide Web; Satellites, Communication; Telephone Industry, Technology of; Television Broadcasting, Technology of.

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CARNEGIE, ANDREW (1835-1919)

An industrialist and philanthropist, Andrew Carnegie was born in Dumferline, Scotland, to William and Margaret Morrison Carnegie. Economic reverses led the family to emigrate in 1848 to Allegheny, Pennsylvania, where for \$1.20 per week Andrew took a job as a bobbin boy in a textile factory. Hungry for knowledge, he also became the heaviest user of Colonel J. Anderson's personal library, which was open to all Allegheny working boys. A year later, Carnegie hired on as a telegraph messenger boy, where he so distinguished himself that Thomas Scott, superintendent of the western division of the Pennsylvania Railroad, hired him as his personal telegrapher for \$35 a month.

Under Scott, Carnegie learned business methods quickly, and when Scott became the general superintendent of the railroad in 1859, Carnegie took over the position of superintendent of the western division. The new salary enabled Carnegie to expand his investments, all of which turned substantial profits. In 1865, he resigned from the railroad to devote full attention to his growing business interests. When investments generated a comfortable income, he wrote himself a note in 1868: "Thirty-three and an income of \$50,000 [sic] per annum. . . . Beyond this never earn—make no effort to increase fortune, but spend surplus each year for benovolent [sic] purposes." For the next twenty years, he generally



Andrew Carnegie. (Corbis)

ignored this commitment while he built a huge fortune in the steel industry.

In 1887, Carnegie married Louise Whitfield, and they had one daughter (born in 1897). By the end of the 1880s, however, the sentiment expressed in his 1868 note began to gnaw on Carnegie's conscience. In 1889, he published two essays in the North American Review outlining a "gospel of wealth" philosophy. Wealthy people, he said, had a responsibility to live moderately and give their excess wealth to needy people who would help themselves. In an essay entitled "The Best Fields for Philanthropy," he specifically identified seven institutions worthy of attention: universities, public libraries, medical centers, public parks and arboretums, concert halls, public swimming pools and baths, and churches. (Carnegie had foreshadowed some of these priorities earlier in the decade with gifts of a library and swimming bath to Dumferline, a library to Braddock, Pennsylvania, and an organ to an Allegheny church.) Much of this rhetoric, however, was tarnished by the Homestead Strike of 1892, in which seven

steelworkers lost their lives in a fight with Pinkerton detectives who had been hired to help Carnegie break the union.

After selling his steel interests to J. P. Morgan for nearly \$500 million in 1901, Carnegie turned his full attention to implementing his gospel of wealth. By the time of his death eighteen years later, he had donated more than \$333 million to underwrite such causes and organizations as the Simplified Spelling Board, 7,689 church organs, the Carnegie Hero Fund, the Church Peace Union, the Carnegie Institute of Pittsburgh (which included an art gallery, library, concert hall, and the Carnegie Institute of Technology), the Carnegie Institute of Washington, D.C., the Carnegie Foundation for the Advancement of Teaching, and the Carnegie Endowment for International Peace. He also provided the money to construct the Pan American Union building in Washington, D.C. (to promote peace in the Western Hemisphere), a Court of Justice in Costa Rica (to arbitrate disputes between Central American countries), and The Hague Peace Palace in the Netherlands (to house the World Court). In 1911, Carnegie endowed the Carnegie Corporation with \$125 million, and over time, he relinquished control of his philanthropy to the directors of the corporation.

Among all his philanthropic interests, Carnegie particularly liked libraries. He often boasted that around the world the sun always shone on at least one Carnegie library. Between 1890 and 1919, he donated \$56 million to construct 2,811 libraries in the English-speaking world (including \$41 million to construct 1,679 American public libraries in 1,412 communities and \$4.3 million to erect 108 academic libraries in the United States). In 1917, Carnegie also donated the money to erect 36 libraries in camps located throughout the United States that trained soldiers for participation in World War I. The sheer size of Carnegie's philanthropy generated a competition between communities to establish libraries; it also helped create a climate of giving that encouraged other library philanthropists.

A typical Carnegie grant first required communities to provide a suitable site for the library. Once that had been established, Carnegie would agree to donate a sum (usually \$2.00 per capita of the local population) to be used in the erection of a building—as long as the community promised to fund the library annually at a rate of 10 percent of the original gift.

Not all communities welcomed Carnegie grants, however. In Wheeling, West Virginia, for example, local labor leaders who remembered the Homestead Strike of 1892 rejected efforts by city fathers to accept a grant. "There will be one place on this great green planet where Andrew Carnegie can't get a monument with his money," steelworker Mike Mahoney told labor delegates at a meeting called to defeat the library levy in 1904. (Seven years later, Wheeling opened a public library with labor support, but without Carnegie money.) In scores of other communities, Carnegie grants were rejected for gender and race reasons. In some, the male elite rejected efforts by local ladies' clubs to add yet another institutional responsibility to the local tax burden. In others (especially in the South), the local white elite worried that to accept a "free" library would force them to offer racially integrated services.

Communities that successfully solicited Carnegie grants were often inexperienced in library design and architecture. To address this problem, James Bertram, Carnegie's private secretary, commissioned a set of six model library blueprints. In part, this had the effect of homogenizing public library architecture in small- to mediumsized communities. A typical classically designed Carnegie building required a library user to climb ten or more steps to enter through (usually) double doors. At that point she (the large majority of patrons were women and children) could turn left and descend to a lower level, where she generally found a restroom, heating plant, and meeting room available for community groups such as the local women's club and the Rotary Club. If the patron chose not to descend to the lower level, she could step forward to the circulation desk. Located in the middle of an open space (and often under a dome), the U-shaped circulation desk stood waist high and functioned as the command post of the librarian. From behind the desk, the librarian (almost always a woman) could, without moving, look right and monitor activities in the children's wing. The librarian could also look left into the adult reading room, where periodicals and newspapers were available. Behind the librarian were stacks filled with books that the American Library Association (ALA) had recommended in bibliographical guides (e.g., Booklist magazine, the ALA *Catalog*). These guides were funded in part by the interest that accrued on a \$100,000 endowment made by Carnegie in 1902.

After Carnegie's death on August 11, 1919, in Lenox, Massachusetts, the Carnegie Corporation continued to favor most of his philanthropic interests, especially librarianship and higher education. The legacy of Carnegie's philanthropy was significant. Organizations that he founded and institutions that he helped to build during his lifetime evolved into essential agencies for creating, acquiring, organizing, and disseminating multiple forms of communication and information.

See also: LIBRARIES, HISTORY OF.

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WAYNE A. WIEGAND

CATALOGING AND KNOWLEDGE ORGANIZATION

If information cannot be found when it is wanted, it cannot be integrated into the world of human knowledge or into an individual's personal knowledge base. Whether people want to write a newspaper article, complete a project, or learn about a new hobby, they need to be able to find information that relates to what they are doing and to what they want to know. The overall purpose of cataloging and knowledge organization is to help people achieve the goal of finding information as easily as possible when they need it. This goal may seem to be a simple one, but accomplishing it is not necessarily easy or straightforward. For example, the way in which information is described and organized should ideally be consistent within one information medium, compatible with other information media, and predictable and appropriate for different kinds of information in different media. In addition, description and organization of information should be flexible enough to accommodate all the different assumptions, views of the world, and natural languages that human beings currently employ, as well as those that they have employed throughout the history of recorded information.

People have recorded information in many ways and in many forms. One general term for all of these information containers is "item." Information items can be textual (e.g., books or magazines), nontextual (e.g., paintings or sculptures), or a combination of the two (e.g., musical scores or maps). In addition, these information items can be physically stored in institutions such as libraries, museums, or archives, and/or they can be virtually stored in databases (textual or nontextual) for private use (e.g., within an organization) or for public use (e.g., through the Internet). This variety of possibilities has motivated information professionals to develop standardized and nonstandardized ways of helping people find what they want.

Recording Data about Information Items

Three processes help information professionals create access for users. These are the description of an item, the choice of descriptive elements as access points (i.e., data that may be searched), and the entry of the description into a file that is either manually or electronically searchable.

The description of an information item is a surrogate representation for it. A surrogate record stands for the information item in a manual or an electronic file. The purpose of the description is to allow people to decide whether they want to look at the thing itself. For example, the surrogate description for a book includes both physical characteristics (e.g., number of pages and dimensions) and intellectual characteristics (e.g., title and subject). These and other data elements (e.g., author, publisher, date of publication) help people decide whether they want to read the book. In general, the process of creating a description and assigning access points is known as "cataloging." The process of creating "metadata" has roughly the same meaning, but it may include how the description is put into machine-readable form, where the item may be found, and/or its relationship with other items. "Resource description" is a similarly broad term for methods of creating surrogates for any kind of item. The surrogate might be a cataloging record, an abstract or summary, or a thumbnail picture of the item. Clearly, if descriptions of items are standardized and predictable, people will more easily find the information they are looking for because they can make a comprehensive and complete search of an information file.

Charles Cutter (1904) identified three purposes for cataloging: (1) to allow someone to find an item with a known creator, title, or subject, (2) to allow someone to discover what an institution has about a certain topic, and (3) to allow someone to select an appropriate item from among a number of similar ones. These three goals still guide any catalog or other finding aid. The first objective is met by cataloging rules and codes, the second is met by knowledge organization systems, and the third is met by both kinds of systems.

Cataloging Rules and Codes

Standardized rules for cataloging have a long history. The most widely used cataloging code in the English-speaking world is the second revised edition of the Anglo-American Cataloguing Rules (AACR2, 1998). These rules were developed by an international Joint Steering Committee that included members from the United States. Canada, Australia, and Great Britain. AACR2 descriptions conform to a more general standard, the International Standard Bibliographic Description (ISBD), which was produced by a 1969 meeting of cataloging experts in Copenhagen, Denmark. The ISBD had three general goals. Its creators wanted to ensure (1) that records produced in one country in one language could be understood in other countries that might use other languages, (2) that records produced in one country could be integrated into files produced elsewhere, and (3) that records could be converted into machine-readable form. The first ISBD standard was developed for monographs, and

since then standards have been developed for printed music, nonbook materials, maps, computer files, and antiquarian materials, among others. Similarly, AACR2 contains rules for describing items in these different formats.

AACR2 is divided into two parts. Rules in the first part prescribe how to record data about the item using eight different areas or fields. These eight areas are either preceded or surrounded by punctuation marks that differentiate among the various roles a person or an institution played in the creation of the item. For example, in the area for the title and statement of responsibility for the item, the statement from the item that names its creator(s) is preceded by "/" (i.e., character spaceslash-character space). Different punctuation marks are used for different information elements in the cataloging record. This kind of standardized punctuation allows people (or computers) to understand the information in the record without necessarily being able to read the language in which the record is written.

The second part of AACR2 contains rules for choosing access points and for standardizing the information content in a surrogate description. For example, a creator often uses a different name for different works. People may use different forms of the same name, or they may use entirely different names. Sometimes, people change their names or write under pseudonyms. First, a cataloger needs to decide which of these names to use in the surrogate record. Next, the cataloger needs to decide which form of that name to use in the surrogate. The purpose of these decisions is to establish a standardized name in a standardized form based on which name is likely to be known to the most people. For example, The Adventures of Huckleberry Finn was written under the pseudonym Mark Twain, but the author's real name was Samuel Clemens. Because Samuel Clemens never wrote under his real name, the cataloger will choose Mark Twain as the name most people are likely to know and use for a search.

In addition, different people can have the same name, and the cataloger needs to distinguish among people who have the same name in order to separate items created by one person from those created by another. For example, works by the nineteenth-century American novelist Winston Churchill need to be distinguished from works by the twentieth-century British prime minister with the same name. One way to make this distinction is to add a person's birth and/or death dates to the name. Another way is to add extra elements (e.g., a middle name). For names in English, the surname is usually listed first followed by the forename(s). This practice is familiar through, for example, telephone books. The process of choosing names and other access points and of establishing standardized forms for them is called "authority work." Authority work includes making references from unused names and from unused forms of a name to the standardized name and form so that, for example, people who look up one name (e.g., Clemens, Samuel) are directed to the chosen name (e.g., Twain, Mark). In this way, authority work ensures that people who are interested in works by the novelist Winston Churchill do not retrieve works by the prime minister Winston Churchill.

Various other sets of standards and rules that have been developed for generating surrogates in both manual and electronic information environments include Archives, Personal Papers, and Manuscripts, the Dublin Core Elements, and Encoded Archival Description. Each of these systems is appropriate for a particular kind of information item, and each has its own set of useful data elements for describing an item and establishing appropriate access points for it. Tools (called "crosswalks") for comparing the various standards have been developed to help information professionals understand differences and similarities among different standards, such as the different definitions each standard may give to the title or the creator of a work. Crosswalks establish which field(s) from one standard map onto which field(s) in another. Similar to translating between different natural languages, translating between different standards is not automatic, but it is an important activity because it allows one to merge files that contain records using different standards. In this way, records can be shared, and more people have access to the record for an item they are interested in retrieving.

Knowledge Organization Systems

One of the objectives that Cutter (1904) had for a surrogate system was to allow people to find items that have the same topic or subject. The topic of an item is what it is about (e.g., landscape painting, theoretical astrophysics, gardening, or how to fly an airplane). The term "knowledge organization" encompasses different methods for organizing information, but the term is sometimes used for information about a topic or subject. Standardized (i.e., alphabetical systems, classification systems) and nonstandardized methods of specifying subjects have been developed, all of which can be used in both manual and electronic environments to help people retrieve the information they want.

Standardized Methods

A cataloger analyzes an information item to determine its topic and the concepts it uses and then translates the concepts in the analysis into a standardized or controlled vocabulary. Standardized methods of knowledge organization include systems that are primarily displayed alphabetically (e.g., subject-heading systems and thesauri) and systems that are primarily displayed systematically (e.g., classification and ontological systems). These two types of systems are not mutually exclusive because alphabetical systems include classificatory elements, and classificatory systems include alphabetical elements. Both kinds of system are used to organize resources on the Internet (e.g., Beyond Bookmarks) and in nonelectronic information environments.

Subject-heading and thesaural systems are called "controlled vocabularies" because the particular terms the system prefers for expressing each concept are chosen in advance and controlled by the system developers. Searchers are guided to these preferred terms by networks of references that are called the "syndetic structure" of the system. Assigning subject headings to information items is usually called "subject cataloging" and assigning thesaurus terms is usually called "indexing."

Subject-heading lists provide words and/or phrases that may be used as access points for subjects. Subject-heading lists are often used in libraries and are usually created for knowledge in general. These systems provide networks of terms to describe the subjects in a document. *Library of Congress Subject Headings*, first published in 1914, is used in many large academic and national libraries in English-speaking countries. Usually, a cataloger gives a book more than one subject heading, and in an online system subject headings can be searched by keywords. That is, the searcher does not have to know the exact form of the subject heading in order to use it for searching.
Thesauri began to be developed in the 1950s. Thesaural systems are similar to subject-heading systems in providing lists of consistent terms that are assigned to an information item by an indexer. Unlike subject-heading systems, however, thesauri are usually created for a particular field. For example, the *Art & Architecture Thesaurus*, published by the Getty Information Institute, provides access to all kinds of heritage information items (e.g., texts, images, museum materials). In addition, the syndetic structures of thesauri are usually more strictly controlled than those of subject-heading systems, and the terms in them are defined for the particular purposes of that field of knowledge.

Both subject-heading and thesaural systems include codes that describe the relationships of one term to other terms. The most common relationships are "broader term" (BT), "narrower term" (NT), and "related term" (RT). A broader term names a concept that is wider in scope than another. For example, the concept "precipitation" is broader than "snow." A narrower term names a concept that is more specific. For example, the concept "oak tree" is narrower than "tree." A related term is associated in some way to the term in question but is neither broader nor narrower in scope. For example, "light" is related to "color" and may interest a searcher who has looked up "color," but the two terms do not have a broader/narrower hierarchical relationship. In addition, some terms are preferred terms (called "used terms"). Terms not preferred by the system are called "unused terms." Unused terms are considered synonyms for used terms and cannot be used for searching. For example, "wig" may be a synonym for "hair." People who look up an unused term (e.g., "wig") are directed to search with a used term instead (e.g., "hair").

Controlled vocabularies are useful in information retrieval systems because the terms assigned to information items can be used to search a database. Searching with an assigned term ensures that all the records that have been indexed with that term are retrieved. Certainty that all the relevant records have been found means that a searcher can feel confident that the search was comprehensive. Otherwise, the searcher would have to think of all the possible synonyms of a term in order to be sure that the search was complete.

Classification systems are structured systems that divide some knowledge domain into groups

on the basis of likenesses and/or differences among the members of each group. The study of classification dates back at least to the philosophers of ancient Greece. Modern bibliographic classification systems started to appear in the late nineteenth century. In an ideal classification system, the classes are both mutually exclusive and jointly exhaustive. That is, the classes do not overlap (i.e., mutually exclusive), and all the classes taken together encompass all possible content so that nothing is left out (i.e., jointly exhaustive). This ideal cannot be fully achieved because new members of the classes can be discovered or invented at any time. Nevertheless, the ideal can be used to help evaluate classification systems because one can assess the classes for mutual exclusivity and joint exhaustivity.

In North America, most libraries use either the Dewey Decimal Classification or the Library of Congress Classification (in which each class is published separately). Both of these classification systems are called "enumerative systems" because they seek to list all of the possible topics that documents may have. In libraries, classification systems are used both to show the place of a particular topic in the context of the world of knowledge and also to provide a shelf address for each document. On the Internet, classification systems (e.g., DESIRE) often provide an address or hyperlink to the relevant site. Researchers into artificial intelligence have begun to create ontologies (i.e., classification systems) for real-world knowledge so computers can represent contexts, understand human languages, and recognize how things in the world are related to each other.

Most classification systems have a hierarchical structure in which the attributes of a class on a higher level are shared by those on the lower levels. For example, a document about Canadian history in general will not be as detailed on each of its constituent topics (e.g., the Canadian constitution) as a document that deals only with that topic, but a document about the narrower topic will also contain elements of the broader topic. For example, a document about the Canadian constitution will also deal to some extent with Canadian history in general. Unlike subject-heading systems and thesauri, classification systems are displayed structurally, not as an alphabetical list. Each class has a notation that represents the place of the class in the world of knowledge and

in the system and that shows its relationships to a hierarchy of other classes. For example, part of the *Dewey Decimal Classification* schedules for "technology" (with growing specificity) is 600 for technology (applied sciences), 630 for agriculture and related technologies, 636 for animal husbandry, 636.7 for dogs, and 636.8 for cats.

Notation can be numeric, alphabetical, or mixed alphanumeric. For example, the notation for the topic "economics of education" is 338.4337 in the *Dewey Decimal Classification* and LC65 in the *Library of Congress Classification*. Hierarchical relationships may also be shown in the notation. For example, in the *Dewey Decimal Classification*, "Canadian history" is notated as 971, where the 9 stands for "history," the 7 stands for "North America," and the 1 stands for "Canada." The *Dewey Decimal Classification* notation 971 thus shows that history is a broader concept than North America and that North America is a broader concept than Canada.

One relatively recent development in the creation of classification systems is the construction of faceted systems. Facet theory was developed by Shiyali R. Ranganathan in India and refined in his Colon Classification (1964). Facet analysis divides a subject field into mutually exclusive groups called "facets" and then divides each facet into its constituents. For example, the material facet for furniture would contain terms for the various kinds of materials from which furniture can be made (e.g., wood, metal, cloth, plastic). Each of these terms has its own notation, and notations from different facets can be synthesized to express a complex topic. For example, one might express the topic "red plastic tables" with notational elements from the color, material, and type facets. The idea of facet analysis has also been adopted for the development of thesauri. Its advantage is that all topics do not have to be listed, and a notational subject statement may be built up in a way that is similar to constructing a sentence from component words in a natural language. Another faceted classification system is the Bliss Bibliographic Classification (devised by Henry Evelyn Bliss and edited by Jack Mills and Vanda Broughton), which is based on Ranganathan's theories and incorporates other advances from modern classification research.

The ability to search a database using notations as search terms means that the searcher does not

have to know the human language that is used in the records. For example, using the *Dewey Decimal Classification* notation 636.8 ("cats") for searching a database in which each record has been assigned one or more notations will retrieve records in English, Spanish, Chinese, Russian, or any other natural language. The searcher does not have to know the word for "cats" and its synonyms in all these languages. This ability is particularly useful in multilingual information environments.

Nonstandardized Methods

Nonstandardized methods of knowledge organization have been developed and are used for accessing the content of an individual document. An abstract is a brief summary that contains only the most salient points from the document and is often written by a professional abstractor, not by the originator of the document. Abstracts are often included at the beginning of a journal article and, in an electronic environment, these abstracts can be searched to find words in uncontrolled vocabulary that are of interest to the searcher. Individual documents such as books often have an index that refers only to that document and its page numbers. These back-of-the-book indexes are created by professional indexers, and no standardized method has been developed. Each book also has a table of contents that includes the names of chapters and/or sections in order to help readers find what they want. In the case of both abstracts and back-of-the book indexes, searching with an uncontrolled vocabulary means that one can never be certain that all the relevant material has been retrieved or that the search has been comprehensive.

Producing Files in a Standardized Format

Individual surrogate records are entered into a file to create a manual or computerized catalog, list, directory, index, guide, or register that can be searched. In a manual (i.e., printed) file, the display format is usually established by a publisher (e.g., for a book) or by an institution (e.g., for a library catalog). For computerized resources (e.g., a database), information is encoded from descriptive standards such as AACR2, and the way this information is displayed can be customized. To encode information means to make it machinereadable. Institutions or individuals that want to exchange records can do so if they are using the same encoding standard or if a method has been developed to convert one standard format to another. Sharing records increases their accessibility for people who are trying to find information. Standardized encoding formats include, for example, Machine-Readable Cataloging (MARC) and Standard Generalized Markup Language (SGML), which allow data to be displayed in human languages. The MARC format is the oldest encoding standard and is used in many libraries. Markup languages such as SGML permit the structures of many different types of documents to be encoded. They show which elements are structural elements (e.g., a paragraph or a title) and which elements are content elements (e.g., the sentences in the paragraph). In addition, standards can be used to describe each other. For example, MARC records can be encoded with SGML.

Conclusion

Cataloging and knowledge organization systems have been developed to make it easier for people to find what they need within the complex worlds of information and knowledge. These systems are used in all kinds of information environments to improve access to actual and virtual documents in many formats, in many languages, and from many periods of history. The evolution of these systems is ongoing because information professionals are constantly striving to improve access for users of the systems.

See also: Archives, Public Records, and Records Management; Archivists; Artificial Intelligence; Bibliography; Dewey, Melvil; Internet and the World Wide Web; Knowledge Management; Knowledge Management, Careers in; Librarians; Libraries, Digital; Library Automation; Museums; Ranganathan, Shiyali Ramamrita.

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CLARE BEGHTOL

CATHARSIS THEORY AND MEDIA EFFECTS

Is viewing violence cathartic? The large amount of violence in the mass media is often justified by the concept of catharsis. The word catharsis comes from the Greek word *katharsis*, which literally translated means "a cleansing or purging." The first recorded mention of catharsis occurred more than one thousand years ago, in the work *Poetics*

by Aristotle. Aristotle taught that viewing tragic plays gave people emotional release (*katharsis*) from negative feelings such as pity, fear, and anger. By watching the characters in the play experience tragic events, the negative feelings of the viewer were presumably purged and cleansed. This emotional cleansing was believed to be beneficial to both the individual and society.

The ancient notion of catharsis was revived by Sigmund Freud and his associates. For example, A. A. Brill, the psychiatrist who introduced the psychoanalytic techniques of Freud to the United States, prescribed that his patients watch a prize fight once a month to purge their angry, aggressive feelings into harmless channels.

Catharsis theory did not die with Aristotle and Freud. Many directors and producers of violent media claim that their products are cathartic. For example, Alfred Hitchcock, director of the movie *Psycho*, said, "One of television's greatest contributions is that it brought murder back into the home where it belongs. Seeing a murder on television can be good therapy. It can help work off one's antagonism." More recently, in 1992, Paul Verhoeven, director of the movie *Total Recall*, said, "I think it's a kind of purifying experience to see violence."

The producers of violent computer games, like the producers of violent films, claim that their products are cathartic. For example, SegaSoft has created an online network containing violent games that claims to provide users an outlet for the "primal human urge to kill." In promotional materials for the fictional CyberDivision movement, the imaginary founder Dr. Bartha says, "We kill. It's OK. It's not our fault any more than breathing or urinating." Dr. Bartha claims that aggressive urges and impulses can be purged by playing violent video games. "It's a marketing campaign," said a SegaSoft spokesperson, "but there is some validity to the concept that you need an outlet for aggressive urges." Some people who play violent computer games, such as the following thirty-year-old video game player, agree: "When the world pisses you off and you need a place to vent, Quake [a violent video game] is a great place for it. You can kill somebody and watch the blood run down the walls, and it feels good. But when it's done, you're rid of it."

What do the scientific data say about the effects of viewing violence? Do violent media decrease or increase aggressive and violent behavior? Social **FIGURE 1.** Comparison of media violence effects from other domains.



scientists have been very interested in this question since the late 1960s. The results from hundreds of studies have converged on the conclusion that viewing violence increases aggression. In fact, the U.S. Surgeon General came to this conclusion as early as 1972. The scientific evidence is overwhelming on this point. Viewing violence is definitely not cathartic—it increases rather than decreases anger and subsequent aggression.

Brad Bushman and his colleagues recently compared media violence effects with effects from other fields, and the results are displayed in Figure 1. A correlation can range from -1 to +1, with -1 indicating a perfect negative relation and +1 indicating a perfect positive relation. As the figure shows, all of the correlations for the studied effects are significantly different from zero. Note, however, that the second largest correlation is for violent media and aggression. Most people would agree that the other correlations displayed in Figure 1 are so strong that they are obvious. For example, most people would not question the assertion that taking calcium increases bone mass or that wearing a condom decreases the risk of contracting HIV, the virus that causes AIDS.

The correlation between media violence and aggression is only slightly smaller than that between smoking and lung cancer. Not everyone who smokes gets lung cancer, and not everyone who gets lung cancer is a smoker. But even the tobacco industry agrees that smoking causes lung cancer. Smoking is not the only factor that causes lung cancer, but it is an important factor. Similarly, not everyone who watches violent media becomes aggressive, and not everyone who is aggressive watches violent media. Watching violent media is not the only factor that causes aggression, but it is an important factor.

The smoking analogy is useful in other respects. Like a first cigarette, the first violent movie seen can make a person nauseous. Later, however, one craves more and more. The effects of smoking and viewing violence are both cumulative. Smoking one cigarette probably will not cause lung cancer. Likewise, seeing one violent movie probably will not turn a person into a psychopathic killer. However, repeated exposure to both cigarettes and violent media can have harmful consequences.

Catharsis theory is elegant and highly plausible, but it is false. It justifies and perpetuates the myth that viewing violence is healthy and beneficial, when in fact viewing violence is unhealthy and detrimental. After reviewing the scientific research, Carol Tavris (1988) concluded, "It is time to put a bullet, once and for all, through the heart of the catharsis hypothesis. The belief that observing violence (or 'ventilating it') gets rid of hostilities has virtually never been supported by research."

See also: Video and Computer Games and the Internet; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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CENSORSHIP

See: First Amendment and the Media; Intellectual Freedom and Censorship

CHAPLIN, CHARLIE (1889–1977)

Although his contributions to film extend from acting to directing, producing, and composing, it was his acting in silent films that brought Charlie Chaplin fame and made him the most widely recognized person of his era. He helped boost motion pictures from a novelty entertainment to a form of art, regularly breaking from convention to create fresh meaning.

Born in deep poverty in London, England, Charles Spencer Chaplin spent his early childhood in run-down housing, poorhouses, and even an orphanage. His music hall performer parents, Charles Chaplin and Lily Harley Chaplin, separated only a year after Chaplin was born. His father died in 1901 from liver complications as a result of his alcoholism, and his mother was placed in an asylum for the insane at about the same time.

Chaplin's acting career began when he was nine years of age. He soon left school and as a young teenager used his talent for entertaining to make living wages that were equivalent to those commonly earned by adults. Chaplin's brother, Sydney, got him a job in a comedy troupe in 1908. The touring troupe traveled to America, where Chaplin began to dream of working in the movie business. Mack Sennett, newly in charge of the Keystone Studios in Los Angeles, California, saw Chaplin's portrayal of a drunk with the comedy troupe and offered him a film-acting job in November 1913. His first film, Making a Living (1914), foreshadowed Chaplin's brilliant career as his creative impromptu comic antics stole the show and received accolades from audiences.

In only his second film, *Kid Auto Races at Venice* (1914), Chaplin invented his trademark jaunty slapstick "tramp" character (often called simply "Charlie") with baggy pants, a tight coat, big shoes, a small derby hat, and a cane. This costume (with some variations that still left it recognizably in tact) was used in most of the subsequent films that Chaplin would make—although the characterization of the tramp would

change significantly. After acting in his first dozen or so films, Chaplin also began directing and codirecting many of the later Keystone films in which he appeared, mostly without the aid of a script.

In 1915, Chaplin achieved more artistic control and a much higher salary with a move to Essanay Studios, where he revealed new levels of character development and multidimensionality, showing a range of mood and personality elements in *The Tramp*, his sixth film with the company. The immortal characteristics of the tramp character, including his homelessness, his jaunty walk away from the camera, the lower stratum of society in which he moved, and the way the world always shunned him, first came together in this film. The character's persistent individuality, ability to overcome adversity and turmoil, and limitless empathy and compassion for another who was downtrodden have made this character into a social icon.

By 1916, Chaplin had again moved on, this time for a record \$10,000 a week, to the Mutual Film Company. At Mutual, Chaplin had more time to make each movie, bigger budgets, and full artistic control. In his first Mutual film, *The Floorwalker* (1916), Chaplin began to emphasize the comedy's narrative structure or form. Instead of the gags and slapstick moves serving as the foundation around which a narrative is built, he began to create strong stories with elements of romance and pathos that are augmented by the comic elements. Other films of this nature that Chaplin made for Mutual include *The Vagabond* (1916), *Easy Street* (1917), and *The Immigrant* (1917).

Chaplin continued to emphasize romance and pathos in the eight films that he created at First National between 1918 and 1923, even though this was a very troubled period artistically and personally. *The Kid* (1921) was his most noted First National film, receiving accolades for the sensitivity that was expressed in the way the tramp became a reluctant father to an orphaned child. Some of his First National films, including the six-reel *The Kid*, stretched his work toward feature length. During this period, he also created his own Chaplin Studios.

Chaplin joined Douglas Fairbanks, Mary Pickford, and D. W. Griffith to form United Artists in 1919 (while he was still working at First National). This association of four of the top talents in Hollywood was designed to compete against the established studios that wanted to



A movie still shows Charlie Chaplin in the classic shoe-eating scene from The Gold Rush (1925). (Bettmann/Corbis)

monopolize the industry to keep salaries in check. It also offered Chaplin the opportunity to have utmost control over the films that he would make after fulfilling his contract with First National.

The Gold Rush (1925), a United Artists production, is most often considered to be Chaplin's greatest film, as well as one of the best films of the silent era. The scene in this film where the tramp character has a boiled shoe for dinner is a classic film moment. This film, which was a financial blockbuster for the financially strapped company, was the last Chaplin film to be finished before the advent of talking pictures.

When Chaplin moved to sound, he did so in gradual and masterful ways. Rather than purely embracing the new technology, he let it enhance the silent art, filming City Lights (1931) with no dialogue and Modern Times (1936) with very little, but both films had synchronized sound effects to enhance emotion and meaning. Chaplin's artistic greatness was solidified with his successful transition to "talkies" in The Great Dictator (1940). While the tramp remained silent, Chaplin adopted a new, boisterous tyrant persona as the dictator, Adenoid Hynkel, who was a representation of Adolf Hitler. Chaplin repeated this tyrant persona in Monsieur Verdoux (1947) and in Limelight (1952), the only other two talkies that he filmed in Hollywood.

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Prior to the release of *Monsieur Verdoux*, Chaplin became the target of politicians during the "Red Scare" and his last two Hollywood films were ignored and boycotted. Chaplin left America for a trip to Europe in 1952 and, rather than answer U.S. Immigration Department questions about his political beliefs, chose to live out the rest of his life in Switzerland. He made two other movies, *A King in New York* (1957) and *A Countess from Hong Kong* (1967), but neither film lived up to the standards that he had set for himself in Hollywood.

Chaplin received a special Academy Award in 1972 for his contributions to the art of motion pictures. *Limelight* was also "officially released" and won an Oscar for best original dramatic score in 1973. Two years later, Queen Elizabeth II of England conferred a knighthood that made him "Sir Charles Chaplin." After a period of illness, Chaplin died at his home on Christmas day in 1977.

See also: FILM INDUSTRY, HISTORY OF; GRIFFITH, D. W.

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STEPHEN D. PERRY

CHARACTERS, ATTACHMENT TO

See: Attachment to Media Characters

CHIEF INFORMATION OFFICERS

The effective use of technology is an essential success factor in almost every aspect of the endeavors of any organization. As a result, the role of the chief information officer (CIO) grew and expanded rapidly in the 1980s and 1990s. This office began as the domain of engineering-based,

technology-focused individuals who were able to make sense of the alphabet-soup world of technology jargon and equipment. By the beginning of the twenty-first century, however, this role had changed. The responsibilities of the CIO now focus on not only responsibility for the technology and information systems in an organization, but also on how the technology can be used to make the organization more effective and successful. The CIO must have both a strategic understanding of the workings and goals of the organization and a strategic understanding of technology. To be able to apply the technology to the workings of a specific business, industry, educational institution, or government agency, the CIO is most often a senior executive and a key player in the executive decisions of the entire organization.

Making Sure Technology Works for People

Peter DeLisi, founder and president of Organizational Synergies, has told a story that illustrates what a CIO position is not. Along a certain bus route in a big city, passengers who had waited patiently for a bus to arrive watched in disbelief as the bus driver smiled, waved, and drove along without stopping to pick them up. The boss asked the bus driver why he was not picking up any passengers. The driver replied that he would not be able to stay on time if he had to stop to pick up passengers, so he was skipping that part of the job. An organization does not care that their computer systems work well if those systems do not help people within the organization to accomplish their assigned tasks. The job of the CIO is to make sure that the technology works-the buses run on time—and that the technology is useful to the people in the organization-people are able to "get where they want to go" and get their work done.

The CIO is, of course, first of all expected to run an efficient information technology operation—the "buses" of the information technology system. The telephones, computers, networks, and all other technologies must be reliable and functional, and the staff who operates them must be customer-focused and helpful. This means that a CIO must know how to manage the technology procurement process and appropriately negotiate with suppliers. The CIO is responsible for buying the right technology for the organization at the best price. Often, he or she is the one who makes the decision about whether an organization should keep a certain technology function "inhouse" (i.e., within the organization) or should buy that function from an outside company.

Frequently, one of the greatest areas of challenge for the CIO is determining and maintaining the technology infrastructure and architecture of an organization. Technology changes rapidly, and the network cables running through the walls of a building that were adequate for the computers of yesterday are often the wrong type for the new technology of today. The way the computers of an organization are networked together—the architecture of an information technology structure often has to change as the company grows bigger, or is merged with another company that has a different system. At these times, the CIO is the individual responsible for keeping technology systems operational and integrated.

An Expanded Role

The CIO is responsible for a great deal more than just computer operations. For example, the CIO must be able to identify when a business or technology trend has the potential to radically redefine the way an organization does its work (i.e., improve its competitiveness and/or profitability). Then, the CIO must know how to assist the organization with that redefinition and how to obtain and implement the technology needed to make it all work.

More and more, business throughout the world is being done electronically, and the success of an organization often depends on "e-business" (or electronic commerce) opportunities and marketplaces. This means that the CIO is responsible for understanding the trends that are driving e-business at a particular time and how e-business is changing where an organization finds its customers.

Organizations are increasingly using information technology to share information and processes with business partners and customers so they can work together in new ways. The CIO is often assigned the key liaison role with these partners and customers and is responsible for determining both the processes and the technologies that must be designed and implemented to create an effective collaborative environment.

In the information age, any organization with the right information can effectively and aggressively compete with another organization. In the business world in particular, the information a company has—about its customers, price–cost relationships, distribution models, and processes—is one of the most valuable assets of the company. The vast majority of this information is obtained and maintained in an electronic format, on computers. Collecting, analyzing, and protecting this information is often a key responsibility of the CIO, who is also responsible for maintaining the privacy and security of organizational information.

Educational and Professional Requirements

Because the CIO is generally one of the executives at the highest level of an organization, the educational and professional requirements for the position depend on what is expected of others at that level in the organization. For example, in the field of higher education, the CIO is generally expected to have advanced degrees and experience teaching or working in comparable colleges or universities. In the world of business and industry, the CIO is generally expected to have a strong business background and education, which may include management experience not only in technology but also in other aspects of the company's endeavors.

A "Big Picture" Job

The role of a CIO is one best suited for those who enjoy a "big picture" perspective. The CIO is in a better position than almost anyone else in an organization to understand the business from an enterprise-wide perspective. The CIO must appreciate and understand information technology, but he or she must be most enthusiastic about what the technology can do to help people and the organization accomplish their goals. Rather than behaving like the bus driver concerned about meeting a timetable, a good CIO must be interested in and working on the whole system-the buses, the routes, the timetables, picking up the passengers, knowing where they want to go, and getting them there on time. The position of chief information officer can be an exciting role for those who not only enjoy technology, but also understand its ability to transform the activities of an organization.

See also: Electronic Commerce; Knowledge Management; Knowledge Management, Careers in; Management Information Systems; Systems Designers.

JOSÉ-MARIE GRIFFITHS

CHILDREN AND ADVERTISING

Most children have their first encounter with advertising messages while they are watching television. It is common for children to begin television viewing by the time that they are two years of age, long before they have developed the reading ability that is required to make advertising in print media accessible. Because children at this age lack the cognitive skills and abilities of older children or adults, they do not understand commercial messages in the same way as do more mature audiences, and hence they are more susceptible to the influence of advertising. A substantial body of research evidence documents age-related differences in how children understand and are affected by television advertising.

Children's Exposure to Television Advertising

It is estimated that the average child views more than forty thousand television commercials each year, most of which are fifteen to thirty seconds in length. Advertisers target the youth market because of its strong contribution to the consumer economy. According to 1998 data, children who are fourteen years of age and under spent \$24 billion and influenced \$188 billion in family purchases.

Approximately 80 percent of all advertising to children falls within four product categories: toys, cereals, candies, and fast-food restaurants. This pattern has remained remarkably stable since the 1970s. During the fourth quarter (October– December) of each calendar year, a seasonal shift in advertising practices occurs with toy commercials airing much more frequently during the pre-Christmas months.

The most common theme or appeal (i.e., persuasive strategy) that is employed in advertising to children is to associate the product with fun and happiness, rather than to provide any factual product-related information. For example, a commercial that features Ronald McDonald dancing, singing, and smiling in McDonald's restaurants, without any mention of the actual food products that are available, reflects a fun and happiness theme. This strategy is also found frequently with cereal advertisements, which often include the appearance of characters (e.g., Tony the Tiger, Cap'n Crunch) to help children identify the product. In contrast, most commercials fail even to mention the major grain used in each cereal unless it is included as part of the product name (e.g., Corn Flakes).

Another common feature of advertising to children is the use of product disclosures and disclaimers such as "batteries not included" or "each part sold separately." However, studies make clear that young children do not comprehend the intended meaning of the most widely used disclaimers. For example, Diane Liebert and her associates (1977) found that fewer than one in four kindergarten through second-grade children could grasp the meaning of "some assembly required" in a commercial; in contrast, the use of child-friendly language such as "you have to put it together" more than doubled the proportion of children who understood the qualifying message.

The phrase "part of a balanced breakfast" is a disclosure that is frequently included in most cereal advertisements to combat the concern that sugared cereal products hold little nutritional value for children. Consistent with the data on toy disclaimers, research by Edward Palmer and Cyn-thia McDowell (1981) shows that most children below seven years of age have no idea what the term "balanced breakfast" means. Rather than informing young viewers about the importance of a nutritious breakfast, this common disclaimer actually leaves many children with the misimpression that cereal alone is sufficient for a meal.

Children's Comprehension of Television Advertising

Children must acquire two key informationprocessing skills in order to achieve "mature" comprehension of advertising messages. First, they must be able to discriminate (at a perceptual level) between commercial and noncommercial content. Second, they must be able to attribute persuasive intent to advertising and to apply a degree of skepticism that is consistent with that knowledge to their interpretation of advertising messages. Each of these capabilities develops over time as a function of cognitive growth in conceptual and analytical ability.

Program-Commercial Discrimination

In their earliest years of television viewing, children do not yet recognize that there are two fundamentally different categories of television content: programs and commercials. Most children who are younger than four to five years of age exhibit low awareness of the concept of commercials, frequently explaining them as if they were a scene in the adjacent program. When this confusion diminishes, children first recognize the difference between programs and commercials based on either affective cues (e.g., "commercials are more funny than programs") or perceptual cues (e.g., "commercials are short and programs are long").

Most children's television shows include program–commercial separation devices (e.g., "We'll be right back after these messages") whenever a commercial break occurs. However, several studies indicate that these separators generally do not help child viewers to recognize advertising content. This likely occurs because most separation devices are not perceptually distinct from the adjacent programming that surrounds them; in fact, many separators feature characters who appear in the show that the commercial has just interrupted.

Popular program figures are frequently used in advertising that is directed to children. When an advertisement includes one of the same characters who is featured in an adjacent program, the practice is known as "host-selling." For example, Fred Flintstone appearing in an advertisement for "Fruity Pebbles" cereal that is shown during a break in the *Flintstones* cartoon show would be considered host-selling. A study by Dale Kunkel (1988) shows that this type of advertising makes the task of discriminating between program and commercial content particularly difficult for young children.

In sum, a substantial proportion of young children do not consistently discriminate between television program and commercial content. By about the time they are four or five years of age, however, most children develop the ability to distinguish between these two types of content quite well at a perceptual level. Still, this ability is only the first of two critical information processing tasks that young children must master in order to achieve mature comprehension of advertising messages.

Recognition of Persuasive Intent

The primary purpose of television advertising is to influence the attitudes and subsequent behavior of viewers. For adults, the recognition that a given message is a commercial triggers a cognitive filter or defense mechanism that takes



The use of characters in settings other than a television commercial, such as featuring Tony the Tiger in the Hot Air Balloon Fiesta in Albuquerque, New Mexico, is a subtle advertising technique designed to reinforce children's interest in the products that the characters represent. (The Purcell Team/Corbis)

into account factors such as the following: (1) the source of the message has other interests and perspectives than those of the receiver, (2) the source intends to persuade, (3) persuasive messages are biased, and (4) biased messages demand different interpretive strategies than do unbiased messages. When all of these considerations can be taken into account, then a child can be said to have achieved mature comprehension of the advertising process.

Young children, by virtue of their limited cognitive development, typically lack the ability to recognize the persuasive intent of television advertising until they reach seven to eight years of age. Prior to this point, children are generally egocentric and have difficulty taking the perspective of another person. This makes it difficult to recognize that commercial claims and appeals are likely to be biased or exaggerated in order to portray the advertised product in the most favorable light.

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Some researchers, such as Thomas Donahue and his associates (1980), have argued that children may understand persuasive intent at a slightly earlier age. Such claims are made on the basis of evidence that indicates that younger children may report that a commercial wants the viewer to buy the advertised product. Such awareness, however, does not necessarily reflect an appreciation of persuasive intent. Just because a child understands that an advertisement seeks to sell a product, it does not automatically follow that the child will recognize the bias that is inherent in persuasive messages and therefore view advertising claims and appeals more skeptically. Overall, the weight of the evidence indicates that most children who are younger than about seven to eight years of age do not typically recognize that the underlying goal of a commercial is to persuade.

Effects of Television Advertising on Children

The effect of television advertising on children can be categorized according to both the intended and unintended effects that result from advertising exposure. For example, a cereal advertisement may have the intended effect of generating product purchase requests and increasing product consumption, but it may also contribute to unintended outcomes such as misperceptions about proper nutritional habits and/or parent–child conflict if a child's attempt to get a parent to purchase the product (i.e., purchase-influence attempt) is rejected.

Intended Effects

Many studies document the effectiveness of commercial campaigns at influencing child viewers' recall for the product, desire for the advertised product, and—depending on the age of the child—either purchase-influence attempts or actual purchase of the product.

Experimental studies that compare children who are shown a particular commercial with those who are not provide some of the most direct evidence of advertising effect. While it is typical for half or more of the children in a control group to report spontaneously a strong desire for a given toy or cereal (i.e., even without being shown a related commercial), exposure to an advertisement leads to statistically significant increases in children's desire for the advertised merchandise. From another perspective, survey research indicates that children who watch greater amounts of television (and hence are exposed to a higher volume of advertisements) tend to make a greater number of purchase-influence attempts when they are shopping with their parents at the supermarket.

Certain advertising strategies tend to enhance the effectiveness of advertising appeals to children. For example, advertising for cereals and fast-food meals often emphasize premium offers, such as a small toy figure included along with the product. In a study by Charles Atkin (1978), where researchers unobtrusively observed parents and children shopping at the supermarket, it was found that almost half of the children who were making product-purchase requests in the cereal aisle were influenced by premium offers.

Research also makes clear that children's purchase-influence attempts have a relatively high degree of success. Frequent parental yielding to children's purchase requests has been reported in studies that rely on parent self-reports as well as unobtrusive observation of behavior in the supermarket. In sum, although the process may be indirect, television commercials that are targeted at children are highly effective at accomplishing their intended goal of promoting product sales.

Unintended Effects

Although each advertisement may have as its primary purpose the goal of promoting product sales, the cumulative effect from children's longterm exposure to television advertising may exert far broader sociological influence. Some researchers have argued that one of the long-term effects of children's exposure to commercials is an increase in materialistic attitudes, although this is particularly difficult to establish because few children in the United States grow up without extensive media exposure, and thus no control group is available for comparative purposes. In other areas, however, several unintended effects of advertising have been more convincingly demonstrated.

One of the most visible of these unintended effects is the influence of television advertising on children's eating habits. Commercials for candies, snacks, sugared cereals, and fast foods represent a large proportion of the advertising that is presented during children's programs, while advertising for more healthy or nutritious foods is rare. Consequently, children tend to develop poor nutritional habits, mistakenly assuming that the products that they see advertised are an appropriate diet whenever they are hungry. Advertisements for alcoholic beverages such as beer products, even though they are not intended for children, are nonetheless seen by many young viewers. Exposure to alcohol advertising exerts influence on young people's alcohol expectancies (e.g., when it is appropriate to drink; what happens when one drinks), which have in turn been shown to predict drinking behaviors later in life.

Another important area of unintended effects involves parent–child conflicts that emerge when children's purchase-influence attempts are refused. Parents obviously cannot honor all purchase requests that are triggered by television advertising. Studies have shown that a majority of children become angry, disappointed, or argumentative when purchase requests are denied. The frequent purchase requests that are associated with children's heavy exposure to television advertising may place a strain on parent–child interaction at times, an issue of consequence largely because of the sheer volume of commercials that are viewed by most children.

Conclusion

Children are a vulnerable audience, with limited information-processing capabilities that constrain their early understanding of the nature and purpose of television advertising. Because of these limitations, young children are more easily persuadable than are older children or adults. They are more trusting of advertising claims and appeals, and they are more susceptible to commercial persuasion. This situation has led over the years to varying legal restrictions on television advertising to children. Advertisers may air no more than 10.5 minutes of commercials during each hour of children's programming shown during weekends, and they may air no more than 12 minutes of commercials per hour during weekdays. In addition, certain advertising practices such as host-selling are prohibited by the Federal Communications Commission. Even with these policies in effect, this topic area remains controversial. Given the huge economic stakes that are associated with marketing to children, debates are likely to continue with regard to the need for further regulation to protect children's interests.

See also: Advertising Effects; Alcohol in the Media; Children's Comprehension of Television; Nutrition and Media Effects; Parental Mediation of Media Effects.

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DALE KUNKEL

CHILDREN'S ACADEMIC ACHIEVEMENT

See: Academic Achievement and Children's Television Use

CHILDREN'S ATTENTION TO TELEVISION

Understanding the nature of children's attention to television helps to clarify the fundamental nature of television viewing and its effect on children. As a practical matter, understanding when and how children pay attention to television has been useful in designing television programs for children (e.g., *Blue's Clues* and *Sesame Street*).

The term "attention" refers to selective perceptual and cognitive activities that are directed toward a restricted portion of a person's environment. Brain research shows that when a person pays attention to an object in the environment, brain activation associated with perception of that object is enhanced, whereas brain activation associated with perception of other objects in the environment is suppressed.

There is no direct way to measure attention to television; rather, attention must be inferred from behavior or from physiological measures. The indicator of attention to television that has been most commonly measured in research with children is looking at the television screen. A look begins when the viewer directs his or her gaze toward the screen and ends when the viewer looks away. In addition, a small scattering of studies have employed other measures, such as eye movements while looking at the screen, reaction times to a secondary task while watching television, changes in heart rate, and the time it takes to push a button to fix a disturbance in the audio portion of a television show.

The most basic observation is that looking at television is variable. Viewers may look at the screen and look away again many times in the course of a viewing session. When preschool children watch an age-appropriate television program in a room that contains toys with which they can play, other things to look at, or other children with whom they can interact, they look at and away from the screen approximately 150 times an hour, with looks averaging about 13 seconds in length (e.g., Anderson, Lorch, Smith, Bradford, and Levin, 1981). Similar patterns have been observed for older children and adults when they watch television in a setting that affords alternative activities besides television viewing (e.g., Burns and Anderson, 1993).

Looking at Television

Much of the research on attention to television has been directed at explaining why children initiate, sustain, and end looks at a television screen. The most straightforward factor that influences children's looking at a television program is the viewing environment. If children watch television in a quiet room that permits no other activities, then they look at the screen more than if there are toys available or other children present (e.g., Anderson, Lorch, Smith, Bradford, and Levin, 1981; Lorch, Anderson, and Levin, 1979).

Because children's homes afford a variety of activities in which viewers can engage while watching television, their looking at the screen is substantially less than 100 percent. Looking at television, moreover, varies with the age of the viewer. Infants under one year of age look at television less than 10 percent of the time they are within sight of a set that is in use. Thereafter, the level of looking steadily increases with age until it reaches a level of about 80 percent in late childhood, after which point it declines to about 60 percent during adulthood (Anderson, Lorch, Collins, Field, and Nathan, 1986).

What accounts for these age differences? For younger children, the comprehensibility of the programming is a central factor. For example, presenting attractive television content in a foreign language, or in backward English, or with the shots presented in random order dramatically reduces preschool children's looking (Anderson, Lorch, Field, and Sanders, 1981). Infants are able to understand little of what they see on television and, consequently, they pay little attention to the screen. What attention they do pay is probably elicited by movement and visual change (e.g., Richards and Gibson, 1997). Looking at television dramatically increases from one to three years of age as cognitive skills and receptive vocabulary grow. As children mature, their increasing cognitive development and world knowledge allow more and more television programming to become understandable. Levels of looking at television therefore increase until late childhood, at which point most adult programs are fully comprehensible (Collins, 1983). The drop in levels of looking by adults is understandable because most of television is relatively simple for an adult to comprehend without paying full visual attention. Consequently, television is commonly timeshared by adults with chores, socializing, and reading (e.g., Anderson and Field, 1991).

When children watch a television program that is generally understandable to them, they tend to look more when the content is cognitively demanding or requires visual attention for full comprehension (e.g., Field and Anderson, 1985). It is not surprising that the personal relevance of the content itself is of the utmost importance in sustaining attention. For example, children look substantially more at children's programming than they do at adult programming, with the difference reaching a peak at about five years of age. From that point, the difference in favor of children's programming declines until about eleven years of age, after which there is a distinct attentional preference for adult programming (Schmitt, Anderson, and Collins, 1999). These changes, of course, correspond to children's changing interests as they approach adolescence. As another example of the importance of personal relevance, children of both sexes look more at female characters than they do at male characters (reflecting the influence of predominantly female caretakers of young children), until they achieve the concept of gender constancy (at about ages five to six years). Gender constancy is achieved when the child gains a substantial understanding that one's own and others' sex is permanent and immutable. After that time, they look more at characters of their own sex (Luecke-Aleksa, Anderson, Collins, and Schmitt, 1995).

Preschool children are highly similar to each other with respect to the points in television programs where they initiate looks at the screen. Children become even more similar as they get older. On the other hand, children are somewhat more idiosyncratic about the points at which they look away, and they become less similar to each other in this respect as they get older (Anderson, Lorch, Smith, Bradford, and Levin, 1981).



The use of puppets can serve to increase the amount of attention that children pay to television, which has been exemplified by the popularity of Jim Henson's characters, including "Ernie" and "Kermit the Frog," on Sesame Street since the 1970s. (Bettmann/Corbis)

Studies of the formal features of television have clarified the reasons for these findings. Formal features are aspects of television that can be described without specific reference to the content of the programming. These include editing and camera techniques such as cuts, pans, zooms, and dollies, as well as production techniques such as animation. Also included within the general concept of formal features are audio features such as sound effects, voice type (such as adult male voice), music, and applause. Additionally, character types (e.g., man, woman, child, animal, puppet) are often included in studies of formal features.

When a child is visually inattentive to the television, audio variations, such as change of speaker, sound effects, applause, peculiar voices, children's voices, and the onset of music, consistently attract looking at the television screen. The fact that, with viewing experience, children become more similar in terms of the points at which they initiate looks at television programs reflects their learning that these auditory features are cues to changing content and content of particular interest.

Visual movement and cuts sustain looking, as do child characters and puppets. Adult men, men's voices, and long zoom shots are associated with child viewers looking away from the television screen (e.g., Alwitt, Anderson, Lorch, and Levin, 1980). It is likely that many of these relationships of the visual features to looking are strongly related to the content with which the features typically appear. For example, adult men are ubiquitous on television (appearing much more frequently than women) and tend to be associated with adult-oriented content. Consequently, children associate men with less comprehensible and less personally relevant content. Familiar adult men associated with popular children's programs (e.g., Fred Rogers on Mister Rogers' Neighborhood; Steve Burns on Blue's Clues), on the other hand, are less likely to produce the negative relationship to children's attention. It is interesting that when content is controlled, there is no evidence that children look at animation more than live-action video (Schmitt, Anderson, and Collins, 1999). Nevertheless, when content is controlled, children look more at programming that is produced with formal features that are typical of children's television (Campbell, Wright, and Huston, 1987). Across all types of content and all ages of viewers, the formal features that have the most consistent relationships to looking are cuts and movement (e.g., Schmitt, Anderson, and Collins, 1999).

Studies with adults have observed that attention can be deployed with greater or lesser intensity. This appears to be true in the case of attention to television, and particularly in the phenomenon of attentional inertia. Attentional inertia was first described when it was shown that the longer a look at television is sustained, the less probable it is, in each successive second, that the viewer will look away. One consequence of this attentional inertia is that while typical looks are relatively short (i.e., less than fifteen seconds in length), there are some very long looks at television that are many minutes in duration, thus producing a highly skewed lognormal statistical distribution of look lengths. Attentional inertia in looking at television is not limited to adult viewers; it has been

found in infants and children as well (Burns and Anderson, 1993; Richards and Gibson, 1997). Investigations of attentional inertia reveal that as a look at television is sustained, viewers become progressively less distractible by stimuli that is external to the television, patterns of heart rate indicate progressively deepened attention, and memory for television content increases (e.g., Burns and Anderson, 1993; Richards and Gibson, 1997). It is likely that attentional inertia is not uniquely limited to television insofar as similar patterns of attention have been reported for children's toy play and reading. In any case, long periods of continuous looking at television indicate deeply engaged attention and increased information processing. Another consequence of attentional inertia during television viewing is that the viewer who has continuously looked at the screen for an extended period of time is more likely to keep looking at completely new content, such as a commercial (Burns and Anderson, 1993).

Listening to Television

Compared to looking, much less is known about auditory attention to television. Two studies have found that children better remembered dialogues if they were looking at the screen at the time when the dialogues occurred, suggesting that children tend to listen primarily when they are looking (Field and Anderson, 1985; Lorch, Anderson, and Levin, 1979). In addition, one study found that this link diminished from four to seven years of age, suggesting that older children are more likely to listen to the television even when they are not looking at it (Field and Anderson, 1985).

A study with adults found that they were progressively less likely to recognize snippets of audio from a program if they were not looking at the screen at the time the audio occurred. Moreover, the longer it had been since they had looked at the screen, the less likely they were to recognize the audio. This suggests that viewers progressively withdraw their auditory attention after withdrawing their visual attention (Burns and Anderson, 1993). Although the evidence suggests that viewers listen primarily when they look, there are some results that conflict with this interpretation. It is clear, as noted above, that young children are sensitive to auditory changes when they are not looking at the television. Additionally, in one study that required children to push a button to

fix a distorted audio track, the researchers found that children were equally quick to fix the audio whether or not they were not looking at the television at the time when the distortion occurred (Rolandelli, Wright, Huston, and Eakins, 1991).

Basic Viewpoints about Attention

There are three main viewpoints on children's attention to television. The first, and simplest, is that children's attention is reflexively elicited by visual change and movement (Singer, 1980). While the evidence indicates that visual change and movement do help sustain attention, there are clearly many other factors that are as influential, if not more so.

The second viewpoint is that attention to television is primarily driven by the child's engagement with the content and that patterns of attention are largely in the service of comprehension (Anderson and Lorch, 1983). This perspective readily accounts for differing patterns of attention in relation to program comprehensibility and age. The theory falls short, however, in explaining the consistent effects of movement and visual change.

The third theory, which is more comprehensive, incorporates aspects of the other two perspectives (Huston and Wright, 1989). Taking into account the role of formal features in conveying content, this theory proposes that children learn how to watch television, gradually moving from a more reflexive form of attention to a more controlled and strategic form.

Conclusion

A number of writers who are concerned with children and education have argued that television produces mindlessly "mesmerized" children who become inattentive to language because of television's visual nature. The research, however, finds little to support these arguments. Children's attention to television is variable, cued by formal features, and sustained by engagement with the content, including language. To the degree that comparisons can be made, attention to television is comparable in many respects to the attention that children pay to other media and to their world in general.

See also: Children and Advertising; Children's Comprehension of Television; Children's Preferences for Media Content; PARENTAL MEDIATION OF MEDIA EFFECTS; SESAME STREET; TELEVISION, EDUCATIONAL.

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DANIEL R. ANDERSON

CHILDREN'S COMPREHENSION OF TELEVISION

Some critics of television have referred to the medium as a "plug-in drug" that causes children to become "zombie viewers" who take in information passively, rather than actively. However, research has shown that children actually are not passive while watching television. Rather, they are active viewers who engage in various forms of mental processing to construct an understanding of the programs they are watching.

Imagine, for instance, children watching a television program in which the detective hero investigates a mystery at a baseball stadium and (in a surprising twist ending) deduces that the pitcher's best friend is the one who stole his lucky cap. Numerous mental operations are necessary for viewers to make sense of and follow this story correctly. On the most basic level, they must comprehend the dialogue and visual action presented. They must access their prior knowledge of baseball to grasp the context in which the action takes place. They must isolate information that is central to moving the plot forward from the incidental information that accompanies it. They must infer the motivations of the characters and reconcile the culprit's deceptive behavior as a "best friend" with his ulterior motives and crime. And many other operations must occur as well.

In cognitive psychology terms, television programs are complex audiovisual stimuli. To understand them, viewers must integrate a range of visual and auditory information: visual action, dialogue, gestures, intonation, and so on. In addition, comprehension of stories on television requires viewers to perform a variety of cognitive tasks and metacognitive tasks (i.e., tasks that monitor or control the process of comprehension), such as distinguishing between information that is central and incidental to the plot, organizing objects and events within scenes, integrating information across separate scenes, and drawing inferences about events, characters, and their motivations. The demands of this mental processing are compounded by the fact that, unlike reading, broadcast television is not self-paced. Television viewers cannot control the speed of the incoming information or review material that is difficult for them to understand; instead, the processing that underlies comprehension must fit the pace of the television program.

In light of the complexity of the incoming information and the challenges involved in making sense of it, it is not surprising that many studies have found consistent age differences in children's comprehension of television programs. Children under two years of age have been found to comprehend and imitate simple actions they have seen on a television screen. Yet, even secondgrade children (i.e., eight-year-olds)-and in some respects, fifth graders-do not understand television programs as well as older children and adults. Research by W. Andrew Collins (1983) and his colleagues has shown that the deficits in young children's understanding stem primarily from several factors. While viewers of all ages draw on prior knowledge to help them understand material on television (and everything else in life), the recall exhibited by second-graders with regard to televised stories has been found to be fairly limited to stereotyped common knowledge (e.g., that police officers wear uniforms). Older viewers, on the other hand, are better able to recognize deviations from common knowledge and rely on information specific to the individual program or story (e.g., that a character without a uniform is a plainclothes police officer). In contrast to older viewers, second-grade children also have difficulty understanding the links between aggression on television and either its consequences or the motives of the characters involved, particularly when the motives, actions, and consequences are presented in separate scenes. (Indeed, this lack of understanding could contribute to children's imitating the aggressive behavior, since they may not understand its roots or consequences.) Finally, older viewers are more skilled at drawing inferences about events and the motives of characters; these differences have been most pronounced for inferences that are relatively abstract or require a greater number of inferential steps (e.g., recognizing an undercover police officer from the person's actions rather than from seeing a badge).

Factors Affecting Comprehension

Broadly speaking, children's comprehension of television rests upon three classes of factors: (1) characteristics of the viewing situation, (2) characteristics of the child, and (3) characteristics of the program. The "viewing situation" refers to the settings in which children watch television. For example, there may be distractions in the children's environment that draw their attention away from important parts of the program and reduce comprehension. Conversely, children may be watching with a parent or someone else who can point out important information in the program, thus helping to increase comprehension.

"Characteristics of the child" refers to the knowledge and cognitive abilities that children bring to the viewing experience and that help them make sense of the programs they watch. One obvious type of knowledge that children apply is their knowledge of the world around them; for example, it is probably easier for a viewer who knows a great deal about baseball (e.g., the rules of the game, the typical sequence of events in a game) to understand a television drama about a

baseball game than it is for a viewer who has never seen a baseball game before. Such knowledge includes social knowledge (i.e., knowledge about the ways in which people interact) as well as more strictly "cognitive" knowledge. A second type of knowledge is program-specific knowledge regarding the characters, settings, and events in the particular program that a child is watching. Because regular viewers of a television series are already familiar with its format, the setting in which it takes place, and the relationships among its characters, this knowledge provides a base upon which they can build their understanding of each new episode. This provides a clear advantage over first-time viewers, who would have to construct all of this background knowledge from scratch while watching that same episode.

On a more abstract level, comprehension has been shown to be aided by prior knowledge of story schemas (i.e., the prototypical ways in which stories are structured). Similarly, comprehension can also be aided by a prior understanding of standard television conventions or "formal features," such as cuts, fades, or montage. These conventions convey narrative information in and of themselves; for example, sophisticated television viewers understand that the brief series of images presented in a montage might actually represent a large number of events or a longer passage of time.

Apart from their prior knowledge, children also bring a variety of cognitive abilities to the screen. One of these, as discussed above, is their skill at drawing inferences. Inferences are essential in understanding dialogue, creating mental representations of the physical settings in which the action occurs (e.g., where the characters are standing when only one of them is on-screen), grasping the motives of characters, linking information across scenes, and so on. Other sets of abilities include the same kinds of linguistic, visual, and information-processing skills that allow children to decode and make sense of visual and verbal information in face-to-face interactions. Finally, Gavriel Salomon (1983) showed that comprehension is also affected by the amount of mental effort viewers devote to the program; when children invest more mental effort (i.e., "work harder") in understanding a television program, their comprehension of the program is enhanced.

"Characteristics of the program" refer to features of the television program itself that can make it easier or more difficult for viewers to comprehend. Following from the discussion of inferences above, one relevant program characteristic is the degree to which important information is made explicit or must be inferred; explicit information is easier to comprehend, particularly for younger children. Another characteristic is the degree to which formal features are used to emphasize and draw the attention of viewers toward (or away from) information that is central to the plot, as when a close-up is used to highlight an important object in a scene. A third, related characteristic concerns the kinds of formal features that are employed in the program, and the ways in which they are used. For example, children below the age of six have been found to have difficulty understanding formal features that violate reality (e.g., thinking that an instant replay is a new event, rather than a repeat of something that has already been shown). A fourth characteristic centers on the relationship between visual and verbal information in the program; research has shown comprehension to be strongest when the same information is presented both visually and verbally at the same time. When different information is presented visually and verbally, children tend to show better comprehension for the visual material (a phenomenon that is referred to as the "visual superiority hypothesis").

Comprehension of Educational Television

The above discussion pertains to comprehension of all television programs. However, additional issues arise when considering children's comprehension of educational television programs. As Shalom Fisch (2000) has pointed out, viewers of educational television programs face even greater processing demands, because these programs typically present narrative content (i.e., the kind of story content discussed above) and educational content simultaneously. Thus, Fisch's "capacity model" proposes that the degree to which children comprehend the educational content depends on the ease or difficulty of comprehending the narrative as well as the educational content itself. In addition, the model argues that comprehension is affected by the degree to which the educational content is integral to the narrative or tangential to it. For example, in the mystery story discussed above, if the detective hero suddenly stopped to give a lesson on mathematical rate-time-distance problems, the mathematical content would be tangential to the narrative. On the other hand, if the hero used the rate-time-distance concept to prove that the pitcher's best friend was the only one close enough to have stolen the lucky cap (i.e., if it provided the key clue that solved the mystery), then the mathematical content would be integral to the narrative.

According to the capacity model, if the narrative and educational content are tangential to each other, the mental processing necessary for comprehension is generally devoted primarily to the narrative; thus, less mental resources are available for processing the educational content. However, if the educational content is integral to the narrative, then the two complement, rather than compete with, each other; the same processing that permits comprehension of the narrative simultaneously contributes to comprehension of the educational content. Thus, comprehension of educational content typically would be stronger when the educational content is integral to the narrative than when it is tangential to it.

When educational television is executed well, it can hold significant and long-lasting benefits for its viewers. Numerous studies have shown that preschool and school-age children comprehend and learn from educational television programs in areas such as literacy, mathematics, science, civics and social studies, and (among preschool children) more general school readiness. Moreover, these effects can last for years; Daniel Anderson, Aletha Huston, John Wright, and Patricia Collins (1998) found that children who had watched educational television as preschoolers demonstrated better school performance than nonviewers as late as high school. Presumably, the data reflect not just preschool children's learning of specific information from television but also the potential of educational television to contribute to an enduring love of learning.

See also: Television, Educational; Violence in the Media, Attraction to.

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SHALOM M. FISCH

CHILDREN'S CREATIVITY AND TELEVISION USE

The question about whether and how television viewing affects children's imagination has been debated since the medium became part of everyday life, and there is still no consensus on this issue. On the one hand, television viewing is believed to produce a passive intellect and reduce imaginative capacities. On the other hand, there has been enthusiasm about educational television viewing fostering children's imaginative skills.

Before reviewing the effects literature, it is necessary to define two aspects of children's imagination that have been addressed in earlier studies, namely imaginative play and creativity. In imaginative play, children pretend that they are someone else, that an object represents something else, or that they are in a different place and time. According to Greta Fein (1981), imaginative play usually emerges at around twelve months of age, reaches its height between five and seven years, and then gradually declines. Creativity is children's capacity to generate many novel or unusual ideas, for example, in drawings or stories. Creativity is believed to start at around five or six years of age.

Although there are some obvious differences between imaginative play and creativity, the two activities are related to each other. First, both imaginative play and creativity require the generation of ideas, and in both activities associative thinking plays an important role. Second, research suggests that children who exhibit a high level of imaginative play in early childhood are more creative in the long term. Because imaginative play and creativity have so much in common, this entry discusses the effects that television viewing has on both imaginative play and creativity.

Researchers have advanced contradictory opinions about the influence of television on imaginative play and creativity. Some authors believe that television encourages play and creativity. This view is referred to as the stimulation hypothesis. Many others, however, argue that television hinders imaginative play and creativity. This view is referred to as the reduction hypothesis.

Stimulation Hypothesis

According to the stimulation hypothesis, viewing television enriches the store of ideas from which children can draw when engaged in imaginative play or creative tasks. Adherents of this hypothesis argue that television characters and events are picked up, transformed, and incorporated in children's play and products of creativity and that, as a result, the quality or quantity of their play and creative products is improved.

There is indeed evidence to suggest that children use television content in their imaginative play and creative products. However, this does not necessarily mean that children's play or creative products that are related to television content are more creative than play or products that are not related to television content. There is as yet no evidence that the quality or quantity of imaginative play or creative products is improved through television viewing in general. More specifically, none of the existing studies have as yet demonstrated that overall television viewing is positively related to imaginative play or creativity.

While a stimulating effect does not appear to be true of television viewing in general, it has been suggested that educational viewing might stimulate children's imagination. Two studies, by Jerome Singer and Dorothy Singer (1976) and Daniel Anderson and his colleagues (2001), have shown that that educational children's programs can promote imaginative play and creativity. Singer and Singer, for example, showed that preschoolers who had watched an episode of *Mister Rogers' Neighborhood* exhibited play with more "as-if" elements than did children who had not seen the show. However, although it is promising, the literature related to the beneficial effects that viewing educational televi-



A prominent feature of Mister Rogers' Neighborhood was the Neighborhood of Make-Believe, through which children were encouraged to be creative and develop their imaginations. (Bettmann/Corbis)

sion has on children's imaginative capacities is as yet too limited to justify decisive conclusions.

Reduction Hypotheses

Most research supports the contention that television reduces rather than increases creativity, but disagreement exists over the manner in which the reduction is brought about. In fact, six different types of reduction hypotheses have been proposed in the literature; displacement, passivity, rapid pacing, visualization, arousal, and anxiety. The first four hypotheses pertain to the effect of television viewing in general, whereas the latter two hypotheses are proposed to explain the effects of television violence on children's imaginative skills.

Displacement Hypothesis

The displacement hypothesis argues that children spend a considerable portion of their free time watching television at the expense of other leisure activities. In the case of imaginative play, the displacement hypothesis assumes that television viewing takes up time that could otherwise be spent on imaginative play. In the case of creativity, it is argued that television viewing occurs at the expense of other leisure activities, such as reading, which are thought to stimulate creativity more than does television viewing.

The displacement hypothesis was tested in three studies conducted during the introductory stage of television, when households with and without television could still be compared. Although none of the studies investigated the effect of the arrival of television on the time devoted to imaginative play, they did investigate the consequences for playtime in general. The studies by Eleanor Maccoby (1951) and Wilbur Schramm and his colleagues (1961) found that television viewing did occur at the expense of playtime in general. Because on average approximately one-third of general play is spent on imaginative play, it is likely that television viewing had a reductive effect on imaginative play as well.

In the case of creativity, there is also reason to assume that the arrival of television resulted in a

displacement of other media, such as comic books and radio (for a review see Valkenburg and van der Voort, 1994). It is, however, still unknown whether this displacement of other media leads to a reduction in creativity. Linda Faye Harrison and Tannis MacBeth Williams (1986) demonstrated that the arrival of television coincided with a decrease in children's creativity (as measured by the Wallach-Kogan creativity test), but this study did not check whether this was caused by a diminished use of radio and books by children.

Passivity Hypothesis

Adherents of the passivity hypothesis see television as an "easy" medium, requiring little mental effort. With a minimum of mental effort, the child viewer consumes fantasies produced by others. According to the passivity hypothesis, this leads to a passive "let you entertain me" attitude that undermines children's willingness to use their own imagination in play and creative products.

Despite popular stereotypes of children just sitting and staring at the screen, a study by Andrew Collins (1982) suggests that the child viewer is cognitively far from passive. Even very young children actively screen television offerings for attractiveness and understandability and make an effort to interpret television images in their own terms. This does not necessarily imply that the amount of mental effort children invest in processing television programs is large. Gabriel Salomon (1984) has demonstrated that for older elementary school children, television viewing requires less mental effort than does reading. There is some evidence then that television viewing requires relatively little mental effort. However, it has never been investigated whether this leads to a general tendency to expend little mental effort, including a diminished tendency to invest mental effort in imaginative play or creative activities. Of course, child viewers consume fantasies produced by others, but there is little reason to assume that this leads to reductions in fantasy play or creativity. Children who read a story, listen to a radio story, or watch a play also consume fantasies produced by others, but nobody has ever argued that print stories or theater hinder children's imaginative play or creativity. Therefore, there is little reason to assume that television's reductive effect on imaginative play and creativity is caused by a television-induced passive attitude of "let-you-entertain-me."

Rapid Pacing Hypothesis

The rapid pacing hypothesis attributes the reductive effect that television viewing has on imaginative play and creativity to the rapid pace of television programs. According to this hypothesis, the child viewer is confronted with images that must be instantaneously processed because scenes are presented in rapid succession. Children are thus allowed little time to process the information at their own rate or to reflect on program content. The hypothesis argues that rapidly paced television programs encourage cognitive overload, impulsive thinking, hyperactivity, and a nonreflective style of thinking (see Singer and Singer, 1990). Because both imaginative play and creative tasks require children to focus their attention for a longer period of time, the quality or quantity of imaginative play and creative products could be impaired.

Of course, rapidly paced programs leave children less room for reflection on program content than slowly paced programs. However, there are no indications that a rapid program pace per se leads to cognitive overload, impulsive thinking, and shortened attention spans. It is no surprise, therefore, that none of the existing studies have demonstrated that program pace affects children's imaginative play (see Valkenburg, 2000).

Visualization Hypothesis

The visualization hypothesis has been proposed and tested only with respect to creativity, not with respect to imaginative play. This hypothesis attributes the reductive effect of television on creativity to the visual nature of the medium. According to Patricia Greenfield and her colleagues (1986), television, unlike radio and print, presents viewers with ready-made visual images and leaves them little room to form their own images. When engaged in creative thinking, children find it hard to dissociate themselves from the images supplied by television, so that they have difficulty generating novel ideas.

Seven experimental studies have been designed to test the visualization hypothesis. In all of these media-comparison experiments, children were presented with either a story or a problem. The stories or problems were presented in either television (audiovisual), radio (audio), or print (written text) format. The text of the story or problem was usually kept the same, whereas the presentation modality was varied. After the presentation of the stories and problems, children were given a creative task. They were asked, for example, to find a solution for a problem, make a drawing, or complete a story that was interrupted just prior to the end.

With the exception of one study, which was conducted by Mark Runco and Kathy Pezdek (1984), these media-comparison studies showed that verbally presented information evoked more novel ideas than did television information. According to the authors, the television presentations led to fewer novel ideas than did the radio and print presentations because children in the video condition had difficulty dissociating themselves from television images during creative thinking.

Arousal Hypothesis

Like the rapid pacing hypothesis, the arousal hypothesis assumes that television viewing promotes hyperactive and impulsive behavior. However, the hyperactivity is not seen as a result of the rapid pace of television programs; it is attributed to the arousing quality of action-oriented and violent programs. This arousing quality is assumed to foster a physically active and impulsive behavior orientation in children, which in turn disturbs the sequential thought and planning necessary for organizing the plots of make-believe games and performing creative tasks.

Although television viewing appears to be generally associated with relaxation, Dolf Zillmann (1991) has found that violent programs can produce intense arousal in children. In addition, there is evidence that the frequency with which children watch violent and/or action-oriented programs is positively related to restlessness in a waiting room and impulsivity at school.

Because research does indicate that violent programs can induce an impulsive behavior orientation, it is no surprise that many studies have demonstrated that watching violent programs can adversely affect children's imaginative play and creativity. However, although there is convincing evidence that violent programs can hinder children's imaginative play and creativity, the studies failed to investigate whether it was the arousal provoked by television violence that was responsible for the reductions in imaginative play and creativity.

Anxiety Hypothesis

The anxiety hypothesis provides a plausible rival explanation for the reductive effect of television violence on children's imagination. This hypothesis also argues that violent programs hinder children's imaginative play, but the reduction effect is attributed not to the arousal that violent programs produce, but to the fright reactions they generate. According to Grant Noble (1970), television-induced fright leads to regression in behavior, which is expressed in a reduction in the quantity or quality of imaginative play.

Although the anxiety hypothesis has only been advanced with respect to the influence of television on imaginative play, it also provides a plausible explanation for reductive effects of violent programs on creativity. First, research by Joanne Cantor (1998) has shown that there is ample evidence that violent programs can induce intense fright reactions in children. Second, there are indications that high levels of anxiety can disrupt fantasy play and creativity. However, there is not yet any conclusive proof that television-induced fright is responsible for the reductive effects on imaginative play and creativity.

With regard to these final two reduction hypotheses, there is evidence that television violence has a negative effect on children's imaginative play and creativity, and that the mechanisms proposed by the arousal and anxiety hypotheses actually operate. However, researchers have not yet determined whether it is arousal or anxiety that is responsible for television-induced decreases in imaginative play and creativity. In fact, it is possible that both the arousal and the anxiety hypotheses are valid reduction hypotheses. It is widely recognized that different types of media violence evoke different reactions in different viewers. It could be that arousing programs, such as the Power Rangers, may affect imaginative play and creativity through arousal, whereas frightening movies, such as The Exorcist, which have been shown to disturb many young viewers, may reduce children's imaginativeness through fright.

Conclusion

Overall, research suggests that television viewing has a negative rather than a positive effect on children's creativity. However, most television studies conducted before the year 2000 examined the relation between television viewing and imagination as an input-output measure, without attempting to explore the mechanisms that might be responsible for the reductive or stimulating effects of television. Therefore, the research does not allow one to single out which of the hypotheses discussed in this entry are the most plausible ones. Future studies should pay closer attention to the question of how television may affect imaginative play and creativity. This is important, because only when people know how television influences imaginative play and creativity, will they be able to mediate its effects adequately.

See also: Children's Preference for Media Content; Researchers for Educational Television Programs; Sesame Street; Television, Educational.

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PATTI M. VALKENBURG

CHILDREN'S PREFERENCES FOR MEDIA CONTENT

Traditionally, research on the effects of television has assumed that children are passive recipients on whom television has a powerful influence. Since the mid-1970s, however, media-effects research has increasingly recognized the child viewer as an active and motivated explorer, rather than a passive receiver. Research now suggests that children are critical evaluators of what they see in the media. Even very young children have been shown to actively screen television offerings for attractiveness and understandability and to make an effort to interpret television images in their own terms.

Children might enjoy media content for a variety of reasons, including differences in experiences, differences in temperament, and differences in cognitive and emotional development. According to the research that has been conducted, two factors that have been shown to be important predictors of children's media preferences are their age, or developmental level, and their gender.

Early Childhood

Many theories of cognitive development distinguish the preschool and early elementary school years from the later elementary school years. Jean Piaget (1954) refers to the period between two and seven years of age as "preoperational," although many other researchers attribute specific characteristics to this age group without using Piaget's label. Although a two-year-old differs from a seven-year-old in many respects, preschoolers and young elementary school children do share certain cognitive-developmental characteristics that justify segmenting them in this way.

Unclear Fantasy-Reality Distinction

For preschoolers and young elementary school children, there is an unclear demarcation between fantasy and reality. Virtually anything is possible in the imagination of a child in this age range; a sponge can become a rock, bears can talk, and the wind can pick the child up and take him or her away. Research by Patricia Morrison and Howard Gardner (1978) has demonstrated that between the ages of three and ten years, children gradually become more accurate in distinguishing fantasy from reality on television. At first, children believe that everything on television is real. Young preschoolers sometimes even think the characters reside inside the television set. Leona Jaglom and Howard Garder (1981), for example, observed that two- and three-year-olds ran to get a paper towel to clean up an egg they saw break on television. In addition, most four-year-olds who participated in a study by Sue Howard (1998) were convinced that Big Bird and Bugs Bunny were real.

Children's failure to distinguish fantasy and reality can affect their preferences for media content in important ways. First, because fantasy and cartoon animals and characters are perceived as real, they can be just as engaging for young children as real-life characters. Second, some special effects or stunts, such as a character vanishing in a puff of smoke, can have a great effect. Because young children cannot put these events in perspective by understanding that they are cinematic tricks, they are more strongly affected by them.

Perceptional Boundedness and Centration

Another quality of thinking exhibited by preschoolers is the tendency to center attention on an individual, striking feature of an object or image, to the exclusion of other, less-striking features. Piaget (1954) and Jerome Bruner (1966) referred to this tendency as "centration" or "perceptual boundedness." A study reported by Dan Acuff (1997) is illustrative of this tendency of young children. In this study, girls were presented with three dolls. Two of the dolls were very expensive, had beautiful and realistic faces, and came with sophisticated mechanical effects. The third doll was cheaply made, but this doll had a big red sequined heart on her dress. To the surprise of the researchers, the majority of the girls preferred the cheap doll with the sequined heart. This choice is typical of children in this age group. When judging a product or media content, they focus their attention on one striking characteristic, and they therefore have little eye for detail. Similarly, their descriptions of television characters tend to fix on single, physical attributes, without integrating them into an overall picture. According to Jaglom and Gardner (1981), young children pay less attention to what characters are doing or saying and pay the most attention to simple, brightly colored visuals and colorful, uncomplicated, nonthreatening characters.

Responsiveness to Language, Rhymes, and Music

Children seem to have an innate tendency to respond to language. Long before infants talk, they are very responsive to human speech, and according to Robert Siegler (1991), they are especially attentive to a form of speech that is referred to as "motherese." Motherese is characterized by a slower cadence, a higher pitch, and exaggerated intonations. This preference lasts for several years. According to Patti Valkenburg and Joanne Cantor (2000), many audiovisual stories and programs for young children use motherese.

Young children also enjoy listening to songs, rhymes, and music. In a study by Margaret Cupitt and her colleagues (1998), almost half of the mothers of children who were two and one-half years of age reported that their children had imitated music, rhymes, or songs from television. This study also showed that nearly all of these children had interacted with television programs while watching—for example, by singing, dancing, or clapping hands. It is no surprise, therefore, that songs, rhymes, and music are often used successfully in educational and entertainment programs for young children.

Limited Cognitive Capacities

Because of their immature cognitive capacity, children in this age group need more time than adults to interpret and make sense of information



The toy industry often takes advantage of children's preferences for particular characters or programs, such as Blue's Clues, to create and sell tie-in products. (Wilfred Tenaillon/Corbis)

and television images. This is the reason why preschoolers often respond best to programs with a slow pace and with lots of repetition, for example *Barney and Friends* and *Mister Rogers' Neighborhood*. For the same reason, preschoolers often prefer familiar contexts and visuals and objects and animals that they can label, such as a cat, a dog, or a horse. According to Dafna Lemish (1987), they like to watch programs that show babies and young children, and they adore nonthreatening real or animated animals, such as kind birds, friendly dinosaurs, and babyish creatures like the *Teletubbies*.

By the time they are five or six years of age, children begin to develop a preference for more fast-paced programs. They also become more responsive to verbally oriented shows with more sophisticated forms of humor, such as the animated situation comedy *The Simpsons*. In addition, they often find slower-paced programs with friendly characters boring or childish, and they begin to prefer more adventurous themes located in foreign countries or in outer space and more complicated characters.

Middle Childhood

In contrast to preschoolers, the fantasies of children between eight and twelve years of age more often entail realistic and plausible themes. In this period, children develop a sincere, sometimes even exaggerated, interest in real-world phenomena. They can be highly critical of entertainment and commercials that lack realism. According to Keith Mielke (1983), children in middle childhood continue to like animals, but they are mainly interested in real-life animals. Because most fantasy characters have been demystified, children in this age group tend to become attached to real-life heroes, such as sports heroes, movie stars, and action heroes.

During middle childhood, children come to appreciate details. As explained above, a preschooler may focus on only one striking detail of a toy—a doll's clothing, for example. For the eight- to twelve-year-old child, many characteristics of a toy may be carefully observed, from the face and body to details of the doll's clothing to how it moves. At this age, children become progressively critical of television programs of low quality, such as those that are poorly produced or repetitious. They are no longer content with simple, salient characteristics, such as a colorful cartoon character. Unlike younger children, who are greatly impressed by special effects and characters with special powers, older children seem to agree that special effects by themselves are not enough.

Influence of the Peer Group

During middle childhood, peer interactions become increasingly sophisticated. Because children in this age group develop a strong sense of commitment and loyalty to the norms of their peer group, they are increasingly sensitive to the thoughts, opinions, judgments, and evaluations of other children, and they become very sensitive to what is "cool" and what is "in." They therefore become alert to how to behave in public and how to avoid being ridiculed with respect to what they wear or prefer to watch on television. For example, older children feel the need to demonstrate firmly their aversion to programs designed for younger children or for shows that feature characters younger than they are.

Gender Differences in Children's Media Preferences

Despite the fact that what it means to "be a girl" has changed considerably since the 1950s (and even the 1960s), there are still important differences in the way boys and girls typically think, what they value, and how they express themselves. Many researchers have observed that in the first two years of life, there does not appear to be any significant gender difference in play style and toy preference. Boys and girls in this age group also do not seem to differ in their liking for television characters, such as Barney versus the Teletubbies.

Significant gender differences in toy preference have been observed as early as two years of age, however. By the time they are three years old, boys and girls frequently participate in different activities, avoid toys that are perceived to belong to the opposite sex, and play primarily in same-sex groups. According to Eleanor Maccoby (1994), this so-called process of gender segregation is found in a variety of cultures and settings.

The emerging differences between boys and girls during the preschool years are clearly reflected in their preferences for media content. In comparison to preschool girls, preschool boys have a strong preference for action and violence in books and entertainment programs. They tend to prefer themes and content in entertainment, such as sports, violent fantasy themes, and more dangerous scenarios, involving, for example, dinosaurs and aliens. They also are attracted to heroic male characters, including superhumans (e.g., the Power Rangers, Hercules), sports stars, knights, soldiers, doctors, and policemen. Preschool girls are more interested in relationshipcentered and nurturing themes. They prefer themes and contexts such as castles, dance studios, school, the circus, and farmyards. According to Acuff (1997), preschool girls generally focus on characters such as fashion models, ballerinas, dancers, good fairies, queens, and princesses.

Children's awareness of societal stereotypes for gender roles continues to increase with age, and in spite of the fact that cognitive flexibility increases in middle childhood and adolescence, the preferences of boys and girls diverge over time. Because children become increasingly involved with peers, there is greater pressure to conform to "genderappropriate" behavior. It is not surprising, therefore, that differences in taste between boys and girls become stronger with age.

Elementary school boys and adolescent males still have a comparatively strong preference for action-oriented and violent programs. They become strongly attached to male action heroes and power figures, although the heroes are now more realistic (e.g., Arnold Schwarzenegger, Bruce Willis). Elementary school girls are in general more likely to react negatively to program scenarios that involve action, violence, horror, and swearing, possibly because girls report being frightened by violent media depictions more often than boys do.

What do girls like? Research on the preferences of girls for computer games suggests that girls are less object-oriented than males. They are less interested than boys in devices, such as lasers, buttons, and futuristic weapons. For girls, it is not so much about winning or killing the enemy. According to Jack Sanger and his colleagues (1997), girls like a story line; they like real-life situations; and they are more often interested in the development of relationships between characters. They also more

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often have a preference for family situations, and they enjoy serial dramas with realistic themes.

Finally, research by Patti Valkenburg and Sabine Janssen (1999) has found that girls attach more value than boys do to the comprehensibility of an entertainment program. This could be because girls are more interested than boys are in dramatic story lines. According to a study by Carrie Heeter (1985), teenage females are more eager than boys are to look for actors or actresses they recognize, invest more time in searching for information about shows and characters, and prefer to watch an entertainment show from start to finish.

Conclusion

Current media theories assume that children purposely select and expose themselves to television content to satisfy specific needs. They also assume that any effect of media content on children is enhanced or mitigated by how the child perceives it. Research has shown, for example, that the effect of television violence on aggressive behavior is mediated by the extent to which a child likes to watch violent programs. To understand media effects on children, then, it is crucial to gain insight into children's preferences for media content. While much research has already addressed how age and gender affect children's preferences, future research needs to focus on how other child characteristics, such as personality characteristics and emotional development, may affect children's media preferences and selective exposure to television content.

See also: Children's Comprehension of Television; Fear and the Media; Gender and the Media; Sesame Street; Television, Educational; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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COMMERCE, ELECTRONIC

See: Electronic Commerce

COMMUNICATIONS ACT OF 1934

The Communications Act of 1934 is the major, comprehensive legislation for the regulation of all nongovernmental wire and wireless telecommunication. It outlines specific laws that telecommunications operators must follow. It created the Federal Communications Commission (FCC) and enabled the commissioners to initiate further regulations that carry out the intent of the act. Most important, the act justifies the regulation of telecommunications, which is paradoxical, given the rights that are guaranteed to the press by the First Amendment.

Evolution of the Act

The Communications Act of 1934 grew out of the Radio Act of 1927, which was the first official attempt by the U.S. government at a comprehensive legislation for radio. The Radio Act of 1927 was passed by the U.S. Congress to help the U.S. Department of Commerce solve interference problems connected with the burgeoning number of new operating stations. Although this act gave First Amendment protection to broadcasting, it defined broadcasting as interstate commerce, a status that, according to the Constitution, gave Congress the power to control it. In addition, this act created the Federal Radio Commission (FRC), the precursor to the FCC, to govern licensing, frequency assignments, and station operations.

This 1927 act, though more comprehensive than its predecessors, still did not provide enough direction and justification for the regulation of the new media. In fact, it was not long after its inception that many of its powers, especially those involving the denial of a license, were challenged in court. Other court cases questioned the underpinnings of the 1927 act, including (1) whether the public-interest standard could be used to deny licenses on the basis of programming content and (2) whether broadcasting could even be considered interstate commerce. Finally, President Franklin D. Roosevelt wrote a letter to Congress asking for new legislation that would better harness the evolving industry of telecommunications, and Congress answered with the Communications Act of 1934.

Design of the Act

The Communications Act of 1934 acknowledges the First Amendment status of broadcasting, yet it also provides a rationale for regulation despite this status. This rationale is built on the premise that telecommunication operators must act "in the public interest, convenience, and necessity." The reason for this is twofold. First, the airwaves are considered to be a publicly owned natural resource. Therefore, as with any scarce resource, the government is entitled to ensure that this public property is used as a public service. The second part of this rationale argues that, because the airwaves are publicly owned, the operators of electronic media act not as owners but as trustees of the frequencies they use, thereby functioning as the public's proxy when managing this public resource. This rationale serves to justify the provisions of the act itself, but it also justifies electronic media regulation by the FCC beyond basic technological regulation.

The first paragraph of the act establishes the FCC as the independent regulatory agency that is charged with carrying out the intent of Congress and the act. Through this establishment, the act becomes the enabling legislation for the FCC, dictating the organization, enforcement measures, and procedural methods that the FCC must follow. Other sections of the act provide principles and initiatives that require specific regulatory action from the FCC in order to be implemented. For example, sections 303(o) and 303(p) of the act allow the FCC to assign call letters to stations and require that the stations publish "such call letters and other such announcements and data as in the judgment of the Commission . . . for the efficient operation . . . " of these stations. The latter part of this allowance entitled the FCC to create rule 73.1201, which requires stations to identify themselves during sign-on, sign-off, and natural breaks at every hour. This identification must include their call letters, the location in which they are licensed, and, for radio stations, their frequency. In this manner, the act empowers the FCC to create and execute rules, policies, and regulations based on the directives of the act.

Conjointly, the act also contains explicit regulations that the FCC must enforce. A prime example of this is found in the political communication provisions of section 315. Section 315, among other requirements, prohibits broadcast and cable operators from censoring the content of any political message. This means that broadcasters and cable operators cannot censor political advertisements, nor can the FCC ban a political spot based on questionable content. It is important to note, however, that although section 315 prohibits the banning of a political spot on the basis of content, even political messages are subject to the indecency and obscenity laws of the U.S. Criminal Code (section 1464) and to the First Amendment tests for "clear and present danger" (as set forth in *Schenck v. United States*, 1919; *United States v. O'Brien*, 1968; and *Preferred Communications v. City of Los Angeles*, 1989). Nevertheless, this statute exemplifies one of the many explicit regulations of the act that must be enforced by the FCC.

Organization of the Act

The Communications Act of 1934 contains seven titles, or sections, each of which addresses a specific area of telecommunication. The first paragraph of Title I lays out the purpose of the act by first identifying wire and wireless communication as interstate and foreign commerce and then introducing the FCC as its regulatory enforcer. This first section also introduces the phrase "in the public interest, convenience, and necessity," the criterion for the discretionary regulatory authority that the government may hold over communications.

Title I also outlines the terms, organization, duties, and general powers of the FCC. It dictates the procedure for the appointment the five commissioners as well as the terms, qualifications, and restrictions that are required of the commissioner positions. It also outlines the various powers that Congress and the president of the United States have over the FCC, including the appropriation of operating funds for the agency. Application fees for the various communication services are listed, and related powers of the FCC are explained.

Title II addresses common carriers, such as telephone services. The first portion of the title requires common carriers to maintain reasonable charges for their services as well as justify these charges in a public inspection file. Other areas of regulation include the extension of lines, acquisition of equipment, and expansion of facilities or of the service area. Restrictions on the use of telephone equipment for various criminal or other infringing actions and requirements for disability access and blocking of offensive material are detailed. Finally, requirements, limitations, and other provisions are placed on existing or developing services.

Title III covers radio and television licensing and regulation, noncommercial and educational broadcasting, and maritime radio use. This is where the licensing procedures, conditions, and regulatory powers concerning all broadcast stations are written. It is also where the public-interest standard is formally addressed in a very tangible regulatory capacity. Enforcement powers and sanctions of the FCC are presented. Likewise, enforceable requirements of broadcasters are identified. Examples of the Title III broadcasting requirements include section 315, which demands that legally qualified candidates running for the same office receive an equal opportunity to use a given station, and section 335, which requires a direct broadcasting satellite (DBS) to carry educational and informational programming. Other sections in Title III cover assistance and provisions for public broadcasting, emergency or distress situations, and ship-to-shore communications.

Title IV lists procedural and administrative provisions that the FCC must follow. It begins with the establishment of the jurisdiction of the FCC to enforce the act and the possibility of court action against any violators of any order set forth by the commission. It then defines and explains the different procedures and types of evidence that may be used in conjunction with an FCC order or court action. These orders and enforcement issues are then expounded upon in the next title.

Title V addresses specific consequences, or penalties, that correspond with certain violations of the act or other FCC regulations, rules, or policies. Fines can be charged as a result of fraudulent contests or game shows, illegal acceptance of rebates or other money in exchange for transmission, and maritime safety violations. Penalties also include the confiscation of illegal or unauthorized telecommunications devices, which can then be sold by the confiscators as long as there is no potential for harming the public.

Title VI describes national policy for cable communication. Among its various provisions, it redefines the relationship between cable operator and franchising authority. In order to operate in a given community, a cable operator must obtain a franchise, which allows the operator to construct a cable system using public roads, or "right-of-way." The franchising authority is the community government or other government entity that grants a franchise to a cable operator, an action that is accompanied by a franchising agreement or contract with which the cable operator must comply.

In its definition of the cable-franchise relationship, the act gives the franchising authority the right to require a cable operator to designate a channel for educational, governmental, or other public use. In addition, the act requires cable operators to carry local television stations or lowpower television stations in certain situations. Regarding the actual process of franchising, Title VI establishes franchising procedures, standards, and fee limitations that cable operators and franchising authorities must acknowledge and follow. Furthermore, the act governs franchise renewal procedures and provides for the protection of cable operators against wrongful denial of renewal. Other provisions of this title address the need for increased competition and public-interest obligations for the cable industry, and the establishment of common guidelines for federal, state, and local government in the regulation of cable.

The last title, Title VII, contains miscellaneous provisions that do not fall within the scope of the previous titles. Part of this title deals with the unauthorized publication and reception of communication. Another section outlines the powers of the president in times of war or national emergency. Services for the disabled, such as closed captioning and hearing-aid compatibility, are also addressed. Finally, the act ends with the establishment of a fund that will be used to promote competition, new technology development, employment and training, and the delivery of telecommunication services to all parts of the United States.

Major Amendments to the Act

Similar to the U.S. Constitution, the Communications Act of 1934 has had to evolve to accommodate new technologies and to ensure that the new and existing technologies were serving the public interest. In order to accomplish this, elements of certain sections were altered, expanded, or abolished in order to update the usefulness of the act. Also, from time to time, laws have been passed that added entire sections to the act. These sections were specific to particular areas of telecommunication, and they gave the FCC additional power and responsibilities.

One such modification to the Communications Act of 1934 is the Communications Satellite Act of 1962, which was enacted to regulate the long-term commercial use of satellites. This act created the Communications Satellite Corporation (COMSAT) to oversee this commercial use. That same year, the All Channel Receiver Act was passed to require all television receivers to receive both VHF and the new UHF signals, and the Educational Television Facilities Act was enacted to provide money for the construction of educational stations.

The Educational Television Facilities Act of 1962 paved the way for the Public Broadcasting Act of 1967, which provided the first direct appropriation for noncommercial programming. More notably, it established the Corporation for Public Broadcasting, which has become the major founder of educational broadcasting facilities.

The next major legislation was the Cable Communications Policy Act of 1984. This act outlined the relationship between cable operator and local franchising authority as well as relaxed the franchise regulation of cable rates. However, the act was created during a time of deregulation, and it soon became apparent that the cable industry would need more conservative regulation. Thus, the Cable Television Consumer Protection and Competition Act of 1992 re-regulated cable by reevaluating the powers of the franchising authority over the cable operator, prohibiting exclusive program arrangements between cable operator and program supplier, and otherwise promoting competition.

Another piece of legislation passed in the same decade was the Children's Television Act of 1990. This act placed limitations on the amount of advertising as well as the use of advertising and other commercial acts during children's programming. It also detailed specific requirements for children's programming and made other suggestions on how communications operators could better serve the public interest.

Finally, the Telecommunications Act of 1996 was enacted as the largest-ever addition to the Communications Act of 1934. It gave the FCC new initiatives and challenges in the face of digital broadcasting and other dawning technologies, and it outlined further public-interest responsibilities that communicators in the new digital era would be obliged to adopt. In sum, the Telecommunications Act of 1996 amended and added provisions to the 1934 act in an effort to promote electronic media competition, provide universal service, and ensure that all future electronic media will serve "the public interest, convenience, and necessity."

Strengths and Weaknesses of the Act

The Communications Act of 1934 has been both praised and condemned for its various provisions and effects. One of its most notable strengths is its breadth in creating a single independent regulatory agency that has the power to regulate all electronic media. Likewise, the act can be admired for its design in that it includes the legislative, executive, and judicial branches of government in the execution and evaluation of its various provisions, similar to the laws establishing other regulatory agencies. A third strength is its interpretive quality in that it dictates initiatives that the FCC can interpret and then execute according to contemporary needs. This interpretive quality, however, has also been regarded as a weakness when certain provisions have needed further clarification in order to be effectively adopted.

Another criticism concerns the appointment method for filling commissioner positions, which leaves this process subject to political considerations that can take precedence over an appointee's qualifications. A related concern is the potential for Congress to refrain from approving the appointment of any or all commissioners or to delay appropriating an operating budget in an attempt to influence the functioning of the FCC.

However flawed the Communications Act of 1934 may be, its survival serves as a testament to its fundamental effectiveness. The act still stands as the first, and only, comprehensive regulatory legislation for all electronic media. It successfully solved the regulatory problems that were experienced by its predecessors, and it will continue to evolve with the evolving media, solving new problems as they arise.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Children and Advertising; First Amendment and the Media; Public Broadcasting; Radio Broadcasting; Telecommunications Act of 1996; Television, Educational; Television Broadcasting; Satellites, History of.

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FRANCESCA DILLMAN CARPENTIER

COMMUNICATIONS DECENCY ACT OF 1996

The rise of new communications technologies, such as the Internet, poses a number of problems for policymakers. Perhaps the most vexing of these problems involves trying to balance (1) the First Amendment rights of those people who wish to communicate using the Internet with (2) ensuring that children who use the Internet are protected from adult-oriented material such as pornography. According to Timothy Zick (1999), millions of children access the Internet everyday despite the fact that approximately 70 percent of Internet traffic is sexually oriented in nature. Clearly, the World Wide Web differs from other media in that the availability of adult-oriented content is greater and restricting the distribution of that type of content is difficult at best.

Faced with the reality of children being able to view material that is intended for adults, the U.S. Congress passed the Communications Decency Act of 1996 as part of the Telecommunications Act of 1996. The Communications Decency Act was signed into law by President Bill Clinton on February 8, 1996. By the time the Communications Decency Act became law, however, it was already a highly controversial piece of legislation. For the first time, Congress had attempted to restrict what types of information could be put on the Internet.

Legislative Development

Faced with an explosion in the pervasiveness of digital communication by the early 1990s, Congress moved to update the various telecommunications laws that were in existence. This effort ultimately culminated in the passage of the Telecommunications Act of 1996. Essentially, the Telecommunications Act of 1996 updated the Communications Act of 1934 to include digital communication and to encourage market competition. This major reform effort was the subject of a great deal of congressional and public debate.

During the winter of 1995, as the Telecommunications Act of 1996 was taking shape, Senator Jim Exon of Nebraska introduced the Communications Decency Act as an amendment. A number of sources characterize this amendment as a lastminute addition to the Telecommunications Act of 1996. Exon built support for the Communications Decency Act by passing around a book that contained a variety of pornographic photographs that had been downloaded from websites. Certainly, the two acts essentially deal with different issues facing the same technological innovations. Because the nature of the Telecommunications Act of 1996 dealt with market conditions, new technology, and telecommunications policy, the Communications Decency Act broke new ground by attempting to regulate the content of digital communication. This fact led a significant number of senators to oppose the legislation initially. However, the Communications Decency Act encountered stronger opposition in the U.S. House of Representatives, which passed The Online Family Empowerment Amendment, a competing piece of legislation that had a similar purpose. In the end, a conference committee largely combined the two pieces of legislation into the version of the Communications Decency Act that ultimately became law.

In general, the Communications Decency Act sought to protect children from harmful material on the Internet. The act made it a crime to use any device to send "obscene, lewd, lascivious, filthy, or indecent communications with the intent to annoy, abuse, threaten, or harass another person." Specifically, the act made it illegal for one to "knowingly within the United States or in foreign communications with the United States by means of telecommunications device make . . . available any indecent communication in any form including any comment, request, suggestion, proposal, image, to any person under 18 years of age." The act stipulated that the penalty for indecent communication sent to minors would be a maximum fine of \$100,000 and a maximum jail sentence of two years. The act further made it a crime for anyone to transmit patently offensive material to any specific minor, regardless of who initiated the communication. Perhaps most important, the act made it illegal to transmit such material in a way that could be accessed by a person under the age of eighteen.

This last portion of the Communications Decency Act became perhaps the most controversial aspect of the legislation because nearly any regular website can be accessed by anybody (whether child or adult) with an Internet connection.

Unconstitutionality of the Communications Decency Act

On the same day that President Clinton signed the Communications Decency Act into law, a number of groups sought and won-in ACLU v. Reno (i.e., Reno I)-a temporary restraining order in the U.S. District Court for the Eastern District of Pennsylvania to prevent enforcement of the act. Several other groups subsequently filed a similar lawsuit that was consolidated into one case at the U.S. Court of Appeals for the Third Circuit. The plaintiffs contended that the language contained in the act was overly vague, allowing regulators to restrict content that was ordinarily protected by the First Amendment. Moreover, enforcing the act might serve to restrict the First Amendment right of adults who choose to access adult-oriented material. The government argued that the Communications Decency Act was worded similarly to past U.S. Supreme Court decisions on indecency and obscenity. In addition, the government argued that there was a compelling interest in protecting children from dangerous material on the Internet.

The appellate court found in Reno v. ACLU (i.e., Reno II) that the Communications Decency Act was an unconstitutional violation of the First Amendment. The court relied on previous cases by noting that any law seeking to restrict content must pass "strict scrutiny." In other words, the law must serve a compelling governmental interest, and the law must be narrowly tailored to fix the problem at hand. Applying that standard, the court reasoned, the Communications Decency Act was unconstitutional because content that may have some literary or artistic merit but would be unsuitable for minors would be restricted. Hence, under the act, protected yet indecent speech may be restricted by the attempts of the law to curtail obscenity. The court further found that the Communications Decency Act was unconstitutional in that there were no technological means for ensuring that websites that featured adult-oriented content would be viewed only by adults. Finally, the court found that the interest of the government in protecting minors could be better served by enforcing already existing obscenity and pornography legislation than by risking the restriction of legitimate (protected) communication.

The U.S. Supreme Court agreed to hear Reno II with arguments presented during the spring of 1997. In a 7-2 decision, the Court ruled in June 1997 that the Communications Decency Act was unconstitutional. Justice Sandra Day O'Connor wrote a separate opinion in which she dissented in part and concurred in part. Chief Justice William H. Rehnquist joined O'Connor. Writing for the majority, Justice John Paul Stevens contended that the Communications Decency Act was too vague and overbroad in its scope and direction to be constitutional under the First Amendment. The first problem addressed by the Court was the notion of indecency versus obscenity. Sexual expression that is indecent but not obscene enjoys some First Amendment protection while obscene expression receives no such protection. The Communications Decency Act, however, at some points uses the terms interchangeably. According to the Court, this could result in confusion in interpreting the scope of the law. For example, a website developer who wishes to operate legally according to the framework of the Communications Decency Act would have extreme difficulty deciding exactly what kinds of depictions and descriptions to omit or include.

A second problem that the Court found with the Communications Decency Act is that because it is a criminal statute, the likelihood of chilling speech would be greater. A person who was afraid of large fines and a jail sentence might be less likely to communicate even though the expression might normally enjoy some constitutional protection. Perhaps most important was the employment of past precedent in the decision. In the case of Sable Communications of California v. FCC (1989), the Court held that a statute that prohibited the transmission of sexually oriented content via the telephone was unconstitutional in that it infringed upon the rights of adults in its attempt to protect children. In Reno II, the Court noted that the Communications Decency Act was similar to the statute tested by Sable. The telephone is similar to the Internet because it is less intrusive than other types of media. Unlike a television broadcast (where the viewer is the recipient of one-way communication), the telephone (and the Internet) gives the user more choice in terms of communicating. The caller chooses to dial a certain number with a particular result in mind, while a television viewer has less choice regarding specific programming offerings. The Court found that the mere fact that a statute is designed to protect children does not exempt that statute from judicial scrutiny. In fact, because the statute prohibited telephone communication in which it was normally legal for adults to participate, the statute was found to be an unconstitutional restriction of free speech.

Applying this logic to Reno II, the Court found that in attempting to protect children, the Communications Decency Act went too far by restricting the First Amendment rights of adults. Because there is no way to ensure absolutely that minors will not access adult-oriented websites, the effect of the Communications Decency Act might be to restrict all websites that contain material that is deemed inappropriate for children. The decision of the Court noted that the Communications Decency Act went too far to try to solve a problem that affected only one class of the population. The ruling of the Court in Reno II clearly indicates that if regulators at any level wish to restrict Internet content, they must design statutes that meet the highest level of scrutiny.

The Child Online Protection Act

The decision in Reno II did not end the controversy of governmental regulation of the Internet, however. Several main events occurred in the wake of that decision, and they affected how government attempts to regulate the Internet. First, existing obscenity laws have been employed to restrict the transmission of obscenity via computer. In the case of United States v. Thomas (1996), the first Internet obscenity case, obscenity laws that prohibit knowingly selling or transporting obscenity were successfully applied to computer-oriented communication. In Thomas, the U.S. Court of Appeals for the Sixth Circuit found that using a computer to transmit obscene material violated obscenity laws. In addition, the Child Pornography Act of 1996 has withstood judicial scrutiny (United States v. Carroll, 1997) of its provision outlawing Internet distribution of child pornography.

After the U.S. Supreme Court struck down the Communications Decency Act for being overly vague and too broad, Congress drafted and passed the Child Online Protection Act (COPA) in 1998. COPA was designed to survive judicial scrutiny by attempting to protect children from harmful material while protecting the First Amendment rights of adults. COPA differed from the Communications Decency Act in several key ways. First, COPA applied only to commercial websites, exempting private websites. COPA also did not use the word "obscenity" interchangeably with indecency. Instead, COPA sought to restrict websites that were deemed "harmful to minors." Specifically, COPA prohibited making "any communication for commercial purposes that is available to any minor and that includes any material that is harmful to minors" measured by "contemporary community standards." In addition, Congress attempted to define the key terms that were used within the wording of COPA. Finally, Congress strengthened the penalty for violating the law. Website operators in violation of COPA could be fined \$50,000 per day. In order to prevent minors from accessing material intended for adults, COPA encouraged website operators to use some method designed to verify that the individual website visitor is indeed an adult. The suggested methods included requiring credit card numbers, having specific passwords generated, personal using identification numbers, and having debit accounts.

President Clinton signed COPA into law on October 21, 1998. The same groups that opposed the Communications Decency Act immediately filed a lawsuit to challenge COPA. On November 20, 1998, the U.S. District Court for the Eastern District of Pennsylvania granted a temporary restraining order that prevented enforcement of the law. Hearings on COPA began in February 1999, resulting in a preliminary injunction that prevented enforcement. Subsequently, on June 22, 2000, the U.S. Court of Appeals for the Third Circuit found in ACLU v. Reno (i.e., Reno III) that the law was unconstitutional. The employment in COPA of "contemporary community standards" was problematic according to the appellate court because website owners would have to conform with the community standards of the most conservative state in order to avoid prosecution. Since the web transcends geographic boundaries, the requirements of COPA served to restrict the expression of adults in less conservative states.

Because the appellate court could not identify a technological means of accomplishing what COPA set out to do (i.e., prevent certain websites from reaching certain groups of people in certain areas, while allowing access to those websites for certain groups in certain other areas), the court held that the law was an unconstitutional violation of free speech. An additional geographic issue involves the fact that the law would apply only to commercial websites that originated in the United States; it would not apply to foreign websites. Children could access many sexually oriented websites that originated from foreign countries and noncommercial entities, thus circumventing the intent and scope of COPA.

The court also found that websites that featured text containing nonsexual information that may be harmful to minors would be subject to age verification under COPA. The example that appeared throughout news accounts of the passage of COPA was the high degree of Internet traffic surrounding the release of the Starr report regarding President Clinton's activities in the White House. Under COPA, the rather graphic details of the Starr report would in the least necessitate the use of some age verification mechanism for the individuals who wish to access it. At worst, under the community standards clause of COPA, the Starr report might not have been legally posted, as the website operator would have to obey the most restrictive standards of the most conservative locality. Moreover, the court found that the remedies that were prescribed by COPA to ensure that only adults could access certain websites were problematic. Credit card verification would restrict websites to only those individuals who possessed a credit card number. In addition, credit card verification may be harmful to expression because the technology that is necessary to carry out this function is expensive to acquire. Finally, the court found that there are other, less restrictive means that are available to protect children from potentially harmful content. For example, the popularity of parental blocking software indicates that children can be protected without legislative action that may infringe upon the rights of adults.

The ruling of the appeals court in *Reno III* is a major event that relates directly to the Communications Decency Act. COPA was drafted as a direct result of the U.S. Supreme Court's ruling in *Reno II*. Despite the attempt of Congress to repair the Communications Decency Act, the courts still found that attempts to regulate the Internet, absent some technological solution to ensure that minors will not see information that is intended for adults, are unconstitutional restrictions on the First Amendment.

Conclusion

Regulating the Internet has turned out to be a controversial and vexing problem for Congress, despite the important interest in protecting children from potentially dangerous Internet sites. The lack of a technology that will simultaneously protect the well-being of the children and the constitutional rights of the adults will likely characterize this problem for some time.

See also: Communications Act of 1934; Digital Communication; Digital Media Systems; First Amendment and the Media; Internet and the World Wide Web; Pornography; Pornography, Legal Aspects of; Telecommunications Act of 1996.

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PATRICK M. JABLONSKI

COMMUNICATION STUDY

Determining the beginning of interest in communication and human affairs is difficult—perhaps impossible. Prior to the fifth century B.C.E. Egyptian and Babylonian writings were already expressing an interest in the role of communication in human affairs.

The Roots of the Field

The first scholars to study and write about communication in a systematic manner lived in Ancient Greece. The culture of the times placed heavy emphasis on public speaking, so it is not surprising that the first theories of communication focused on speech. Perhaps the first theory of communication was developed in Greece by Corax, and later further refined by his student, Tisias. Their focus was on the role of communication as it could be used for persuasion in the courtroom, where many important events of the day transpired.

Both Aristotle and his teacher, Plato, were key figures in the development of early communication theory, but Aristotle was probably the most influential. He wrote extensively about communication—which was then termed "rhetoric." Aristotle thought about communication in terms of an orator, or speaker, constructing an argument to be presented in a speech to hearers—an audience. The goal and ultimate effect of communication was persuasion. He described the process as follows:

[Communication] exists to affect the giving of decisions.... [The] orator must not only try to make the argument of his speech demonstrative and worthy of belief, he must also make his own character look right and put his hearers, who are to decide, in the right frame of mind [Roberts, 1924, p. 1377b].

Beginning with the formal study conducted by Aristotle and his contemporaries, communication came to be viewed as a process through which a speaker conveys messages to influence or persuade one or more receivers. In this paradigm, or perspective, emphasis is placed on the role of a source and on his or her intended message. This view of communication was helpful in many ways. It highlighted the key components in the communication process and emphasized the importance of messages in human behavior. It also emphasized that the source of a particular message can be important in determining the outcomes of the communication process.

In his writings, Plato provided a description of what he believed would be necessary for the study of rhetoric to contribute to a broader explanation of human behavior. He explained that the field would need to include the study of words and their nature, the study of human beings and their ways of approaching life, the study of the nature of order, and the study of the instruments by which human beings are affected.
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Two other scholars, Cicero and Quintilian, also contributed to the development of communication thinking during this period. Similar to Plato and Aristotle, Cicero saw communication as a practical and academic subject, and Quintilian's contributions were as an educator.

During the classical period discussed so far, democracy and oral expression were valued and important aspects of the societies in which communication was studied. These values and the approach to communication that they implied were largely reversed in the medieval and Renaissance periods. At the close of the fourteenth century, most of the communication ideas that had been developed in rhetoric were instead being studied in religion.

The writings of Augustine led to a reemphasis on the earlier Greek approaches to communication study. His writings applied communication to the interpretation of the Bible and to the art of preaching.

During the eighteenth and nineteenth centuries, the focus of communication study was on written argument, persuasion, and literature. Speaking style, voice, pronunciation, and gestures also became topics of interest, and the National Association of Elocutionists was founded in 1892.

Speech and Journalism Emerge as Disciplines

The early twentieth century heralded the emergence of speech as a discipline. The Eastern States Speech Association—which later became the Eastern Communication Association—was formed in 1909, and the Speech Association of America—which later became the Speech Communication Association and then the National Communication Association—was established in 1914. One year later, the first issue of the *Quarterly Journal of Speech* was published.

Journalistic practice dates at least to the times of the early Egyptians, but the formalized study of the field did not begin until the early 1900s. In 1905, the University of Wisconsin offered what may have been the first journalism courses at a time when there were few published books on the subject.

Communication was also of interest in other fields, particularly philosophy, anthropology, psychology, and sociology, during the early part of the twentieth century.

Multidisciplinary Growth

In the 1940s, communication began to grow rapidly as a field as scholars from various subject areas pursued their interests in the topic. Psychologists studied communication and individual behavior, sociologists studied communication and social relations, anthropologists studied communication and language and culture, and political scientists studied communication and political activity.

At the same time, studies in rhetoric and speech contributed to a growing emphasis on speech and speech communication. Studies in journalism and mass media were providing the foundation for emergence of the study of mass communication.

By the end of the 1950s, a number of writings had appeared that linked speech and mass communication together under the heading of communication. During the middle of this decade, the National Society for the Study of Communication—which later became the International Communication Association—was established with the stated goal of bringing greater unity to the study of communication by exploring the relationship among speech, language, and media.

The 1960s brought many new integrating communication books to the field, particularly notable among them are *The Process of Communication* (1960), *On Human Communication* (1961), *The Science of Human Communication* (1963), *Pragmatics of Human Communication* (1967), and *Communication and Communication Systems* (1968). At the same time, many authors were applying communication concepts in various other fields and settings, laying the foundation for additional segmentation and specialization that would flourish in the years to come.

Growth and Segmentation

The expansion and specialization that began to emerge in the 1960s reached new heights during the 1970s. The topics of interpersonal communication, group communication, organizational communication, political communication, international/intercultural communication, and mass communication began to emerge as subfields within the larger discipline of communication. Meanwhile, interest in more traditional communication topics, such as rhetoric, public speaking, journalism, and mass media, continued to hold the interest of many scholars. During the 1970s, 1,329 books were published with the word "communication" in the title. This is an amazing number when compared to the 20 such books published in the 1940s, the 61 books published in the 1950s, and the 329 books in the 1960s (Ruben, 1992).

The Information Age

The 1980s brought changes that resulted in the information age and continue to have a pervasive effect on the study of communication. The term "information age" refers to the fact that information and communication technology have come to have an influence on virtually every facet of the personal and occupational lives of individuals. Since the 1980s, information has come to be viewed as a commodity—an "economic" good—that can be bought and sold. The 1980s also marked the beginning of a trend toward consolidation and mergers among major communication and information providers and services.

Hybrid communication technologies began to be introduced in the 1980s. The video monitor, formerly associated with only the viewing of television programs, was beginning to be a common sight on desks in offices and other workplaces. Similarly, the keyboard, once simply a mechanical device that was an important part of a typewriter, was suddenly transformed into an electromechanical tool for inputting digital data. At the beginning of the information age, telephones were hard-wired to walls, "CD" only referred to certificates of deposit at the bank, "ATM" was an unfamiliar acronym, and videocassette recorders and modems were known only to technophiles. Telephone lines, previously used only for voice calls, were beginning to find use as channels to connect computers to other computers, to national networks, and to international networks. The rest, as they say, is history.

These many technological developments have had a huge effect on human communication practice and on communication study. Interest in communication, technology, and communication media has become common among a wide range of scholars, and the study of communication has become the study of message-related behavior. Communication study focuses on the ways in which individuals process information in order to adapt and influence, and in these endeavors, communication technology plays an ever-more central role. Where interpersonal communication was once thought of almost exclusively in terms of face-to-face communication, many who study this topic are now also interested in the role played by communication that is mediated by things such as the telephone, answering machines, and e-mail. Group communication studies may include studies of groups that exist electronically-"virtually"—as well as physically. The electronic group environments include Internet chat rooms and teleconference settings. The more traditional emphasis on the use of mass media, such as network television, radio, and newspapers, has now been expanded to give consideration to cable television, cell telephones, videocassette recorder usage, and the Internet.

Summary

As is apparent from the above discussion, communication is both an ancient and a newly emerging discipline. The core of contemporary communication thought has its origins in the writings of the Ancient Greeks in the area of rhetoric, but the twentieth century marked the emergence and growth of the field of communication as a social science and professional area of study. Through the intervening centuries, interest in the communication process has been strong in any number of related fields, including fields now known as psychology, sociology, cognitive science, political science, and management.

See also: Culture and Communication; Evolution of Communication; Group Communication; Information Society, Description of; Instructional Communication; Interpersonal Communication; Models of Communication; Nonverbal Communication; Organizational Communication; Paradigm and Communication; Rhetoric.

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BRENT D. RUBEN

COMMUNITY NETWORKS

Community networks, often called "civic networks" or "free-nets," are computer networks that have been developed for public access in broad support of a geographic community. The developers of community networks hope to create longlived public institutions that focus on digital communication much as public libraries, at least historically, have placed their focus on books and other printed material. Community networks apply the notions of free and uncensored access for everybody, both as producer and consumer, to the text, graphic, audio, and other resources found in cyberspace.

Although there is no precise definition of community networks, they have several common characteristics. Community networks aggregate a wide variety of information and communication services in a central, though "virtual," location, becoming, in effect a nonprofit "portal." Community networks are general purpose and strive to support the six "community core values," defined by Douglas Schuler (1996) as conviviality and culture; education; strong democracy; health and well-being; economic equity, opportunity, and sustainability; and information and communication. Furthermore, they generally do not charge for their services or make their money through advertising. In addition to performing the technical duties related to running a networked computer for a large community, community network developers typically engage in a wide range of other related activities including training, social activism, and advocacy.

The question of funding has plagued the community networks movement and the search for financial stability has been an overarching concern for community networks since their inception. Unlike public libraries, public broadcasting, and public access cable television, no universally adopted formula for sustained support has been found. Although many early developers believed that success was to be found through a businessoriented perspective, few (if any) community networks attained this. Many community networks have been kept alive only through long hours of unpaid volunteer labor and intermittent (and insufficient) foundation and government support. With the current lack of public and political support for government projects, it has been difficult to devise a model of financial viability. Also, as is discussed below, access to computer networks has become much more widespread and there are many websites offering free e-mail and other services that compete with community networks. Although it remains to be seen whether the advertising-based model will be viable over the long term, many community networking efforts have already ceased.

The Seattle Community Network

Community networks reflect the intent of their developers and users, and vary from community to community. The Seattle Community Network (SCN), however, can be considered somewhat representative. Launched in December 1992, SCN is a relatively successful and stable community network. SCN offers free e-mail (dialup and web-based), free web space, and free list servers to anybody.

The SCN is a nonprofit membership organization that elects its board of directors. The board of directors works with members, users, and volunteers to maintain and expand the system according to the dictates of the principles and policies that the organization has adopted (and made available online). SCN may be something of an anomaly as it has been all-volunteer-based since its inception. Although SCN has received very little direct financial support from foundations or government, SCN has received strong nonfinancial support from another civic institution, the Seattle Public Library. Since its beginning, the Seattle Public Library (SPL) has allowed SCN to house its computers in the same room as the SPL computers, to use the Internet connection of the library, to hold classes in SPL branch libraries, and to distribute SCN brochures in the library.

Although SCN first used a line-oriented menu system that was primarily accessed via dial-up telephone lines, it quickly became more oriented toward the World Wide Web. When a World Wide Web user accesses SCN (http://www.scn.org/), he or she will see the SCN logo, some announcements, and links to the thirteen subject areas of SCN (i.e., activism, arts, civic, earth, education, health, marketplace, neighborhoods, news, people, recreation, sci-tech, and spiritual). Although "activism" is listed first only by virtue of its alphabetic ordering, its placement highlights the focus of SCN on civic, citizen-led activities rather than activities that are commercially driven. Each section is managed by a volunteer subject-area editor who works with the information providers (IPs) in that subject area to make sure the information is readily accessible. The activism page has links to information on the World Trade Organization (the 1999 WTO Ministerial Meeting was held in Seattle), human rights, women's issues, and other concerns. The earth web-page has links to farmer's markets, environmental groups, and other organizations and projects related to the environment. The neighborhood web-page has links to one hundred neighborhood sites in Seattle and elsewhere in the region and beyond.

History

In the early days of the Internet, when access to computer networking services was restricted to academia and military research and development, several innovative pioneers developed projects aimed at the general community. Although most of these early community networks are no longer operational, they explored important new ground related to technology, community development, and the public sphere.

Community Memory of Berkeley, California, created by Efrem Lipkin, Lee Felsenstein, and Ken Colstad, was the world's first community network. Initially started in the mid-1970s after experiments on unmediated two-way access to a message database through public computer terminals, Community Memory was intended to help strengthen the Berkeley community. Their brochure stated that "strong, free, non-hierarchical channels of communication-whether by computer and modem, pen and ink, telephone, or face-to-face-are the front line of reclaiming and revitalizing our communities." Their commitment to serving those without ready access to information technology was demonstrated by numerous training programs and their insistence that all Community Memory terminals be in public places (e.g., libraries and laundromats) but could not be reached via modem or from the Internet. Moreover, all of the information on the system was community generated, such as the "Alameda County War Memorial Project," which contained information on every deceased veteran in Alameda County. Community Memory adopted a creative, direct approach to funding: They offered coin-operated terminals that were free to read, but required twenty-five cents to post an opinion or a dollar to start a new forum.

Big Sky Telegraph was designed to overcome some of the problems related to sparse population and long distances between communities in the rural American West. Frank Odasz (1991), working out of Western Montana University in Dillon, Montana, started the system in 1988 when he began electronically linking one- and two-room schoolhouses across Montana. Odasz used the telegraph metaphor, reflecting the influential communication technology of the nineteenth-century. According to their Homesteading the Educational Frontier brochure, "Teachers in rural Montana serving as Circuit Riders, Community Telegraphers, and Teletutors have used modems to overcome time, distance, and economic limitations to empower rural education and community survival." By the early 1990s, Big Sky Telegraph was a distributed system consisting of "Big Skies" and "Little Skies" that offered K-12 lesson plans and a "telecurricular clearinghouse" for K-12 projects running on networks all over the world.

The Public Electronic Network (PEN) in Santa Monica, California, a computer system designed to promote community-oriented participatory democracy, was one of very few government initiatives during that period. Through PEN, Santa Monica citizens could converse with public officials and city servants as well as with each other. PEN was established in 1989 and had over three thousand registered users and over five hundred user log-ons per month in the mid-1990s. PEN provided access to city government information such as city council agendas, reports, public safety tips, the online catalog of the library, and to government services such as obtaining permits. PEN also provided e-mail and conferences on a wide variety of local civic issues. PEN was an early testbed for many ideas related to "electronic democracy," and Pamela Varley (1991) has documented some of the problems PEN experienced.

The Cleveland Free-Net, the world's first freenet, was the most influential community network. With more than thirty-five thousand registered users and more than ten thousand log-ins per day, it was probably the largest as well. The model was developed by Thomas Grundner at Case-Western University and grew from his work on the public health information system, "St. Silicon's Hospital and Dispensary," an electronic question-andanswer forum devoted to medical topics. Doctors, lawyers, automotive mechanics, and others answered questions online on the Cleveland Free-Net, and this format persisted until the system was closed down in late 1999.

The free-nets employed a "city" metaphor to orient users; users go to the appropriate "building" to find the information or services they want. U.S. Supreme Court decisions, for example, were found in the "Courthouse." Free-nets were established in hundreds of locations around the world (although mostly in the United States and Canada) and were often members of the National Public Telecomputing Network (NPTN), an umbrella organization for free-nets that ceased operation in 1997.

Other notable early efforts include the New York Youth Network, which explored computer networking for disadvantaged youths; the Electronic Cafe project, developed by Kit Galloway and Sherrie Rabinowitz, which explored interactive encounters among people in the Los Angeles area and around the world using video and satellite technology; and Playing to Win, a popular educational effort, launched in New York City prisons and housing projects, that evolved over time into the Community Technology Centers Network (CTCNet), a coalition of several hundred computer centers in the United States.

Related Efforts

There is a wide range of efforts worldwide that promote the idea of "community networking" without necessarily being community networks. Community technology centers provide physical places in communities all over the world. Proponents of these centers, like proponents of community networks, believe that access to digital communications, both as consumers and as producers, will be key to economic—as well as political—survival in coming years. The centers, unlike community networks, address the fact that many people worldwide do not own computers at home and need a place that is conveniently located where they can learn about and use computers.

No census of community networks worldwide—or even in the United States—is completely up-to-date or exhaustive. Community networks and institutions that promote community networking exist all over the world. The Association for Community Networking (AFCN) in the United States, the European Association of Community Networks (EACN) in Europe, and the Community Area Networks (CAN) forum in Japan all focus on community networking issues. Six community networks were launched in the late-1990s in Russia and similar projects are underway in Latin America and South America. Government support does exist in some cases. In the United States, the Telecommunications and Information Infrastructure Assistance Program (later the Telecommunications Opportunities Program) was launched in 1994 to provide assistance for innovative civic projects (including community networks) that use telecommunications technology, while similar projects exist within the European Union.

There were fifteen thousand Internet users when the Cleveland Free-Net started in 1986. Thirteen years later, when the system ceased operation, there were an estimated fifty million. What do community networks do when access is less of an issue, when the world, seemingly, is finding access to digital networking without their assistance, a world that is apparently willing to put up with advertisements to use Hotmail and other advertising-based networking services?

One answer is to concentrate less on the technological infrastructure and more on the idea of community networking in general—the idea of aligning communication technology to community needs in a noncommercial, inclusive way. Ann Bishop and her colleagues (1994) have been involved in several relevant projects. One example is the "Assets Mapping" project, which uses the insights of John Kretzmann and John McKnight (1993) to promote community development using community assets (rather than deficits) through the PrairieNet community network. Bishop and her colleagues have also worked with SisterNet, a local grassroots group, to develop web-based information services that address African-American women's health concerns.

Directions and Issues

The 1990s witnetssed major changes in political, economic, and other social forces, with the rise of global capitalism perhaps being the most dramatic. The accompanying changes in communication technology, such as the explosive growth of the Internet and its rapid commercialization, and the mergers of the world's largest media corporations, are also noteworthy. As the world has shrunk, so, too, as many have noted, have our problems increased. The possibility of global warming and other ecological disasters confront humankind collectively as does war, economic disparities, and our difficulties in addressing these problems collectively.

Robert Putnam (1995) of Harvard University has written about the decline of "social capital," based largely on declining membership in nearly all sectors of noncommercial and nongovernmental organizational life. At the same time, there was a phenomenal rise in the number of nongovernmental organizations worldwide between 1950 and 1999 (see Runyan, 1999) and in so-called virtual communities in cyberspace. Community networks are expressions of civic society whose objectives, unlike commercial systems, are complex and not intended to be judged in economic terms alone. They are alternatives to the commercial systems and often evolve to fit needs not met commercially, such as providing forums for voices that are often unheard or unrecognized. Community networks, though obviously no panacea, may ultimately become a meaningful institution for a new collective intelligence.

See also: COMPUTER LITERACY; COMPUTING; INTERNET AND THE WORLD WIDE WEB.

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DOUGLAS SCHULER

COMPREHENSION OF TELEVISION

See: Children's Comprehension of Television

COMPUTER GAMES

See: Ratings for Video Games, Software, and the Internet; Video and Computer Games and the Internet

COMPUTER-HUMAN INTERACTION

See: Human-Computer Interaction

COMPUTER LITERACY

Computer literacy can be defined from two vantage points, each of which is informed by a dynamic mixture of skills that are needed to access and manipulate digitally encoded information. For an individual, it simply means being able to use the computer as a means to an end. A person who uses a vehicle to get from point a to point b must know how to drive, have a basic understanding of the need for automobile maintenance (such as having the oil changed), and demonstrate knowledge of the rules of the road. That person does not need any in-depth knowledge of how a car functions. In a similar fashion, attaining competence in using computers to perform personal or vocational tasks is the most rudimentary form of computer literacy. It is not essential that computer users know how the machine does what it does, although such knowledge might provide motivation for more sophisticated or increasingly efficient use or serve as a foundation for understanding how computers function in the social order. Hence, computer literacy can also be defined as one element of information literacy and as a collective concept that includes a grasp of the economic, social, and political consequences of widespread computer use.

Computers receive information as input by human beings. They then store, process, retrieve, and provide results in the form of displayed or printed output. All computer operations transpire in accordance with instructions that are written by human beings. At the most basic level, computer literacy means having the aptitude to manipulate these sets of instructions-rendered as programs or applications-to tell computers to process digital data in ways that serve human ends. Mastery of a word-processing program affords one the ability to create, edit, format, display, or print a document in record time. Computer literacy enables a person to exploit the computer's capacity for calculation and representation through use of spreadsheet and database applications. Computer literacy is critical for easy and immediate sorting, management, and association of a mixture of information that can be used for financial or inventory purposes. In their role as communication tools, computers serve to transfer information through programs that shift information from computer to computer, allowing it to be displayed as text or in graphic form. The concept can also include knowing how to connect to storehouses of information to satisfy curiosity or be entertained.

A person who is computer literate should be able to use computers to perform a few tasks such as writing letters or reports, calculating and comparing numbers or objects, or communicating via connections that support e-mail or (perhaps) a web-page, as personal, business, or educational circumstances require. A modest definition of individual computer literacy turns, therefore, on knowing how to use computers to personal advantage. It means using computers to do what they do best—storing, accessing, and repetitively and rapidly processing massive quantities of data for human interpretation, which adds value that turns data into information. The definition might include knowing how to connect to storehouses of information to satisfy curiosity or be entertained.

Computer literacy is not corroborated through a tidy checklist that enumerates how many and which functions an individual can complete using the tool. It occurs in the intersection of knowing how to do or find what one needs or wants in a particular place, at a particular time, for particular reasons. Similar to the driver's understanding of the need for basic car maintenance, a rudimentary definition of computer literacy would also include awareness of the basic elements of, and forces associated with, this machine. The coincidence of computer use and connectivity have brought about a changed atmosphere wherein users, regardless of their level of know-how, are aware that terms such as "hardware," "byte," "monitor," "modem," "bandwidth," "virus," and "protocol" have distinct meanings. Even if a user does not fully understand all of the vocabulary that comes with computer use, these words permeate public consciousness and emphasize a presumed need for computer literacy. Fundamental understanding of computer capabilities and configuration in networks suggests an expanded definition of computer literacy that recognizes the effect that computers have had on society. The notion of computer literacy thus grows to include access to means of improving one's computer skills through education or additional experience.

Within the United States, widespread computer use and networked exchange of information prompted the realization that most citizens should know how to work with applications that are used for writing, calculating, displaying, finding, and communicating information in digital form. A brief overview of the way in which computers became so pervasive in this, the information age, sets the stage for understanding collective computer literacy. By the mid-1970s, microcomputers



To increase their computer literacy and their familiarity with the use of specific software packages, many people take part in large instructional sessions, which are generally tailored to specific products. (Corbis)

were powerful enough and low enough in cost to be introduced into a variety of work settings. By the early 1980s, IBM had produced a personal computer that found its way into industry, schools, and homes. Other manufacturers modeled IBM, and micro (personal) computer use grew as prices decreased within an ever-expanding market. Computers became smaller and more powerful, replacing typewriters, cash registers, and (sometimes) human beings. Apple's Macintosh entered the market in 1984 with an easier-touse, graphically based operating system that freed users from the need to input complex lines of instructions in order to tell the computer what to do. As a result, computer use continued to soar.

By the 1990s, the full force of networking computers linked to one another so users could easily send and receive messages—could be felt throughout the world. In the United States, faster and cheaper networked computing moved out from under the umbrella of government and scholarship. More computers permeated the workplace, and more people had computers at home. Computers were linked in local-area networks in offices and factories and by wires and telephone lines from residence to residence. Worldwide connections ultimately flowed throughout the world to form the Internet-one massive network of computers that permits global exchange of information. With the conception of hypertext (providing fast links from one information source to another), graphical World Wide Web browsing capability (popularized in 1994 with the transcendence of Netscape), and the web's delivery of hypermedia, computer use and connectivity fused and heralded the need for computer literacy as a new competency to be addressed by educational and employment policies. These circumstances combined to spawn growing concern about how new generations could become conversant with the new information technology.

Concern for collective computer literacy is evident in America in the form of a succession of fed-

eral statutory and executive initiatives. As early as 1983, the need to ensure competence in computer use was set forth in A Nation at Risk: The Imperative for Educational Reform. This was an extended report on the quality of education, and it was prepared by the National Commission on Excellence in Education for the U.S. Department of Education. The report recognized the growth of technologically driven industry and the need to emphasize technological literacy among the mix of subjects to be taught in school. Among its recommendations for basic education, the report included the teaching of high school "computer science" so that students could (1) understand the computer as an information, computation, and communication device, (2) be able to use computers to study other fundamental subjects, (3) be able to achieve personal and work-related objectives, and (4) understand the effect of computers and attendant technologies on society.

The High-Performance Computing Act of 1991 declared that "advances in computer science and technology are vital to the Nation's prosperity, national and economic security, industrial production, engineering, and scientific advancement" and established the federally funded National Research and Education Network (NREN). Through NREN, researchers, educators, and students were afforded support for computer and scientific information resources and education. Although the act was not meant to advance computer use by the general public, it explicitly linked computer proficiency to economic progress and provided for coordination of federal agency activities and funding to support NREN. By 1993, the Clinton administration's National Information Infrastructure: Agenda for Action called for the establishment of "a seamless web of communications networks, computers, databases, and consumer electronics." This effort resulted in the alignment of government, industry, and general public interest in developing a National Information Infrastructure (NII), which came to be known as the "information highway" in popular culture.

The NII process activated a convergence of interests that can be interpreted as defining computer literacy characterized by both ability and access. Government, industry, and public-interest groups all became involved in an effort to create an enlarged concept of collective computer literacy at the end of the twentieth century. In 1995, the National Telecommunications and Information Administration (NTIA) issued the results of the first in a series of investigations into the phenomenon of limited Internet and computer access among certain segments of the population. This issue has come to be called the "digital divide." The Telecommunications Act of 1996 produced the first major overhaul of telecommunications law since 1934 and authorized Federal Communications Commission oversight of a program whereby service providers would give reduced rates (or e-rates) for Internet service to schools, libraries, and health-care providers. Various federal agencies, including the NTIA and its Technology Opportunities Program (TOP, formerly TIIAP), initiated programs to support both computer connectivity and distribution of equipment and training. Interest groups and nonprofit organizations, such as Computer Professionals for Social Responsibility and the Benton Foundation, became active in the study and advocacy of ways and means of equitable and improved access to information technology.

In 1998, the Next Generation Internet Research Act amended the High-Performance Computing Act of 1991 and authorized federal interagency cooperation and funding for development and implementation of new and progressive networking capabilities. While this effort is again concentrated on a certain strata of scholarly and government users, the potential spin-off effects of all such legislation prompt continued discussion of what computer literacy means as a requirement for economic progress and participation. Computer literacy is an evolving concept that has rippled throughout society, reshaping thoughts on education, employment, intellectual freedom, privacy, and equality.

See also: Communications Act of 1934; Commu-NITY NETWORKS; Computer Software; Computer Software, Educational; Computing; Federal Communications Commission; Inter-NET AND THE WORLD WIDE WEB; LITERACY; TECHNOLOGY, ADOPTION AND DIFFUSION OF; TELECOMMUNICATIONS ACT OF 1996.

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TONYIA J. TIDLINE

COMPUTER SOFTWARE

Computer hardware, consisting mainly of the central processing unit (CPU), random access memory (RAM), and various peripheral devices, provides the physical components needed for computation, but hardware by itself can do nothing useful without the explicit step-by-step instructions provided by computer software.

Computer software consists of sequences of instructions for the CPU. A sequence of instructions for the CPU is typically referred to as a program. Programs vary in size and complexity and can be as simple as a utility that prints the current time and date on the screen or as large and complicated as a spreadsheet application or a full-featured word processor. Each instruction in a program directs the CPU to do one simple task, such as accessing the contents of a memory location, adding two numbers, or jumping to a different part of the program depending on the value contained in a register. Because individual instructions are so simple, it takes many of them to create a program. Complicated programs, such as word processors, contain literally millions of instructions and may require years of development time.

Historical Background

In 1944, the Hungarian-born mathematician John von Neumann developed the first practical way for computers to use software. The machine he designed to use this fundamental advance in computing was called the EDVAC (Electronic Discrete Variable Automatic Computer). All previous computers-including the Electronic Numerical Integrator and Computer (ENIAC), the first electronic digital computer-had to be rewired every time a different program was run. Obviously, this rewiring was a time-consuming, tedious, and error-prone task. With the EDVAC, programs could be loaded from external storage (typically by means of punched paper tape) exactly the same way as data. In fact, at the level of memory storage, programs were indistinguishable from data. By clever manipulation of the binary codes used to represent instructions as they resided in the computer memory, it was even possible to write programs that modified themselves as they ran. Such is the infinitely malleable and somewhat schizophrenic world of software that, for many individuals, makes it a fascinating and sometimes consuming passion.

During the very earliest years of general-purpose computing, programmers explicitly wrote all the instructions that the computer would execute in the course of running a program, including the instructions needed for input and output of the data on which the program performed its computations. This resulted in large numbers of programs that contained sections of identical code commonly used for reading data at the beginning of the run and writing results at the end. Programmers soon realized that these commonly used sections of code could be stored in a "library" that their programs could access whenever they needed to perform a common system-level function. For example, a library of routines to send output to the printer could be provided for programmers who were writing data processing software. The remainder of the code in each program would therefore be only that needed for the unique requirements of the specific task that the program was intended to perform. This allowed programmers to focus on the problem-solving, applied aspects of their programs and led the way not only for increased programmer productivity but also for the advent of software production and computing on a large-scale global basis.

Operating Systems and Applications

The two main types of software are system software and application software. As explained in the previous section, this fundamental division arose when programmers realized that they could be more productive, and their programs could be

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Microsoft 2000, which is billed as an operating system for the highpriced, high-volume server computers that businesses use to run their networks, was unveiled by Bill Gates during a keynote address in San Francisco on February 17, 2000. (AFP/Corbis)

more reliable and efficient, with a layer of systemlevel software between their application programs and the computer hardware. System software consists mainly of the operating system and utility programs that help with its use.

The operating system is more than just routines to help with program input and output (I/O). Operating systems give application software access to the CPU, disk drives, modems, and any other hardware connected to the computer. The operating system governs the entire operation of the computer and supervises the behavior of application programs. It allocates CPU time to programs so that they use the resources of the computer efficiently. For example, in a multitasking operating system, one program can execute while another is waiting for an I/O operation to complete. The operating system also allocates memory to each incoming program, giving it a range of memory addresses to use. If a program performs an illegal operation, such as attempting to access a part of memory outside of its allocated portion, the operating system aborts execution of the program, frees the resources it was using, and reports the problem to the user. This is one way in which the operating system prevents errant programs from disabling the entire computer or corrupting the data used by other programs.

Some operating systems are capable of very sophisticated memory management. The use of programs that require large amounts of memory has led to the development of virtual memory, in which the operating system uses a large hard disk to emulate a large RAM. As a program requests more and more storage, the operating system allocates more virtual memory to it, switching segments of memory between physical RAM and the disk as necessary. This is particularly economical because a hard disk of a given size is cheaper than a similar size of RAM, but the processing is slower than if the computer had that much physical RAM.

Those who use IBM-compatible personal computers probably use the operating system Microsoft Windows, or a version of it such as Windows 98 or Windows NT. Prior to about 1992, those using IBM-compatible personal computers probably used Microsoft's DOS (Disk Operating System). The operating system is usually supplied (or "bundled") with a new computer when it is sold to the user.

Operating systems such as Windows and Linux also provide support for the graphical user interface (GUI) that application programs use for screen displays and for reading input from the keyboard and mouse.

The operating system by itself, however, does not afford much in the way of useful work with a computer. For this, it is necessary to use an application such as a word processor for writing papers or a spreadsheet application for doing financial planning. Any given application is written for use with one particular operating system (sometimes referred to as a "platform") and can only be used with that operating system because it expects to find the specific services and function calls that that operating system provides. Thus, for example, a word processor written for Microsoft Windows will not run on a machine that has a DOS operating system.

As computer technology has progressed, the division of labor between operating systems and

applications has become ever more important. New types of I/O devices, such as magnetic tape, magnetic disk, printers, monitors, keyboards, mice, and even network interfaces are all controlled through the operating system and never directly by application software. This is because each kind of device has unique control codes, and a single application could not be expected to anticipate every device that might be connected to the computer on which it runs. The operating system, therefore, provides applications with common ways of interacting with different types of devices. An application can, therefore, use one routine to write a file to a floppy disk, hard disk, or a remote disk connected through a network. This allows for device independence, which is crucial to the continued usability of existing software with new devices. If application programs had to know about the particulars and the operational details of each device that might be connected to a computer, not only would software development be far more expensive and time-consuming than it is already, but any device developed after that software was written would not work with the software.

When hardware vendors (e.g., printer manufacturers) introduce a new product, they typically provide "device driver" software with it. This is software that the operating system uses to communicate with and control the device on behalf of the application that requests the use of it. When the user selects the print command while using a word processor, for example, the word processor calls the operating system's print function and passes a copy of the current document to it. The print function in turn uses the device driver for that printer (and possibly other specialized software as well) to control the actual printing of the document. Having the operating system as a mediator, the word processor can print a document even though it does not know how to control the printer directly.

Programming Languages

A single CPU instruction does very little, and useful programs require thousands or even millions of instructions. If a programmer had to write each instruction individually, the task of developing software would be labor intensive and error prone. To expedite the development, as well as to improve the reliability of software, programmers use programming languages instead of writing machine instructions directly.

To see how a programming language can simplify the process of software development, consider the following sequence of machine instructions that adds two numbers. First, the computer loads the value stored at memory location X into a CPU register, then adds the number stored at memory location Y to it, and finally stores the result in memory location Z:

LOAD X

ADD Y

STORE Z

In a programming language such as FORTRAN (Formula Translator), for example, the programmer merely has to write Z = X + Y. This is easier for the programmer to write, but it is also easier for other programmers to read. This is important for the long-term maintenance of large systems, where a program may continue to go through development cycles years after the original programmer has left the company.

Even though most software is written using programming languages, computers still only understand CPU instructions. Thus, a special program called a "compiler" translates the programming language statements written by the programmer into the equivalent CPU instructions. Each programming language requires its own special compiler. Due to the generalized nature of programming languages, compilers are large, complicated programs that require months or even years of development time by teams of expert programmers. Developing a new programming language is therefore a long and expensive undertaking.

Hundreds of computer languages have been developed since the late 1950s, each with specialized purposes or particular kinds of users in mind. A few of the most common ones are briefly described below.

The first version of FORTRAN, which was developed for use in numerical and scientific applications, was released in 1958. LISP (List Programming), released the same year, was developed for use in artificial intelligence research. Both of these languages have been used extensively since that time and are still widely used.

COBOL (Common Business Oriented Language) was released in 1960 as a language to be used for business applications. It was designed to have an English-like structure and vocabulary so nonprogrammers (e.g., managers, accountants) could read it. While its effectiveness in this regard has been subject to debate, COBOL continues to be used extensively in business, particularly for large mainframe-based computer applications in banking and insurance.

Most programmers learn BASIC (Beginner's All-purpose Symbolic Instructional Code) as a first language. BASIC has an easy-to-learn syntax and does not require the use of complicated system software as do FORTRAN and COBOL. Because the syntax and resource usage of rudimentary versions of BASIC are so modest, it was the choice of microcomputer manufacturers in the early 1980s. At that point, the RAM supplied with such computers was as small as 8 kilobytes, and the BASIC interpreter and system software were permanently stored in read-only memory (ROM). More recent versions of BASIC take advantage of the larger capacity and increased speed of personal computers to offer more language features. Some versions of BASIC now resemble Pascal, a language that was developed in the late 1960s for programming education and that included sophisticated language features to help programmers avoid common errors in the structure of their programs.

During the 1980s, C became a widely used language. Although it has a sophisticated syntax, allowing programmers to write statements that would be very difficult and tedious to construct in machine language, it also allows the programmer to manipulate directly the register bits and memory addresses. Most other programming languages do not allow such direct manipulation. C was developed in 1972 at AT&T Bell Laboratories and was flexible and powerful enough that it was used to implement the UNIX operating system.

C continues to be used to implement operating systems and applications and is the principal language used to implement Linux, the freely distributed UNIX-like operating system developed by Linus Torvalds and other developers. The idea behind Linux is to provide computer users with a technically sophisticated alternative to other operating systems, particularly Microsoft Windows, and to do it in such a way that no large corporation or other centralized entity can control its licensing or otherwise dictate its terms of use.

Beginning in the late 1960s, attention turned to "object orientation" as a way to improve programmer productivity, software reliability, and the portability of programs between different operating systems. Object orientation allows programmers to think about program code and data much as individuals think about objects in the real world, with their inner workings being hidden and only the parts intended for user access being visible. An example of a real-world object that relates well to software objects is a portable radio; it is a self-contained object that has complicated inner workings but only presents a few simple controls to people. The radio is made to work by manipulating the external controls, not by tinkering with the complicated electronics inside of it. Software objects simplify software development by only allowing users (including programmers who use objects to build other programs) to manipulate the external attributes of objects. Only the developer of an object can tinker with its inner workings. Smalltalk, publicly released in 1980, was one of the first languages designed to be specifically object oriented, and it continues to be the model for object-oriented systems. C++ was developed as an object-oriented extension of C, but it has proved complicated and difficult to manage for large projects.

In 1995, Sun Microsystems introduced Java, an object-oriented language designed for developing Internet-based applications. Java's syntax is based on C, to encourage C and C++ developers to use it, and it does not require programmers who build network-aware applications to do complicated network programming. Java is also designed as a platform-independent language, allowing programmers to write code once and run it on any operating system and hardware. Java does this by running within a special environment that makes all platforms appear the same. Java "applets" are little programs that run in World Wide Web browsers and are often used as part of web-pages. Java "applications" run outside of web browsers, just like other applications do.

Influence of Software on Computer Markets

Even though people tend to think of computer hardware as the more substantial part of the computing package, software is often the more important consideration when buying a computer. Software is also more valuable because of the greater effort and expense involved in its development. Developing hardware is by no means trivial, but advances in hardware are typically manifested by increased speed and memory capacity. Advances in software are more difficult to measure, and they may only become apparent to users who have specialized needs or who are in particular circumstances.

Once users find software that satisfies their needs, they typically do not want to change, even when a new version or a competitor's version becomes available that may better serve them. The use of a particular piece of software represents not only an investment in that software and the hardware to run it, but also in training of the personnel who use it and do collaborative work with it. In this way, the use of particular kinds of software (as with any other tool) becomes enmeshed in the culture of the community that uses it. As time goes on, changing to a different system becomes more expensive. Therefore, the software company that establishes a greater market share first will most likely dominate the market thereafter.

This was the case with IBM, which dominated the computer hardware and software market from the 1950s through most of the 1980s, even though its hardware and software were not particularly advanced. They were sufficient to do the data processing jobs their customers required, and IBM's sales and service staff made up for any deficiencies that remained.

By the late 1990s, Microsoft had taken over the dominant position in the software market that IBM had once held. Microsoft uses its dominance in the operating system market to leverage sales of its application software, which it claims makes the best use of its operating system features. However, the extent to which Microsoft has pursued this dominance has caused them to have legal difficulties. Many competing software companies have successfully sued Microsoft for predatory business practices as well as for breach of licensing agreements. Most significantly, in late 1999, the U.S. Department of Justice found Microsoft in violation of antitrust statutes.

Conclusion

Computer software is an integral part of everyday life, not only in the use of personal computers but also behind the scenes of every business transaction, telephone call, and even in the use of everyday devices such as automobiles. Even devices that are not ostensibly computers may contain one or more small, embedded computers to enhance their operation in some way. All of these computers depend on the proper operation of software to accomplish their tasks. In certain respects, the operation of software is indistinguishable from the operation of the device that houses it, and some devices that were introduced in the late 1990s (such as DVD players and other digital media devices) would not even be possible without software.

Software will continue to be an ever more pervasive presence for the foreseeable future; it will become increasingly difficult, if not impossible altogether, to do anything without using software in some way. This presents challenges on a number of fronts, the most important being that the software be reliable and that people have control over how it is used, especially when it involves the transmission of personal information over data networks such as the Internet.

The Open Source Initiative (OSI), of which the Linux operating system is a part, seeks to improve the software development and distribution process by having a large and loosely knit group of developers write code that is freely available to all who use it, as well as freely modifiable by developers who discover bugs and other problems with the software. This is in contrast to the corporate model of software development, where only the company that produces the software maintains it and users of the software have no access to the source code.

See also: Computer Software, Educational; Computing; Digital Communication; Digital Media Systems; Internet and the World Wide Web; Privacy and Encryption; Standards and Information; Systems Designers.

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COMPUTER SOFTWARE, EDUCATIONAL

Educational computer software inherited from television the hope for revolutionizing educational practice. In addition to the audiovisual qualities found in educational television, computers offered learners interactivity, immediacy of feedback about responses, and control over learning experiences. Academic subjects such as mathematics, science, history, and reading could be taught to children in an efficient manner. Nonetheless, not all computer applications are alike in the educational opportunities that they afford children.

Basic Applications

In his book *Mindstorms: Children, Computers, and Powerful Ideas*, Seymour Papert (1980) advanced the idea that computers can teach children by serving as a tutor, a tool, or a tutee. As a tutor, the computer became an extension of teaching machines in which children learn by drill and practice. The computer tutors the child until the child masters that content. Lessons can be tailored to the knowledge bases of individual learners, and interactive contingent feedback allows children immediate knowledge about the accuracy of their responses. The research literature on computerassisted instruction (CAI) demonstrates that drill and practice applications are effective in teaching children basic knowledge and even cognitive skills.

As a tool, computers can be used by children in their search for, and in their communication of, knowledge. Word processing packages are tools that children can use to meet their learning goals and objectives. Writing can be edited quickly and efficiently. Spell checkers automatically highlight words that are spelled incorrectly. Functions such as cut and paste, activities that were once done by hand with real scissors and tape, are now done electronically by computers. Children also use the computer as a tool for collaborating with others, particularly over the Internet.

Papert (1980) argued that the most powerful educational computer application, which is the least used option by children, is when the computer is a tutee. As part of this application, children tell the computer what to do. More specifically, children actively control the computer with their own programs, thereby mastering its codes and inner workings by engaging in cognitive activities such as logical thought, debugging, and planning. Research conducted by Yasmin Kafai (1995) demonstrated that child programmers use abstract cognitive skills when constructing logical flow charts to make fraction programs. Even so, other researchers, such as Diane Poulin-Dubois and her colleagues (1989) have found that learning a computer program designed to teach children geometry yielded specific skills but not general cognitive effects.

One way to foster children's involvement with computers is to embed the content in intrinsically interesting learning environments. In such applications, children become involved with the interactive software and master learning activities, such as reading along with a videodisc or a CD-ROM storybook or learning to read and write words within interesting computer simulations. Research by Carol Chomsky (1990) suggests that children are sometimes more motivated to learn in these interesting computer environments than when the same lesson is taught by a live teacher. More important, the research summarized by Sandra Calvert (1999a) shows that children learn and retain more of the educational material, recognizing new words or understanding complex concepts about how the brain works. These applications work for most children, including those with developmental difficulties such as autism.

Software Production Feature

Attractive formal production features from television can also be adapted to create intrinsically interesting computer environments. Formal features are audiovisual production features, such as action, sound effects, and language, that structure and represent the content that is to be learned. Formal features can be used to motivate, to focus attention selectively on important content, to provide visual and verbal modes to represent content, and to reward children for correct responses.

Moderate action has been a particularly useful feature for teaching children. According to research summarized by Calvert (1999b), when objects on a



Some educational software, such as Reader Rabbit, helps young children learn to read by presenting the process in the context of a game. (Wolfgang Kaehler/Corbis)

computer screen move rather than simply appear in still frame, children are more likely to select those objects, produce those object names, and remember those objects. Beneficial effects of action are most pronounced for young children and for those who have reading difficulties. These findings suggest that action is a developmentally appropriate mode that young or developmentally delayed children can use to represent content.

Production features, however, can also distract children from the learning task. For example, in one study summarized by Aletha Huston and John Wright (1998), first-grade boys became so interested in attractive CD-ROM production features that they rushed through an interactive story, later recalling less of the story material than children who saw the story without interactive capability.

Multimedia Teaching Methods

Anchored instruction is another method for creating intrinsically interesting learning environments for children. In anchored instruction, educational concepts are linked, or anchored, to entertaining, real-life material. For example, film situations such as Indiana Jones using his bullwhip to swing across a pit in *Raiders of the Lost Ark* are used to teach children math concepts. In addition to using the height of Indiana Jones and the length of the bullwhip to figure out how far he had to jump, the children can also apply this problemsolving approach to real-life problems that they encounter. According to research by Robert Sherwood and his associates (1987), such applications make learning fun while teaching children useful problem-solving strategies. Most of the research on anchored instruction was done with videodiscs, a device that has now been replaced by CD-ROMs.

The Internet provides academically oriented sites, including places to help children with their homework, to practice basic competency skills, and to explore areas that are of interest to them. Children collaborate online with other children throughout the world, including multinational efforts such as writing a joint newspaper.

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Multimedia environments are emerging as a preferred method for teaching children. *Voyage of the Mimi*, a series developed by Bank Street College, was one of the first multimedia applications in which books, television, and computer software were used to teach science lessons. Such lessons were initially embedded within stories presented through books and television programs. The lessons could then be mastered by interacting with complementary computer software. These kinds of multimedia environments will become the norm as technologies converge, with the Internet delivering educational software applications and video content online to children in their schools and in their homes.

See also: CHILDREN'S CREATIVITY AND TELEVISION

USE; COMPUTER LITERACY; COMPUTER SOFTWARE; EDUCATIONAL MEDIA PRODUCERS; INTERNET AND THE WORLD WIDE WEB; TELEVISION, EDUCATIONAL.

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SANDRA L. CALVERT

COMPUTER SOFTWARE, RATINGS FOR

See: Ratings for Video Games, Software, and the Internet

COMPUTING

Computers and computer networks have changed the way in which people work, play, do business, run organizations and countries, and interact with one another on a personal level. The workplace of the early twentieth century was full of paper, pens, and typewriters. The office of the early twenty-first century is a place of glowing monitor screens, keyboards, mice, scanners, digital cameras, printers, and speech recognition equipment. The office is no longer isolated; it is linked by computer networks to others like it around the world. Computers have had such an effect that some say an information revolution is occurring. This revolution may be as important as the printing revolution of the fifteenth century, the industrial revolution of the nineteenth century, or the agricultural revolutions of the ancient and medieval worlds.

The computer was invented to perform mathematical calculations. It has become a tool for communication, for artistic expression, and for managing the store of human knowledge. Text, photographs, sounds, or moving pictures can all be recorded in the digital form used by computers, so print, photographic, and electronic media are becoming increasingly indistinguishable. As Tim Berners-Lee (1998), developer of the World Wide Web, put it, computers and their networks promise to become the primary medium in which people work and play and socialize, and hopefully, they will also help people understand their world and each other better.

During the last half of the twentieth century, electronic digital computers revolutionized business, learning, and recreation. Computers are now used in newspaper, magazine, and book publishing, and in radio, film, and television production. They guide and operate unmanned space probes, control the flow of telecommunications, and help people manage energy and other resources. They are used to categorize and preserve the store of human knowledge in libraries, archives, and museums. Computer chips called "embedded microprocessors" are found in the control systems of aircraft, automobiles, trains, telephones, medical diagnostic equipment, kitchen utensils, and farm equipment. The effect on society has been so great that digital information itself is now exchanged more rapidly and more extensively than the commodities or manufactured goods it was originally supposed to help manage. Information has become an essential commodity and, some would argue, a necessary social good.

The history of computing is several stories combined. One is a hardware story—a tale of inventions and technologies. Another is a software story—a tale of the operating systems that enabled specific computers to carry out their basic functions and the applications programs designed to deliver services to computer users. A third story tells how computers provide answers to the problems of society, and how they in turn create new possibilities for society.

Computers and the Media

The computer has transformed print journalism and magazine and book production, changing the ways in which stories are researched, written, transmitted to publishers, typeset, and printed. Through computing and telecommunications, a news story breaking in Asia can be sent within seconds to North America, along with digital pictures. Word-processing software and more sophisticated desktop publishing programs allow authors to create and revise documents easily and to check them for spelling, grammar, and readability.

Copies of digital documents can be printed on demand, and because computers check for transmission errors, all the copies will be identical. While the first word-processing programs offered little more than typewriter-style characters, the introduction of graphical user interfaces (GUIs) in the 1980s and 1990s opened new design possibilities. Writers could choose from a variety of type fonts, select different page layouts, and include photographs and charts. Some feared that this might eliminate jobs since tasks performed by authors, editors, typesetters, proofreaders, graphic designers, and layout artists could all be performed by one person with a computer.

Laptop or notebook computers gave writers even more flexibility. A reporter on location could compose a story and transmit it immediately to a newspaper (using a modem and a hotel room telephone) on the other side of the globe and, perhaps, to wire news services such as The Associated Press or the Reuters news agency. Satellite uplinks, cellular phones, and infrared "beaming" between machines provide even more possibilities. Moreover, digital photography eliminates the time taken to develop photographs, and digital pictures can be transmitted as easily as text.

Computers have revolutionized radio, television, and film production as well. Computerized camera switching and special-effects generators, electronic music synthesizers, photographic exposure control, and digital radio and television programming are all examples. Computer graphics can be used to superimpose sports statistics over a picture of a game in progress or allow a commentator to explain a key play by drawing a diagram over a television picture. Computers have made it possible to produce the entire programming lineup of a radio station without relying on tape recorders except for archival materials or for recordings made in the field.

Digital sound editing can eliminate noise, mix voice and music, and give producers second-bysecond precision in the assembly of programs. Computerized film processing can provide better quality images or allow images to be converted from color to black-and-white and vice versa. While movie animation has traditionally involved photographing thousands of separately drawn pictures or "cells," computer animation can use fewer drawings and produce thousands of variations. Special effects are much more convincing when the computer handles the lighting, perspective, and movement within the movie scene.

Speech recognition and dictating software can convert voice recordings directly to wordprocessed text, and translation programs can then rewrite the word-processed text into another human language. Musicians can compose new works at a computer keyboard and create a printed score from the finished version.

Even when an organization's primary medium is print, radio, or television, it has become common

to provide more in-depth coverage on an associated website. While some radio and television networks simultaneously broadcast and webcast their programming, perhaps the most powerful potential will be found in ever-growing digital archives. Using search engines and, increasingly, programs called "intelligent agents," users can retrieve items from the archives, print fresh copies, or compare different accounts of the same event.

Most young people probably first use a computer for entertainment. Individual- and multiple-player games, online "chat" rooms, newsgroups, electronic mailing lists, and websites provide computer-mediated education and leisure activities that were never possible before.

At first, computer programmers wrote games to amuse themselves. The classic "dungeons and dragons" game, Adventure, invented by Will Crowther and Bob Woods, was a favorite. Players gave commands such as "go left" or "take lamp," and the computer printed replies such as "OK." There were no pictures. Simple games that used graphics, with names such as Pong and Pacman, became available during the 1970s. As personal computers and handheld games became practical to produce, an entire electronic games industry was born. Nintendo and Sega are two familiar games companies. Computerized video games and lottery ticket machines soon became such popular attractions in shopping malls and corner stores that critics began to warn that they might become addictive.

Research Databases

Computing has changed the way writers research and prepare scientific articles. During the early 1970s, a small number of databases containing "abstracts" (i.e., summaries of scholarly and popular articles) could be searched offline. Users submitted lists of subjects or phrases on coding forms. Keypunchers typed them onto computer cards, and operators processed them on mainframe computers. The answers would be available the next day. Library catalogs were printed on paper cards or computer output microform (COM). A microfiche is a transparent plastic slide, roughly the size of an ordinary index card, but it contains images of many pages of computer output.

The Library of Congress, and national libraries in other countries, had by this time converted most of the descriptions of the books they owned into machine-readable form. Toward the end of the 1970s, research databases and library catalogs were becoming widely available online. The Dialog database, and library services such as the Online Computer Library Center (OCLC), made it possible to search the contents of many journals or the holdings of many libraries at once. Standards such as the Machine-Readable Cataloging format (MARC) made it possible to exchange this information worldwide and to display it on many different types of computers. However, limits on computer disk space, telecommunications capacities, and computer processing power still made it impractical to store the full text of articles.

Because of the costs, researchers working for large institutions were the main users of these services. By the mid-1980s, when microcomputer workstations became widely available and compact disc read only memory (CD-ROM) became a practical distribution method, much research could be conducted without connecting to large central databases. Companies such as EBSCO and InfoTrac began licensing CD-ROMs to their subscribers. With better magnetic "hard" disks and faster microcomputer chips, full-text storage and retrieval finally became workable.

By the end of the twentieth century, databases and catalogs could be accessed over the Internet, on CD-ROM, or through dial-up connections. Some of the special databases include ERIC (for educational issues), Medline and Grateful Med (for medical issues), and Inspec (for engineering issues). Legal research was simplified by services such as Lexis and Westlaw, which allowed identification and cross-referencing of U.S. and international statute and case law. In one of the more interesting applications of computing technology, the Institute for Scientific Information in Washington, D.C., introduced its citation indexing services, which allow researchers to discover important authors and issues by revealing which authors quote one another. Some databases are free of charge, and some are available for a fee.

A researcher at a public library, in a television newsroom, or in a medical practice can perform searches against thousands of special databases and millions of sites on the World Wide Web. While this sort of research was possible with printed directories in the past, it was time consuming and labor intensive. However, searching for data electronically can have unexpected results. Because the computer does not really understand what the string of letters "Jim Smith" means, it will faithfully report any occurrence it finds, regardless of the context. Information retrieval theory and informetrics are two fields that study the implications.

The Computer Industry

In the late 1960s, some writers scoffed at the potential of computers. The mainframe machines of the time occupied entire rooms, and only large institutions could afford them. No computer ever conceived, suggested one writer, had ever weighed less than a human being or been capable of performing as many tasks.

Without the transistor and the integrated circuit, computers would still fill large rooms. Without the laser and improved plastics, optical storage media such as CD-ROMs and digital versatile discs (DVDs) would not be possible. Magnetic tapes and disks have also improved greatly over the years and can now store much more information than they could in the past. It is difficult to buy an item in the supermarket or to borrow a book from a library without that item having a barcode label on it. Credit and debit cards with magnetic strips make it easier to access bank accounts and make retail purchases. Inventions such as these are part of the story of computing, although they are often overlooked.

For example, a minicomputer of the mid-1980s could cost about \$500,000 and could contain 64 kilobytes (kb) of random access memory (RAM). By the end of the century, a magnetic floppy disk containing 1.4 megabytes (Mb) of memory sold for less than a dollar, a CD-ROM disk that held 650 Mb was less than two dollars, and desktop microcomputers with 64 Mb of RAM were common household items.

As the industry grew, so did the legends of inventors who made fortunes or revolutionized the industry. William R. Hewlett and David Packard started their company in a garage. Graduate students David Filo and Jerry Yang developed the Yahoo! Internet directory in a dormitory room. Steve Jobs of Apple Computer, Bill Gates of Microsoft, and the heads of many other companies in California's Silicon Valley became known around the world.

Computer engineers and programmers have often exchanged their ideas openly, out of scien-

tific duty. The Xerox Corporation hit on the idea of the graphical user interface (GUI), developed the "mouse," and then told everyone how to produce them. Linus Torvalds developed the Linux operating system as a personal project and then made it available for free. Universities also have a long history of developing software and computers and then sharing the knowledge.

The History of Computers

While digital computers are a relatively recent invention, analog devices have existed for thousands of years. The abacus, sometimes considered to be a computer, was used in medieval China and by the Aztecs of Central America, and earlier "counting boards" were found in ancient Babylon. Another analog device, the slide rule, continues to have a following because some engineers still prefer them to electronic calculators. Circular slide rules, called "dead-reckoning computers," were used by aircraft pilots well into the 1970s to perform navigational tasks.

During the Middle Ages, the Franciscan scholar Ramon Llull used circular disks that had letters and numbers (representing terms from philosophy) written on them. By turning the wheels, Llull could come up with new combinations of concepts. Llull's work continued to influence logicians. Gottfried Wilhelm von Leibnitz made it the topic of a treatise, *Dissertio de arte combinatoria*, in 1666.

During the industrial revolution, mass-production devices such as the Jacquard loom became common. Designs to be woven into cloth could be punched onto the cards that controlled the loom. Charles Babbage, working with Lady Ada Lovelace in the early nineteenth century, first thought of using punched cards to do mathematics. Their Analytical Engine wove numbers into tables the way the loom wove cloth from strands of thread. The modern Ada computer language commemorates their work. Toward the end of the nineteenth century, Herman Hollerith, who founded International Business Machines (IBM), developed the punched cards used in early digital computers.

In a 1936 paper, "On Computable Numbers," the British mathematician Alan Turing first suggested the idea of a general-purpose computing machine. With electronic digital computers, Turing's idea became realizable. Turing and the Hungarian-American mathematician John von Neumann are



Grace Hopper works on a 1944 manual tape punch, which was an early computer. (Bettmann/Corbis)

two of the many pioneers of digital computing. Turing designed machines called, individually, the Bombe and Colossus to break the "Enigma" cypher—a secret code used by Germany during World War II. He also proposed the famous "Turing test" for artificial intelligence. The Turing test suggests that if a person cannot tell the difference between responses from a computer and responses from a human, then the computer must be considered to be "intelligent."

The first generation of electronic computers, which included the Mark 1, the ENIAC, and other machines built with vacuum tubes, were huge, expensive, and apt to fail or "crash." Grace Hopper once repaired the U.S. Navy's Mark II computer by removing a moth from its circuitry. The term "debugging" is often associated with this incident.

The transistor made it possible to produce computers in quantity. However, mainframe computers such as the IBM 370 were still huge by modern standards, and only universities, government agencies, or large companies could afford them. By the 1980s, with integrated circuits, a new generation of minicomputers was born. Digital Equipment Corporation (later Compaq), Hewlett-Packard, and Data General were some of the key manufacturers. These machines were about the size of a refrigerator.

By the end of the 1970s, desktop microcomputers began appearing in smaller offices and in ordinary people's homes. Beginning with the Osborne, the Commodore 64, the Apple, and the IBM PC, microcomputers and their software systems came to dominate the market. These machines used microcomputer chips-room-sized central processing units shrunk to less than the size of a penny. The Intel 8080 and the Motorola 6800 were among the very first such chips, appearing in the latter half of the 1970s. Many programmers joked about these new "toys." During the next decade, microcomputers would grow into powerful workstations-powered by chips from Intel and Motorola and built by companies such as Sun Microsystems, IBM, Apple, Dell, Toshiba, Sony, and Gateway, to name just a few.

Digital Information

Computing involves three activities: input, process, and output. Data enters the computer through a keyboard or mouse, from a camera, or from a file previously recorded on a disk. A program or "process" manipulates the data and then outputs it to a screen, printer, disk, or communications line.

Over the years, many different input devices have been used, including punched paper tape, punched cards, keyboards, mice, microphones, touch-screens, and video cameras. Output devices have included paper printouts, teletypewriters, and video monitors. The part of the computer that does the processing is known as the central processing unit (CPU). Collectively, everything other than the CPU, including memory boards, disks, printers, keyboards, mice, and screens can be thought of as peripheral devices, or just "peripherals."

There are two sorts of computer software. Operating systems, such as Microsoft Windows, Macintosh, or UNIX, allow machines to perform their basic functions—accepting input, running programs, and sending output to users. Applications programs, such as word processors, Internet browsers, electronic mail programs, or database management programs, do the work required by computer users.

Digital computers use data that has been encoded as series of zeros and ones-binary digits or bits. Text, images, sounds, motion pictures, and other media can all be represented as strings of zeros and ones and processed by digital computers. Programs-the instructions on how to manipulate data-also are represented in binary form. The earliest digital computers were designed to store and manipulate the numbers and letters of the alphabet that were found on typewriter keyboards. The American Standard Code for Information Interchange (ASCII) uses 128 combinations of bits to represent the letters, numbers, and symbols on a typewriter keyboard. Plain text worked well when computers were used primarily for mathematics.

Binary numbers can represent visual and audio information as well. By the end of the 1980s, designers had expanded the coding systems to store drawings, photographs, sounds, and moving pictures. Each dot on a screen is called a "picture element" (or "pixel"). To display graphics on the screen, computers use groups of binary numbers—ones and zeros—to represent the color, intensity of light, and position of each pixel.

Modern computers almost always use some type of GUI. Programmers use small graphics called "icons" to represent a program, a document, a movie, or a musical work. When a user selects an icon, the computer can open a file or program that is associated with it. This technique is object-oriented programming.

When the price of computers dropped, it became possible to distribute work among several machines on a network instead of using a large central computer. A piece of software called a "server" could now send information to smaller programs called "clients" located at the workstations. Shared files remain on large computers called "file servers," so several users can access them at once. Internet browsers, such as Netscape and Internet Explorer, are good examples of "client/server" design at work, where the browser is a client and an Internet site hosts the server software and the large files of information.

There are many programming languages, each better at addressing certain types of problems. The Formula Translation language (FORTRAN) was developed to handle scientific problems. The Beginner's All-purpose Symbolic Interchange Code (BASIC) and the Common Business-Oriented Language (COBOL) were better for office automation. The languages C, C++, Java, and Visual Basic use libraries of small, interchangeable programs that perform frequently required tasks, such as sorting items or displaying them on a screen. Programmers can combine these small programs into more complex systems, allowing programmers to build new applications quickly. Other languages, such as Prolog and LISP, were invented for work in artificial intelligence, while Ada was designed to address military needs.

Once personal computers were available, the demand for special software packages or "applications" increased. Spreadsheets, such as the early SuperCalc and Excel, have simplified accounting and statistical processes, and they allow users to try out various financial scenarios. If the costs or quantities of items change, the results will appear immediately on the screen. A whole range of database management packages, including dBase, Fox-Pro, Oracle, and Access, help users do inventories, maintain customer profiles, and more. Because records in databases can be matched against ones in different files, say a customer demographic file with a warehouse inventory file, businesses can predict supply and demand trends and improve the delivery of goods and services. Geographic information systems, online census data, and telephone directories make it easier to market products in areas where there is demand. Some critics argue that using data for reasons other than those for which it was collected is an invasion of privacy. In many countries, freedom of information and privacy protection laws have been passed to address these issues.

Computing and Knowledge

Computers have changed the world in which people live and work, and they have provided new ways of thinking about, and making sense of, that world. At the beginning of the twenty-first century, computer science is a mature academic discipline, with almost every university or college offering computer courses.

As an academic subject, computer science may involve information theory, systems analysis, software engineering, electrical engineering, programming, and information studies that examine the use of digital information. The founders of information theory, Claude Shannon and Warren Weaver, published *The Mathematical Theory of Communication* in 1949. The mathematician Norbert Wiener, who coined the term "cybernetics," showed how computing theories could be applied to problems of communication and control in both animals and machines. Ludwig von Bertalanffy founded general system theory because he saw that large complex systems did not necessarily behave in the same what that their individual components did. He is considered one of the founders of systems analysis.

Professional associations have also played important roles in the development of computing theory, practice, and standards. The Association for Computing Machinery, the Institute of Electrical and Electronic Engineers, the International Standards Organization, and the W3 Consortium are all agencies concerned with computing methods and standards. Less widely known groups, such as the International Society for Systems Sciences and Computer Professionals for Social Responsibility, concern themselves with professional ethics and the social effect of computing. Computing has its own journals and magazines that are aimed at special groups of professionals and at consumers.

Modern computing researchers come from many backgrounds. In turn, scholars from other areas apply computing theory and systems analysis to their own disciplines—from philosophy to psychology to social work. Centers such as the Media Lab at the Massachusetts Institute of Technology or the Xerox Corporation's Palo Alto Researcher Center bring together experts from many fields to design "neural networks" that simulate the human brain, to build smaller and faster machines, or to find better ways of managing digital information. Nicholas Negroponte, Marvin Minsky, and their colleagues at the Media Lab are associated with developments in artificial intelligence and robotics.

Some people fear that while computers relieve humans of repetitive tasks, they may also "deskill" workers who forget how to do such tasks by hand. Others suggest that having to cope with computers on the job adds extra stress, raises expectations of promptness, and requires ongoing retraining of workers. Because computing has made it possible to recombine and repackage stories, pictures, and sounds, some fear that the work of authors may one day be regarded as interchangeable, much like mechanical parts. In addition, as people depend more on computers, they become more vulnerable to system failure. If the world's computers should fail all at once, economic and social chaos might result. A series of Internet "worms" and "viruses" heightened concern over society's dependence on computers during 1999 and 2000. Governments, banks, companies, and individuals worried that the clocks in their computers might fail at the beginning of 2000, but the "Y2K" crisis they feared did not occur.

Computer designers and computer users think about computers in different terms, and they use different jargon. Hackers, who explore aspects of computers that designers could not have foreseen, have their own way of looking at and talking about computers. People who use computers for destructive purposes are more properly called "crackers." Finally, those people who do not have access to computers run the risk of economic and educational hardships.

The Internet and the Future

During the early 1980s, the Defense Advanced Research Projects Agency (DARPA)—the central research and development organization for the U.S. Department of Defense—commissioned work on a standard design for its wide area networks, computer connections that could link entire countries or continents. In response, communications standards called the Transmission Control Protocol and the Internet Protocol were published in 1981.

Many computer networks, with names such as Decnet, Usenet, and Bitnet, were already in operation, but within about a decade, the new standards were adopted around the world. At first, because there were no graphics, the Internet was used for electronic mail and discussions and for text-only directory services such as Gopher (from the University of Minnesota) and WAIS (wide area information service). Then Berners-Lee and his colleagues at CERN, the European nuclear research center in Switzerland, came up with a new set of protocols that could be used to mix pictures and sounds with text and let users locate any document on any network computer anywhere in the world. The result was the World Wide Web.



The Internet has created a new forum for expression and discussion of social issues. In April 2000, for example, the Dalai Lama, in New Delhi, India, was given a demonstration of a website that is intended to provide basic knowledge of a citizen's rights during a police complaint. (Reuters NewMedia Inc./Corbis)

Briefly, this is how the web works. Every computer on the Internet has a numeric Internet Protocol (IP) address, which looks like four groups of numbers separated by periods. Because humans would have trouble with addresses such as 123.12.345.1, websites also have "domain names," such as "wayne.edu" or "acme.com," which are easier to understand. Scattered around the world, domain name servers (DNSs) provide large telephone-directory style lists, which map the names to the numbers.

Every item on the web, whether a file of text, a picture, or a sound, can be found and retrieved by its uniform resource locator (URL). A URL contains the domain name of the computer on which the item is stored and, optionally, additional information about the file folders and file names on that computer. Documents on the web, called "pages," are written in the HyperText Markup Language (HTML) and exchanged using the HyperText Transmission Protocol (HTTP). Berners-Lee (1998) believes that once most of human knowledge is made available over the Internet, and once the Internet becomes the primary way in which individuals communicate with one another, humans will have the wisdom to use computers to help analyze society and to improve it.

While the promise is bright, the Internet presents many challenges for information scientists. While URLs provide a way of locating individual documents anywhere on the network, the web is always in flux, and URLs are quite "volatile" or apt to change from day to day or even from minute to minute. In addition, because material on the web may look highly polished, it is sometimes hard for users to distinguish reliable information from unreliable information. Metadata—data about data—is one of the schemes proposed to reduce confusion. Metadata tags are similar to subject, author, and title entries in a library catalog, and can be written at the top of a web document.

Increasingly, the computer network is the medium through which scientists assemble and exchange knowledge from many sources and train future generations. The Human Genome Project and simulations to train surgeons or aircraft pilots are examples. Many scholars publish directly to the Internet by posting their discoveries to the World Wide Web, newsgroups, or mailing lists. This speeds the process of information exchange, but since such works are not examined by editors, it also increases the chances of error and makes it harder for readers to determine whether the information is reliable. The need to be able to index and describe web-pages has led to the development of metadata as a way of categorizing electronic documents. However, with millions of authors publishing to the web, the task of indexing and describing their work is staggering.

Computers continue to become smaller, less expensive, more powerful, and more essential to society. So far, dire predictions of de-skilled workers or massive unemployment due to an increased use of computers in the workplace have yet to materialize. In the future, computers will be still smaller and many times more powerful as engineers find ways to use nanotechnology to build microscopic machines. Some people predict that computers will eventually use individual molecules, or even subatomic particles, to store and manipulate the ones and zeros that make up digital information.

By building microprocessors into cars, aircraft, and even household devices such as microwave ovens, designers have produced a raft of "smart" devices. Steve Mann and his colleagues at MIT and the University of Toronto have even developed smart clothing, which can detect signs of sudden illness in the wearer. Increasingly, computers will be able to assist people with disabilities. Smart cars and smart houses have obvious social benefits. However, the same technologies can be used to produce smart weapons. Sensors in a smart office can prevent burglaries or announce guests. They can also monitor employees, minute by minute. Will ubiquitous computers have positive or negative effects on society? This is a question for which only the future can provide an answer.

See also: Artificial Intelligence; Computer Software; Computer Software, Educational; Databases, Electronic; Diffusion of Innovations and Communication; Digital Communication; Digital Media Systems; Geographic Information Systems; Internet and the World Wide Web; Knowledge Management; Libraries, Digital; Library Automation; Privacy and Encryption; Ratings for Video Games, Software, and the Internet; Retrieval of Information; Standards and Information; Technology, Adoption and Diffusion of; Webmasters.

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CONFLICT AND GROUP COMMUNICATION

See: Group Communication, Conflict and

CONSERVATION

See: Archives, Public Records, and Records Management; Archivists; Conservators; Librarians; Libraries, Functions and Types of; Museums; Preservation and Conservation of Information

CONSERVATORS

Conservators are trained professionals who focus on the care and restoration of objects that have cultural or historical value. Such objects may include paintings and sculptures, fine prints, textiles, books, photographs, archival records and paper, and archeological artifacts. These artifacts are considered valuable sources of information for study and research, specifically in their original form. Conservators develop skills that allow them to examine an artifact, learn about its original form and purpose, and develop a plan for the care and maintenance it requires for continued use, study, and long-term preservation. Conservators receive training that specifically relates to this process and includes advanced study in artistic, historical, and scientific topics that provide a greater understanding of the materials with which they work.

A conservator determines what an artifact is composed of and what is required to preserve an artifact in its original form or as close to that original form as possible. A conservator must examine an artifact to determine the amount of damage or deterioration that has occurred. This examination often involves research concerning the history of an artifact and its cultural significance. Conservators also gather information through scientific analysis of the properties of an artifact—always ensuring that materials used in conservation treatments do not damage or destroy an artifact.



Conservators used computer technology in 1989 to help with the restoration of works by Tiziano Vecellio in Venice, Italy. (Vittoriano Rastelli/Corbis)

Professional conservators are trained to develop treatment methods that maintain the form, structure, and appearance of artifacts, to fix and repair damage to objects, and to develop treatments that stabilize, decrease, or halt further damage and deterioration. Treatment methods, most of which are done painstakingly by hand, may result in restoring an artifact to a close facsimile of its original appearance. Types of conservation treatments include cleaning and repairing tears in paper, creating envelopes or boxes to house artifacts (such as books), restoring paintings, removing mold and adhesives on objects, and developing recommendations for the proper storage of artifacts. When applying treatments, professional conservators are careful to make sure that any repairs or steps taken to stabilize an artifact do not alter or destroy its original form or historical integrity. For example, a conservator might repair a torn photograph or clean a photograph using appropriate solvents that do not cause staining, abrasions, or loss of the original image. Conservators also take steps to ensure that treatments or repairs made to an object can be reversed if necessary.

Conservators document the condition of an object before treatments are undertaken, the types of treatments they perform, and the condition of an object after treatment. Conservators also develop recommendations and guidelines for continued care or preventative care of artifacts and make recommendations concerning the type of storage environment that should be used to assure long-term preservation of an artifact. For example, a conservator can determine which type of storage enclosure will protect a photograph from dust and light, discuss proper handling methods, and recommend a long-term storage environment with temperature and humidity controls. In addition, conservators work with individuals who administer collections in order to assess conservation and preservation needs, to establish priorities for conservation work, and to develop cost estimates and budgets for conservation treatments.

All conservators are involved in the treatment and care of artifacts or collections of artifacts. There are specializations within the profession that allow an individual to develop skills that may adapt to the needs of a particular institution, focus on specific types of objects, or involve other conservation work such as preservation, administration, or education. Conservators may be employed in museums, libraries, archival repositories, or similar institutions. Alternatively, conservators may be employed on a contractual basis by institutions that do not have the resources to maintain a conservation laboratory or preservation department. Private collectors, as well as institutions such as libraries, archives, and museums may hire a conservator on such a contractual basis. Conservators may also choose to maintain their own businesses.

Individuals who are interested in conservation as a career must acquire the appropriate scientific, historical, and cultural knowledge that is necessary to become a practicing conservator. Those interested in a career as a professional conservator seek academic training in a graduate-level program. Coursework in conservation programs provides the theoretical and scientific background required for the application of conservation methods and treatments in a professional setting. Graduate programs typically include core classes in such areas as chemistry, studio art, art history, anthropology, archaeology, and related classes in the humanities and the sciences, as outlined by the American Institute for Conservation in "Conservation Training in the United States" (2000). Admission requirements and graduation requirements will vary depending on the program. Information about the individual prerequisites for graduate work in conservation is usually provided by academic institutions and by professional conservation associations.

Graduate programs in conservation are now recognized as the standard for training professional conservators, but internships are a valued and integral part of graduate coursework and research. Internships provide an opportunity for students to receive instruction in a variety of conservation methods, to see how these methods are practiced, and to have an opportunity for handson training. Internship opportunities allow a student to gain experience and training in an area most closely related to their interests. Individuals who are interested in conservation internships may find such opportunities through graduate programs, professional conservation organizations, or by contacting a conservator.

Once an individual becomes a practicing conservator, continued professional development is required, particularly in areas of technology, research, and conservation treatments. Participating in workshops, continuing education classes and seminars, attending conferences sponsored by professional conservation organizations, and reading current literature offer opportunities for professional development. Conservators also have a specific philosophy and set of guidelines that assist them in achieving a high standard of work. Conservators are encouraged to maintain a commitment to these standards and high levels of performance.

See also: Archives, Public Records, and Records Management; Archivists; Libraries, Functions and Types of; Museums; Preservation and Conservation of Information.

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M. E. DUCEY

CONSUMER CULTURE

Any spectator of the contemporary visual landscape readily recognizes the prominence of material goods and their consumption in the increasingly global culture. Some observers argue that the landscape is "littered" with consumption icons and that it is a product of a larger project to create and sustain consumer culture. Other, less conspiratorial perspectives at least acknowledge the role that the "dream worlds" of the media play in perpetuating consumerism.

Defining Consumer Culture

There are many definitions of consumer culture. To begin, consumer culture should not be confused with two of its attributes: consumerism and materialism.

According to Yiannis Gabriel and Tim Lang (1995), consumerism has at least five distinct connotations. It is a moral doctrine, a means for demarcating social status, a vehicle for economic development, a public policy, and a social movement. Consumerism is defined here as the collection of behaviors, attitudes, and values that are associated with the consumption of material goods.

Materialism is another perspective that is prevalent in consumer culture. The term "materialism" also has a rich etymology. However, as it relates here, Russell Belk (1985, p. 265) defines materialism as "the importance a consumer attaches to worldly possessions." At the highest levels of materialism, possessions assume a central place in a person's life and are believed to provide the greatest sources of satisfaction and dissatisfaction. While one might readily think that materialism is a good synonym for consumerism, materialism, at least as it is defined here, only covers a part of consumerism. Namely, materialism deals only with the social value of material goods.

Consumer culture, which subsumes both consumerism and materialism, has been studied from the perspective of a variety of disciplines, including communication, cultural studies, theology, sociology, psychology, marketing, anthropology, and philosophy. Regardless of the disciplinary approach, a central feature of consumer culture is the relationship between people and material goods. Generically, consumer culture is a social arrangement in which the buying and selling of goods and services is not only a predominant activity of everyday life but also an important arbiter of social organization, significance, and meaning.

Origins of Consumer Culture

In a review of historical accounts of consumption and culture, Grant McCracken (1988) remarks that there is little consensus as to the origins of consumer culture. According to the perspective of Neil McKendrick and his associates (1982), consumer culture began in eighteenthcentury England with the commercialization of fashion precipitating a mass change in taste. According to these historians, the new predilection for style fueled a demand for clothing that was mass-produced through technical innovations in the textile industry and mass-marketed through innovations in printing technologies that afforded wide-scale advertising.

Another historian, Rosalind Williams (1982), claims that the consumer revolution began in latenineteenth-century France, when the pioneering efforts of French retailers and advertisers transformed Paris into a "pilot plant of mass consumption" through the Paris expositions of 1889 and 1900. Williams argues that the expositions significantly contributed to the development of the department store and the trade show, key factors in the development of consumer culture.

Finally, McCracken (1988) suggests that it may be less useful to identify the specific points of origin for the consumer revolution than to note patterns of cultural change that foretold the radical restructuring of society. He identifies three moments in history that undergird the development of modern consumer culture. The first was Elizabethan politics in sixteenth-century England, where Queen Elizabeth I introduced the use of objects to her highly ceremonial court to communicate the legitimacy of her rule. The second was the increased participation of the masses in the marketplace in eighteenth-century Europe. As more members of the culture could participate in the marketplace because of the widespread prosperity of the industrial revolution, the marketplace expanded, creating an explosion of consumer choices. The gentry, the middle class, and the lower class perceived and adopted the social significance of goods and attempted to appropriate those significances for themselves. The third was the institutionalization of consumption through the emergence of the department store in the nineteenth century. The department store, McCracken argues, fundamentally changed the nature and the context of purchase activity as well as the nature of the information and influence to which the consumer was subjected.

Don Slater (1997) summarizes these thoughts by arguing that consumer culture began with a wide penetration of consumer goods into the everyday lives of people across social strata, that consumption was ignited through a new sense of fashion and taste, and finally that the culture was cemented through the development of infrastructures, organizations, and practices that took advantage of the new markets, namely, the rise of shopping, advertising, and marketing.

The Role of the Media in Consumer Culture

From the beginning of consumer culture, the media, particularly print advertisements, were used to help inculcate demand for newly massproduced goods. Stuart Ewen (1976) maintains that before the advent of mass production, industry had produced for a limited, largely middle- and upper-class market. However, with the revolution in production, particularly Fordism (i.e., the use of the assembly line to mass-produce consumer goods), industry required an equivalent revolution in consumption. The mechanism of mass production could not function unless markets became more dynamic, growing horizontally (nationally), vertically (into social classes not previously among the consumers), and ideologically. The media were used to encourage people to respond to the demands of the productive machinery. Ewen identifies "captains of consciousness," industry leaders and advertising executives, as the chief architects of the new social structure that privileged the consumption of mass-produced materials.

A structural concern of the "captains" was the provision of resources, namely time and money, for greater consumption by the masses. Ewen (1976) asserts that the general strategy to consumerize labor began in the 1920s as laborers were given higher wages in the hopes that they would purchase some of what they produced. They were also given more time in which to spend those wages because shorter work hours were made possible as a result of the greater efficiency of the production line. That labor movements were already pushing for these concessions made the job of the "captains" easier.

Once structural barriers to consumption were set aside, the industrialists needed to change the attitudes of the masses so they would be favorably disposed to purchasing the goods that they were constructing. Inspired by the social psychology of Floyd Henry Allport (1924), advertisers tried to grasp the nature of human motivation. They believed that if human "instincts" were properly understood, they could be manipulated not only to induce consumers to buy particular products but also to create in them a habitual desire to participate in the marketplace to extract social meaning. That is, not only might the consumers buy the advertised product, but they might also use the advertisement to understand their social selves, others, and the culture at large. Advertisements were to be the substance of mass culture's dreams. In such a case, the social control of the captain would be maximized (Ewen, 1976, p. 81).

As Ewen (1976) indicates, this project of social control was accomplished through the presentation of partial truths depicted through commercialized expression, namely art. Ewen states, "Artists, often gifted in their sensitivities to human frailties, were called upon to use those sensitivities for manipulation" (pp. 65–66). The images these artists produced painted industry as a benevolent fatherly figure that held society together, able to fulfill all of mass society's dreams by depicting perfect harmony, happiness, and opportunity for all.

In Advertising the American Dream, Roland Marchand (1985) provides a more neutral analysis of the early role of media in the promulgation of consumer culture. In doing this, he analyzed more than 180,000 advertisements, corporate archival data, trade journal articles, and even the minutes of advertising agency meetings during the period between 1920 and 1940. Marchand argues that advertisers in the 1920s assumed the dual function of "apostles of modernity"-heralds of modern technologies and missionaries of modern styles and ways of life-and "social therapists"assuaging feelings of diminution and alienation stimulated by the fast pace of modern production and consumption. Advertisers presented a twosided message about the good news of modernity. First, they praised the coming of a corporate, technologically sophisticated, urban civilization. Second, they reassured the masses that this civilization was a kind of self-correcting system that produced numerous products that were capable of solving the problems and calming the anxieties that it generated.

Marchand's analysis of the advertisements of the 1920s and 1930s revealed two categories of conventions. The first comprised a series of textual parables and the second a host of visual clichés that advertisers repeatedly used to advise



The Welch Grape Juice Company, Westfield, N.Y.

A 1920s advertisement for Welch's Grape Juice supports the notion of a growing consumer culture where people have time and money available for leisure activities such as picnics. (Bettmann/Corbis)

consumers of the promises and the perils of the times. In terms of parables, the first he discusses is that of the "first impression." This parable stresses the importance of external appearance in an impersonal society in which one is under the constant surveillance of strangers who judge character. These advertisements advised the consumer to avoid the disastrous consequences of body odor, bad breath, and other problems by using the advertised product. The second parable regards the "democracy of goods," which held that social equality was realized through the genuine opportunity of everyone to buy the same staple products (e.g., toothpaste, cereal, mattresses) that the wealthy purchase. Another parable, that of "civilization redeemed," reassured Americans that modernity would rescue itself from its own shortcomings. As an example, vitamin advertisements promised to supplement the nutrient-impoverished diets of people caught up in the fast pace of modern life. Finally, the parable of the "captivated

child" offered consumer products as a way of placating even the most angry children, making other forms of coercion obsolete.

Advertisers also insinuated products into the consciousness of consumers by using visual clichés. The expanded technology for reproducing illustrations and using color made visuals an attractive alternative for advertisers. Because psychologists had regularly advised that pictures could best stimulate the basic emotions, the strategy was irresistible. Visual images also became the preferred modes of presentation because, as Marchand (1985, p. 236) states, of their utility "in cases where the advertiser's message would have sounded exaggerated or presumptuous if put into words, or where the advertiser sought to play upon such 'inappropriate' emotions as religious awe or thirst for power." Visual clichés include the office window through which a business executive gazes on a dynamic cityscape as the master of all that is surveyed, the family painted in soft focus, the towering and resplendent heavenly city of the future, and the harmonious world saved by modernity. Marchand suggests that advertisers appropriated sacred symbolism to imbue products with spiritual significance. Goods were presented in heroic proportions, towering over towns of consumers. Adoring throngs or smaller collections of worshipful attendants surrounded them. Often, products were juxtaposed against poignant moments, such as weddings, or were the object of radiant beams of light.

The Media in Contemporary Consumer Culture

If consumer culture was established at the beginning of the twentieth century, what role do the media play in its promulgation in the twentyfirst century? With consumer culture established, the media are no longer tools of its development but rather transmit the culture to the young and reinforce the culture among adults. This process of transmission and reinforcement is referred to as socialization, and in the case of consumer culture, it is referred to as consumer socialization.

In the seminal work in this area, Scott Ward (1971, p. 2) defined consumer socialization as the "processes by which young people acquire skills, knowledge, and attitudes relevant to their functioning as consumers in the marketplace." He argued that in order to understand the consumer behavior of adults, one must first grasp the nature

of the childhood experiences of the adults, since those experiences shape patterns of cognition and behavior later in life. Ward sought to understand how children acquire attitudes about the "social significance" of goods, or how they learn that the acquisition of some kinds of products or brands of goods can be "instrumental to successful social role enactment" (p. 3).

The role of the consumer is defined by the skills, attitudes, and behaviors that are associated with consumption. Consumer skills include such practices as pricing goods before making a purchase decision, knowing the rights of the consumer, and budgeting. Consumer attitudes include the affective orientation toward goods, both general and specific, the value placed on the practice of consumption and the products consumed, and the evaluation of the marketplace. Consumer behavior simply refers to the consumption of goods.

Agents of consumer socialization can range from the small-town store clerk who teaches children to exchange bottles for money that they can use to buy candy, to the big-city billboard that depicts a liquor as a means to high social status and pleasure for adults. However, there are four agents of consumer socialization that have been formally studied in the literature: family, peers, mass media, and schools.

Whereas print advertisements were the medium of choice for establishing consumer culture, television has served a vital role in socializing new consumers and reinforcing consumerism among older ones. There are at least three different ways in which television may be related to consumer culture. The first way suggests direct effects through a learning model (e.g., social cognitive theory). It may be that individuals watch portrayals of consumerism and then model consumerist behaviors and adopt socially rewarded consumerist attitudes and values. Television also may be related to consumerism by influencing viewer perceptions of the world (e.g., cultivation theory). Finally, television may simply reflect the existing consumer culture.

Regardless of the mechanism, perhaps the most prevalent media messages for consumer socialization are television commercials. Interspersed between television programs, commercials are explicitly geared to prompt viewers to participate in consumer culture. Leslie Savan (1994) reports that the average television viewer in America is exposed to approximately one hundred television commercials a day.

For the most part, the messages for consumer socialization found in television programming are not as explicit as those found in advertising. Nonetheless, they are present and add to the cumulative effect of the general consumption message of television. One manner by which consumer socialization messages are implicitly conveyed is through the presentation of a world of affluence. Early studies of television, conducted by Dallas Smythe (1954) and Melvin DeFleur (1964), for example, during the 1950s and 1960s found a strong bias toward portrayals of middleand upper-class lifestyles in network programs. More recently, George Gerbner (1993) analyzed 19,642 speaking parts that appeared in 1,371 television programs (including cable) from the 1982-1983 season through the 1991-1992 season. The content analysis of these programs revealed that, on average, 92.3 percent of the characters were middle class, 1.3 percent were clearly lower class, and 4 percent were clearly upper class. Gerbner concluded that in the overwhelmingly middle-class world of television, poor people play a negligible role.

Another manner in which television conveys consumer culture is through its biased presentation of high-status occupations. Such occupations are esteemed at least in part because of the high incomes and consumption power that they wield. Nancy Signorielli (1993) conducted an extensive content analysis of the occupations presented in prime-time programming. She examined weeklong samples of prime-time programs between the 1973 and 1985 television seasons. When compared to U.S. census reports, professionals were overrepresented by 66 percent on television. Doctors, lawyers, judges, and entertainers were some of the overrepresented occupations. Teachers, clerical and secretarial workers, sales workers, and other blue-collar workers-occupations that are generally associated with less than affluent lifestyles-were some of the underrepresented occupations.

Some work has been done on the effects of media messages on socializing people to consumer culture. As is true of most other areas, more work is needed to draw definitive conclusions about the nature of the relationship; however, examples of work in the area that uses different methodologies indicate that the media play at least a modest role in promulgating consumer culture. Survey research has indicated that television viewing is related to consumer role conceptions (Moschis and Moore, 1978), and motivations to view television commercials are related to the adoption of materialistic values among adolescents (Ward and Wackman, 1971). Longitudinal research has indicated that exposure to television advertising leads to higher levels of subsequent (fourteen months later) materialism among adolescents who are not already materialistic or who do not discuss consumption issues with their families (Moschis and Moore, 1982). Finally, experimental research has shown that preschoolers who are exposed to advertising are more materialistic than their counterparts who are not exposed to advertising (Goldberg and Gorn, 1978). In this research, children who were exposed to advertisements were twice as likely as children who were not exposed to advertisements to choose to play with an advertised toy instead of playing with a playmate in a sandbox.

The research in the field as a whole does not permit definitive conclusions about the effect of the media on promulgating consumer culture. Many questions still need to be addressed to explain a relationship that is likely to be small and cumulative over time. What role do the media play in conveying other aspects of consumer culture to audiences? Through selective exposure, can audiences avoid consumer culture messages? How do the media reinforce consumer culture among adult audiences? These are just a few unanswered questions in an area that begs further exploration.

See also: Advertising Effects; Children and Advertising; Cultivation Theory and Media Effects; Cultural Studies; Culture and Communication; Culture Industries, Media As; Social Cognitive Theory and Media Effects.

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Emory H. Woodard

CONSUMER ELECTRONICS

"Everything that can be invented has been invented." This comment, commonly attributed to Charles H. Duell, commissioner of the U.S. Office of Patents in 1899, is intriguing, if not entirely accurate. At the end of the nineteenth century, it did seem as if everything that was absolutely necessary for a rural/agrarian or an urban/industrial mode of living had been invented. By the end of that century, transportation innovations including the railroad and the steamboat were flourishing, the nascent automobile had been developed, and experiments with flight were beginning to show promise. Communications systems had been advanced to include the telegraph, telephone, and radio telegraphy. Both factory owners and farmers benefited from machines that could do jobs faster and better than humans could do them. Few could have predicted the revolution to come that led the world beyond the industrial age and toward the information age. The twentieth-century innovations that would forever change almost every aspect and sphere of human behavior would not be foreseen until the final decades of the century, by which time they had spawned a multibillion-dollar consumer electronics industry.

History

The term "consumer electronics" encompasses a variety of products ranging from home theater systems to cellular telephones to personal computers. Though no one person can be identified as the "founder" of consumer electronics, Thomas Edison would be most deserving of the title. Edison's invention of the electric typewriter in 1872 and the phonograph in 1877 suggested the early potential of a new breed of business and entertainment devices. It was his discovery called the "Edison Effect," patented in 1883, that actually led to the creation of consumer electronics. Using the Edison Effect to control electricity, Edison opened his first experimental power station in the early 1880s. Though later perfected using the alternating current (AC) system, the electronics age commenced with Edison's power system. Over the course of the twentieth century, appliances and household devices were either redesigned or created to take advantage of modern electrical service to the home.

The radio, not the phonograph, can be considered the first consumer electronic device. Though the phonograph was invented and sold decades before the radio, it was initially marketed as a mechanical device, while radio was introduced to the public as a fully electrical device. Radio history is rooted in nineteenth-century wire transmission technologies that gave rise to the telegraph (1820s) and the telephone (1870s). Guglielmo Marconi, generally considered to be the inventor of radio, first transmitted telegraphic dots and dashes without the use of wires in the 1890s. In the early twentieth century, tremendous advances led to radio telephony that allowed voice and music to be transmitted without wires. Radio sets of the 1900s and 1910s were limited to a growing number of tinkering enthusiasts. The general public did not own radios until the 1920s.

In 1920, the first radio stations began operation. Public displays that were held at department stores showed consumers the magic of the new device, with its ability to carry live music and information. These displays were effective and led to the initial acceptance of radio sets. Radio networks that were created later in the decade introduced programming that further advanced receiver sales, and radio supplanted the phonograph as the most popular consumer entertainment device. Much like the phonograph sales in the nineteenth century, radio sales did not take off until there was software that consumers found of value. The software of the phonograph was recorded music on discs and cylinders; the software of radio-and later television-was live programming.

One cannot underestimate the importance of the radio and the phonograph in the modern consumer electronics industry. These innovations had a direct effect on the development of a new breed of consumer electronic devices, including television, stereo systems, cassette and compact disc (CD) players, and home theater systems. By the end of the twentieth century, more than 98 percent of the U.S. population owned radios and televisions, and more than 90 percent owned videocassette recorders (VCRs). The information age had blossomed.

The Modern Marketplace

More than 250 million people lived in the United States by the end of the twentieth century. The Consumer Electronics Association (formerly the Consumer Electronics Manufacturing Association) reported in 1998 that the number of consumer electronic devices in the country was estimated at 1.6 billion, with annual sales exceeding \$80 billion. The average person owned about six consumer electronic devices, with the average household spending about \$1,000 annually on electronics. More than six million U.S. jobs were attributable to some aspect of the consumer electronics industry. This suggests the dramatic maturation of an industry in an extremely short time period.

Consumer adoption of new technologies is occurring faster than at any time in human history. The MP3 handheld music devices that down-

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Consumer Electronic Device	Penetration Rate (%)
Radio	99
Color Television	98
Videocassette Recorders	91
Cordless Telephone	73
Compact Disc Player	54
Personal Computer	44
Wireless Telephone	41
Camcorder	32
Pager	29
Home Theatre System	20

load music files from the Internet became so popular in such a short amount of time that music distribution was forever altered virtually overnight. Digital satellite systems (DSS) and digital video, or versatile, discs (DVD) reached one million sales in a time period of eighteen and twenty-six months, respectively. It took fifteen years for cable television and four years for the VCR to reach that same mark of one million sales. Because consumers so quickly adopted a wide range of consumer electronic devices (see Table 1), the electronics industry introduced more consumer electronic devices and gadgets in the final twenty years of the twentieth century than it did during the first eighty years of the century. Some of these innovations have become commonplace; others failed to make an impression.

There are individuals who will buy almost any new gadget. They are referred to as "early adopters" because they want the newest and best consumer electronics gear. For products to be successful, however, they must reach a "critical mass" that includes a much wider base of consumers. This critical mass is divided into the "early" and "late" majority of buyers. A person who is the last to purchase a technology is referred to as a "laggard." Consumer electronics that reach a "critical mass" are considered to be successful, while those that are unable to sell beyond the early adopters are considered to be failures.

The DSS satellite dish, the DVD, and the MP3 player are examples of major success stories that occurred in the consumer electronics industry during the 1990s. However, for every success, failures litter the marketplace. The digital compact cassette (DCC), Atari Jaguar video game system, digital video express (Divx), and a number of interactive television applications were among the misfires. It is difficult to explain why one technology succeeds where another fails. A body of research called "diffusion of innovations" helps to identify why consumers, over time, either accept or reject new consumer electronic items. Diffusion research suggests five important attributes affecting the success of a new technology: (1) relative advantage, (2) complexity, (3) reliability, (4) observability, and (5) compatibility.

The first four diffusion attributes are straightforward. The issue of relative advantage concerns how much better a new innovation is than the method that existed before it. The cellular telephone had an advantage over previous telephones because of its portability. Complexity deals with the ease of operation of the item. One of the chief advantages of radio was that the user interface was so simple, almost any family member could turn it on and make it work. Reliability is the measure of the consistency of the device over time. A 4-mm videotape system brought to market in the 1990s proved to be a failure, in part, because the tapes were easily damaged. As a result, the reliability questions were cited as a primary reason for the demise of the format.

Compatibility involves two different issues: (1) the technology's compatibility to the lifestyles of the consumers, and (2) the technology's interoperability with existing equipment. Consumers found that the time-shifting and video software playback features that were offered by the VCR were compatible with their busy lifestyles. As a result, the VCR became one of the most successful technologies of the 1970s. Interoperability of equipment is a more complex area that involves technical standards.

A consumer must determine if a particular computer peripheral or software works with an existing home system. The manufacturer usually places information on the packaging that explains compatibility issues. When groups of products work together, some form of technical standard has been established. Technical standards of consumer devices fall into several key categories, including first-agent standard, industry-wide agreement, and *de facto* standard.

With a first-agent standard, a single manufacturer or small group of companies will introduce a device, but they allow other companies to license the device. This type of industry agreement led to the widespread success of the CD player, which was jointly developed by Philips and Sony. The companies made one CD system available to the music industry in 1982, and consumers had a clear choice in the audio field. Consumers were able to buy CD music software and play it on any CD player.

An industry-wide agreement takes place when several companies that may be developing their own incompatible technologies agree to one standard device. Before the DVD was introduced, Sony and Philips had plans to release the MMCD (multimedia CD), while Toshiba was scheduled to release the similar, but incompatible, super density (SD) disc. The companies were urged by both the software industry and other manufacturers to agree to one DVD-type of system to avoid the compatibility problems of sustaining multiple formats. Industry-wide agreements can be fostered by congressional and/or Federal Communications Commission (FCC) actions. Government standards have been established for specific television set features, including closed-captioning and Vchips that screen out shows with violent content.

The *de facto* standard is established in the open marketplace. Consumers decide the format battle at the cash register. *De facto* standards have been developed with devices that include VCRs (VHS becoming the standard in many countries and supplanting the Beta format) and audiotape (the cassette defeating the eight-track, digital audiotape [DAT], and the DCC). Even after an industry-wide agreement was reached to release one format of DVD, Circuit City released the competing Divx format in 1998. The DVD became the *de facto* standard in 1999 when Divx was discontinued. Compatibility issues are a major factor in the ultimate success or failure of a consumer electronic device.

Trends

While it may have appeared to some by the end of the nineteenth century that everything necessary for leading a comfortable agrarian or industrial life had been invented, it will not so easily be accepted that everything needed to function in the information age has been introduced. Internet connectivity, cellular telephones, fax machines, laptop computers, and personal data assistants (PDAs) allow consumers to receive and send data instantaneously from almost anywhere in the



An Internet browser, an e-mail program, and an MP3 music player are all features of the Sharp Corporation's palmtop computer Zaurus MI-E1, which was first shown to the press on November 21, 2000. (AFP/Corbis)

world. Just as it was misguided to predict the end of change at the end of the nineteenth century, it would be a mistake to assume that innovation in the consumer electronics industry will cease in the near future. Several major trends continue to stimulate innovation in the electronics sector. Included in this list are miniaturization, digitization, and convergence.

Miniaturization

The modern consumer takes for granted the portability of electronics devices such as Walkmans, cellular telephones, pagers, and portable DVD players. Such portability of electronic devices has not always been the case. Early models of the radio, television, and computer were not considered portable. The processor of ENIAC, the first computer that was ever produced, included eighteen thousand vacuum tubes. As a result, ENIAC filled an entire room and generated a great amount of heat. Contemporary computers use
semiconductor chips that are microscopic when compared to ENIAC's "brain." The widespread use of chips and transistors has allowed designers to create personal communication devices that are highly portable.

Cellular telephones, Palm Pilots, and laptop computers are among the items that have decreased in size while providing more options than ever before. This trend will continue as designers have unveiled prototype MP3 players that can be placed in a device the size of a wristwatch and in other wearable computer devices. Consumer electronics firms will continue to make "smarter" portable devices by packing miniature chips into devices that may include smart pagers and language translation devices.

Digitization

The gravitation of communications-related software and hardware away from analog and toward digital will continue to drive the consumer electronics industry. The recordable DVD and hard drive-based personal recorders such as TiVo and Replay are poised to replace the analog VCR, just as the CD basically replaced the vinyl record album. The broadcast industry is also undergoing a major transition from an analog-transmitted medium to a more dynamic digital medium. The conversion to high-definition television (HDTV) and digital audio broadcasting will hasten the demise of analog television sets and traditional AM/FM radios.

The conversion of entertainment and communications to digital ones and zeroes has made software more portable and easily transmitted. The MP3 has allowed music fans to download music with ease and to send music as e-mail attachments. Video-streaming concepts will be the next stage of development as people will be able to exchange home videos and video clips in the same manner as MP3s are exchanged. Digitization and the widespread sharing of digital files over cellular, satellite, and telephone lines does raise significant concerns about piracy of copyrighted material and issues that are related to the privacy of the individual who is receiving and sending digitized communication. However, the great advances that are offered by digital communication will continue without interruption as new generations of improved digital camcorders, personal computing devices, and still-frame cameras are introduced to the marketplace.

Convergence

Probably the most important trend for consumer electronics is that of convergence. The computer. the telephone, and broadcasting were always considered distinct from each other. The consumer electronics industry has long realized that devices that are useful to consumers could be created by combining the power of telecommunications with the power of computing. The rise of modems to provide Internet service on personal computers, cell telephones that provide e-mail and online services, and televisions that allow for Internet connectivity demonstrate the notion of convergence. The merger announced by AOL and Time Warner in 2000 lends further support to the fact that the boundaries within the various communication-related industries have been obliterated.

All technologies that were once considered "wired" are converging toward wireless delivery modes. Both telecommunication and Internet devices have become less dependent on traditional telephone lines. Cellular telephone systems use a series of radio transmitters to provide interconnectivity. The next wave of convergent devices may use the same type of system to provide increased interconnection. The most promising of the wireless standards is known as the "Bluetooth" standard. Bluetooth would allow for the wireless networking of television, home theater, and Internet equipment. Furthermore, Bluetooth could provide a wireless interconnection between MP3 players, Palm Pilots, pagers, and cell telephones. This would allow for the wireless transfer of entertainment and information between devices. thereby eliminating the wire connection. The ease of interoperability between electronic devices suggests a dynamic and convergent future for a new breed of consumer products.

See also: Computer Software; Computing; Copyright; Diffusion of Innovations and Communication; Digital Communication; Edison, Thomas Alva; Internet and the World Wide Web; Marconi, Guglielmo; Privacy and Communication; Privacy and Encryption; Radio Broadcasting, History of; Radio Broadcasting, Technology of; Recording Industry, Technology of; Technology, Adoption and Diffusion of; Technology, Philosophy of; Telecommunications, Wireless; Telephone Industry, Technology of; Television Broadcasting, Technology of; V-Chip.

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CONVERSATION

See: Interpersonal Communication, Conversation and

COPYRIGHT

Copyright is one of three types of intellectual property law, along with patents and trademarks. Copyright gives authors and creators a limited right to control the use of their expression. Expression is how people convey their ideas, and it can include books, drawings, paintings, sculptures, photographs, music, movies, sound recordings, and computer software programs. Copyright protects only expression, not the idea or fact that is being expressed. For example, a history book will include many base facts and ideas, as well as some original ideas that the author developed on his or her own. A second author (or filmmaker, etc.) can use any of the facts and ideas contained in the book but would need permission to copy the original author's expression.

Expression must be fixed (stored) in a tangible medium before it is protected by copyright. Recording music on a cassette tape, painting on a canvas, or saving text on a computer are all ways of storing expression. The copyright owner has the right to control the reproduction, distribution, public performance, and public display of the work that contains the expression, whether that work is a book, film, sculpture, and so on. In addition, the copyright owner can control derivative works (i.e., adaptations and transformations of the original work), as when a novel is turned into a movie.

A work is protected by copyright as soon as it is created. In many cases, the author sells or licenses the copyright to a media company, which then markets the work to the public. Huge media conglomerates such as AOL-TimeWarner, the Walt Disney Corporation, and the Sony Corporation own the copyrights to thousands of books, songs, films, and pictures. Computer software companies also own very important copyrights because computer programs are used in so many facets of modern day life. The duration of a copyright for a single-author work lasts for the life of the writer plus seventy years. The duration of a copyright for a corporate product is ninety-five years from the date of publication. After the copyright expires, the work falls into the public domain, and anyone may freely copy, distribute, or otherwise use the work.

Origins of Copyright

Before the development of the printing press in the fifteenth century, anyone could copy someone else's expression. Most books were written by hand, a very time-consuming process. The first European printers spent a lot of money setting up their presses and fonts, and they were concerned that rival printers would copy their books, causing them to lose money. Sometimes a government official would issue a special printing privilege, prohibiting other publishers from printing the same book. These privileges served two important purposes. First, they protected the young printing industry from competition. Second, they helped governments and the Roman Catholic Church to impose censorship on the publishing industry and control the spread of seditious and heretical books.

The first copyright law to give the author rather than the publisher initial control over how the work could be used was passed in England in 1710. Other European countries followed suit, and when the United States won its independence, the new nation modeled its first copyright law on the English statute. Copyright originally was a "Western" concept. Many countries in other parts of the world did not adopt copyright laws until the latter half of the twentieth century.

Justifications for Copyright

The primary purpose of copyright is to provide an economic incentive to create new works for the benefit of the public. Copyright law gives the author the ability to restrict access to the work in order to charge users and recoup his or her initial investment in creating the work. If competitors or consumers could copy and use the work without paying the author, the author might decide not to create the work in the first place. The dilemma for lawmakers is determining the appropriate amount of copyright protection. If the law grants more protection than necessary, the public will not have full access to the works that are created, reducing the public benefit of those works. If the law grants too little protection, fewer works will be created. Economists disagree about the degree of protection that is necessary to encourage creativity. On the one hand, creativity and expression flourished long before the first copyright law, suggesting that copyright protection is not necessary to encourage new works. On the other hand, more content is being produced than ever before, and that content is a significant portion of the world's economy, suggesting that copyright is beneficial to society.

In many countries, a second justification for copyright is to protect the moral rights of the author. This concept, sometimes referred to as droit moral for its basis in French copyright law, stems from the viewpoint that expression is the output of an author's distinct, individual personality and that authors deserve to be rewarded for their creative output. Moral rights typically include attribution of authorship (known as paternity) and protection for the integrity of the work. In countries that recognize a right of paternity, the author has the right to have his or her name associated with any work that the individual has created. The right of integrity gives the author control over how a work is altered to ensure that the work is not used in a way that would harm the author's reputation or distort the author's intent in creating the work. Moral rights, particularly the right of integrity, are limited in the United States because they sometimes conflict with free speech rights. Some commentators argue that authors deserve very strong copyright protection since they create new, original expression from their own minds. Other commentators argue that there are very few new or original ideas, and that most ideas come from the author's culture. These commentators believe that there should be very little copyright protection because the authors borrowed their ideas from the public domain in the first place.

Copyright in the United States

The U.S. Supreme Court has repeatedly stated that the purpose of copyright is to encourage creativity for the benefit of the public, not to reward authors for their labor. In an important 1991 ruling in *Feist Publications, Inc. v. Rural Telephone Service Company*, the Supreme Court said that the U.S. Constitution requires some degree of originality before expression can be protected by copyright. The fact that a work might be expensive and time-consuming to create (such as a telephone directory) does not mean that it deserves copyright protection.

Since copyright gives the author such a broad set of rights over how his or her expression is used (essentially granting the author a monopoly over the use of that expression), the law contains a number of limitations to ensure that the public can still gain reasonable access to the work. The most important limitation is known as fair use. Fair use allows someone to copy, without permission, portions of the author's expression in limited circumstances for purposes such as criticism, comment, teaching, news reporting, or research. Fair use eases the tension between copyright law and the First Amendment's protection of free speech.

Most of the other provisions of copyright law were created as compromises between the various media industries that exploit copyrighted works. For example, cable television companies pay a special fee for the right to retransmit the signals of local television stations. Musicians pay a special fee to record and distribute a new version of a different songwriter's song. Libraries and schools have been granted exemptions from many of the specific rules contained in copyright law since these institutions are supposed to make knowledge widely available to the public.

International Copyright

Copyright laws are designed primarily as a form of protectionism for the content industries, and international disputes play a major role in the development of each nation's domestic law. Problems of international piracy and lack of protection for foreign authors under the domestic copyright laws of most nations led to a major copyright treaty in 1886, the Berne Convention for the Protection of Literary and Artistic Works, which is administered by the World Intellectual Property Organization (WIPO). The Berne Convention outlines only the minimum standards of protection that each country must enact through its domestic laws. Thus, the potential for conflict between the laws of any two nations remains high.

The United States was precluded from joining the Berne Convention at first because the U.S. statute did not meet some of the minimum standards. From 1891 to 1955, the United States relied on bilateral agreements with individual nations. As intellectual property exports increased, the U.S. copyright industries (i.e., the publishing, film, music, and computer software industries) began to lobby more forcefully for U.S. involvement in international copyright treaties. In 1955, the United States joined the Universal Copyright Convention (UCC), which is administered by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The United States then joined the Berne Convention in 1989. The economic power of the copyright industries has made them forceful lobbyists for increased international and domestic copyright protection.

Copyright and Technological Change

Copyright law has changed dramatically as new technologies have been invented to create, store, and distribute copyrighted expression. With each new method of storing or transmitting expression, two key questions arise. First, does using the new technology infringe any of the rights of the copyright owner? For example, does playing a song on the radio count as a public performance of the song? Second, should the new technology itself be protected by copyright? For example, is the signal of a radio station protected by copyright? In the United States, the Copyright Act of 1976 attempted to answer these questions by granting protection to expression fixed in any tangible medium, no matter what technology is used. Yet the questions still persist. For example, does transmitting a song through the Internet count as a reproduction, distribution, public performance, or all three?

Technological advances such as photocopiers, videotape recorders, and cassette decks have made



In connection with one of the first cases to deal with copyright issues on the Internet, Napster founder Shawn Fanning (center) held a press conference in San Francisco on February 12, 2001, and said that his company would appeal a ruling by the Ninth Circuit Court of Appeals that said that Napster, an online music downloading service, must prevent subscribers from sharing copyrighted material. (Reuters NewMedia Inc./Corbis)

copying cheaper than ever before. All of these technologies have made it easy for consumers to make copies for their own personal use, resulting in lost sales by content creators. Yet it has proven impractical for copyright owners to try to enforce their legal rights in most cases involving such small-scale infringement.

The development of digital technology has increased the concerns of copyright owners. Unlike analog technology, digital technology creates perfect copies that are indistinguishable from the original work. In many instances, digital copies are also easier and cheaper to make than analog copies. For example, computer files can be copied almost instantaneously at the click of a button. While these attributes reduce the costs that are incurred by copyright owners in producing and distributing their works, they also significantly increase the amount of copyright infringement that takes place. Copyright owners increasingly have sought to use new technology to limit the ability of consumers to make copies. For example, cable and satellite television signals are often scrambled using encryption technology to prevent nonpayers from obtaining the content. In

addition, much of the consumer electronic equipment that is used to play copyrighted content now contains special anticopying technology.

The Internet has dramatically exacerbated the threat of copyright infringement because computer networks are designed to facilitate the distribution of content. So now, not only are digital copies easy and cheap to make, they are also easy and cheap to distribute. This change in technology has led many commentators to question whether copyright law remains a useful concept. Copyright law has focused primarily on restricting the copying and distribution of the physical object that contains the expression. In a 1994 essay, John Perry Barlow suggested that copyright would quickly become anachronistic in a digital world where expression is created and distributed as digital bits on the Internet and where physical objects have less relevance.

The response of the copyright industries has been to rely more heavily on technological measures to control access to their content. The Digital Millennium Copyright Act (DMCA), a 1998 amendment to U.S. copyright law, makes it illegal to circumvent the technology used to protect a work or to develop or distribute devices that are designed to circumvent protection technology. Copyright owners claim that without these strong enforcement measures, the Internet will not reach its full potential as a distribution medium for copyrighted content. Many critics argue that copyright law is being expanded to grant copyright owners more control over their works than ever before, making it difficult for individuals to engage in fair use or gain access to the legally unprotected ideas contained in an author's expression.

Another important feature of the Internet is its global nature. The Internet allows users to send and receive information from almost anywhere on the planet. This creates additional challenges for copyright because each country has its own copyright law. A website that may be perfectly legal in the country where it was created is easily accessible from countries where that website would be considered copyright infringement. This problem is creating pressure for more conformity among the domestic laws of each nation. However, such conformity does not take into account the cultural differences and unique policy objectives of each nation. In the future, the World Intellectual Property Organization and the World Trade Organization will play an increasingly important role in shaping the balance of copyright between protecting content and providing access to information.

See also: First Amendment and the Media; Inter-Net and the World Wide Web; Printing, His-Tory and Methods of; Writers.

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MATT JACKSON

CREATIVITY

See: Children's Creativity and Television Use

CULTIVATION THEORY AND MEDIA EFFECTS

Cultivation analysis is the third part of a research strategy designed to examine the role of the media in society (see Gerbner, 1973). The first component, "institutional process analysis," investigates how media messages are produced, managed, and distributed. The second component, "message system analysis," examines images in media content. The third component, "cultivation analysis," studies how exposure to the world of television contributes to conceptions that viewers have about the real world. In its simplest form, cultivation analysis tries to ascertain if those who watch more television, compared to those who watch less but are otherwise comparable, are more likely to perceive the real world in ways that reflect the most common and repetitive messages and lessons provided by television programs.

Cultivation theory is not concerned with the "effect" of particular programs or with artistic quality. Rather, it looks at television as the nation's storyteller, telling most of the stories to most of the people most of the time. While these stories present broad, underlying, global assumptions about the "facts" of life rather than specific attitudes and opinions, they are also market- and advertiser-driven. Television's stories provide a "dominant" or mainstream set of cultural beliefs, values, and practices. Heavy viewing may thus override differences in perspectives and behavior that ordinarily stem from other factors and influences. In other words, viewers with varied cultural, social, and political characteristics should give different answers to questions about values, beliefs, and practices. These differences, however, are diminished or even absent from the responses of those who watch a large amount of television, while they exist for viewers who watch small amounts of television. Thus, television cultivates common perspectives; it fosters similar views and perspectives among those who, on the surface, should be very different.

The methods and assumptions behind cultivation analysis are different from those traditionally employed in mass communication research. Cultivation analysis begins with identifying and assessing the consistent images, portrayals, and values that cut across most programs, either by conducting a content (message system) analysis or by examining existing content studies. These findings are then used to formulate questions about people's conceptions of social reality. The questions juxtapose answers reflecting the television world with those that are more in line with reality. Questionnaires also measure television viewing, typically by asking how much time the respondent watches television on an "average day," and assess demographic variables such as age, gender, race, education, occupation, social class, and political orientation.

The cultivation questions posed to respondents do not mention television, and the respondents' awareness of the source of their information is seen as irrelevant. The resulting relationships, if any, between the amount of television viewing and the tendency to respond to these questions in the terms of the dominant and repetitive facts, values, and ideologies of the world of television (other things held constant) illuminate television's contribution to viewers' conceptions of social reality.

For example, one of the most examined features of television is gender-role stereotyping. Study after study has found that women are underrepresented and that most television characters are gender-typed (Signorielli, 1985; Signorielli and Bacue, 1999). Two cultivation analyses focusing on gender roles examined children's responses to questions that dealt with gender-role attitudes and behaviors (Morgan, 1987; Signorielli and Lears, 1992b). The questions that were related to genderrole attitudes asked if certain chores (i.e., wash or dry the dishes, mow the lawn, take out the garbage, help with the cooking, clean the house, help with small repairs around the house, and make the bed) should be done by boys only, girls only, or either girls or boys. Responses to these questions were analyzed to indicate whether or not they reflected traditional gender-role divisions of labor. The children's gender-role behaviors were also determined by asking which of these seven chores they did. In these studies, the "television answer" was the response that only girls should do "girl chores" (i.e., wash or dry the dishes, help with the cooking, clean the house, and make the bed) and that only boys should do "boy chores" (i.e., mow the lawn, take out the garbage, and help with small repairs around the house). With regard to the children's own behaviors, the "television answer" was indicating that they did those chores that were consistent with their gender. These

studies found that those who watched more television typically gave more gender-stereotyped views about which chores should be done by boys and which should be done by girls.

The most well-known area of cultivation analysis has focused on the manifestation of television violence through the "mean-world syndrome" (see Signorielli, 1990). These questions (with the television answers in *italics*) included the following:

- 1. Would you say that most of the time people try to be helpful, or that they are mostly *just looking out for themselves?*
- 2. Do you think that most people would try *to take advantage of you* if they got a chance, or would they try to be fair?
- 3. Generally speaking, would you say that most people can be trusted or that *you cannot be too careful in dealing with people?*

Again, the results of these studies indicate that those who spend more time watching television's mean and dangerous world tend to have conceptions that the world in which they live is a mean and dangerous place.

Cultivation analyses have also examined relationships between viewing and the conceptions that people have about aging (i.e., those who watch more television tend to underestimate and undervalue the elderly population of society), occupations (i.e., those who watch more television want high-status and well-paying jobs but do not want to work very hard), and nutrition (i.e., those who watch more television tend to eat less healthy food) (e.g., Gerbner et al., 1980; Signorielli, 1993; Signorielli and Lears, 1992a).

As in most studies of media effects, the observable empirical evidence of cultivation tends to be modest in terms of its absolute size. In most national surveys a trivial, and demographically diverse, number of respondents (about 4% or less) say they do not watch television. Consequently, there are no real control groups. Even "light" viewers watch some television and live in the same cultural environment as "heavy" viewers. But, if one argues that the messages are stable, that the medium is virtually ubiquitous, and that it is accumulated exposure that counts, then it seems reasonable that almost everyone should be affected, regardless of how much television they watch. This means that the cards are stacked against finding evidence of cultivation. Therefore, the discovery of a systematic pattern of small but pervasive differences between light and heavy viewers may indicate far-reaching consequences. Indeed, in study after study, the evidence continues to mount as to the viability of cultivation theory in explaining the cumulative, long-term effects of watching television.

In summary, cultivation theory is an attempt to understand and explain the dynamics of television as a distinctive feature of the modern age. Cultivation analysis concentrates on the enduring and common consequences of growing up and living with television: the cultivation of stable, resistant, and widely shared assumptions, images, and conceptions that reflect the underlying dimensions, institutional characteristics, and interests of the medium itself. Cultivation analysis examines television as the common symbolic environment the true "melting pot" of the twentieth and twenty-first centuries.

See also: Elderly and the Media; Fear and the Media; Gender and the Media; Nutrition and Media Effects; Violence in the Media, History of Research on.

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NANCY SIGNORIELLI

CULTURAL STUDIES

Cultural studies has become an increasingly difficult field of communication scholarship and political activism to define, mostly owing to the attempts of its adherents to transcend the confines of academic boundaries. As a result of this disciplinary and institutional resistance, cultural studies often is described in terms of the intellectual biographies of some of its leading scholarly figures (e.g., Raymond Williams and Stuart Hall in the United Kingdom, James Carey, Hanno Hardt, and Lawrence Grossberg in the United States, and Australians John Fiske, who now teaches in the United States, and John Hartley), as well as in terms of the geographical locations of cultural studies (e.g., the Birmingham School and the Glasgow School, both of British cultural studies; U.S. cultural studies at the University of Illinois and the University of Iowa; and cultural studies in Canada, including the work of Donald Theall and John Fekete). Dozens of spin-offs, reamalgamations, and reconfigurations of many disciplines in the humanities and social sciences, from postcolonial theory to queer theory, have become part of the landscape of cultural studies.

One mass communication theory text brackets cultural studies within a cultural turn as part of the last of five broad theoretical bases discussed, thus pointing out by its relation to other media theories the marginality of cultural studies (Baran and Davis, 1999). In a chapter on "critical cultural studies," British cultural studies is identified as one of the "contemporary schools of neo-Marxist theory." Cultural studies becomes a subtheory of "critical cultural studies," along with Marxist theory, textual analysis and literary criticism, the Frankfurt School, political economy theory, the media theories of Canadians Marshall McLuhan and Harold Innis, popular culture research, media as culture industries, and advertising as a cultural commodity, among others.

In resisting categories, cultural studies attempts to remain an open field, defying method and tradition. For example, Cary Nelson, Paula Treichler, and Lawrence Grossberg (1992) discuss cultural studies as defying research domains, methodologies, and an intellectual legacy of a tradition and language. They suggest that cultural studies averts being a traditional discipline and is even antidisciplinary. Cultural studies crosses domains, or disciplines, from Marxism and feminism to psychoanalysis and postmodernism. Cultural studies also has no identifiable methodology, best described as a "bricolage" of textual analysis, semiotics, deconstruction, ethnography, content analysis, survey research, and other methods. But while approaches may be methodologically diverse, it must be recognized that every method is applied self-reflexively and in context.

Despite the difficulties, Nelson, Treichler, and Grossberg attempt a general definition of cultural studies to include these elements of domain and methodology. Cultural studies is inter-, trans-, and counter-disciplinary, maintaining a tension between broad, anthropological concepts and narrow, humanistic concepts of culture. It studies primarily modern industrial societies, insists on treating high and popular culture as equals of cultural production, and compares these cultural products to other social and historical forms. It is "committed to the study of the entire range of a society's beliefs, institutions, and communicative practices." Culture itself is both conceptualized as a way of life and a set of cultural practices, the former including "ideas, attitudes, languages, practices, institutions and structures of power," and the latter including

"artistic forms, texts, canons, architecture, massproduced commodities" and so forth. In terms of its traditions, cultural studies has political aims, studying cultural change with the intent of intervening in it, although these aims differ in the British and U.S. versions. A frequent frame of analysis for cultural studies is race, gender, and class as culture and power are studied in tandem.

Searching for a definition of cultural studies, Hartley (1992) identifies the institutional and the genealogical levels of its identity. First, he finds cultural studies to be an "intellectual enterprise of the left" of the 1960s that was transformed, for the worse, into an "academic subject increasingly of the center" in the 1980s and 1990s. Second, cultural studies becomes a list of names of "prodigal parents" who begat a field that detests orthodoxy, avoids authority, and is committed to interdisciplinary work, but "it has no unified theory, textual canon, disciplinary truths, agreed methodology, common syllabus, examinable content or professional body."

Scholars Steven Best and Douglas Kellner (1991) situate cultural studies within their call for a multiperspective and multidimensional critical theory of the media and society, one that relates all dimensions of society, from the cultural to the social, political, and economic, to each other and to the dominant mode of social organization. Advertising, for example, not only would be studied under capitalism and its economic effects, but also as it adapts cultural forms and affects cultural life and as it has changed politics. Stressing multiple perspectives, Best and Kellner advocate using many approaches, theories, and disciplines, such as Marxism and feminism, critical theory and postmodernism, or economics, sociology, and philosophy. By multiple dimensions, Best and Kellner mean that each dimension of society is treated as relatively autonomous, thus inviting analysis from many disciplines or perspectives.

Given this whirlpool of contemporary versions of cultural studies and their instability, cultural studies might best be approached historically as part of a much wider cultural and critical turn in communication research after World War II. Reflecting on the divergent history of administrative and critical research in North America, the University of Iowa's Hanno Hardt (1992) groups U.S. cultural studies and critical theory together. Approaching communication as environments is one of the ideas of communication systems that is included in the cultural studies approach, where culture is the social context for creating meaning. In the longer history of U.S. mass communication research, critical theory and cultural studies are considered a radical branch.

Administrative Versus Critical Theory

The historical ground of the debate between mainstream administrative theory, or American empiricism, and critical theory, which is European theory, began as the two strains attempted a crossfertilization in 1938. Paul Lazarsfeld brought Frankfurt School critical theorist Theodor Adorno to Princeton University's radio project (Slack and Allor, 1983). Lazarsfeld defined administrative research as carried out in the service of an administrative agency. He posed critical research as the study of the general role of media in the social system. His early attempts at convergence of these two approaches failed because he did not adequately appreciate the political and epistemological differences between the two. Adorno felt that administrative research was inherently narrow in scope and precluded the analysis of the system itself, and its cultural, social, and economic premises. He argued that the rift was more than a difference of theory and methods. Adorno wanted to study the process of communication critically. Administrative research was unable to confront the political and epistemological bases of the social order and its role in that order.

Slack and Allor contend that more recent attempts to accommodate the critical and administrative approaches have duplicated the same pitfalls that befell Lazarsfeld. They argue against casting administrative versus critical research in either (for the former) simple empirical, quantitative, functional, positivist, and effects-oriented dichotomies or (for the latter) qualitative, Marxist, structuralist, and owner/control-oriented dichotomies. They also argue against mainstream research adopting some critical theory aspects, such as communication context, ethical aspects, and multimethod approach. This convergence, critics say, amounts to co-optation of critical theory. Searching for the deeper boundaries separating administrative and critical approaches, Slack and Allor find that many models of communication developed in the administrative camp since the 1950s adhere to the basic linear causality

reflected in the earliest sender-message-receiver model. Administrative research still treats communication as a process without context in which each element can be isolated. Adding bits of social context only adds a layer of sophistication to the simple linear terms.

The two authors view critical theory as encompassing a range of developing alternative approaches in such areas as international communication, new technologies, political economy, radical sociology, and cultural studies. The common thread is a critical perspective on the role of communication in the exercise of social power, a premise that leaves critical theory in opposition to liberal social theory. Critical approaches share a rejection of the linear causal model, adopting positions ranging from Marxist sociology to dependency theory and the Frankfurt School.

Slack and Allor argue that all critical approaches view media institutions and mass communication as intertwined with other social institutions, such as the family, the state, and the economy. Individuals are viewed as members of social groups defined by class, gender, race, and subculture. For example, Marxist studies looks at the complex and often contradictory interrelationships between politics, economics, and culture. This approach looks at the struggle over social meaning between dominant and oppressed groups. Using a structural approach, political economy studies look at the institutions involved in the production and distribution of communication. Cultural studies measures power in terms of hegemony, which is the idea of rule by consent. Hegemony describes the process by which oppressed classes come to experience the world in terms created by the ruling class. The authors see all these approaches to critical theory as offering an opportunity for communication research by redefining old research questions and opening new areas of inquiry. The challenge to the field is confronting the role of power and epistemology in communication institutions and research itself.

Canadian critical scholar Dallas Smythe and Tran Van Dinh (1983) assert that the ideological orientation of the researcher is inescapably linked to the choice of problems and methods. They argue that all researchers have a predisposition to either try to change the existing political–economic order or to preserve the status quo; valuefree scientific inquiry is a myth. The two camps uneasily coexist in sharp, irreconcilable contrast as they define each approach in terms of problems, methods, and ideological perspective.

Administrative research focuses on how to make organizations more efficient-example, how to innovate word processors within a corporation, they argue. Administrative methods comprise neopositivist, behavioral theory applied to individuals. Administrative ideology means linking these problems and tools with results that either support or do not disturb the status quo. Conversely, critical theory researches problems of how to reshape or create institutions to meet the needs and achieve the values of the community. The critical method is historical, materialist analysis of the contradictory, dialectical processes of the real world. And critical ideology links these problems and methods with results that involve radical changes in the established order.

Smythe and Van Dinh stress the transdisciplinary scope of critical theory, including humanities, the arts, and social sciences. It must include criticism of the contradictory aspects of phenomena in systemic context, whether it is Marxist or not. The authors note that Marxist work was repressed in the United States until the 1960s, when research, teaching, and publishing spread rapidly.

On their agenda as objectives of critical research are the demystification of science and technology; the decentralization and democratization of media institutions; the formulation of praxis, where theory and practice intersect; and mass mobilization for action. Sketching needs for future critical research, Smythe and Van Dinh suggest researchers should study the communication theories and practices of independence, liberation, and revolutionary movements, the actions of multinational corporations, and Third World alternatives for horizontal media. Community research could involve projects to help people imposed communications systems. resist Researchers would work with labor, feminist, religious, and environmental groups as well as political parties.

Culture and media historian and sociologist Gaye Tuchman (1983) takes more of a middle ground in the critical versus administrative theory debate. Tuchman argues that theoretically and empirically sound studies of the "production of culture" can be done without adhering to a linear causality model. In other words, Tuchman's approach tries to accommodate the empirical demands of administrative research with the dialectics of critical research. Tuchman writes that the social movements of the 1960s made American media researchers expose themselves to ideas familiar to Europeans who looked at media as the study of the formation of consciousness. Tuchman's concern with consciousness forces consideration of dominant ideologies, the maintenance of power, the control and integration of social change, and the praxis for resistance to media hegemony. The circular model implicit in this perspective is that production influences content, which influences social behavior and structure, which influence production processes.

Hegemony and Ideology

False consciousness is the desired end product of the process of hegemony, which U.S. cultural historian Todd Gitlin (1980) and Williams (1977) both applied in relation to the mass media, as does the tradition of British cultural studies extended by Stuart Hall. According to Italian Marxist Antonio Gramsci, hegemony is the ruling class's domination through ideology and the shaping of popular consent. Hegemony unites persuasion from above with consent from below. The concept helps Gitlin's work and other cultural studies scholars explain the strength and endurance of advanced capitalism. In his study of the news media, Gitlin suggests that hegemony is secured when those who control the dominant institutions impress their definitions upon the ruled. The dominant class controls ideological space and limits what is thinkable in society. Dominated classes participate in their domination, as hegemony enters into everything people do and think of as natural, or the product of common sense-including what is news, as well as playing, working, believing, and knowing, Gitlin argues. Hegemonic ideology permeates the common sense that people use to understand the world and tries to become that common sense.

In capitalist society, the media and other institutions formulate the dominant ideology, Gitlin believes. The media also incorporate popular opposing messages into the dominant ideology, redistributing them through journalistic practices. Gitlin focuses on the struggle between the media, which uphold the dominant ideology, and groups out of power, which contest the ideology. The hegemonic ideology is reproduced in the media through media practices that stem from the ways journalists are socialized from childhood and then trained, edited, and promoted by media. Although journalists do not consciously consider ideology when they make news decisions, they tend to serve the political and economic elite's ideology by doing their jobs. Gitlin suggests the media remain free as long as they do not violate the essential hegemonic values or become too sympathetic to radical critiques. Opposition groups can exploit the contradictions in hegemonic ideology when elites conflict, but opposition groups and autonomous media will be muffled if the challenge to the hegemonic ideology is critical.

Gitlin contends that the media are controlled by corporate and political elites who bring media professionals into their social spheres. The ruling elites depend on the culture industry to advance their unity and limit competing ideologies. The media frame the ideological field within which the dominated classes live and understand their domination in order to perpetuate the hegemony of the elites. The elite economic class, however, does not produce and distribute ideology directly. Media workers do this within the culture industry, but only the media owners are directly linked to corporate and political leaders.

Gitlin suggests indirect control of the hegemonic ideology is difficult because liberal capitalism contains contradictions. The economic system generates ideologies that challenge and alter its own rationale. The hegemonic framework narrows the range of worldviews, preferring its version. To do this, the internal structures of the framework have to be continually re-created and defended, as well as challenged and adjusted superficially. The dominant ideology seems natural to media workers, who reproduce and defend it unconsciously. Gitlin says the media owners and managers reflect the ruling class's interest in private property, capital, the national security state, and individual success within the bureaucratic system.

The media also reproduce the discontinuity and detachment that characterize capitalism, Gitlin adds. Natural life rhythms are replaced by the artificial time of the workplace. Reading the newspaper or watching television reproduces the rhythms of capitalist production. The media reflect the production system's interchangeable time segments, such as the thirty-minute television show and the three-minute rock record. The fleeting images and abrupt changes of television socialize viewers into the discontinuity of the system. "Revolution" is co-opted in the changing of commodities, fashions, and lifestyles in a cycle that reflects the economic system. Individually, perpetual adaptation becomes the goal of comfort and status. The fast pace of consumer goods and advertising fuels the growth of new technologies and capital. This process culminates in a "tradition of the new."

The cultural-commodity process allows minor changes in the hegemonic ideology and may even require it, Gitlin argues. Contradictions within the ideology make it flexible enough to bend with the times and make opposition profitable. Opposition movements may be directed into other channels, from politics into culture and lifestyles, for example. The media balance, absorb, marginalize, and exclude to manage opposition or turn it into a commodity. The media may intensify change, but as long as the political economy provides goods that most people define as essential, the hegemonic system will prevail.

In Gitlin's analysis, ruling elites control media to spread a blanket of false consciousness over dominated classes, who are left with no room systemically for change. By contrast, Williams builds a hegemonic model that leaves more room for the emergence of a counterhegemony. Gitlin draws his concept of hegemony from Williams, who allows for the seeds of liberation and oppositional hegemony to grow. He identifies hegemony as a process rather than a system or structure. This approach to hegemony lets the process shape individual perceptions as a lived system of meanings and values that permeates all aspects of life. Hegemony defines reality for most people in the culture and sets the limit of reality beyond which it is difficult to think or move. However, as a complex process, hegemony does not passively exist as a form of dominance. It continually has to be renewed, defended, and adjusted. Because it is not absolute, hegemony is always resisted, challenged, and changed by counterhegemonies and alternative hegemonies that are produced by emergent social classes. A new class is always a source of emergent cultural practice, but as a subordinate class its practice is sporadic and partial. If the new class opposes the dominant social order, the new practice must survive attempts to co-opt it into

the hegemonic ideology. As an example, Williams gives the emergence and successful incorporation, or co-optation, of the radical popular press in nineteenth-century England.

For Williams, the chink in the armor of the dominant ideology is that no hegemonic order includes or exhausts all human practice. Hegemonic ideology is selected from the full range of human practice, leaving the rest as the personal or private, natural or metaphysical. The danger of advanced capitalism is the media's seizure of these reserved areas of human practice. The dominant culture now reaches much further with mass media. Williams calls for resistance to the seizure of these private, personal human practices. He provides no program for resistance other than the study of the ownership and control of the capitalist media tied with wider analyses of capitalist structures. Williams helped create the strong commitment of cultural studies to a Marxist position as the only position that offers the potential of creating a new society. He also advocated the cultural studies assumption that culture is ideological.

Media Texts and Active Audiences

Cultural studies author John Fiske (1987) rejects "false consciousness" in the Marxist sense because the term implies a true consciousness. Fiske considers twentieth-century history as evidence that a society without ideology is impossible. He also argues that truth is a product of language and other cultural meaning systems, so truth is always a product of culture, society, and history. Fiske borrows neo-Marxist scholar Louis Althusser's concept of ideology as a process that is always reproduced in the way that people think, act, and understand themselves and society. Althusser contends that the relatively autonomous superstructure of the family, schools, media, political system, and other institutions shape norms of thought and action. The norms, however, are developed in the interests of the dominant groups who try to naturalize them as common sense. Social norms are ideological and accepted as natural even by classes whose interests are opposed by the norms. The institutions producing the dominant ideology share some characteristics, Fiske notes. They are patriarchal and concerned with wealth and possessions. They assert individualism and competition, yet they present themselves as neutral regarding class and interested in equality

and fairness, despite their serving the white, male, middle class.

Fiske says cultural studies distinguishes between the individual, as a product of nature, and the subject, as a product of culture. Studying the subject-in-ideology is the best way of "explaining who (we think) we are." Social norms construct the subject's sense of self, society, and the world. According to this theory, a biological female can have a masculine subjectivity by adopting a patriarchal ideology; a black can have a white subjectivity; and a lower-class subject can have a middle-class subjectivity. Two more of Althusser's concepts, "hailing" and "interpellation," are used by cultural studies to describe the media's work. The media get a subject's attention by "hailing." This includes a social position for the subject to occupy. Interpellation is the larger process of providing social positions for all communicating parties. Fiske offers the television show The A-Team as interpellating the viewer as masculine, desiring power, and a team member.

Fiske argues that cultural studies should combine these concepts with Gramsci's theory of hegemony. The constant process of the dominant social groups constructing people as subjects-inideology is studied in the larger context of a constant process of struggle of the dominators to extend their power and the dominated to resist. Fiske reports that earlier cultural studies showed how the dominant ideology reproduced itself in popular television, but Stuart Hall's work introduced the idea that media texts are open to various interpretations. Hall also introduces the idea of the active audience that can interpret or read media texts in various ways. Hall's theory of "preferred reading" was developed to account for the correlation of various social meanings with social positions. Fiske summarizes Hall's three reading strategies: the dominant reading, the negotiated reading, and the oppositional reading. In the dominant reading, the viewer receives the intended ideological message in the social position of the dominant ideology. In the negotiated reading, the viewer may alter the media message to fit his or her social position. The third reading, the oppositional reading, is taken by those out of power and at odds with the dominant ideology.

Fiske offers two methodologies for use in cultural studies. He studies reading strategies about television and popular culture figures, such as the singer Madonna, through ethnography of fans' or viewers' responses, and semiotic and structuralist text analysis to analyze the signifiers in the text and the signifieds in the ideology of culture. Cultural studies has evolved to accommodate criticism of Hall's categories of reading as simplistic. French postmodernist Michel Foucault's discourse theory may be applied as a source for a media analysis model, treating discourse as a socially located way of making sense of a topic, according to Fiske. The media texts are discourses, and the consciousness of the audience is a discourse. The moment of reading takes place when these discourses meet, giving the audience's discourse equal weight in making meaning. The process involves the constant dynamic of agreement with the dominant ideology and resistance against it.

Fiske argues that the media audience is made up of diverse groups who actively read media to produce meanings that agree with their social experience. The television, and other media, text is capable of a variety of meanings, and is, in Fiske's word, "polysemic." The relationships between the television medium and content that comprise these polysemic messages are formed by three codes. First are the social codes of reality, including appearance, speech, and expression. Second, the technical codes of representation, including camera, lighting, editing, music and sound, transmit the conventional representational codes of, for example, narrative, conflict, character, action, and dialogue. Third, according to Fiske, ideological codes include individualism, patriarchy, race, class, materialism, and capitalism.

Culture, Society, and Postmodernism

U.S. cultural studies leading scholar James Carey (1989), who spent much of his academic career at the University of Illinois and has shaped the distinctively American and non-Marxist brand of cultural studies through his teaching and writing, suggests that mass communication research in America has erroneously overlooked the question at the heart of the mass culture debate of the 1950s: What is the relationship between popular art and other social forms, including the scientific, aesthetic, and religious, that popular art influences? American scholars generally have not, Carey suggests, examined the relationship between cultural, expressive forms, particularly art, and the social order. European scholars focus on this relationship. Culture is, in British sociology, the meaning people find in their experience through art, religion, and other expressive forms. Carey writes that culture must be regarded as "a set of practices, a mode of human activity, a process whereby reality is created, maintained, and transformed, however much it may subsequently become reified into a force independent of human action." One of his central contributions to the shift from the mainstream "effects" school of mass communication research in the United States to the cultural school is his development of a ritual model of communication, as opposed to a transportation model. In ritual communication, an entire sphere of cultural activity centers on the task of building community.

Cultural studies also may be seen as a linking bridge to postmodernist thinking, but its relationships to postmodernism are probably as varied as its approaches to cultural studies itself. However, a number of themes that are central to postmodern theory can be identified in reviewing the writing of cultural studies theorists about postmodernism. British sociologist Nick Stevenson (1995) contrasts the postmodern theories of French philosopher Jean Baudrillard, whose "rejection of ideology, truth, representation, seriousness, and the emancipation of the subject" embrace many issues of postmodernism, to the postmodern theories of U.S. cultural theorist Fredric Jameson (1991), whom Stevenson finds to be the "most sophisticated" postmodernist. In general, Jameson calls postmodernism the "cultural expression" or "logic" of "late capitalism." Fine and popular arts have been merged as the economic sector takes over the cultural sphere. Modernist culture has lost its subversiveness and contemporary cultural forms, like punk rock, are co-opted by the capitalist economic system.

For Jameson, the main themes of postmodernism include the absence of context and the uncertainty of interpretation; a growing concern with discourses; the end of the notion of individual style or the "death of the subject"; and a fragmentation of social meanings yielding "discursive heterogeneity" that best represents modern culture by parody or "pastiche," which Jameson calls a "blank parody" because the fragmenting of cultural styles has eroded social norms. The themes of postmodernism identified by Jameson and some other themes that rise among a group of cultural studies scholars include: the death of individualism, as well as the end of Enlightenment thinking; fragmentation leading to parody and beyond to pastiche, with the loss of text and context and, more positively, the gaining of intertextuality; the focus on discourse and codes; the retrieval in postmodern thought of premodernism; the pointlessness of political action; and the concept of the "other."

Cultural studies absorption with issues of its own identities has helped lead not only to reevaluations of communication theory in the Journal of Communication, but also to a special 1997 issue of the University of Iowa's Journal of Communication Inquiry. Scholars debated the past, present, and future of cultural studies from a variety of perspectives, including calls for reclaiming its political activism and Marxist roots by Hardt. British scholar John Storey urges pursuing cultural studies as an academic discipline rather than as a political party. And still others contend that cultural critiques from the Third and Fourth Worlds centering on postcolonialism, multiculturalism, and globalization should be the focus of a reinvigorated cultural studies of the future that transcends the debate of its co-optation by academic institutions.

See also: Culture Industries, Media AS; Innis, Harold Adams; Journalism, Professionalization of; Lazarsfeld, Paul F.; McLuhan, Herbert Marshall; Models of Communication; News Production Theories; Political Economy; Schramm, Wilbur; Semiotics; Social Change and the Media; Williams, Raymond.

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CULTURE

See: Consumer Culture; Cultural Studies; Culture and Communication; Culture Industries, Media as; Globalization of Culture Through the Media; Intercultural Communication, Adaptation and; Intercultural Communication, Interethnic Relations and; Organizational Culture

CULTURE AND COMMUNICATION

The term "culture" refers to the complex collection of knowledge, folklore, language, rules, rituals, habits, lifestyles, attitudes, beliefs, and customs that link and give a common identity to a particular group of people at a specific point in time.

All social units develop a culture. Even in twoperson relationships, a culture develops over time. In friendship and romantic relationships, for example, partners develop their own history, shared experiences, language patterns, rituals, habits, and customs that give that relationship a special character—a character that differentiates it in various ways from other relationships. Examples might include special dates, places, songs, or events that come to have a unique and important symbolic meaning for two individuals.

Groups also develop cultures, composed of the collection of rules, rituals, customs, and other characteristics that give an identity to the social unit. Where a group traditionally meets, whether meetings begin on time or not, what topics are discussed, how decisions are made, and how the group socializes are all elements of what, over time, become defining and differentiating elements of its culture.

Organizations also have cultures, often apparent in particular patterns of dress, layout of workspaces, meeting styles and functions, ways of thinking about and talking about the nature and directions of the organization, leadership styles, and so on.

The most rich and complex cultures are those that are associated with a society or a nation, and the term "culture" is most commonly used to refer to these characteristics, including language and language-usage patterns, rituals, rules, and customs. A societal or national culture also includes such elements as significant historical events and characters, philosophies of government, social customs, family practices, religion, economic philosophies and practices, belief and value systems, and concepts and systems of law. Thus, any social unit—whether a relationship, group, organization, or society—develops a culture over time. While the defining characteristics—or combination of characteristics—of each culture are unique, all cultures share certain common functions. Three such functions that are particularly important from a communication perspective are (1) linking individuals to one another, (2) providing the basis for a common identity, and (3) creating a context for interaction and negotiation among members.

The Relationship Between Communication and Culture

The relationship between communication and culture is a very complex and intimate one. First, cultures are created through communication; that is, communication is the means of human interaction through which cultural characteristicswhether customs, roles, rules, rituals, laws, or other patterns-are created and shared. It is not so much that individuals set out to create a culture when they interact in relationships, groups, organizations, or societies, but rather that cultures are a natural by-product of social interaction. In a sense, cultures are the "residue" of social communication. Without communication and communication media, it would be impossible to preserve and pass along cultural characteristics from one place and time to another. One can say, therefore, that culture is created, shaped, transmitted, and learned through communication. The reverse is also the case; that is, communication practices are largely created, shaped, and transmitted by culture.

To understand the implications of this communication-culture relationship, it is necessary to think in terms of ongoing communication processes rather than a single communication event. For example, when a three-person group first meets, the members bring with them individual thought and behavioral patterns from previous communication experiences and from other cultures of which they are, or have been, a part. As individuals start to engage in communication with the other members of this new group, they begin to create a set of shared experiences and ways of talking about them. If the group continues to interact, a set of distinguishing history, patterns, customs, and rituals will evolve. Some of these cultural characteristics would be quite obvious and tangible, such that a new person joining the group would encounter ongoing cultural "rules" to which they would learn to conform through communication. New members would in turn influence the group culture in small, and sometimes large, ways as they become a part of it. In a reciprocal fashion, this reshaped culture shapes the communication practices of current and future group members. This is true with any culture; communication shapes culture, and culture shapes communication.

Characteristics of Culture

Cultures are complex and multifaceted. As is apparent from the above discussions, cultures are complex "structures" that consist of a wide array of characteristics. The cultures of relationships or groups are relatively simple compared to those of organizations and, especially, societies. Edward Hall (1959, 1979) is one of the most significant contributors to the general understanding of the complexity of culture and the importance of communication to understanding and dealing with cultural differences at the societal level.

Cultures are subjective. There is a tendency to assume that the elements of one's own cultures are logical and make good sense. It follows that if other cultures-whether of relationships, groups, organizations, or societies-look different, those differences are often considered to be negative, illogical, and sometimes nonsensical. If, for example, an individual happens to be in a romantic relationship that is characterized by public displays of affection, that person might think that the behaviors of other people who have more reserved relational cultures may seem strange, even inappropriate. The person might wonder why a romantic couple would not be more open in displaying affection to one another in public. The individual might even be tempted to conclude that the "reserved" relationship lacks depth and intensity. This phenomenon is true in a variety of situations. People who are used to informal meetings of a group might think that adherence to formal meeting rules is strange and stilted. Employees in an organization where suits are worn every day may react with cynicism and questioning when they enter an organization where casual attire is standard practice. Someone from a culture that permits one man to have only one wife may find it quite inappropriate that another culture allows one man to have multiple wives.

With regard to culture, the tendency for many people is to equate "different" with "wrong," even though all cultural elements come about through essentially identical communication processes.

Cultures change over time. In fact, cultures are ever changing-though the change is sometimes very slow and imperceptible. Many forces influence cultural change. As indicated above, cultures are created through communication, and it is also through communication between individuals that cultures change over time. Each person involved in a communication encounter brings the sum of his or her own experiences from other (past or present) culture memberships. In one sense, any encounter between individuals in new relationships, groups, organizations, or societies is an intercultural communication event, and these varying cultural encounters influence the individual and the cultures over time. Travel and communication technologies greatly accelerate the movement of messages from one cultural context to another, and in small and large ways, cultures come to influence one another through communication. Phrases such as "melting pot," "world community," and "global village" speak to the inevitability of intercultural influence and change.

Cultures are largely invisible. Much of what characterizes cultures of relationships, groups, organizations, or societies is invisible to its members, much as the air is invisible to those who breathe it. Language, of course, is visible, as are greeting conventions, special symbols, places, and spaces. However, the special and defining meanings that these symbols, greetings, places, and spaces have for individuals in a culture are far less visible. For example, one can observe individuals kissing when they greet, but unless one has a good deal more cultural knowledge, it is difficult to determine what the behavior means in the context of the culture of their relationship, group, organization, or society. In other words, it is difficult to tell, without more cultural knowledge, if the kiss is a customary greeting among casual acquaintances or if such a greeting would be reserved for family members or lovers. As another example, beefsteak is thought of as an excellent food in some cultures. However, if one were a vegetarian or a member of a culture where the cow is sacred, that same steak would have an entirely different cultural meaning.

Glimpses of Culture

For the reasons noted above, opportunities to "see" culture and the dynamic relationship that exists between culture and communication are few. Two such opportunities do occur when there are violations of cultural conventions or when there is cross-cultural contact.

When someone violates an accepted cultural convention, ritual, or custom—for example, by speaking in a foreign language, standing closer than usual while conversing, or discussing topics that are typically not discussed openly—the other members of the culture become aware that something inappropriate is occurring. When "normal" cultural practices are occurring, members of the culture think little of it, but when violations occur, the members are reminded—if only momentarily—of the pervasive role that culture has on daily life.

When visiting other groups, organizations, and, especially, other societies, people are often confronted by—and therefore become aware of different customs, rituals, and conventions. These situations often are associated with some awkwardness, as the people strive to understand and sometimes to adapt to the characteristics of the new culture. In these circumstances, again, one gains a glimpse of "culture" and the processes by which people create and adapt to culture.

The Role of Technology and Media

All institutions within society facilitate communication, and in that way, they all contribute to the creation, spread, and evolution of culture. However, communication media such as television, film, radio, newspapers, compact discs, magazines, computers, and the Internet play a particularly important role. Because media extend human capacities for creating, duplicating, transmitting, and storing messages, they also extend and amplify culture-building activities. By means of such communication technology, messages are transmitted across time and space, stored, and later retrieved and used. Television programs, films, websites, video games, and compact discs are created through human activity-and therefore reflect and further extend the cultural perspectives of their creators. They come to take on a life of their own, quite distinct and separate from their creators, as they are transmitted and shared around the increasingly global community.

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Issues and Areas of Study

Understanding the nature of culture in relationship to communication is helpful in a number of ways. First, it helps to explain the origin of differences between the practices, beliefs, values, and customs of various groups and societies, and it provides a reminder of the communication process by which these differences came into being. This knowledge can and should heighten people's tolerance for cultural differences. Second, it helps to explain the process that individuals go through in adapting to new relationships, groups, organizations, and societies and the cultures of each. Third, it underscores the importance of communication as a bridge between cultures and as a force behind cultural change.

A number of questions also concern researchers and policymakers in this area. As communication increases between individuals. groups, and countries, does this mean that cultural differences and traditions will inevitably erode altogether? Will the cultures of individuals from groups, organizations, and societies that have great access to and control of communication media overpower those in cultures that have fewer resources and less access and control? Can knowledge be used to help individuals more comfortably and effectively adapt to new relationships, groups, organizations, and societies? The importance of these issues makes this area an important one for continued examination by scholars and practitioners.

See also: Globalization of Culture Through the Media; Group Communication; Intercultural Communication, Adaptation and; Intercultural Communication, Interethnic Relations and; Interpersonal Communication; Language and Communication; Organizational Communication; Relationships, Types of; Social Change and the Media; Social Goals and the Media; Society and the Media; Symbols.

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CULTURE INDUSTRIES, MEDIA AS

In his essay "Culture Industry Reconsidered" (1975), Theodor Adorno recalls that Max Horkheimer and he first coined the term "culture industry" in their book Dialectic of Enlightenment (1972; first published in Amsterdam in 1947). The specific reference is to an essay entitled "The Culture Industry: Enlightenment as Mass Deception." Adorno points out that in early drafts of the essay they used the term "mass culture" but eventually replaced it with "culture industry" in order to "exclude from the outset the interpretation agreeable to its advocates: that it is a matter of something like a culture that arises from the masses themselves" (p. 12). Instead, Horkheimer and Adorno used the term to describe a commodified and industrialized culture, managed from above and essentially produced for the sake of making profits.

In "The Culture Industry," Horkheimer and Adorno laid out the basic framework for the study of culture under capitalism associated with the Frankfurt School of critical theory. The essay was part of a larger theoretical project begun with the founding of the Institute of Social Research at Frankfurt University, Germany, in 1924. Other important associates of the school were Erich Fromm, Leo Lowenthal, Herbert Marcuse, and Walter Benjamin. The institute's original mission was to serve as a sort of think tank for the German labor movement, but this soon changed with the rise of fascism.

Most of the members of the institute were Marxist and Jewish, and they managed to emigrate to the United States in the early 1930s. As they observed the continuing rise of European fascism, the Frankfurt School Èmigrés were compelled to compare these developments to their new environment. They found disconcerting tendencies toward totalitarianism in the United States similar to those they had left behind in Germany.

Although the U.S. culture industries—movies, music recording, radio broadcasting, newspapers, magazines, and books—were not directly controlled by a state ministry of information, their ownership structure and commercial nature made them function much like the state propaganda system of the Third Reich. They mobilized the working class to support causes against its own interests while at the same time demobilizing it through diversion. Rather than coming into consciousness and overthrowing the capitalist system, the working class had become more incorporated into it than ever, for which the culture industry was largely to blame.

The Frankfurt School shared some of the basic premises of mass society theory first laid out by European sociologists in the mid-nineteenth century. These theorists were trying to understand the nature of emerging industrialization and urbanization processes, including their effects on culture. With urban industrialization, people go from making their own living to working in factories where they must sell their labor to earn a living. This new way of making a living also involves the emergence of new forms of cultural life. Just as households began substituting mass-produced manufactured goods for homemade goods, the culture industry began substituting a manufactured and industrialized culture for the traditional cultural activities of rural society that revolved around family, community, and church.

The industrialization process results in a certain logic that governs the production and distribution of commodities. They are produced first and foremost for their exchange value (i.e., the profits they generate when sold to consumers). In consumer-goods markets, mass production has resulted in the output of increasingly homogeneous products that are artificially differentiated through advertising, providing the illusion of choice. The same has occurred with the industrialization of culture but the ramifications of homogenization seem more significant because of their fundamental role in helping shape the way reality is perceived. This is where the Frankfurt School becomes distinct from mass society theory. The culture industries are not ideological merely because they are controlled by economic and political authorities but rather primarily because their output is governed by the logic of capital. The result is formulaic and escapist entertainment that distracts and immobilizes agency for social change.

The Frankfurt School's Critique of the Culture Industry

By the late 1930s and early 1940s, when Horkheimer and Adorno began conducting their analysis of the U.S. culture industry, a small number of companies controlled each of the primary sectors of the mass media. Five companies controlled the production, distribution, and exhibition of movies in the United States. Since they owned their own theaters, screen time was guaranteed. The Great Depression had left four companies in charge of the recorded music industry. The music industry developed a symbiotic relationship with the radio broadcasting industry, which logically replaced live performances with cheaper recorded ones. This, in turn, helped the music industry sell its records. Prime-time radio programming belonged to two main networks, NBC and CBS, which through their owned-andoperated stations and affiliates, reached most of the nation.

The U.S. government helped establish NBC's parent company, RCA, after World War I to promote the development of a domestic radio industry. RCA went on to become one the of the media's first conglomerates. In addition to owning radio stations and the NBC network, RCA owned RKO, one of the five major film companies, and RCA Records, one of the four major recording companies. RCA also manufactured radios, record players, and theater sound systems, as well as car radios in a joint venture with General Motors.

The print media also underwent similar processes of concentration. For example, national magazines became primary outlets for the promotion of products and lifestyles, through both editorial content and advertisements. The book publishing industry also discovered the mass market, exploiting genres such as the romance novel, western, crime drama, and science fiction. The structure of the newspaper industry was also undergoing change. More and more communities found themselves with only one newspaper as advertisers logically shifted their advertising dollars to the newspapers offering the largest number of readers for the lowest price. These local monopolies, in turn, began to be bought up by regional and national newspaper chains that were pursuing the benefits of horizontal integration, such as pooling of news stories, sharing of presses, and selling of advertising space across a number of papers, thus lowering transaction costs to advertisers.

Horkheimer and Adorno (1972) provided one of the earliest frameworks for analyzing how this oligopolistic structure of the culture industry influenced the production, distribution, and consumption of entertainment and news. They identified several of the basic strategies used by the culture industry to sell itself and its products. First, though weak in comparison to the major industrial sectors of the day-steel, petroleum, electricity, and chemicals-consumers had come to see the culture industry as a producer of essential commodities. The wealth amassed by culture industry owners and the high salaries paid to culture industry executives seemed to validate the industry's contribution to the economy and society. Additionally, big-budget productions, what Horkheimer and Adorno called "conspicuous production," sought to demonstrate the apparent dedication of the industry to quality; that no expenses would be spared in the service of audience needs and desires. They recognized, of course, that the "varying budgets in the culture industry do not bear the slightest relation to factual values, to the meaning of the products themselves" (p. 124). Yet the hype surrounding the marketing of the blockbuster movie or record made it so compelling that audiences simply had to attend to it or feel left out.

The conspicuous production sought to attract the largest mass audiences. However, a second strategy of the culture industry aimed at carving up audiences on the basis of demographics and creating cultural content aimed at their specific needs and interests. Horkheimer and Adorno (1972) used the term "style" to describe what has more commonly come to be known as "genre." Style represented the artificial differentiation of cultural products along prefabricated lines that had been designed to attract specific audiences identified by marketers. They equated the differing styles of Warner Brothers and Metro Goldwyn Mayer movies to the superficial differences among the lines of cars produced by Chrysler or General Motors and argued that due to the logic of oligopolistic markets, movies and automobiles tend to be "all alike in the end" (p. 123).

Styles and genres are, in turn, based on yet a third strategy of the culture industry: imitation and repetition. Each cultural product follows a formulaic structure, whether a movie romance comedy, three-minute pop song, or star biography. Horkheimer and Adorno (1972) did acknowledge that there had to be some variation to keep audiences interested, but the formulas could not deviate too greatly from audience expectations. The result, they argued, was "calculated mutations which serve all the more strongly to confirm the validity of the system" (p. 129). They also recognized that audiences derived pleasure from mastering the various formulaic codes of their favorite genres but that this pursuit of pleasure left them with little room for reflection about the content itself, particularly the ideological messages embedded within it.

The last, and perhaps most essential, strategy used by the culture industry to promote itself and the capitalist system as a whole involves the use of stars. For Horkheimer and Adorno (1972), stars not only guaranteed the sale of a certain number of theater tickets or records, their life stories and lifestyles helped promote the ideology of success and the habits of consumption. Their life stories provided audiences with hope that they too were just a chance away from being discovered by talent scouts. Their lavish lifestyles depicted in celebrity and fan magazines and on the movie screen gave audiences something to emulate while their advertising endorsements told consumers what to buy. Indeed, they argued, cultural products had become increasingly designed to "lend themselves to ends external to the work" (p. 163), particularly to the sale of consumer goods.

Horkheimer and Adorno concluded that the culture industry had undermined the normative role of art in society, which for them meant questioning the existing social order as well as offering alternative visions of the good life. All that remained of this tradition in the mid-twentieth century was found in the works of a handful of avant-garde artists, such as Samuel Becket, Franz Kafka, and Arnold Schonberg. These artists belonged to the high culture of the day, and their influence was not felt by the audiences of the culture industry.

Alternative Perspectives

The Frankfurt School's critique of the culture industry was not without internal dissent. In his essay "The Work of Art in the Age of Mechanical Reproduction" (1969), Benjamin put the culture industry of the early twentieth century in a more positive light, arguing that it had helped to demolish the "aura" surrounding works of high art and so to democratize aesthetic pleasure. More people could now learn to appreciate a variety of artistic forms provided by new media technologies, making the culture industry a potentially progressive force for social change. For Benjamin, the mechanical reproduction of art transformed the reaction of the masses toward art: "The reactionary attitude toward a Picasso painting changes into the progressive reaction toward a Chaplin movie" (p. 234).

In his book One-Dimensional Man (1964), Marcuse acknowledged that the consumption of mass-produced goods, including culture, brought pleasure to the masses. He argued, however, that this pleasure was based on "false needs" created by the consumer-goods and culture industries. This system provided consumers and audiences only with short-term gratifications, leaving their genuine needs unsatisfied and unfulfilled. Nonetheless, due to their total integration into this "one-dimensional society," the masses continued to pursue happiness in the form of consumption. In the essay "Art as Form of Reality" (1972), Marcuse concluded that artistic and intellectual creativity could only be truly free under socialism. Then it would no longer be a separate sphere of activity belonging to media capitalists and professionals, but one that was integrated into everyday life and in which everyone participated.

Another associate of the Frankfurt School, Jurgen Habermas, based his normative vision of a democratic communications system on the concept of the public sphere. In an essay titled "The Public Sphere" (1974), Habermas essentially reiterated the Frankfurt School position that the culture industry, including news and public-affairs programming, tended to promote the special interests of economic and political elites. The integration of big business, the media, and government undermined any possibility of democratic discourse about economic, social, and political issues because these institutions were not motivated by any general concern for the good of societv and because they excluded genuine participation by the vast majority of the citizenry. Habermas concluded that establishing a new public sphere would require the dispersal of social and political power into the hands of a wide range of "rival organizations committed to the public sphere in their internal structure as well as their relations with the state and each other" (p. 55).

Hans Magnus Enzensberger, who had only a brief association with the Frankfurt School, criticized the culture industry approach for being too economically deterministic. In his book *The Consciousness Industry* (1974), Enzensberger argued that the ideological nature of the culture industry was determined more by the direct organization of consciousness by economic and political elites and not merely derivative of the commodification process. Indeed, he substituted the term "consciousness industry" for "culture industry" to underscore this point. The consciousness industry played an essential role in neutralizing the radical potential guaranteed to the citizenry of liberal democracies.

Enzensberger (1974) stressed that the ruling class had to work to gain the consent of the dominated classes, and that culture industry workers played a primary role in helping it to do so. However, he also saw them as the weak link in the system of domination. He believed that culture industry workers could play a vital role in undermining this consent from within the media system because media capitalists were ultimately dependent on human artistic and intellectual creativity for delivering the ideas and products from which they earned their profits. Media owners were aware of this and had developed a range of tactics to suppress this potential, from "physical threat, blacklisting, moral and economic pressure on the one hand, [to] overexposure, star-cult, co-optation into the power elite on the other" (p. 14). Nevertheless, Enzensberger concluded that the relative autonomy of artists and intellectuals held the greatest potential for inspiring social change through the media.

Among the contemporaries of the Frankfurt School were English scholars F. R. Leavis, Richard Hoggart, and Raymond Williams. They sought to reconsider the negative connotations associated with mass culture as an industrial product imposed from above, by shifting the focus to how audiences actually used the products of the culture industry. In his book The Uses of Literacy, (1957), Hoggart found that the British working classes of the mid-twentieth century were quite selective in their consumption of the products of the culture industry, and actually relied much more heavily upon oral and local forms of culture left over from the beginning of the century to adapt to their ever-changing urban industrial environment. However, Hoggart concluded that the growing influence of the culture industry, and the seduction of consumerism, was gradually undermining traditional working-class culture. Finally, like the Frankfurt School, he viewed the increasing commercialization of the culture industry as a threat to any potential for its "progressiveness" and "independence" because it was required by its very nature to "promote both conservatism and conformity" (p. 196).

In his book The Long Revolution (1958), Williams agreed that the development of mass media technology was progressive to the extent that the working class had managed to gain some control over media output, for example, the working-class press. Furthermore, the increasing democratization of education and the spread of literacy gave the working classes new means by which to organize and express their interests. Williams stripped the critique of the cultural industry of its mass society roots and its nostalgia for some pure age of artistic and intellectual freedom, and refused the escape into high art. His response to mass society theory was simply that "there are no masses, only ways of seeing people as masses" (p. 289). His response to cultural elitism was just as simple: "creation is the activity of every human mind" (p. 17) and every human being therefore possesses artistic abilities that can be cultivated. He agreed that the industrialization culture had generally stifled this potential, especially the professionalization of intellectual and artistic creativity, which had produced an increasing division between producers and consumers of culture. Like Marcuse, Williams insisted that the separation of artistic and intellectual creativity

from daily life had to be resolved, and this could only occur with the extension of public ownership of the means and systems of communication, along with the means of production in general.

Developing Perspectives on the Culture Industries

The debates about the role of the culture industry among the Frankfurt School and its contemporaries continued to influence media theory and research through the late twentieth century. These scholars, among others, not only generated the central questions for the study of the culture industry, they also opened the space for such an inquiry by providing criticisms of the dominant research paradigm guiding studies of mass communication from the 1930s through the 1960s, based primarily on survey and laboratory research on media uses and effects. They argued that prioritization of such empirical approaches to the study of the media were too narrow to generate any thorough understanding of the role of communications in society. Indeed, Adorno's involvement with quantitative research efforts led him to write an essay on "Scientific Experiences of a European Scholar in America" (1969) in which he concluded that the application of purely empirical methods to the study of cultural phenomena was "equivalent to squaring the circle" (p. 347).

The Frankfurt School also criticized the dominant paradigm for its orientation toward so-called administrative research, mainly its privileging of survey and laboratory studies on consumer and voter opinions and behavior produced primarily for use by business and government. This administrative orientation served two purposes for mass communications scholars. First, within the academy, it helped to establish the field of communications studies as a distinct and legitimate field of social science. Second, outside the academy, it facilitated efforts to attract funding from industry and government sources. While mass communications scholars could claim to be neutral and objective social scientists following the methods of normal science, their research agendas had turned the discipline into another pillar of support for the existing political-economic structure.

In an essay entitled "Historical Perspectives of Popular Culture" (1950), Lowenthal called for a critical alternative to the study of audiences as markets beginning with the still-unanswered and

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One of the major products of the Hollywood star system was Elizabeth Taylor, who was later able to use that studio success to her own personal commercial advantage with the launch of a perfume line in 1987. (Bettmann/Corbis)

essential question: "What are the functions of cultural communication within the total process of society?" Lowenthal continued that a critical alternative would then proceed to two more specific yet vital questions: "What passes the censorship of the socially powerful agencies? How are things produced under the dicta of formal and informal censorship?" (p. 331). To broadly generalize, cultural studies has taken up the former question and political economy the latter.

Within the cultural studies perspective, a focus on culture industries follows the tradition of Hoggart and Williams and echoes the critical theory of Benjamin and Enzensberger. This approach tends to emphasize the relative autonomy of culture industry workers, media texts, and media audiences. It reasserts the position that the inherent tension between profitability and creativity allows culture industry workers significant space for advancing messages that challenge the status quo, but it also highlights media producers working outside the dominant communications systems, such as grassroots and alternative media resisting the processes of commodification.

The cultural studies approach to culture industries also insists on making the analysis of media content a specific mode of inquiry. This is based on the view that news and entertainment products are not simple reflections of media industry structures and practices. Rather, for a number of reasons-from the ambiguity of language and divisions among political and economic elites, to the aforementioned tension between profit and creativity-media texts contain within them many layers of meaning and therefore many potential interpretations that must be explored on their own terms. Some texts, such as news photo captions, leave little room for interpretation. Others, such as rock-music videos, are deliberately left open to interpretation. Accordingly, how audiences interpret the products of the culture industry must also be taken as a separate problem.

In their research on culture industries, cultural studies scholars employ audience reception theory

to explore the actual interpretations made by audiences of media texts. Their research confirms that audiences are indeed capable of producing a variety of readings of news and entertainment content, sometimes even in opposition to the intended meaning of the producer. In addition to examining how audiences actually read texts, the cultural studies approach uses ethnographic research methods to look at ways in which audiences use the media in their daily lives. These studies demonstrate that subcultures are capable of making a variety of uses of culture industry output, again often in ways not intended by their producers. The results of studying audience interpretations and uses of media texts demonstrate that a variety of factors beyond the structure of the text are at work in shaping the responses of audiences, including class, gender, race, ethnicity, age, and so on.

The political economy approach has built on the critique of the culture industry laid out by Horkheimer and Adorno in the 1940s. The analysis of the structure and marketing strategies of the culture industry therefore remains central to this approach. This includes continuing to document the tendency toward concentration in the culture industry, which accelerated in the late twentieth century as the industry became dominated by a handful of global multimedia conglomerates. This period also saw the increasing convergence between media, computer, and telecommunications companies and a tightening of the vertical integration between producers and distributors of informational and cultural products.

This global culture industry continues to use the same basic strategies identified by Horkheimer and Adorno: the star system, style, genre, formula, and imitation. It also relies increasingly on remakes, sequels, spin-offs, and the recycling and repackaging of entertainment products. Additionally, the conglomerate structure of the culture industry facilitates the cross-promotion of cultural products through a variety of outlets. A featurelength movie comes packaged with a music video, a movie soundtrack, a novelization, a magazine review, and a promotional website, all produced under the same corporate umbrella. These practices are simply the logical result of culture industry owners and executives seeking to minimize risk and maximize profit. However, from the normative perspective of political economy, they also deprive audiences of a genuinely diverse range of informational and cultural output, first by crowding the media marketplace with similar products, and second, by deterring potential voices through oligopolistic control of production, distribution, and marketing.

From the political economy perspective, the commodification and industrialization of intellectual and artistic creativity significantly circumscribes the relative autonomy of culture industry workers, media texts, and audiences. Culture industry workers are constrained not only by the mandate to produce profitable commodities but also by the interventions of media owners seeking to protect or promote their specific economic and political interests, as well as the general interests of the capitalist class to which they belong.

Additionally, advertisers have significant influence over culture industry content. Advertisers shape both the structure and content of the media marketplace by the way they allocate their advertising expenditures. Advertising dollars tend to go to media outlets that reach audiences with the specific traits desired by advertisers, leaving undesirable audiences under-served. Advertising also affects media form, be it the layout of a magazine or newspaper, the dramatic structure of a prime-time television program, or a radio format based on three-minute songs. Finally, advertising affects media content. Producers of advertiser-supported entertainment and news cannot alienate either their sponsors or audiences due to the risk of losing advertising revenues. They are also expected to help promote consumerism. A magazine, for example, will specifically tie its editorial content directly to an advertisement in the same issue, while primetime television must generally keep audiences in a buying mood and assure them that their problems can be solved through consumption.

The political economic critique of the structure and practices of the culture industry lead to the obvious conclusion that commodification of culture and information, intervention by economic and political elites, and the influence of advertisers result in the production of media texts that tend to reinforce the status quo rather than promote social change. Furthermore, audiences are predisposed toward the preferred interpretations intended by producers because the culture industry fails to provide them with the alternative perspectives required to generate oppositional readings.

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Both cultural studies and political economy have sought answers to the central question posed by the Frankfurt School: What is the role of the culture industry within the social totality? From the cultural studies perspective, it can serve as a force for social change because there is much that escapes what Lowenthal (1950) called the "censorship of the socially powerful agencies" (p. 331). For political economists, the culture industry continues to be too interwoven into existing structures of economic and political domination to play any significant role in social change. Therefore, artistic and intellectual creativity cannot be truly free and spontaneous without the transformation of the social totality within which it is produced.

See also: Advertising Effects; Cultural Studies; Culture and Communication; Film Industry; Globalization of Culture Through the Media; Globalization of Media Industries; Magazine Industry; News Effects; Newspaper Industry; Political Economy; Publishing Industry; Radio Broadcasting; Recording Industry; Williams, Raymond.

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CUMULATIVE MEDIA EFFECTS

Researchers who study the effects of the mass media typically focus on the immediate, short-term effects of a particular program or movie. However, many of the effects of media exposure occur over the long term, with repeated exposure over time. One important area in which there is extensive evidence for cumulative effects is media violence.

By the 1970s, scholars concurred that early childhood exposure to media violence caused children to be more aggressive. As Leonard Eron and his associates wrote (1972, p. 262), "the weight of evidence . . . supports the theory that during a critical period in a boy's development, regular viewing and liking of violent television lead to the formation of a more aggressive life style." The consensus of scholarly opinion in this area prompted the U.S. Surgeon General to issue a warning in 1972 about the cumulative effects of viewing violence in the media.

While short-term stimulating effects of media violence have been found in people of all ages, cumulative long-term effects have generally only been observed in children. Although the processes that underlie these cumulative effects were unclear in 1972, they have since been elaborated. The five major processes are as follows: observational learning of behaviors and scripts, observational learning of attitudes and beliefs, emotional desensitization, cognitive justification processes, and cognitive cueing and priming.

Observational Learning of Behaviors and Scripts

Observational learning theory, as originally developed by Albert Bandura and his colleagues (1963, 1986), proposes that children develop habitual modes of behavior through imitation and vicarious reinforcement. Identification with the model, the perception that the behavior is realistic, and the perception that the model possesses valued characteristics, influence whether a child will imitate the model. Furthermore, direct reinforcement of the child's own behavior leads to a continuation of imitated behavior patterns and resistance to extinction.

More recently, Rowell Huesmann (1998) extended the concept of observational learning to include the learning of social scripts, which are "programs" that children may employ automatically when they are faced with social problems. Often, after a script is suggested by an observation, the child fantasizes about behaving that way—making the use of the script even more likely.

Observational Learning of Attitudes and Beliefs

Television shapes schemas about how hostile the world is. Viewing television cultivates a sense of personal risk in the real world, according to George Gerbner and Larry Gross (1976). Compared to viewers who watch a small amount of television, viewers who watch a large amount of television are more anxious about becoming victims of violence (e.g., carrying weapons for protection), are less trusting of others, and are more likely to perceive the world as being a dangerous, mean, hostile place. Kenneth Dodge and Nicki Crick (1990) have demonstrated that such attributional biases foster a misinterpretation of the actions of others as being hostile and thus promote aggressive interactions.

Television violence changes normative beliefs about violence. In the United States and elsewhere, a "culture of violence" is said to exist, and a number of studies have shown that more aggressive children are less likely to believe that aggression and violence are wrong. Moreover, longitudinal studies have shown that early childhood exposure to television violence is related to normative beliefs that are more accepting of violence—even fifteen years later, during young adulthood.

Television violence produces a cognitive desensitization to violence. An inhibiting factor of aggressive and violent behaviors in socialized humans is that individuals are simply not "used" to violence. However, the more that individuals are exposed to it or even think about it, the more accustomed to it they become. Psychologists call this a cognitive desensitization to violence, and repeated exposures to television violence facilitate this process.

Emotional Desensitization

Just as repeated exposure to television violence has been shown to cause cognitive desensitization, emotional desensitization can also occur. In one quasi-experimental field study conducted by Victor Cline and his colleagues (1973), boys who regularly consumed a heavy diet of television displayed less physiological arousal in response to new scenes of violence than did control subjects. In another study, Ron Drabman and Margaret Thomas (1974) demonstrated that children who watched violence responded less emotionally afterward to other scenes of violence and tolerated such violence more. For most people, the arousal that is naturally stimulated by observing violent behaviors is unpleasant and, therefore, inhibits aggressive actions. However, once this arousal habituates, aggression is no longer inhibited.

Cognitive Justification Processes

The justification process is a psychological phenomenon that explains why people who are aggressive like to watch violent television. A child's own aggressive behaviors normally should elicit guilt in the child because of the responses of others. However, for the child who watches a lot of television violence, this guilt is reduced by the recognition that "everyone is doing it." The child who has behaved aggressively and watches violent television programs feels justified and does not try to stop behaving aggressively.

Cognitive Cueing and Priming

An important element of the cumulative effects of exposure to violence is the increase in the number of cues that become associated with violence for the viewer who watches a large amount of television. While the observational learning process explains how exposure to media violence leads to the acquisition of violent scripts, priming theory explains why such violent scripts are more likely to be used. Leonard Berkowitz and his colleagues (1967, 1984, 1993) have proposed that any cues that appear in violent videos become associated with violence and in the future can "prime" aggressive scripts. Just the sight of objects that have often been associated with violence, such as guns, primes the retrieval of aggressive scripts. Furthermore, as Wendy Josephson (1987) has shown, even an innocuous object (e.g., a walkietalkie) that has been observed in a violent scene can subsequently stimulate aggression in a future encounter.

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Longitudinal Research

The five processes described above help explain why the cumulative effects of media violence can be so strong for children. As Huesmann and his associates (1986, 1997, 1999) have shown in two separate studies, children who grow up watching a steady diet of media violence are significantly more at risk to behave violently as young adults than are comparable children who watch less violence. In one study, the children (at eight years of age) who watched more violence behaved more violently ten years later (when they were eighteen years of age), and again twelve years after that (when they were thirty years of age). In a second study, the children (six to eleven years of age) who watched more violence behaved more violently fifteen years later (when they were between the ages of twenty-one and twenty-six).

Conclusion

The five major processes that were discussed above probably account for most of the cumulative long-term effects of television violence on the behavior of a viewer. The processes are wellunderstood psychological processes that operate in all humans. The outcome of such processes is highly predictable: an increase in the likelihood that the child who repeatedly watches violent television will behave more violently when he or she grows up.

See also: Arousal Processes and Media Effects; Desensitization and Media Effects; Ratings for Television Programs; Social Cognitive Theory and Media Effects; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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CURATORS

Curators work in museums and similar institutions that serve as repositories for objects that document and explain the artistic, historical, or scientific conditions of human existence. Such settings can be thought of as distinct types of "information systems" that exist to disseminate the kind of knowledge that resides in representative objects or specimens. Like books, documents, or records, museum objects are made useful when they are arranged according to particular principles and are disseminated on the basis of their context and communicative capacity. Within a museum setting, it is the curator who performs this function, using professional expertise to generate vital associations among objects to satisfy the curiosity of the general public and to meet community educational and scholarly needs. Curators are found in art museums, children's museums, history museums, maritime museums, and science and technology museums, in botanical gardens and arboretums, and in cultural societies and zoos. The curator oversees selection, acquisition, organization, preservation, and presentation of museum objects and collections.

Like their information professional peerslibrarians and archivists-curators make sure their particular information system responds to its environment by applying specific organizing conventions and interpretive sensibilities to museum collections. They do this by carrying out research about museum objects and by making sure artifacts are displayed in exhibitions in ways that are meaningful to museum patrons. The curator thus establishes or reinforces the circumstances of the existence of artifacts, their relationship to life, culture, or custom, and their relevance both to the museum's mission and its audience. In doing this, the curator guarantees the institution's survival and its commitment to the purpose for which it was created.

In addition to applying rules of organization by creating exhibitions that display and interpret museum collections, curators are in charge of collection development, selecting items that fit the institutional mission. They also direct conservation and preservation of museum objects. Curators are frequently involved in the public relations and fund-raising activities of their museums. They may supervise the creation of flyers, brochures, webpages, or other descriptive and educational materials that accompany exhibitions. Curators may need to write grants to secure funding for museum projects. They frequently attend, speak at, or manage fund-raising or other special events



A curator for the Numismatic Vault at the Smithsonian National Museum of American History in Washington, D.C., weighs gold coins. (Richard T. Nowitz/Corbis)

that help their institutions maintain a positive public image. Consequently, curators need to be well informed and have a range of communication skills, which come from a mixture of education and experience.

Undergraduate school may be the place where a future curator begins to develop the subject expertise in art, history, or science that leads to work in a specific museum environment. Graduate education provides training in organizational principles that are appropriate to their craft and introduces future curators to the range of possible job responsibilities. Like librarians, archivists, and other information professionals, curators must learn organizational principles that reflect a mixture of museum purpose, the unique characteristics of the type of information found in museums, and best practices for making this kind of information available. Although some colleges and universities offer undergraduate education in the study of museums, or museology, curators typically gain expertise and credentials in graduate programs of museum or cultural studies or of museum science.

Graduate programs offer instruction in museum administration and management, preservation of materials, collection management, exhibition design, interpretation, public programming, and museum education. Courses emphasize the history, function, and philosophical and societal roles of museums. They also cover different museum types, review issues of contemporary museum practice and professional concern, analyze the technical aspects of museum work, and examine monetary or other resources available to museums. Future curators get instruction in the planning, design, and production of exhibitions, become skilled in translating museum exhibition concepts into detailed plans or models, and learn about preservation and restoration strategies. Classes in museum education teach the students how to create and deliver successful museumbased instruction to a variety of audiences.

Requirements for a graduate degree in museum or cultural studies or in museum science usually include an internship or practicum component that gives students experience with regular museum activities. Students get to work in an actual museum setting where they have the opportunity to put their classroom knowledge of collection development strategies, exhibition design, conservation techniques, and administrative protocols into action. They may get direct insight into museum research and grant-writing efforts and get to do this kind of work as well. An internship or practicum also affords students the chance to meet future colleagues. Moreover, graduate education generally helps develop the level of analytical, decision-making, and communicative skills that curators need to do an effective job for their institution.

Organizations such as the American Association of Museums, the Institute of Museum and Library Services, and the International Council of Museums advocate for or provide services or funding to museums. These entities give guidance and support for continuing education and professional development activities for curators and other museum staff. They offer or suggest programs that help curators stay abreast of the best practices in object acquisition, conservation, interpretation, and presentation. These programs may feature advice about working with members of the museum's board, other members of the museum's staff, and members of the museum's community. The American Association of Museums, the Institute of Museum and Library Services, and the International Council of Museums also help make curators aware of funding opportunities related to museum activities. The American Association of Museums issues standards for museum accreditation. Their standards prescribe appropriate education and expertise for curators and other staff members. The Institute of Museum and Library Services, established by the United States Museum and Library Services Act of 1996, works in cooperation with the American Association of Museums on museum assessment and conservation assessment programs. Curators are likely to be involved in determining the eligibility of their museums for these programs. The International Council of Museums, which counts museums of all types and from various countries among its membership, maintains a committee devoted to recommending educational standards and has adopted a code of ethics for curators and other museum professionals.

See also: Archivists; Librarians; Museums.

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D

DATABASE DESIGN

"Database design" is the term that is commonly used to refer to a wide variety of functions that are associated with database generation within organizations that are involved in the electronic publishing of data or information collections that are intended for search and retrieval or other manipulation by computer. Database design can be interpreted narrowly, broadly, or anywhere in between. This entry uses a broad interpretation; it assumes that design is seldom a one-person effort and may require a team of experts in order to provide the necessary technical, management, human resources, financial, and subject expertise. Design is not a one-time activity even though many people think of it as occurring only prior to the creation of a database. In a broad sense, database design involves the continued improvement of database products. The principal designer or leader of the design team is unlikely to be an expert in all aspects of design, so he or she must call on and interact with others to accomplish a good, flexible, expandable design.

Database design involves the organization and presentation of data (where the term "data" is understood to refer to data or information or facts of any type) so it can be easily located, accessed, and used. It includes a wide variety of functions and activities that range from selection and acquisition of raw, reduced, or otherwise processed data to a variety of value-adding activities.

Design involves specification of criteria for limiting the type of content by subject matter (i.e., its breadth and depth—often referred to as "horizontal" and "vertical," respectively—in connection with an information system), language, type of data (e.g., abstracts, full text, numeric data, images, audio data), geographic location, file size, and so on. In general, database design covers all aspects of what needs to be accomplished both manually and by computer in preparing, processing, and maintaining a database. Design must include documentation of all of the parameters and activities discussed in this entry.

Content and Value Adding

Database content is roughly determined by the visionary who proposed the product and by amplifications that are made by a design team of experts who will have checked appropriate reference sources and experts to gain further understanding of the user needs and sources for the data. Details will depend on the subject matter or functions that will be served by the proposed database. The methods for organizing and indexing (or otherwise making access points to the data) will dictate the type of format that is appropriate and the standards that should be considered. Content is the most important element of the database, but next to that is the added value that may determine the uses to which the data can be put and the attractiveness of the database.

Adding value applies to virtually any aspect of the database. It applies to basic production processes as well as enhancements that improve, for example, the content, accessibility, appearance, usability, of databases. Value-adding activities include the following:

- reducing data (where needed),
- formatting data in accordance with standards,
- enhancing, expanding, merging with other data or data records,
- categorizing, classifying, indexing, abstracting, tagging, flagging, and coding to improve accessibility,
- sorting, arranging or rearranging, putting the information into one or more forms that will satisfy users,
- creating visual representations of data (especially for numeric data),
- updating, correcting errors,
- adhering to production schedules, and
- putting the data into searchable form with appropriate access points (and links to other databases and application packages) for search, retrieval, manipulation, and use by users.

These and many more activities are all considered to be a part of adding value to the product.

Computers and Information Technology

Database design includes the recommendation and eventual selection of appropriate information technology for processing, storing, and manipulating data, as well as the selection of the media for processing and storing data on site and for distribution of data to customers. The database may be produced in several different media (e.g., CD-ROM, DVD, diskettes, hand-held devices, or any new technology that may appear in the marketplace), depending on the type of product that is needed by customers. Any organization that produces databases must remain alert to the development of new technologies that may be of use to the organization for (1) processing, storing, distributing, and using their data, (2) management of the various functions, or (3) generation of reports. Computer selection is important because of its centrality to the entire process of database production and use.

Software for Processing, Management, and Search/Retrieval

Database design includes the development of, or acquisition of, software for managing the flow of data and records through all steps of the process—from acquisition and processing of data, to generating management reports about the data flowing through the system, to delivery to customers or making data accessible to users online. Software is required for search/retrieval processes, as well as for manipulation of the data (e.g., using spreadsheets, sorting, rearranging, running statistical programs on data) and the generation of reports in compliance with user requests.

In general, a database design is created for a master database from which a variety of products can be produced. The products can have exactly the same content, and they can be produced in the same format or in differing formats. The products created from the master database can be made available on different media for distribution. The master database can also be used to create subsets of the same data to meet specific customer needs. Subsets of the data can be merged with outside data to create new products, or the records in the master database may have additional data elements added in order to increase the value for specific customers.

Quality Assessment and Control

When designing a database, quality is an important consideration. The designer or design team must indicate the areas where quality should be monitored, determine how it can be monitored, and establish methods for controlling quality. The quality of a database product involves many different aspects of the database, such as reliability of the medium for distribution/access, accuracy of data, timeliness, inclusion of essential data elements in every record, and additional elements that may or may not be present because of the variability of data sources. Customers and users judge databases according to many objective and subjective factors. Accuracy of data, clarity of presentation and ease of using the front end to the information system, and adherence to time schedules are a few of the objective factors. The subjective factors include such things as acceptability of price in relation to the user's budget and how good a match there is between the user's need and the database design.

Market Analysis, Pricing, and Marketing

Designers must determine the target market for a given database product in terms of potential size, characteristics, geographic location, language, spending limits, needs/wants for data, and current information use patterns. Much of this would depend on a "user needs assessment" that should be done prior to the design phase or as the first step of the design process. Designers must analyze the potential market, review the competition, compare both the positive and negative aspects of competitor products with the planned database product, estimate prices for types of lease, license, and online use of the database, estimate likely levels of sales from a reasonable fraction of the market, and estimate the design, production, and operating costs. These various types of market data become a part of the business plan for the database. The designers must consider methodology for marketing the database, including the use of site visits, telephone contacts, attendance at conferences/meetings, advertising, and websites that have two-way links to appropriate databases.

Business Plan

When a new database is designed, the design documentation or proposal for creating the database should include a business plan as a part of the general design. Producer organizations normally require detailed cost data for any new product. Three-year or five-year projections (sometimes more) of costs for selected methods for marketing, along with identification of the named sources, targets, and links, should be included in the text description and in the spreadsheets of the business plan. The plan must also include detailed discussion of all aspects of the database, including source material (where will the data come from and what will it cost) required for the data, quality assessment and control, analysis, and all planned aspects of adding value.

The total cost information that is provided for the business plan should include the estimated cost of designing and testing a sample database and the cost of gearing up for production, as well as revenue projections for a specified number of years. By using a computer-generated spreadsheet application (e.g., Excel or Lotus), it is easy to make adjustments in pricing—for example, to see how the adjustments affect the projected costs to the producer and the projected revenue from the customers.

Legal Considerations

The design of a database must take into account the legal problems that are associated with

the intellectual property rights, copyrights, and use rights that belong to the author of the original data contained in the database; the rights of the users to have open access to information; the rights and liabilities of the database producer who makes a collection of data available to a wide audience; and the responsibilities that the producer has to the sources of information as well as to the customers who use the database. These aspects, plus financial consideration and pricing, are put into legal contracts (prepared by an attorney for the producer) that are executed between the database producer organization and the data sources and between the producer and the customers. In large organizations, there is generally an attorney to handle such matters, and in small organizations, a consulting attorney is employed to develop contracts. The design team should have a knowledge of where the problems lie and should be able to convey the necessary information to the attorney.

See also: CATALOGING AND KNOWLEDGE ORGANIZA-TION; COMPUTER SOFTWARE; COMPUTING; DATA-BASES, ELECTRONIC; KNOWLEDGE MANAGEMENT; LIBRARIES, DIGITAL; LIBRARY AUTOMATION; MAN-AGEMENT INFORMATION SYSTEMS; RETRIEVAL OF INFORMATION; SYSTEMS DESIGNERS.

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DATABASES, ELECTRONIC

Electronic databases are organized collections of data, or information, that are stored in computerreadable form. In general, electronic databases are of two types: those that can be accessed by large mainframe computers and those that can be accessed by small personal computers. However, this distinction is becoming less important as small (in physical size) computers continue to increase in power. In general, mainframe databases—most of which are highly specialized—are maintained by large businesses, institutions, and government agencies. Databases can be either publicly available or private. Private databases can be accessed only by employees of the organization that maintains the databases. Public databases are designed for access by the public. Databases for personal computers typically are created and used by individuals, small businesses, and units within large businesses; they can be used for a wide variety of purposes.

Definitions

The term "database" is used in two senses. One refers to the organized collection of data that is created, maintained, and searched. The other refers to the software that is used to create and maintain the data. Database management systems are often simply called "databases." This entry concentrates on large, publicly available databases, together with the services that make them available.

The term "data" refers to facts, numbers, letters, and symbols that describe an object, idea, condition, situation, and so on. Data elements, which are the smallest units of information to which reference is made, are combined to create records. Data elements in a bibliographic reference include the names of the author or authors, the title of referenced work, the journal name, the pagination, the volume number, the issue number, and the date of publication. A data set is a collection of similar and related data records or data points that have not yet been organized for computer processing. A data file is an aggregation of data sets or records treated as a unit. While databases are also collections of related data and information, the difference between a data file and a database is that a database is organized (by a database management system) to permit the user to search and retrieve or process and reorganize the data.

The data in a database may be predominantly:

- word oriented (e.g., textual, bibliographic, directory, dictionary, full text),
- numeric (e.g., properties, statistics, time series, experimental values),
- image—both fixed images (e.g., photographs, drawings, graphics) and moving images (e.g., a film of microbes under magnification or time-lapse photography of a flower opening), or
- sound (e.g., a recording of the sound of a tornado, wave action, or an explosion).

The discussion in this entry is concerned primarily with digital data, although a large portion of raw data is recorded as analog data, which also can be digitized. Digital data are represented by the digits zero to nine. In the case of analog data, numbers are represented by physical quantities (e.g., the lengths obtained from a slide rule, the measurements of voltage currents). These physical quantities can be converted to digital data through an analog-to-digital converter. Because word-oriented, numeric, image, and sound databases differ, they are processed by different types of software that are specific to each type of data. Digital data may be processed or stored on various types of media, including magnetic media (e.g., tapes, hard drives, diskettes, random access memory) and optical media (e.g., CD-ROMs, digital video discs). Users can access the data either through portable media or, more generally, through online sources.

The term "data" can refer to raw data, processed data, or verified data. Raw data consist of original observations (e.g., those collected by satellite and beamed back to Earth) or experimental results (e.g., laboratory test data). Raw data are subsequently processed or reduced to make them more useable, organized, or simplified. Large data sets need to be cleaned, processed, documented, and organized to enable their use. These activities are occasionally called "curation." In general, the more curated the data are, the more broadly useable they become to users outside the original research group or subdiscipline. Verified data are data whose quality and accuracy have been assured. For experimental data, this means that the original test or experiment has been duplicated and the same data have been produced. For observational data, it means that either the data have been compared with other data whose quality is known or the instrument through which the data were obtained has been properly calibrated and tested.

Many databases are used to retrieve and extract specific data points, facts, or textual information for use in building a derivative database or data product. A derivative database, which is the same as a value-added database or a transformative database, builds on a preexisting database and may include extractions from multiple databases as well as original data. When dealing with derivative databases, the question of intellectual property rights arises and must be resolved.

Availability of Online Public Databases

The range of public databases has grown to the extent that it is now possible to find data on almost any subject. Databases have been created for nearly every major field and many subfields in science, technology, medicine, business, law, social sciences, politics, arts, humanities, and religion as well as for news (worldwide, regional, or subject-related), problems (specific to topics and organizations), missions (such as transportation, defense, shipping, robotics, oil spills, solid waste), and consumer interests such as shopping and automobile repair.

The first comprehensive database directory, *Computer-Readable Databases* (CRD), was com-

piled and edited by Martha E. Williams and was published in 1976 by the American Society for Information Science. CRD originally covered 301 publicly available databases, but by the mid-1980s, the number of publicly and commercially available electronic databases that were listed in CRD had grown to more than three thousand. Gale Research, Inc. (which became the Gale Group in 1999) acquired CRD in 1987 and continued to publish it until 1992, when they renamed it the Gale Directory of Databases (GDD). By the year 2000, GDD had grown to include more than twelve thousand databases. Both CRD and GDD included all types of public, commercial databases (i.e., word-oriented, number-oriented, picture-oriented, and sound-oriented databases), as well as multimedia, which include combinations of these types.

Access Services

When a database is developed for public use, it is usually made accessible to users through a telephone connection to the host computer ("online") where it resides; wireless access, however, is gaining importance as a technology for access. Database services may be provided by the producer of the database or, more commonly, by a separate organization that offers online searching of one or more databases.

In order to find information online, one needs to know which database is likely to contain that information. There are several ways of identifying specific databases. One way is through the use of printed directories such as GDD. Another way is through online directories that are maintained by search services for those databases on their systems. Yet another way is through the various search engines on the World Wide Web. Search engines may use various methods to index or catalog website contents. Web crawlers robotically go from website to website and index their contents. Examples of web crawlers include AltaVista, Excite, Hot-Bot, Magellen, and WebCrawler. Some search engines, such as Yahoo, Lycos, and LookSmart, use directories that are generated by humans who intellectually catalog websites. Metacrawlers check many search engines to produce a single list of databases so that the user does not have to check each search engine individually.

Organizations that provide online search services are also called online vendors. They have the computers and software (computer programs) that allow outside users to search databases themselves for data and information, whether it is in the form of numeric data, text, images, sounds, or a mixture of these formats.

Users and Access

Users of public databases include most groups of people whose profession, business, and educational activities require quick access to information. This includes scientists, lawyers, doctors, stockbrokers, financial analysts, librarians, executives, students, and other researchers. Some public databases and search services are focused on consumer needs, providing access to such information as flight schedules, merchandise catalogs, movie reviews, theater schedules, restaurant information, and hotel/motel availability and reservation services. In addition, there are financial, bibliographic, and other services that were initially developed for professional and business users.

Online access to a database usually requires that the user has computer access to an account with a search service that offers such access, a password to log onto the service, knowledge of how to use the service, and information about specific features of the database.

Procedures that users need to know in order to take full advantage of search services and the databases to which they provide access vary widely in complexity. This complexity depends on the type of stored information and the user that the database was designed to serve. For example, searching a database for physical or chemical properties of a certain class of substance requires a different and less widely held kind of knowledge than does searching a database for the names of theaters in a given geographic area. Similarly, an online system intended for professional researchers who use the system daily can be very complex and therefore will contain more useful features than one aimed at occasional end users. Some database producers and/or vendors offer their services to users over the Internet, providing access to all or a sampling of their database product, either for free or for a fee.

Types of Databases

Databases are organized and maintained in different ways for different types of information (i.e., words, numbers, sounds, and images). Each information type has a distinctive machine representation and requires a distinct kind of software. Word-oriented databases contain words, phrases, sentences, paragraphs, or text as their principal data. The principal data in numeric databases, often called "databanks," consist of numbers and symbols that represent numbers, statistics, experimental values, time series (i.e., events or phenomena observed over a span of time), tables of numbers, graphs that are based on such tables, and similar material. Pictorial databases, many of which are constructed for scientific or engineering purposes, may contain representations of virtually any multidimensional structure (e.g., chemical structures, nuclear particles, graphs, figures, photographs, architectural plans, and geographic maps). Moving picture databases can represent virtually anything shown in motion. Audio databases, which contain sounds, can represent music, voices, sounds of nature, and anything than can be heard.

Alphabetic and alphanumeric strings of characters cannot be handled by numeric processing software. In other words, these strings cannot be added, subtracted, multiplied, or divided. Therefore, they require software that is designed specifically for handling character strings. Word-oriented databases allow the users to search the database for strings of characters that match the strings of characters in, for example, names, titles, and keywords. Most of these databases allow the user to search using partial words (i.e., truncated words that use a wildcard symbol such as an asterisk to permit multiple endings on the word stem). For example, a user who conducts a single search using the string or partial word "bridg*" would be able to retrieve information related to "bridge," "bridges," "bridged," "bridging," and other similar words or phrases. Word-oriented databases were the earliest publicly available electronic databases They were introduced in the 1960s and contained predominantly information related to science, engineering, technology, and medicine. These early databases contained bibliographic references to published scientific and technical literature, and there were initially only a few dozen of them. They have since multiplied into the thousands.

Bibliographic databases range in size from small files such as the Acid Rain database (with approximately four thousand citations) and the AgeLine database (with approximately fifty thousand citations) to large files such as Medline (with more than eleven million citations in the biomedical and health sciences fields). Chemical Abstracts Service produces several databases, which in the year 2000 collectively included more than twenty-two million document citations to documents.

Full-text databases provide access to the texts of such documents as legal cases and statutes, wire services, journal articles, encyclopedias, and textbooks. Except for the Lexis-Nexis service, which has a large set of legal databases that are mostly grouped in "libraries" of databases, most of the full-text databases were established after 1980. The first full-text database, Lexis, was established in 1973 by Mead Data Central (which later became the Lexis-Nexis service). Lexis-Nexis is one of the world's largest word-oriented database services, and among services that have legal databases, it is approached in size only by Westlaw, a legal database service established in 1975 by West Publishing Company (which later became the West Group). The Westlaw service includes billions of pages of information in thirteen thousand databases in a few dozen "libraries" (all represented as a few dozen entries and umbrella entries in GDD).

Online newspapers, newsletters, journals, and textbooks are among the numerous full-text databases that are available online. Examples include the United Press International and Associated Press wire services, *The New York Times* and *Wall Street Journal* newspapers, and *U.S. News and World Report* and *Newsweek* magazines. Examples of electronic journals are the *Harvard Business Review* and many of the American Chemical Society journals. Electronic encyclopedias include the *Academic American Encyclopedia and Encyclopaedia Britannica.*. Among the many thousands of medical textbook databases are *Gray's Anatomy*, *Textbook of Surgery*, and *Principles and Practices of Emergency Medicine*.

In numeric databases, numbers and symbols are the principal data that are stored and processed. Generally, compared to word-oriented databases, numeric databases involve less fetching and character-string matching and more processing. Most of the programming for a numerical database involves manipulating the data mathematically and presenting it in reports that are formatted and labeled in forms that are familiar to the specific class of users for which the database is designed. Statistical routines, time series, and other programs for manipulating data mathematically work in the same way for numeric data regardless of whether the data relate to sociology, economics, finance, chemistry, or any other field. One example of a large time series database is the National Online Manpower Information Systems (NOMIS), which is produced by the University of Durham in England and has more than twenty billion time series records in its databases.

Pictorial databases are relatively specialized and are fewer in number. Their data consist chiefly of specifications for shapes, distances, geometrical relationships (including three-dimensional relationships), colors, and the like. The computer processing of pictorial data (including photographs and videos) requires sophisticated programs for such functions as video pattern matching, coordinate matching, and extraction of specific features of photographs, maps, videos, or other pictorial representations. Computer processing of sounds has its own set of requirements for matching and analyzing sounds (e.g., by parsing and other techniques).

Production and Distribution

Databases are produced by a wide variety of commercial, governmental, academic, and nonprofit organizations. The way in which a database is created depends on whether it is a primary database (e.g., containing the text of an original article) or a secondary database (e.g., providing references, abstracts, or index entries associated with an original article). To prepare a secondary database, the producers cull the primary literature for source material, books, journals, dissertations, government reports, and conference proceedings in order to identify items that are relevant to the subject area of the database. For each item selected for mention in the secondary database, the producers prepare a bibliographic record that lists the names of the author or authors, the title of the article or book, and further information that is needed in order to find the cited publication. The record is then entered into the database, and individual data elements (e.g. author, title, date of publication, journal name, volume number, issue number, page range, and so on) are identified by a specific code or position in the record. In some bibliographic databases, the records include index terms and/or keywords for the articles and books
that are referenced. Other bibliographic databases also include abstracts of the articles.

Most large databases are updated periodically (e.g., monthly, weekly, continuously). These updates may be put on magnetic tape and shipped, they may be transmitted directly to search service organizations for incorporation, or they may be made available for downloading from the producer's website. Some small databases are issued on floppy disks or CD-ROMs for use on personal computers. Other small databases are sold as a part of handheld devices that contain both information and searching capabilities. Some large databases are sold or leased to government agencies and corporations for in-house use. Other large databases are sold or licensed to online search services where they are reformatted by the search service's software or search engine in order to allow searching by their customers.

Electronic databases are accessed mainly through online search services (i.e., database vendors) and/or directly through the Internet. These services provide online databases together with software for search and retrieval, data manipulation, and modeling. They are sometimes called "information utilities," because, like electric or gas utilities, an online search service serves a widely distributed network of users. Several hundred such services in the United States and Europe provide access to more than twelve thousand databases and databanks worldwide with billions of records.

If a database is part of a commercial online service, anyone with a microcomputer, a modem, and a telephone can have access to it for a fee. The search fee includes charges for accessing the database itself and for the use of its search software. There may also be charges for printing or downloading search results.

The fees required for using search services vary widely from service to service and from database to database. Many services charge only for the actual use of the service. Others require subscription fees, monthly or yearly minimum payments, and the like. Information that is available at websites on the Internet may be entirely free, or it may require a payment.

Charges usually are based on usage or on units accessed, retrieved, or delivered. Usage is measured in terms of connect time (i.e., the number of minutes that are used to carry out an online search), or in terms of the number of records accessed, viewed, retrieved, downloaded, or printed, or in terms of computer resource units. Resource units measure the amount of the computer facility (including machine time and storage capacity) that is used in a search. The units accessed, retrieved, or delivered may be, for example, bibliographic references in a bibliographic database, individuals identified in an employment database, or time series in a time series database. The units may be displayed on the user's terminal, printed out by the search service and sent to the user, or, more commonly, downloaded by the user for local printing and use.

Among the commercial online services for searching numeric databases are Standard & Poor's DRI (Data Products Division), GE Information Services, The WEFA Group, and the Oxford Molecular Group (Chemical Information System). All of these except Chemical Information System provide mainly business-oriented databases; Chemical Information System provides mainly scientific databases. Among the vendors of wordoriented databases are Lexis-Nexis, The Dialog Corporation (DIALOG Information Services, Inc.), the U.S. National Library of Medicine, West Group (Westlaw), CompuServe Information Service, America Online, Inc., and Dow Jones and Company, Inc.

DIALOG, the largest of the online search services that provide mostly bibliographic databases, began offering commercial search services in 1972. At that time, it featured two government-produced databases-ERIC (Educational Resources Information Center) and NTIS (National Technical Information Service). By the year 2000, DIALOG had several hundred databases with nine terabytes of data. The U.S. National Library of Medicine began its search service in 1971, offering the Medline database with 147,000 records. By the year 2000, the U.S. National Library of Medicine had dozens of databases with about eleven million records. Lexis-Nexis, the largest service to provide mostly textual databases, introduced its commercial online service in 1973 with a database of 208,000 documents or 2.5 billion characters. By the year 2000, it had burgeoned to more than 2.8 billion searchable documents or 2.6 trillion characters of data.

See also: Bibliography; Cataloging and Know-Ledge Organization; Computer Software; Computing; Database Design; Information Industry; Internet and the World Wide Web; Knowledge Management; Libraries, Digital; Library Automation; Management Information Systems; Systems Designers.

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MARTHA E. WILLIAMS

DECISION MAKING AND GROUP COMMUNICATION

See: Group Communication, Decision Making and

DEMOCRACY AND THE MEDIA

In modern societies, it is impossible to talk intelligently about democracy without considering the role played by print and electronic media in disseminating political messages to the public. Especially following the creation of electronic media in the twentieth century, the connections between democracy, political campaigns, public opinion, and journalistic practices have become the focus of great attention and anxiety among communication scholars. Each new media innovation is evaluated for its potential effect on democratic politics, and media professionals are regularly criticized for practices that are perceived in one way or another as being antidemocratic. Also, as media have allowed politicians and political candidates to address large audiences, Richard E. Neustadt's contention in his book Presidential Power (1980)—that the real power of the U.S. president is the "power to persuade"-has become increasingly intuitive, with presidents and other politicians acquiring more and more channels through which to reach their constituents, in addition to their normal interactions with other appointed and elected policymakers.

The relationship between democracy and the media has been a regular topic of discussion ever since the emergence of liberal democratic theory as an intellectual force in Europe. In the seventeenth century, John Milton's Aeropagitica provided a libertarian argument for the right of free discussion, as such discussion presumably would lead to the rejection of false and unsound opinion and the discovery of truth. Although the free press guarantee in the Bill of Rights of the U.S. Constitution received surprisingly little attention at the time of the adoption of the First Amendment, that guarantee has been the object of much debate ever since. In part because of frustration with the early Federalists, Thomas Jefferson and other anti-Federalists were passionate defenders of the free press in the early days of the American republic. In the nineteenth century, the English philosopher John Stuart Mill articulated a fully developed justification for free speech and a free press, as silencing anyone might prevent the truth from being told and would run the risk that errors would not be discovered.

The modern media has only been able to convey up-to-date political information to the public for a little less than two centuries, thanks largely to technological innovations in print media and the rapid development of electronic media forms. Furthermore, German sociologist Jürgen Habermas explains in his book The Structural Transformation of the Public Sphere (1962) that the rise of the politically oriented public sphere in parts of Europe and the United States was fundamentally linked to the development of the media. In the emerging democratic societies of Europe and North America, newspapers became not only reporters of news but shapers of public opinion. However, as newspapers became increasingly dependent on commercial advertising for support, economic considerations meant that newspaper editorial policy and journalistic practice could also be influenced by those who controlled financial resources. The result, as described by Habermas, is that wealthy individuals or those who control wealth have more influence over public opinion and, ultimately, over what policies are changed than do members of the lower and middle classes. Other scholars also have worried that, in addition to the economic forces that might distort public debate, the heavy reliance of the modern media on governmental sources of information might lead in

some cases to less scrutiny and criticism of governmental policies.

As the relationship between democracy and the media has been considered throughout the twentieth century, much attention has been given to the extent of media effects, especially following the experience with government-produced propaganda during two world wars. If media coverage of politics and political campaigns has little influence on public attitudes and behaviors, then presumably people need not be concerned over the quantity and quality of attention that is paid to politics in the media. However, if media coverage of politics and political campaigns has a moderate or strong influence on public attitudes and behaviors, then protecting democratic government requires careful review-and possibly governmental regulation-of media, whether print or electronic, mainstream or alternative. Historically, some scholars have maintained at one time or another that the media have almost no effect or that the media have a strong, direct effect on audiences, but the vast majority of contemporary scholars believe that the media have some, usually moderate, effects on some audiences in some situations.

Further complicating the relationship between democracy and the media has been the emergence of computer-based interactive media, including the Internet, and other new technologies, such as facsimile machines. New media forms provide ordinary people with unparalleled opportunities to distribute information quickly and inexpensively to large numbers of their fellow citizens. The democratic potential of such new media is sometimes described as being a way to compensate for the ownership of traditional media forms (e.g., newspapers) by fewer and fewer large corporations, given the concern that this trend to "media monopolies" has or will reduce the diversity of opinions that are expressed in established media. However, the proliferation of Internet sources has meant that the information provided on the Internet often is not accurate or, at the very least, Internet information has not been properly checked for accuracy. Additionally, while some political observers have discussed the potential of Internet voting and campaign material distribution to rejuvenate interest in voting and in political activism, others have argued that the tendency of Internet websites to engage in shallow political humor and parody is more likely to foster cynicism than to combat it. Of course, given the rapid development of the Internet and its steady increase in availability and ease of use, the political implications of emerging electronic media are far from certain, whether in historically democratic societies or in authoritarian nations where governments are struggling, usually with uneven success, to restrain the free flow of information.

Moral Obligations of Media Professionals

The obligations or duties of media professionals as those duties relate to life in a democracy have been far from clear as new media technologies have become available. By the eighteenth century, liberal democratic theory as developed in Europe and North America suggested that opinion and deception were inevitably going to be part of a free society, but such theories also maintained that truth would emerge in the end after vigorous debates about public policy issues. In the latter half of the nineteenth century, however, slipshod journalistic practices and highly partisan editors and publishers (including Joseph Pulitzer and William Randolph Hearst) led many observers to become increasingly uncomfortable with media that frequently published exaggerated stories that came complete with an obvious political slant.

In response to such excesses, alternative theories of the relationship between democracy and the media were considered. Specifically, what eventually was called the social responsibility theory of the media emerged by the mid-twentieth century in the United States, most noticeably in the 1947 report of the Hutchins Commission on Freedom of the Press. While still embracing the notion of a free press, social responsibility theory suggested that the special freedoms that were given to media in democratic societies meant that media had a responsibility to report accurately and objectively the multiple perspectives on matters of public relevance. This argument was used with particularly great force against radio and television broadcasters who were allowed to use a public resource, broadcast frequencies, for their individual gain. Because media have an obligation to inform the public about politically relevant information, for example, some members of the Hutchins Commission even speculated that the failure of media to meet their public obligations might require further governmental regulation to see that this obligation was met. While government surveillance and regulation of media content along the lines discussed

by the Hutchins Commission never took place, prevailing sentiment among media professionals who reported political news favored some version of the social responsibility theory for the latter half of the twentieth century.

Even as social responsibility theory was gaining acceptance among journalists, modern political campaigns increasingly were required to rely heavily on media for contact with prospective voters in nations such as France, Great Britain, and the United States. Even the ancient practice of political speech making, as Kathleen Hall Jamieson observes in her book Eloquence in an Electronic Age (1988), became relatively more intimate, conversational, and television-friendly by the late twentieth century. In addition to "paid media," or media messages that were distributed in the form of paid advertisements, for example, political candidates sought to capitalize on the advantages of "free media" exposure by soliciting favorable media attention in one way or another, even by staging media events, or "pseudo-events," whose only purpose was to attract the attention of print and electronic journalists.

While media effects research in the 1940s and 1950s often indicated that the influence of media on prospective voters was minimal, more recent research suggests that media coverage of political campaigns may have some worrisome and, ultimately, undemocratic effects. In U.S. presidential campaigns, for example, some scholars have argued that the tendency of many media outlets is to emphasize the "horse race" component of the contest itself, rather than focusing on the issues that are being discussed by the various candidates. In presidential primaries, the tendency of media professionals to give the vast majority of their attention to the best-known candidates and to put great importance on performance in a few early primaries or caucuses means that the choices of those professionals may have an enormous effect on the outcome of the campaign. Furthermore, even when media outlets talk about issues, those issues may concern campaign issues (e.g., the age of a political candidate) rather than policy issues (e.g., income tax reductions). Another complaint is that some electronic media, most notably television, address a diverse mass audience that discourages candidates from taking any meaningful or controversial positions for fear of alienating some voters.

As a result of these observations, some scholars conclude that the media have not met their obligations to the public by providing relevant information about the public policies that are preferred by different candidates. In contrast, defenders of media campaign coverage point out that people learn about issues and policy preferences from media outlets. If voters do learn relatively little about issues, it may be because candidates themselves take few substantive policy positions during campaigns. Perhaps the most optimistic way to interpret the current situation is described by Roderick P. Hart in his book Seducing America (1994). According to Hart, one way to interpret the relationship between democracy and the media is that television, at least, is an imperfect and frequently shallow source of political information, but it teaches something about politics to even the most apathetic citizen and encourages the best citizens to learn more about politics and even to become politically active. The problem for Hart, unfortunately, is that television, the primary source of political information for most people, is a passive medium designed for personal entertainment, rather than encouraging political action and a sense of civic responsibility. Only the exceptional individual is inspired by television to take an active and personal interest in politics, let alone in political campaigns.

One clear example of the controversial and complex relationship between democracy and the media is found in research on campaign debates. Beginning with the famous Kennedy-Nixon U.S. presidential debates in 1960, campaign debates involving two or more political candidates have become an increasingly important part of political campaigning. Presidential candidates have no choice but to participate in such debates if they wish to be perceived as being capable and qualified, and candidates in state and even local political campaigns are likely to be invited to participate in one or more debates. Certainly, the available evidence suggests that, whatever their previous levels of information, voters acquire more knowledge about political candidates after watching a debate, in which voters are able to compare the policy platforms and personal attributes of the major-party candidates. When compared to traditional campaign speeches, debates may be more informative and rightly deserve the large amount of media attention that they get. However, media coverage



One of the turning points in terms of media influence on democracy was the television broadcast of the 1960 presidential debates between Richard Nixon and John F. Kennedy. (Bettmann/Corbis)

of and participation in campaign debates has been repeatedly criticized. First, media are sometimes said to influence public perceptions of those debates by focusing on competitive concerns, namely who "won" or "lost" a given debate. The result is that public policy concerns addressed in those debates are given relatively little attention. Second, as media professionals sometimes ask questions of the candidates or serve as moderators during the debates, their participation in the debates is subject to great scrutiny. For example, one study published by Frances R. Matera and Michael B. Salwen (1996) found that journalists who asked lengthy questions of candidates during presidential debates, especially questions with multiple parts, might contribute to the tendency of candidates to give long-winded answers that ignore part or all of the original question. As long as media representatives continue to participate in such debates, there will be a need to assess their contributions to campaign debates, along with the performances of the candidates themselves.

The increasing importance of media in political campaigns has also led to a rise in the use of professional political consultants by candidates. While such consultants could be found by the mid-nineteenth century in the United States, only since the 1960s have consultants dealing with scientific polling and various media outlets become a fixture in all but the most local of political campaigns. Candidates and their professional advisers became increasingly sophisticated in their targeting of certain groups of voters, and, by the 1990s, President Bill Clinton would be described as the most polldriven and public-opinion-sensitive politician in the nation's history. Consultants are depicted as constantly attempting to "spin" the perceptions of U.S. voters in a way that is favorable to the candidate, and some critics of political consulting believe that consultants are responsible for a shift to an increasingly superficial style of political campaigning. However, defenders of consulting argue that voter cynicism is most directly attributable to disenchantment with political parties and with

widely reported political scandals. Furthermore, consultants reject any strategy or approach that would alienate key groups of voters. In the end, consultants design and create campaign messages not to anger voters but because they believe those messages have a good chance of working. Finally, if political consultants are guilty of unethically manipulating media professionals and the public, then it is the job of media professionals and the public to uncover and point out those attempts at manipulation.

Social-Scientific Theories of the Media

Several different social-scientific theories of media effects have important implications for the creation and modification of public opinion in democratic societies. Some of the most successful and well-known contemporary media theories are related to agenda setting, the knowledge gap, news diffusion and information flow, and the spiral of silence.

The Agenda-Setting Effect

As originally explained by Maxwell E. McCombs and Donald L. Shaw (1972), media may not be able to tell people what to think, but they are able to tell audiences what to think about. In other words, media may set the public agenda by saying which concerns are important and which are not. Hundreds of studies of the agenda-setting effect suggest that media exposure encourages individuals to agree more closely on what public issues are most important at any given time. This finding is important because it suggests that media gatekeepers (e.g., editors) may help to determine what issues will find their way onto the public agenda. Also, most people are only able to remember and describe a few issues at a time, so issues to which the media pay attention are quite likely to displace or crowd out other potentially worthy issues that receive less media attention. Once an issue is perceived as important by ordinary citizens, politicians and political candidates are more likely to address this issue in their public statements and/or to work for social and political changes that will resolve the public policy problems with which that issue is linked. Other organizations and people outside the media, of course, also work to set the agenda in a democratic society. Media act as only one force among many in determining what issues get attention and what issues are ignored.

Consistent with contemporary theories of indirect media effects, the relative importance of the agenda-setting effect depends on the situation in which the effect is measured. For example, a strong agenda-setting effect is more likely when the relevant audience believes that the source of the media message is highly credible, since a highly credible source is more likely to be persuasive. Furthermore, heavy media exposure may result in a stronger agenda-setting effect than when media use is fairly light.

The Knowledge Gap Hypothesis

Democratic theory requires that citizens be informed about political candidates and public policy debates in order to make reasoned decisions, and from this perspective, the media in a democratic society are obligated to provide appropriate information to the public. However, some researchers have maintained that providing a larger quantity of information does not necessarily reduce the "gap" in the amount of knowledge that is possessed by some groups when compared to others. Early versions of this thesis, called the knowledge gap hypothesis, maintained that higher socioeconomic status groups would acquire knowledge at a faster rate than lower socioeconomic status groups. Some studies suggest that knowledge gaps exist for other reasons as well. For example, a group that is highly motivated will gain knowledge more quickly than a group that is not motivated, and highly educated groups will acquire knowledge more quickly than will less educated groups. Situational factors and the source(s) of information may also determine the nature and extent of knowledge gaps.

If such knowledge gaps sometimes persist despite efforts to distribute information to all members of society, then these gaps suggest that some groups are better equipped to influence public policy than others. Such a conclusion is obviously troubling in democratic societies. Some knowledge gap researchers have tried to isolate strategies for reducing knowledge gaps, such as finding ways to increase motivation among groups that have a lower socioeconomic status.

News Diffusion and Information Flow

Scholars have periodically attempted to determine how members of the public learn about breaking news stories, what media are turned to for information, and what sorts of information are actively sought by the public. Various labels have been used for research of this sort, including "news diffusion," "news seeking," "information seeking," "flow of information," and "news learning." While these various research projects have differed in some important ways, all seek to explain how information is acquired in various contexts. For example, when a crisis or catastrophic event occurs, such as the assassination of a prominent politician, people are likely to turn to the media they most often use to acquire information. However, especially if people find a certain event to be upsetting, they are apt to talk about it with others, which can result in additional people learning about that event. As a result, when almost everyone knows about an event, the majority of those who are familiar with the event will have heard about it via interpersonal communication. For events that are less well known, those who are familiar with the events are more likely to have learned about them from the media.

Some research on this topic, not surprisingly, suggests that contextual factors such as prior knowledge determine the extent of learning that takes place when information is provided by the media. Where information-seeking is concerned, a study by Walter Gantz, Michael Fitzmaurice, and Ed Fink (1991) found that people are most likely to seek regular weather information from news sources, but people seek information on other topics, including politics, much less frequently. While this finding is not particularly encouraging in a democratic society, it is not surprising that ordinary people in a heterogeneous society would not actively seek political information on a regular basis. Where television newscasts are concerned, some researchers have suggested that, to help people recall and understand more news programming, including programming that deals with politics, the ideal news program should include fewer stories, explain those stories in more detail, and eliminate distracting visual images.

The Spiral of Silence Theory

Elisabeth Noelle-Neumann (1974) has argued that people who hold a minority viewpoint about an issue or political candidate often feel pressured to keep silent, while people who hold a majority viewpoint are more likely to express that viewpoint. The explanation for this behavior is that people in the minority will doubt their own critical thinking abilities and, ultimately, question their own beliefs as they try to avoid isolating themselves socially. In contrast, people who are in the majority will become increasingly self-confident in the rightness of their beliefs and, as a consequence, will talk about their beliefs with ever-greater frequency. As such talk increases, it can tend to silence those who hold minority views. The implications of this phenomenon, in which overt opposition to prevailing beliefs becomes less and less likely, are obvious, as public opinion is a measure more of people's desire to be on the winning side than of which set of arguments is most persuasive. As a result, the spiral of silence theory predicts that media can influence public opinion by creating perceptions about which opinions are in the majority or are gaining influence and which are in the minority or are losing influence. Rather than public opinion being the product of rational debate about the best course of governmental action, as described by some democratic theorists, the spiral of silence theory depicts public opinion as the product of essentially undemocratic choices that are made by media professionals.

Obviously, if the spiral of silence theory always worked in the way outlined by Noelle-Neumann, there would only be one prevailing public opinion on each subject to which the media paid attention. As the existence of social movements and pressure groups proves, however, there are still many minority groups that loudly and repeatedly demand social change. The available evidence suggests that, for some people and in some situations, people who perceive that their opinion is in the majority are slightly more likely to express their opinion than people who are in the minority. However, other factors may lead people in the minority to speak or people in the majority to remain silent, so the spiral of silence theory, by itself, is not sufficient to explain how public opinion is created and maintained. Also, the theory is not particularly good at describing how public opinion shifts from month to month or year to year, as examples exist of minority positions that later become majority positions.

Conclusion

In one way or another, many theories of media now claim that objectivity is not a feasible goal for media in a democratic society because political "facts" typically are based on subjective experiences and impressions. From this perspective, media help, however unintentionally, to determine how people perceive the political realities of the world in which they live, and the demand for objective reporting that is central to social responsibility theory simply cannot be met. When a woman or man watches a television news program, for example, she or he is not simply collecting information about a local school bond issue. Instead, that woman or man is learning what matters and what does not in society and is being told how legitimate (or illegitimate) a specific political perspective is. If media coverage of an issue does have a real chance of shaping people's perceptions of reality, then the goal must be for people to become active listeners and readers in their assessments of media messages. Unfortunately, the trend in the United States favors a lack of interest in politics. Surveys indicate that American citizens knew no more about politics in the 1990s than they did in 1940, despite the fact that the U.S. population had far more education on average in the 1990s than it did fifty years earlier. Demanding a more critical audience that would carefully analyze media messages about politics seems unduly optimistic. However, the experience of other democratic countries with democracy and the media has often differed from that of the United States, and voter participation in elections, at least, remains comparatively high in many of those countries. The experience of other countries with democracy and the media needs to be considered before coming to pessimistic conclusions on the basis of the U.S. experience alone.

Another contemporary concern that was not envisioned by the creators of social responsibility theory in the mid-twentieth century is the widespread availability of multiple media channels for conveying information to the public. Different media channels are perceived differently by users, so that the interactive experience of using the Internet poses a sharp contrast to the passive experience of watching television. The most famous example of these differences in experience with media channels involves the 1960 Kennedy-Nixon presidential debates. One study found that those who listened to the debates on the radio thought that Nixon had won, while those who watched the debates on television thought that Kennedy had won. Those people who research the relationship between democracy and the media must deal with the challenges that are posed by several different channels, with each channel affecting the perception of information in different ways.

Obviously, the relationship between democracy and the media remains complex. Many citizens of democratic societies do not want any government control of major media because they fear that governmental regulation of media would be incompatible with democracy, yet these citizens very much hope that media will restrain themselves voluntarily and act in a responsible fashion that facilitates and promotes democracy. Of course, what key terms in the last sentence mean, including "democracy" and "responsible," will continue to be debated. Also, as media sources are no longer provided only by full-time professionals using incredibly expensive equipment, more and more individuals with little commitment to careful research will be able to make their views known on the Internet or using inexpensive desktop-publishing software programs and personal computers. As society continues to be introduced to new and exciting communication technologies, the goal for individuals should be to become more critical receivers and users of the various media outlets. Only by carefully analyzing the sources of information and the arguments made by those sources can people reach thoughtful conclusions on the political issues that matter in their everyday lives. Whether most media professionals are proponents of big government or apologists for big corporations-both of which charges are made by media critics-the final responsibility for judging the performance of the media rests with ordinary people.

See also: BROADCASTING, GOVERNMENT REGULATION OF; BROADCASTING, SELF-REGULATION OF; ELEC-TION CAMPAIGNS AND MEDIA EFFECTS; FIRST AMENDMENT AND THE MEDIA; GLOBALIZATION OF CULTURE THROUGH THE MEDIA; GLOBALIZATION OF MEDIA INDUSTRIES; HEARST, WILLIAM RAN-DOLPH; INTERNET AND THE WORLD WIDE WEB; JOURNALISM, HISTORY OF; JOURNALISM, PROFES-SIONALIZATION OF; NEWS PRODUCTION THEORIES; OPINION POLLING, CAREERS IN; PIRATE MEDIA; PROPAGANDA; PUBLIC BROADCASTING; PULITZER, JOSEPH; SOCIAL CHANGE AND THE MEDIA.

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BRIAN R. MCGEE

DEPENDENCE ON MEDIA

Millions of Americans, and no doubt many more millions of people around the world, believe that television viewing can be addictive. Although only 2 percent and 12.5 percent of American adults in two separate surveys believed that they were addicted, 65 percent to 70 percent believed that others were addicted (McIlwraith, 1990; McIlwraith, Jacobvitz, Kubey, and Alexander, 1991). Many millions more appear to experience some misgiving about how much they view. According to a 1990 Gallup poll, 42 percent of adult Americans reported spending "too much time watching television"—up from 31 percent in the late 1970s.

Although it is tempting to use a term such as "addiction" when referring to individuals who report more than sixty hours of viewing each week, the term connotes different things to different people, and it is likely that less confusion will result if more care is taken in the choice of words.

The prime diagnostic manual used by psychotherapists throughout North America, the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSMV-IV, 1994), does not even use the term "addiction." Instead, the committees that wrote the DSM preferred the term "substance dependence." Still, there are researchers and clinicians who use the term "addiction." As a result, this entry also uses that term from time to time.

How the Viewing Habit Is Formed

Giving thought to how people's viewing habits are formed can be helpful. Among the primary

experiences that people report when viewing television is "relaxation," but research suggests that the relaxed and passive bodily and mental states that are associated with television viewing may also make it difficult for many people to turn the set off. According to Robert Kubey and Mihaly Csikszentmihalyi (1990), the passivity of viewing appears, for many people, to continue after the set is turned off (i.e., the feeling of passivity spills over into how they feel afterward).

As noted by Gary Steiner (1963), it is critical to know that many people also use television to escape negative and unpleasant moods. In fact, according to Robert McIlwraith (1990), adults who called themselves "TV addicts" were significantly more likely than "nonaddicted" viewers to report using television to cope with negative moods such as loneliness, sadness, anxiety, and anger.

Self-labeled "addicts" also say that they are particularly likely to use television when they have nothing to do and when they need to fill open time (McIlwraith, 1990). In comparison with viewers who watch less than two hours of television a day, viewers who watch more than four hours of television per day generally report feeling worse when they are alone and when they are in unstructured situations, such as when they are waiting in line or when they are "between" activities (Kubey, 1986). These findings suggest that dependence on television develops in some people partly as a function of their need to fill the unpleasant emotional voids that accompany solitude and/or open time.

In both the United States (Smith, 1986) and Canada (McIlwraith, 1990), researchers have found that self-reported television "addicts" score significantly higher than "nonaddicts" on measures of mindwandering, distractibility, boredom, and unfocused daydreaming. This all presents the possibility of a vicious circle. Negative moods and thoughts that people experience when they are alone and when they are in unstructured situations can be quickly and easily escaped by viewing television. However, as a result of spending many hours viewing television over many years, some people may become unpracticed in spending time alone, entertaining themselves, or possibly even in readily and simply directing their own attention. This could, in turn, lead some people to experience negative moods and thoughts when they are alone or in unstructured situations-resulting in their returning to television viewing for escape and comfort.

People who live alone and/or feel lonely appear to be particularly inclined to turn to television viewing and may become even more uncomfortable when alone and left without the quasi-social experience the medium offers. Viewers who watch a large amount of television do tend to have more time on their hands and spend more time alone than do viewers who watch only a small amount. The demographic groups that tend to have higher proportions of people who watch a large amount of television are the elderly, the unemployed, and people who are recently divorced or separated.

Television viewing also helps people relax, and anecdotal reports indicate that it relaxes them quickly. Within moments of sitting or lying down and pushing the power button of a television set, many viewers report feeling more relaxed than they did before. Because the reinforcement of relaxation occurs quickly, people readily learn to associate viewing with relaxation. The association is then repeatedly reinforced through simple operant conditioning because viewers remain relaxed throughout viewing but not afterward (unlike a general feeling of passivity that does seem to last after viewing) (Kubey and Csikszentmihalyi, 1990).

The quick onset of relaxation is particularly telling when compared to the use of certain drugs that prove to be habit-forming or "addictive." According to Alvin Swonger and Larry Constantine (1976, p. 235), "The attribute of a drug that most contributes to its abuse liability is not its ability to produce tolerance or physical dependence but rather its ability to reinforce the drugtaking behaviors." This is why both the speed with which a drug takes effect and how quickly it leaves the body can be critical factors as to whether or not dependence occurs. Reinforcement does not need to be experienced consciously for dependence to occur.

Some tranquilizers, for example, those whose effects do not last as long as the effects of other drugs, are often more habit-forming precisely because the user is more aware that the effects of the drug are wearing off. When one starts feeling bad again rather quickly after the drug's effect is no longer experienced, the tendency to turn to the drug again for relief will be greater than if its effects were to have worn off more gradually. Similarly, or even more notably, the change in mood that one experiences when one suddenly stops viewing television can be abrupt. Many people will report a subtle sense of having given something up when they first turn the set off. Many parents find it easier to get children to turn off the set if the parents can interest the children in another activity.

According to Kubey (1984), viewing begets more viewing because one must generally keep watching in order to keep feeling relaxed. In short, relative to the other possible means that are available to bring about distraction and relaxation, television is among the quickest, and certainly among the least expensive. Unlike engaging in conversation or playing games, one does not need anyone else to be present in order to watch television. With the incredible ubiquity of television and other media, self-control over one's viewing habits may be more of a challenge in the contemporary environment than it was in the notso-distant past.

Using DSM-IV as a guide can be illuminating, and the case has been made by Kubey (1996) that were television a substance, there is little question that people could legitimately be given diagnoses of dependence. Indeed, Dr. Allen J. Frances, who oversaw the 1994 revision of the manual concluded that "Under the broader definition, many kinds of compulsive behavior could be considered addictive, including obsessive sex or compulsive television viewing" (Goleman, 1990, p. C8).

DSM-IV lists seven possible criteria for making a diagnosis of substance dependence. Only three of the criteria must apply in order to make a diagnosis of "dependence." However, five of the seven diagnostic criteria might readily be applied to television viewing and its concomitant behaviors and effects.

One of the most interesting questions to consider is whether people experience anything akin to withdrawal if and when they stop viewing or using other media. In 1963, Steiner presented the following fascinating individual accounts of what happened when a family lost the use of a television set due to a technological malfunction (in a time when many families had only one set): "The family walked around like a chicken without a head." "It was terrible. We did nothing—my husband and I talked." "Screamed constantly. Children bothered me and my nerves were on edge. Tried to interest them in games, but impossible. TV is part of them" (p. 99).

Charles Winick's (1988) review of studies of families whose television sets were in repair led him to the following conclusion:

The first three or four days for most persons were the worst, even in many homes where viewing was minimal and where there were other ongoing activities. In over half of all the households, during these first few days of loss, the regular routines were disrupted, family members had difficulties in dealing with the newly available time, anxiety and aggressions were expressed, and established expectations for the behavior of other household members were not met. People living alone tended to be bored and irritated. Over four-fifths of the respondents reported moderate to severe dislocations during this period. . . . The fifth to eighth day represented, in many cases, some form of readjustment to the new situation. . . . By the second week, a move toward adaptation to the situation was common [pp. 221–222].

Video Games, Computer Games, and the Internet

Contemporary concerns are focused as often on computer and video games and Internet habits as they are on television viewing. There has been much less research on video games, but it is not difficult to use many of the explanations regarding television dependence to help explain people's affinity for video games. As with television, the games offer the player an escape and distraction, and as with television, players quickly learn that they momentarily feel better when they play the games—leading to a kind of psychological reinforcement.

Computer and video games also have particular characteristics that make children and adults especially likely to report that they are "addicted" to them. First, there is the general challenge posed by the game and the wish to overcome it and succeed—something largely or entirely missing with television viewing. Second, there is the critical characteristic that the games are designed to increase the level of challenge and difficulty as the player increases his or her playing ability.



The rows of computer games in a game center in Osaka, Japan, illustrate the variety of challenges that are available and that can keep some people involved in trying to "defeat" them. (Michael S. Yamashita/Corbis)

Psychic pleasure accompanies the improvement of one's skills and the increased mastery of most any human endeavor. In being programmed to challenge players at their current ability, video and computer games offer a nearly perfect level of difficulty for the player who enjoys such challenges. One may search for months or even years to find another tennis or chess player who has a very comparable ability, but many programmed games will provide a near-perfect matching of challenge with player skill. Thus, computerized games also make extended play extraordinarily common because one is feeling neither bored by too easy an opponent nor too anxious by not being able to match the level of competition.

Computer and video games offer all the essential features that are likely to result in a "flow" experience. This term refers to a period of intense, enjoyable, high concentration and involvement resulting from being engaged in an activity where skills and challenges are closely matched and where rapid feedback is available regarding one's performance (Csikszentmihalyi, 1975; Kubey and Larson, 1990). The games give the player nearly instantaneous feedback as to whether the last activity (shot, jump, run, or whatever) was successful. In computer play, as with sports, musical performance, and certain hobbies, the feedback is quick and clear, and insofar as it often occurs at the height of one's own personal level of performance, it is no wonder that the games are extremely engaging and, perhaps, "addictive."

The latest media "addiction" to be proposed both popularly and in academic and clinical circles is so-called Internet addiction. Few journal articles using scientific methodologies and subjected to the rigors of peer review have been published. Much of the existing work has been published on websites. There is little question, though, that as with other media before it, a wide variety of Internet activities have a very strong "pull" or "hold" on users (Young, 1998).

What appears to distinguish the Internet most from the usual media that are examined in terms

of dependence is that the Internet is interactive and that it can be readily used to sustain or form social relationships. Playing computer games on the "net" can doubtlessly entail forms of involvement and/or dependency that are very much akin to those related to video games. People may also become dependent on the Internet in connection with hobbies, whether it be genealogy or baseball card collecting. However, insofar as people can communicate readily online with friends, relatives, and professional colleagues-regardless of distance or time-this relatively new technology provides a whole new array of social possibilities. If people have been dependent on the telephone for social contact, it is no wonder that the Internet adds all manner of new possibilities. Being connected with others when one is alone-at any time of day and at very little expense-is very attractive, and there can be little doubt that some individuals are becoming dependent on the Internet. Future research will undoubtedly provide important insights related to this phenomenon.

Dependence on Pornography

A final important consideration is the phenomenon of pornography, a media form that also has often been cited as being addictive. Indeed, with the huge growth in the availability of pornography that has accompanied the availability of video playback technology in the home since the early 1980s, and now with the development of interactive pornography available via CD-ROM and the Internet, the concern over the potentially addictive properties of pornography will undoubtedly be an issue for some time.

It must be noted that research and reporting on the effects of pornography have long been politicized, and thus it is more difficult to weigh the validity and veracity of some contributions to the literature. As with other debates that are related to media effects, it is very difficult to disentangle cause from effect when dealing with pornography. Still, a number of researchers and clinicians report significant evidence for dependence and addiction.

Authorities often find large private pornography collections in the residences of people who are arrested for sexual crimes (Cline, 1994; Reed, 1994), especially pedophiles (Lanning and Burgess, 1989). At a minimum, it can be said that a relationship between the frequent use of pornography and problematic sexual disorders exists for some individuals. Whether the pornography is merely symptomatic of the disorder or plays a causal role is very difficult to establish.

For some observers, there is little doubt that both negative effects and pornography addiction do indeed occur. M. Douglas Reed (1994), a practicing psychiatrist, is explicit in his presentation of specific criteria that he believes would constitute an addiction to pornography. He notes that DSM-IV itself recognizes that many paraphilias (i.e., compulsive sexual deviances) frequently involve the use and collection of pornography. Reed lists thirteen paraphilias and how they are related to the use of pornography.

Victor Cline (1994), a clinical psychologist who has treated hundreds of people who have sexual disorders, describes a four-step process in the involvement of his patients with pornography. First, Cline describes an "addiction effect" wherein the person comes back repeatedly for more material because it provides "a very powerful sexual stimulant or aphrodisiac effect followed by sexual release most often through masturbation" (p. 233). Second, Cline describes an "escalation effect" in which there is an "increasing need for more of the stimulant to get the same effect [that had been obtained initially]" (p. 233). Third, Cline observes "desensitization" in which things that might have once seemed shocking become less so and are thereby legitimized. Fourth, Cline claims that there is an "increasing tendency to act out sexually the behaviors viewed in the pornography" (p. 234).

A number of other psychological and physiological mechanisms have been suggested for how pornography addiction might develop. Among the most common is that sexual gratification is a powerful reinforcer (Lyons, Anderson, and Larson, 1994). For Cline, and for many other observers, pornography provides powerful occasions in which modeling and imitative learning can occur.

Dolf Zillmann (1994) has proposed that in many instances, "initial sexual dissatisfaction drives exposure to pornography" and a vicious circle then ensues. With consumption of pornography, the dissatisfaction grows stronger and draws the person into further consumption. It is important to point out that video recorders and the Internet have led to an explosion in pornographic materials and that such materials are far more accessible to people, including children and adolescents, than they have ever been before. This

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is important since, if a pornography habit—or addiction—can indeed develop, it would seem more likely to develop if pornographic materials can be easily obtained and if the use of such materials is socially sanctioned.

- See also: PORNOGRAPHY; PORNOGRAPHY, LEGAL
 - Aspects; Ratings for Video Games, Software, and the Internet; Video and Computer Games and the Internet; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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ROBERT KUBEY

DESENSITIZATION AND MEDIA EFFECTS

Desensitization is a psychological process that has often been involved in explaining viewers' emotional reactions to media violence. Research on emotional reactions to violent messages has been concerned with the possibility that continued exposure to violence in the mass media will result in desensitization, that is, that exposure to media violence will undermine feelings of concern, empathy, or sympathy that viewers might have toward victims of actual violence.

To understand the effects of repeated exposure to violence, researchers have suggested that viewers become comfortable with violence that is initially anxiety provoking, much as they would if they were undergoing exposure therapy. According to Gordon Paul and D. A. Bernstein (1973), exposure therapy is widely regarded as the most effective clinical therapy for training individuals to engage in behaviors that were previously inhibited by anxiety responses. Originally, researchers emphasized a therapeutic counterconditioning technique known as "systematic desensitization," in which the patient was gradually and systematically exposed to a graded series of anxiety provoking objects or situations. Many researchers, including Edna B. Foa and Michael J. Kozak (1986), have demonstrated that simply exposing a patient to frightening stimuli, regardless of whether it is presented in graduated form, will significantly diminish the anxiety or negative affect that the stimulus once evoked. This logic may be applied to the effects of repeated exposure to media violence.

Most of the early work on desensitization to media violence, such as that conducted by Victor B. Cline and his colleagues (1973) and Margaret H. Thomas and her colleagues (1977), involved exposure to rather mild forms of television violence for relatively short periods of time. These studies indicated that viewers who watched large amounts of media violence showed less physiological reactivity to violent film clips, compared to viewers who watched only small amounts, and that general physiological arousal decreased as viewers watched more violent media. Children as well as adults are susceptible to this effect.

More recently, Daniel Linz, Edward Donnerstein, and Steven Penrod (1984, 1988) measured the reactions of adult men to films that portrayed violence against women, often in a sexual context. The viewings took place over a period of several days, and comparisons of first-day reactions and last-day reactions to the films showed that, with repeated exposure, initial levels of self-reported anxiety decreased substantially. Furthermore, the research participants' perceptions of the films also changed from the first day to the last day. Material that was previously judged to be violent and degrading to women was considered to be significantly less so by the end of the exposure period. Participants also indicated that they were less depressed and enjoyed the material more with repeated exposure. These effects generalized to responses to a victim of sexual assault in a mock trial presented to the men at a later time. Men who had been exposed to the sexually violent films, compared to a no-exposure group, rated the victim as being less severely injured. The men who had been exposed to the violent film, again compared to men in a no-exposure control group, were also less sympathetic to the rape victim portrayed in the trial and less able to empathize with rape victims in general. These effects did not emerge following exposure to a single film. Longer film exposure was necessary for it to affect the violence-viewing participants' general empathetic response. Linz and his colleagues (1984, 1988) suggested that the viewers were becoming comfortable with anxietyprovoking situations much as they would if they were undergoing desensitization therapy. Carol Krafka and her associates (1997) observed these same effects for women who viewed sexual violence. Linz and his colleagues (1989) also showed that a reduction in physiological responsiveness accompanies repeated exposure to sexualized violence and that viewing violent films results in less sympathy for victims of domestic violence as well as rape victims.

Most recently, Charles R. Mullin and Linz (1995) demonstrated that viewers who show a desensitization toward victims of violence in nonmedia contexts following exposure to media violence may recover sensitivity rather quickly provided they are not exposed to additional violent depictions. An experiment was conducted to examine the effects of repeated exposure to sexually violent films on emotional desensitization and callousness toward domestic abuse victims. Results indicated that emotional responses, selfreported physiological arousal, and ratings of the extent to which the films were sexually violent all diminished with repeated film exposure. Three days following exposure to the final film, participants in the experiment expressed significantly less sympathy for domestic violence victims and rated their injuries as being less severe than did a

no-exposure control group. Five days after the final film exposure, the participants' level of sensitivity to the victims of domestic violence rebounded to the baseline levels that were established by the no-exposure comparison group.

In conclusion, exposure to violence in the mass media may result in a desensitization effect in which viewers experience diminished feelings of concern, empathy, or sympathy toward victims of actual violence. Research has shown that viewers who watch large amounts of media violence show less physiological reactivity to violence in other contexts. Men and women who are exposed to sexual violence in the media also show less sympathy toward rape victims portrayed in other contexts and are generally less able to empathize with rape victims. However, resensitization to victims after desensitization may occur given a sufficient rest period.

See also: Arousal Processes and Media Effects; Pornography; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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DANIEL LINZ

DESIGNERS

See: Database Design; Systems Designers

DEWEY, JOHN (1859-1942)

A native of Burlington, Vermont, John Dewey received his B.A. from the University of Vermont in 1879 and his Ph.D. from Johns Hopkins University in 1884. Except for a brief appointment at the University of Minnesota, he taught at the University of Michigan from 1884 to 1894.

In 1894, Dewey joined the faculty of the University of Chicago as head of the department of philosophy, psychology, and pedagogy. While at Chicago, he founded an experimental elementary school that came to be known as the "Dewey School." Among the major influences on his theory of communication during this period were his colleague George Herbert Mead and Jane Addams (the founder of Hull House).

In 1904, Dewey resigned from the University of Chicago and accepted a position at Columbia University where he was appointed professor emeritus of philosophy in residence in 1930 and professor emeritus in 1939. He traveled widely, presenting



John Dewey. (Bettmann/Corbis)

lectures in Japan, China, Mexico, Turkey, and Russia, among other places. Politically active, he was an energetic promoter of the American Civil Liberties Union, The American Association of University Professors, and the women's suffrage movement. Dewey died at his home in New York City on June 1, 1952. An urn containing his ashes is interred at the University of Vermont.

In 1896, Dewey published his watershed essay "The Reflex Arc Concept in Psychology" (EW.5.96), in which he attempted to replace the received model of a stimulus–response arc with the model of an adjustive circle or spiral. He rejected the idea that stimuli exist as already complete in a world external to a passive subject and that they impinge on the subject in ways that effect a response. In place of this view, he advanced the idea that stimuli are selected by an active subject. They are properties of the interaction between a subject and its environing conditions rather than properties of a world external to the subject. Applied to a situation involving communication between two subjects, for example, this means that when A asks B to bring him or her something and points to it, the stimulus for B is neither A's asking nor A's pointing, but the anticipation that B has as a result of the cooperative situation that is shared with A. In order for there to be a stimulus at all, B must have already entered into a cooperative situation by placing him- or herself in the position of A, thus viewing the situation from A's standpoint. This cooperative situation is what Ludwig Wittgenstein would later call a "language game."

The most succinct formulation of Dewey's philosophy of communication is in chapter five of his book *Experience and Nature* (1925). In this material, Dewey criticized what he considered to be reductionist theories of communication. On one side, he rejected supernaturalist and other transcendentalist views that locate the origin or measure of communication in a *logos* beyond human conduct. He thought that this had been the error of the Athenian Greeks and their heirs, the medievals. They had mistaken the structure of communication for the structure of things.

On the other side, he rejected views that drive a wedge between internal states and external expression by locating language and meaning in a private, subjective world. He thought that this had been the error of philosophers of the modern period, beginning with René Descartes. They had failed to recognize that language is a social product. Further anticipating the work of Wittgenstein, Dewey argued that there can be no private language.

He thus rejected the view that communication consists of fixed messages that move through inert media, much as water through a pipe, to be delivered fully intact to passive recipients. His rejection of this absolutist notion—that communication is the transmission of fixed ideas—was balanced with his rejection of the opposite view, namely, the nominalist notion that communication is a purely arbitrary social construct. He argued that nominalism cannot account for the fact that communication is both organized and objective. Meanings are organized by language, which is the tool of tools. Further, meanings become objective as they are grounded in the natural interactions—including those that are social—of which they are by-products.

Dewey's view of communication is perhaps best understood as a variety of social behaviorism. When an organism becomes capable of understanding an expression as meaningful from the standpoint of another organism, meanings are made common to at least two centers of behavior. Meanings then "copulate," as he put it, breeding new and more enriched meanings. Signs and significance come into existence not intentionally but as a kind of overflow or by-product of communication. In articulating this view, Dewey drew heavily on the work of Mead.

In what is perhaps his most precise characterization of the term, Dewey wrote that communication is "the establishment of cooperation in an activity in which there are partners, and in which the activity of each is modified and regulated by partnership" (LW.1.141). Such partnerships can be formed between and among humans, between humans and other organisms, and even between humans and inorganic materials. Artists, for example, can be said to communicate with their materials when they take them into account in ways that express and enlarge the meanings of the materials. Dewey characterized intelligence as the ability to engage in such activities. A corollary of his view is that meanings are properties of behavior first, and properties of objects only derivatively.

Dewey described communication as "uniquely instrumental and uniquely final." It is uniquely instrumental in the sense that it organizes events in ways that render them more meaningful, thus affording liberation from what is dangerous, debilitating, or boring. It is uniquely final in the sense that when meanings are shared and thereby enriched, an enhanced sense of community with the human and nonhuman environment is achieved. The separation of these two functions is infelicitous because what is only instrumental remains thin and partial and what is only final tends to be either corrupting or trivial. In true communication, instrumental and final functions cooperate. Meanings are enriched and a corresponding growth of the organism is produced. "Of all affairs," he wrote, "communication is the most wonderful" (LW.1.132).

See also: Mead, George Herbert; Society and Communication; Society and the Media.

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LARRY A. HICKMAN

DEWEY, MELVIL (1851–1931)

An educational reformer and librarian, Melvil Dewey was born in Adams Centre, New York, on December 10, 1851 (a "decimal" date, he later boasted to friends), the fifth and last child of Joel and Eliza Greene Dewey. He attended rural local schools and early in life determined that his "destiny" was to become a "reformer" in educating the masses. In September 1870, he enrolled in Amherst College in Massachusetts.

In 1872, Dewey began working in the college library. There he discovered a site for his reforming interests, which by that time had also extended to simplified spelling, use of shorthand, and metric conversion. After he graduated in 1874, Amherst College hired Dewey to manage the library and reclassify the collections. For two years Dewey worked out a new scheme that superimposed a system of decimals on a structure of knowledge first outlined by Sir Francis Bacon and later modified by William Torrey Harris. In 1876, Dewey copyrighted the "decimal classification," moved to



Melvil Dewey. (Library of Congress)

Boston, and in the summer of 1876 helped found the Spelling Reform Association, the Metric Bureau, and the American Library Association (ALA). He also became managing editor of a new periodical—*Library Journal*—which was introduced in October 1876 at the first ALA conference. For each organization, Dewey also authored a constitution and served as the first secretary, a post from which he exercised close control.

Lacking sufficient capital to push for reforms, however, Dewey soon merged the treasuries of all of these organizations into a single account and (without informing any of them) used that account as collateral against which to borrow money to fund initiatives that he was pushing in each. He continued this practice as president of the private Readers and Writers Economy Company (RWEC) that he started in 1879. In 1880, when other RWEC investors discovered what he was doing, they obtained a court injunction that denied him access to these funds. Because the injunction prevented him from accessing the accounts of reform organizations he had founded, he had to tell them about his unorthodox business practices. An out-of-court settlement enabled him to restore access to organizational treasuries, but by that time "Dui" (in 1879 he had changed the spelling of his last name to a more simplified, phonetically accurate form) had lost substantial credibility with all of the organizations. In March 1881, he established the Library Bureau and, as president, resumed efforts to increase the efficiency of library services and to advance spelling and metric reform.

In May 1883, "Dewey" became librarian-inchief at Columbia College, an all-male institution, and, at the urging of his new employers, reverted to the original spelling of his name. Quickly implementing changes that he had been marketing through the Library Bureau, Dewey consolidated, by 1887, more than fifty thousand poorly cataloged and lightly used volumes housed in nine separate campus locations into a central facility classified by the decimal system. In January of that year, Dewey opened the world's first library school, and against the opposition of many faculty members and most of the university board members, he included seventeen women in the first class of twenty students. The friction he caused by this and other acts eventually led Dewey to accept an offer in December 1888 from the Regents of the University of the State of New York (USNY) to become their secretary and the New York State librarian. All parties also agreed to let Dewey move the library school with him to Albany.

As secretary, Dewey crafted his office into a powerful force to lobby the legislature for higher education, to increase funding for New York libraries, and to eliminate bogus diploma mills. He also began to use the growing number of public libraries in New York as sites where USNY instructors would teach courses that would enable local residents to obtain a USNY degree. To help with this endeavor, he organized the New York Library Association in 1890, set up extension sites in public libraries, and created departments within the State Library that provided traveling and interlibrary loan services and issued bibliographies of "best books" recommended for purchase by local libraries. In 1892, Dewey convinced the legislature to provide matching grants to the public libraries of New York if their collections passed inspection by a State Library employee. Because he irritated a number of politicians in the process of pushing for all these reforms, he also became an obstacle to efforts to merge New York's separately run common school and higher education systems. In part to remove himself from unification politics and in part because he wanted to avoid charges of conflict of interest (for helping a family member whose proprietary school operated in violation of a university charter that Dewey had responsibility for enforcing), he resigned as secretary of the USNY in 1899. However, he remained the state librarian.

While in Albany, Dewey did not neglect his other reform interests. As president of the American Library Association in 1893, he organized an annual conference for the Chicago World's Fair that exhibited a 5,000-title "model library" that his New York Library School students and faculty had put together. He then got the U.S. Bureau of Education to publish the model library as a bibliographic guide that librarians across the country could obtain as a government document. In the 1890s, his Library Bureau also developed a cardindex system that reduced record-keeping costs for banks and insurance companies. Most of the money Dewey realized by this venture he rolled back into other reforms, including a private Lake Placid Club that he and his wife Annie started in 1894 as an exclusive rest and recreation facility in the Adirondack Mountains. From the beginning, however, the club admitted no Jews or ethnic or racial minorities. In 1905, several prominent New York City Jews protested, and under the pressure, Dewey resigned as state librarian. About the same time, several library school alumnae and ALA women threatened to bring a vote of censure against Dewey for sexual harassment of females at ALA conferences. In 1906, they forced him out of active ALA participation.

Dewey then channeled his efforts to improve the Lake Placid Club, which in the next twenty years grew from a central clubhouse to a 10,000acre complex with scores of buildings, five golf courses, and twenty-one tennis courts. The club also cultivated winter sports and by 1930 had become so popular as a site that the International Olympic Committee chose the village of Lake Placid to host the 1932 Winter Olympics. By that time, Dewey had started a second club in Florida with the same exclusionary rules as its northern counterpart. All assets from both clubs were left to the Lake Placid Education Foundation, an organization Dewey and his wife had established to carry on reform efforts in areas such as metric conversion and simplified spelling.

In the twentieth century, the decimal classification system that Dewey copyrighted in 1876 (and which had gone through several editions) became the common organizing system for hundreds of thousands of libraries of all types in the United States and throughout the world. In addition, the jurisdictional boundaries of library science that he had defined in the late nineteenth century became a formal professional structure. This system gave a privileged position to information process over content and focused on developing the library as an information agency where library professionals exercise the expertise and management skills that are necessary to run it efficiently. The American Library Association that he helped to found grew into the largest such association in the world, and the bibliographies of "best books" that he fostered evolved into a system of guides upon which librarians relied to develop their collections. Finally, his activities as secretary for the University of the State of New York significantly improved the quality of higher education in New York and became a model that other state systems emulated. Dewey died in Florida on December 26, 1931.

See also: Cataloging and Knowledge Organization; Libraries, History of; Library Associations and Consortia.

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WAYNE A. WIEGAND

DIFFUSION OF INNOVATIONS AND COMMUNICATION

The diffusion of an innovation is the spread of a product, process, or idea perceived as new, through communication channels, among the members of a social system over time. Innovations can be a new product or output, a new process or way of doing something, or a new idea or concept. The "newness" of an innovation is subjective, determined by the potential adopter.

Diffusion Processes

Generally, the diffusion, or cumulative adoption, of an innovation over time follows an Scurve: that is, slowing growing initially, then accumulating quickly, then flattening out as the maximum level of adoption is reached. Portions of this diffusion curve (i.e., standard deviations of the normal curve) can be characterized as types of adopters. The first 2.5 percent of adopters within a social system are innovators, the next 13.5 percent are early adopters, the next 34 percent are early majority, the next 34 percent are late majority, and the final 16 percent are laggards. Innovators and early adopters are usually distinguished by high levels of "innovativeness," a general disposition toward change and trying new things, as well as higher education and higher income, among other factors.

Diffusion and adoption can be measured in a variety of ways: number or percentage of adopters at a certain time, number or percentage of organizational units adopting, average duration of usage, number of innovation components adopted, number of units sold or implemented, level of system usage (such as number of log-ons, messages sent, files stored, records processed), level of satisfaction, acceptance, diversity of planned uses, number of new uses, and so on.

Crucial to all diffusion patterns is the achievement of a "critical mass," or the number of adopters sufficient to foster sustained adoption beyond that point. This concept of critical mass is especially relevant to interactive communication innovations, such as the telephone or electronic mail. This is because the value of the overall system (the telephone system, the Internet) grows exponentially as each additional user adopts, so that later adopters perceive and obtain much greater value than do early adopters. Further, with communication innovations, there are typically competing channels already in place, so that early adopters have to use multiple channels while nonadopters, or late adopters, have to choose only one of the competing channels. Thus, it is important to provide early adopters extra incentives, or to target clusters of early adopters who have special needs for, or who can gain particular benefits from, the new innovation. Unless critical mass is achieved early, the new communication channel will likely falter. Indeed, considering time as a crucial element of diffusion, different innovations may take very different lengths of time to achieve widespread adoption. For example, in the United States, it took more than half a century to obtain broad residential adoption of the telephone, while compact disc has been quickly adopted as the standard for audio music recording and distribution.

An intriguing extension of critical mass is the concept of adoption thresholds. The idea here is that each individual has a (possibly variable) threshold for adopting a particular innovation. From a social and critical mass perspective, initial adopters have low thresholds-they may have sufficient resources, high innovativeness, unique relative advantages, and low need for social influence. Thus, they are likely to be innovators and early adopters within their social systems. Later adopters have higher thresholds, but, as more and more innovators adopt the innovation, these higher thresholds are more likely to be met. Thus, as initial innovators adopt, those close to them in the social network will now have achieved their justslightly-higher thresholds, and also adopt. This in turn makes it more likely that others with evenslightly-higher thresholds will soon adopt. The implication here is that innovation implementers must be able to identify those with low initial thresholds and enable those to communicate soon after with those having slightly higher thresholds.

There are several interim stages in the adoption decision process: knowledge or awareness of the innovation, persuasion (reactions to and evaluations of the innovation), decision (to obtain, purchase, try out), implementation (acquiring, adjusting, applying, including a "fair trial" period), and confirmation (including public display of the adoption, and recommending the innovation to others).

Within organizations, there are five major stages as well: agenda-setting (a general definition of the initial rationale or problem statement, which may be more or less "rational" or wellinformed), matching (alternative solutions are identified, evaluated, and compared to the agenda), redefining (the attributes of the innovation are defined relative to the needs of the organization, but the alternative solutions may also lead to recasting the initial agenda), structuring and interconnecting (where elements of the current social system and/or the innovation are redesigned to integrate the innovation within appropriate procedures and processes, through both formal and informal negotiations and peer pressure), and routinization (where the innovation becomes a part of normal organizational operations).

There are, of course, many other factors influencing the success, failure, or rate of diffusion of an organizational innovation. These include the justification for the initial agenda rationale; the geographic location and closeness of potential adopters; the complexity, size, and culture of the organization (decentralized, small organizations may be much better at initiating innovations, while centralized, large organizations may be more successful at implementing them); the personalities and power bases of the organizational actors; changes in political agendas, resources, and goals that affect the nature and evaluation of the innovation; different stakeholders becoming activated by different stages in the lifecycle of the innovation; external organizational environments, including changing competitors, regulatory environments, economic resources; and technological changes, rendering a current innovation incompatible or inappropriate.

Indeed, there are many important examples where the wider economic, regulatory, and social environment heavily determine the success or failure of an innovation. "Positive feedbacks," "positive network externalities," or "complementarities" are, respectively, benefits associated with an innovation that accrue to later adopters rather than early adopters, benefits that increase the value of early versus later innovations, and services and other innovations that arise due to the success and features of an earlier innovation. For example, the Microsoft Windows operating system has extensive positive externalities because, since it is the dominant operating system, most other companies design their software applications for use under Windows. This, in turn, raises the value and market centrality of Windows. Another example is the design of the typewriter (and, thus, computer keyboard) keys. The QWERTY system (named because of the sequence of the top left-hand row of letters) was initially designed to slow down typing speed because the early metal typewriter mechanisms would become jammed if pressed too quickly. By the time that manufacturing innovations allowed for faster mechanisms (especially consider modern computer keyboards), the infrastructure surrounding the typing industry (manufacturing processes, repair, training, secretarial skills) made it too expensive (socially, organizationally, personally) to switch to a different, more efficient keyboard layout (such as the DVORAK design). Thus, initial adoption patterns can heavily constrain or influence later diffusion (an example of path dependence), often institutionalizing initial innovations that are in fact less technologically or socially innovative or effective.

Another time-based factor in the diffusion process is the "chasm" between early and later innovation design and adoption. Initial development of an innovation tends to be technologydriven, as widespread uses and critical mass have not yet been established. Here, developers attempt to design sufficient performance, features, and quality to satisfy early adopters, who are often willing to pay more (and become initial subscribers), and to tolerate poorer design, in return for new technological features and the status of "innovators" and "early adopters." However, "early" and "late" majority adopters are not typically interested in the technological aspects, but are more concerned about relative advantage, compatibility, and low complexity. Thus, the technology itself is not perceived as important; rather, usable devices, commodities, services, and content become more valued. The challenge for the developer and implementer, then, is to cross this "chasm," knowing when to emphasize technology and when to emphasize the general marketplace.



E-mail, one of the most rapidly diffused innovations of the late-twentieth century, continues to change with the introduction of products such as 3Com's "Audrey" Internet appliance, which became available in January 2001 and offers three ways to send e-mail: typical message, handwritten message, and voice message. (Reuters NewMedia Inc./Corbis)

Because of these several stages in the individual and organizational adoption process, and the wide and complex range of factors affecting diffusion, an innovation may not be rejected initially, but still may be discontinued at any stage of the diffusion process.

Innovation Attributes

Generally, potential adopters assess five main attributes of an innovation. Relative advantage is the extent to which the innovation provides greater benefits, and/or fewer costs, than the current product or process. Compatibility is the extent to which the innovation fits in with existing habits, norms, procedures, and technical standards. Trialability is the extent to which potential adopters can try out components, instead of the entire innovation, or can try out the innovation through pilot demonstrations or trial periods, but decide to return to their prior conditions without great cost. Complexity is the extent to which potential adopters perceive the innovation as difficult to understand or use. Finally, observability or communicability is the extent to which potential adopters can observe or find out about the properties and benefits of the innovation. Every innovation has positive and negative aspects of each of these attributes.

Consider, for example, electronic mail (email). Clearly, a general critical mass of users has been achieved, especially within communities of certain online information services, but certain subgroups have low overall levels of adoption so would not experience critical mass. E-mail has relative advantages over a face-to-face interaction because one can send the message at any time, regardless of where the other person is or how difficult it would be to actually meet up with them. To many people, e-mail is still somewhat incompatible with traditional social norms such as sending holiday greetings, but it is highly compatible with other work and computer applications. With trial subscriptions or even free e-mail now offered, it is relatively inexpensive to try out electronic messaging, but one still has to have purchased a modem and communication software. Regardless of how simple advertisements make using e-mail appear, the various functions and interconnections with other applications still make e-mail fairly complex to understand and use. It is fairly easy to communicate the basic features, uses, and benefits of e-mail to others, but it might be hard to actually observe some of those benefits, or even one's own e-mail, without taking the time and effort to check the e-mail system. However, developments such as accessing one's e-mail by WebTV or a standalone e-mail appliance for the kitchen will make the benefits of e-mail more compatible and observable and less complex.

A major development in the conceptualization of an innovation was the realization that an innovation is not a fixed, static, objective entity. Rather, it is contextual, flexible, and dynamic. It may be adapted and reinvented. A reinvention is the degree to which an innovation is changed by the adopter(s) in the process of adoption and implementation, after its original development. A reinvention may involve a new use or application of an already adopted innovation, or an alteration in the innovation to fit a current use. Reinventions may be categorized based on intentionality whether they are planned (intentional) or vicarious (learning by other's mistakes)—and source—whether they are reactive (solving a problem generated by the innovation itself) or secondary (solving unintended consequences elsewhere in the organization or innovation due to the reinvention). The four levels of reinvention include unsuccessful adoption (low integration), successful adoption (clockwork systems), local adaptation (expanding systems), and systemwide adaptation (high-integration systems).

One significant distinction within organizational settings is between administrative (managing organization processes) and technical (specific manufacturing or service processes) innovations, each fostered by different influences and each having different consequences. Another distinction, often found in consumer studies of innovations, is the extent to which the innovation is perceived as being part of a "cluster" of already adopted products, processes, or ideas. A marketer or implementer can attempt to determine these innovation clusters, and then position the proposed innovation as having relative advantage to, yet compatibility with, things already familiar and valued. So, for example, while designers of desktop videoconferencing thought that users would perceive this innovation as similar to faceto-face interaction, they typically perceive it as more similar to the telephone. Thus, design, marketing, implementation, and pricing efforts should take this into consideration.

Another major factor influencing both the initial agenda rationales, relative advantage, observability, and management of organizational innovations is the extent to which the innovation is information-based as opposed to materialbased. Information is difficult to completely own because it is easily copied and distributed to others. Furthermore, some uses and values of information are unpredictable, and can only be determined through usage by specific adopters. Because all the benefits of information-based innovations cannot easily be appropriated by the innovator, it is not economically rational to fully invest in innovations. Thus, the legal and economic infrastructure of copyright, patents, licenses, disclosure agreements, royalties, and so on has been developed to help guarantee innovators that their ideas, and the benefits associated with them, accrue to the developers during a specific period. Furthermore, it is difficult to identify, much less estimate, all the long-term benefits associated with information-based innovations, so initial agenda rationales based on traditional return-on-investment calculations will suppress the adoption of many innovations. Thus, specific institutions have arisen, such as universities, government and other funding agencies, incubator organizations, and "skunkworks" in protected units within organizations, to foster the development of innovations.

Communication Channels

Communication channels also play an important role in diffusion. Because the innovation is a new product, process, or idea, it must be communicated to potential adopters in order for them to assess its attributes and decide whether to try out and eventually adopt it. Very broadly speaking, mediated communication and interpersonal communication play complementary, but different, roles. Electronic mass media channels such as television and radio are useful for raising awareness about the innovation, but cannot provide much detail (except for specialty radio programs). They can provide images and brand name identification, helping the attributes of compatibility and observability. Print mass media channels such as newspapers and magazines (and, to some extent, the Internet) are useful for explaining conceptual and technical details, helping out with the attributes of relative advantage and complexity. New media such as the World Wide Web can provide interesting mixtures of image, explanation, and demonstrations, thus also fostering trialability.

Interpersonal communication is especially important in changing opinions and reducing uncertainty about the innovation, as potential adopters turn to credible and important sources to provide first-hand experiences and legitimization of the new idea. Much innovation research shows the significant role that social influence, peer pressure, and social learning plays in affecting not only the final adoption decision, but also the evaluation of the attributes of the innovation. This is particularly important when initial relative advantages are low (high adoption costs or low observability), critical mass has not yet been achieved (thus representing higher learning and adoption costs for early adopters), or when the innovation is not obviously compatible with current social or group norms. In such cases, certain innovation roles become crucial.

The "cosmopolite" is a member of a social system who travels more, communicates and uses the media more, attends more conferences, and is generally more aware of the external environment, than other members. Thus, the cosmopolite is a valuable source to the social system for innovations. Within particular groups or organizational units, this role may be filled by a "technical gatekeeper," who seeks out and brings into the group relevant facts and practices, freeing the rest of the group to focus on the group's task but also keeping it informed of innovative ideas. Within a social system, the "opinion leader" plays the valuable role of evaluating and legitimizing new ideas, especially normative ideas that fit in with the general social context of the group. The opinion leader must be fairly similar to the rest of the group in order to represent the central norms and values of the group, but tends to be just slightly more educated and experienced, and receives more communication, than the other members. Different types of innovations or social norms may be regulated by different opinion leaders. For example, political, religious, and agricultural innovations would probably be discussed and evaluated by different (if somewhat overlapping) social groupings and opinion leaders. Thus, an important diffusion strategy is to identify the appropriate opinion leader for the type of innovation, communicate the relative advantage and compatibility of the innovation for that social system, and then provide incentives and communication channels for the opinion leader to diffuse the idea to other members.

Radical or "taboo" innovations are highly incompatible with the norms and practices of a social system, so an opinion leader will quickly reject such suggestions, even presuming the leader will have been exposed to the idea. Thus, the social "isolate" (who is not heavily constrained by group norms) or the cosmopolite who has many "weak ties" (infrequent, somewhat distant, or diverse communication with others outside the social group) are necessary to ensure that social groups become exposed to, and eventually try out, innovations. For example, highly traditional or conservative groups are unlikely to find out about, much less try, radical or taboo innovations, largely because of their social structure and use of communication channels. A well-known

example is the adoption of family planning within Korean villages. The concept was so taboo that husbands and wives did not communicate about it, and it certainly was not discussed in public meetings or media. However, relatively isolated individual "mother's clubs" with innovative leaders began talking about and practicing family planning, motivated by face-to-face communication with change agents. Adoption spread within the boundaries of these small social systems, and, with increasing evidence of relative advantage, began to diffuse through the more-normative mother's clubs. However, clubs that did not have the active support of their opinion leaders were either late adopters or nonadopters.

The diffusion of innovations is a rich, complex, challenging, and rewarding area for communication and information research and practice.

See also: Internet and the World Wide Web; Organizational Communication; Technology, Adoption and Diffusion of.

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DIGITAL COMMUNICATION

In order to understand the notion of digitizing information, it must first be understood that everything in nature, including the sounds and images one wishes to record or transmit, is originally analog. The second thing to be understood is that analog works very well. In fact, a first-generation analog recording can be a better representation of the original images than a first-generation digital recording. This is because digital is a coded approximation of analog. With enough bandwidth, a first-generation analog videotape recorder (VTR) can record the more "perfect" copy.

Binary Systems

Digital is a binary language represented by zeros (an "off" state) and ones (an "on" state), so the signal either exists ("on") or does not exist ("off"). Even with low signal power, if the transmitted digital signal is higher that the background noise level, a perfect picture and sound can be obtained—"on" is "on" no matter what the signal strength.

Digital uses its own language that is based on the terms "bits" and "bytes." Bit is short for binary digit and is the smallest data unit in a digital system. A bit is either a single 1 or a single 0. A byte consists of a series of bits. The most common length for a byte "word" is 8 bits, although there can be other lengths (e.g., 1, 2, 10, 16, 24, 32).

In an 8-bit system, there are 256 discrete values, ranging from 0 to 255. The mathematics are simple because the number of discrete values is equal to the number 2 (as in binary) raised to the power of the number of bits. In this case, 2 raised to the power of 8 equals 256. The two extreme bytes in the 8-bit system are 00000000 and 11111111, which are calculated as follows:

00000000

 $= 0 \cdot (2^7) + 0 \cdot (2^6) + 0 \cdot (2^5) + 0 \cdot (2^4) + 0(2^3) + 0 \cdot (2^2)$ $+ 0 \cdot (2^1) + 0 \cdot (2^0)$ $= 0 \cdot (128) + 0 \cdot (64) + 0 \cdot (32) + 0 \cdot (16) + 0 \cdot (8)$ $+ 0 \cdot (4) + 0 \cdot (2) + 0 \cdot (1)$ = 0 + 0 + 0 + 0 + 0 + 0 + 0 = 0.

and

$$11111111$$

$$= 1 \cdot (2^{7}) + 1 \cdot (2^{6}) + 1 \cdot (2^{5}) + 1 \cdot (2^{4}) + 1 (2^{3}) + 1 \cdot (2^{2})$$

$$+ 1 \cdot (2^{1}) + 1 \cdot (2^{0})$$

$$= 1 \cdot (128) + 1 \cdot (64) + 1 \cdot (32) + 1 \cdot (16) + 1 \cdot (8)$$

$$+ 1 \cdot (4) + 1 \cdot (2) + 1 \cdot (1)$$

$$= 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1$$

$$= 255$$

An example of an 8-bit value between the two extremes is 10100011, which is calculated as follows:

10100011- 1 (2⁷) + 0 (2⁶)

 $= 1 \cdot (2^7) + 0 \cdot (2^6) + 1 \cdot (2^5) + 0 \cdot (2^4) + 0(2^3) + 0 \cdot (2^2)$ $+ 1 \cdot (2^1) + 1 \cdot (2^0)$ $= 1 \cdot (128) + 0 \cdot (64) + 1 \cdot (32) + 0 \cdot (16) + 0 \cdot (8)$ $+ 0 \cdot (4) + 1 \cdot (2) + 1 \cdot (1)$ = 128 + 0 + 32 + 0 + 0 + 0 + 2 + 1= 163.



On January 29, 2001, Matsushita unveiled the digital video camcorder Digicam NV-MX2000, which features a set of three 380,000-pixel CCDs (lightsensitive picture elements) on its image sensor and a 2.85-28.5 mm zoom lens equipped with an optical image stabilizer system. (AFP/Corbis)

The more bits in the byte, the more distinct the values. For example, a gray scale can be represented by 1 bit. This would give the scale two values (2 raised to the power of 1): 0 or 1. Therefore, the gray scale would consist of white and black. A 2-bit gray scale has four values (2 raised to the power of 2): 0, 1, 2, and 3. In this case, 0 = 0 percent white (black), 1 = 33 percent white, 2 = 67 percent white, and 3 = 100 percent white. As the number of bits is increased, a more accurate gray scale is obtained. For example, a 10-bit system has 1,024 discrete values (2 raised to the power of 10), providing a more detailed gray scale. With each additional bit, the number of discrete values is doubled, as is the number of values for the gray scale.

Digital Video and Audio

In digital video, black is not at value 0 and white is neither at value 255 for 8-bit video nor 1,023 for 10-bit video. To add some buffer space and to allow for "superblack" (which is at 0 IRE while regular black is at 7.5 IRE), black is at value

16 while white is at value 235 for 8-bit video. For 10-bit video, black is at value 64 while white is at value 940.

While digital is an approximation of the analog world—the actual analog value is assigned to its closest digital value—human perception has a hard time recognizing the fact that it is being cheated. While a few expert observers might be able to tell that something did not look right in 8bit video, 10-bit video looks perfect to the human eye. Digitizing audio, however, is a different story. Human ears are not as forgiving as human eyes; in audio, most people require at least 16-bit resolution, while some experts argue that 20-bit, or ultimately even 24-bit, technology needs to become standard before recordings will be able to match the sensitivity of human hearing.

To transform a signal from analog to digital, the analog signal must go through the processes of sampling and quantization. The better the sampling and quantization, the better the digital image will represent the analog image.

Sampling is how often a device (such as an analog-to-digital converter) samples (or looks at) an analog signal. The sampling rate is usually given in a figure such as 48 kHz (48,000 samples per second) for audio and 13.5 MHz (13.5 million samples per second) for video. For television pictures, 8-bit or 10-bit sampling systems are normally used; for audio, 16-bit or 20-bit sampling systems are common, though 24-bit sampling systems are also used. The International Telecommunications Union-Radiocommunication (ITU-R) 601 standard defines the sampling of video components based on 13.5 MHz, and the Audio Engineering Society/European Broacasting Union (AES/EBU) defines sampling based on 44.1 and 48 kHz for audio.

Quantization, which involves assigning a more limited scale of values to the sample, usually occurs after the signal has been sampled. Consequently, it defines how many levels (bits per sample) the analog signal will have to force itself into to produce a digital approximation of the original signal. As noted earlier, a 10-bit digital signal has more levels (thus higher resolution) than an 8-bit signal.

Errors at this stage of digitizing (called quantization errors) occur because quantizing a signal only results in a digital approximation of the original signal. Errors can also occur because of loss of signal or unintended changes to a signal, such as when a bit changes its state from "off" to "on" or from "on" to "off." Just how large the error will be is determined by when that change occurred and how long the change lasted. An error can last briefly enough not to even affect one bit, or it can last long enough to affect a number of bits, entire bytes, multiple bytes, or even seconds of video and audio.

Errors

In an 8-bit byte, for example, the 1 on the far right represents the value 1. It is the least significant bit (LSB). If there is an error that changes this bit from 1 ("on") to 0 ("off"), the value of the byte changes from 163 to 162—a very minor difference. Error increases as problems occur with bits more toward the left of the byte word.

In contrast, the 1 on the left that represents the value 128 is called the most significant bit (MSB). An error that changes this bit from 1 (on) to 0 (off) changes the value of the byte from 163 to 35—a very major difference. If this represented

the gray scale, the sample has changed from 64percent white to only 14-percent white.

If the error occurs in the LSB, chances are that the effect will be lost in the noise and will not even be noticed. An MSB error may result in a pop in the sound or an unwanted dot in the picture. If the error occurs in a sync word (i.e., the part of the digital signal that controls how a picture is put together), a whole line or frame could be lost. With compressed video, an error in just the right place could disrupt not only one frame but a long string of frames.

One of the benefits of digital is that through a process called "error management," large errors can become practically invisible. When things go wrong in the digital world, bits are corrupted and the message can become distorted. The effect of these distortions varies with the nature of the digital system. With computers, there is a huge sensitivity to errors, particularly in instructions. A single error in the right place, and it becomes time to reboot. With video and audio, the effect is more subjective. Error management can be broken down into four stages: error avoidance, error detection, error correction, and error concealment.

Error management, error avoidance, and redundancy coding constitute a sort of preprocessing in anticipation of the errors to come. Much of this is simply good engineering, such as preventative maintenance for errors. For example, technicians check to make sure that there is enough transmit power and a strong enough antenna to ensure an adequate signal-to-noise ratio at the receiver.

Next comes redundancy coding, without which error detection would be impossible. Detection is one of the most important steps in error management. It must be very reliable, because if an error is undetected, it does not matter how effective the other error management techniques are.

Redundancy codes can be extremely complex, but the simple parity check illustrates the principle. As with all redundancy codes, the parity check adds bits to the original data in such a way that errors can be recognized at the receiver. Certain bits in a byte, when their representative values (1 for "on" or 0 for "off") are added together, must always be an odd or an even number. If the receiver sees that the redundancy code is incorrect (i.e., odd when it should be even, or vice versa), the receiver can request a retransmission of that part of the data.

Of course, every system has its limits. Large errors cannot be corrected. However, it is possible to interleave data (i.e., send the data out of sequence) during transmission or recording to improve the chances of a system to correct any errors.

No matter how elegant the coding, errors will occur that cannot be corrected. The only option is to conceal them. With digital audio, the simple fix is to approximate a lost sample by interpolating (averaging) a value from samples on either side. A more advanced method makes a spectral analysis of the sound and inserts samples with the same spectral characteristics. If there are too many errors to conceal, the only choice is to mute.

With digital video, missing samples can be approximated from adjacent samples in the same line or adjacent lines, or from samples in previous and succeeding fields. The technique works because there is a lot of redundancy in a video image. If the video is compressed, there will be less redundancy, so concealment may not work as well. When both correction and concealment capabilities are exceeded in video, the options are either to freeze the last frame or to drop to black.

To make digital video more affordable for both professionals and consumers, compression is used. The trade-off is quality because compression "throws away" some of the signal. For example, high definition is compressed to approximately 18 Mbits per second (18 million bits per second) for digital television transmission, a compression ratio of almost 55:1.

There are two general types of compression algorithms: lossless and lossy. As the name suggests, a lossless algorithm gives back the original data bit-for-bit on decompression. Lossless processes can be applied safely to a checkbook accounting program, but their compression ratios are usually low—on the order of 2:1. In practice, these ratios are unpredictable and depend heavily on the type of data in the files. Alas, pictures are not as predictable as text and bank records, and lossless techniques have only limited effectiveness with video.

Virtually all video compression uses lossy video compression systems. These use lossless techniques where they can, but the really big savings come from throwing things away. To do this, the image is processed or "transformed" into two groups of data. One group will, ideally, contain all the important information. The other gets all of the unimportant information. Only the important data needs to be kept and transmitted.

Lossy compression systems take the performance of the human eye into account as they decide what information to place in the important pile and which to discard in the unimportant pile. They throw away things that the eye does not notice or will not be too upset about losing. Because human perception of fine color details is limited, for example, chroma resolution can be reduced by factors of two, four, eight, or more, depending on the application.

Video compression also relies heavily on the correlation between adjacent picture elements. If television pictures consisted entirely of randomly valued pixels (noise), compression would not be possible. Fortunately, adjoining picture elements are more likely to be the same than they are to be different. Predictive coding relies on making an estimate of the value of the current pixel based on previous values for that location and other neighboring areas. The rules of the estimating game are stored in the decoder, and, for any new pixel, the encoder need only send the difference or error value between what the rules would have predicted and the actual value of the new element. The more accurate the prediction, the less data needs to be sent.

The motion of objects or the camera from one frame to the next complicates predictive coding, but it also opens up new compression possibilities. Fortunately, moving objects in the real world are somewhat predictable. They tend to move with inertia and in a continuous fashion. With the Motion Picture Experts Group (MPEG) standard, where picture elements are processed in blocks, quite a few bits can be saved if it can be predicted how a given block of pixels has moved from one frame to the next. By sending commands (motion vectors) that simply tell the decoder how to move a block of pixels that is already in its memory, resending of all the data associated with that block is avoided.

As long as compressed pictures are only going to be transmitted and viewed, compression encoders can assign lots of bits into the unimportant pile by exploiting the redundancy in successive frames. This is called "interframe" coding. If, on the other hand, the video is destined to undergo further processing such as enlargement or chromakey, some of those otherwise unimportant details may suddenly become important, and it may be necessary to spend more bits to accommodate what postproduction equipment can "see." To facilitate editing and other postprocessing, compression schemes that are intended for postproduction usually confine their efforts within a single frame and are called "intraframe." It takes more bits, but it is worth it.

Ratios

Ratios such as 4:2:2 and 4:1:1 are an accepted part of the jargon of digital video, a shorthand that is taken for granted and sometimes not adequately explained. With single-channel composite signals, such as the National Television System Committee (NTSC) and Phase Alternate Line (PAL) signals, digital sampling rates are synchronized at either two, three, or four times the subcarrier frequency. The shorthand for these rates is 2fsc, 3fsc, and 4fsc, respectively.

With three-channel component signals, the sampling shorthand becomes a ratio. The first number usually refers to the sampling rate that is used for the luminance signal, while the second and third numbers refer to the rates for the red and blue color-difference signals, respectively. Thus, a 14:7:7 system would be one in which a wideband luminance signal is sampled at 14 MHz and the narrower bandwidth color-difference signals are each sampled at 7 MHz.

As work on component digital systems evolved, the shorthand changed. At first, 4:2:2 referred to sampling luminance at 4fsc (about 14.3 MHz for NTSC) and color-difference signals sampled at half that rate, or 2fsc. Sampling schemes based on multiples of NTSC or PAL subcarrier frequency were soon abandoned in favor of a single sampling standard for both 525- and 625-line component systems. Nevertheless, the 4:2:2 shorthand remained.

In current usage, "4" usually represents the internationally agreed upon sampling frequency of 13.5 MHz. Other numbers represent corresponding fractions of that frequency. Thus, a 4:1:1 ratio describes a system with luminance sampled at 13.5 MHz and color-difference signals sampled at 3.375 MHz.

The shorthand continues to evolve. Contrary to what one might expect from the discussion above, the 4:2:0 ratio that is frequently seen in discussions of MPEG compression does not indicate a system without a blue color-difference component. Here, the shorthand describes a video stream in which there are only two color-difference samples (one red, one blue) for every four luminance samples. Unlike 4:1:1, however, the samples in 525-line systems do not come from the same line as luminance; they are averaged from two adjacent lines in the field. The idea was to provide a more even and averaged distribution of the reduced color information over the picture.

See also: Cable Television, System Technology of; Digital Media Systems; Recording Industry, Technology of; Television Broadcasting, Technology of.

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DIGITAL MEDIA SYSTEMS

The conversion from analog to digital technology is one of the most fundamental and dramatic changes in modern media. Digital technology is displacing analog at every stage of the productiondistribution-exhibition (PDE) process. At the exhibition level, consumers already have a variety of digital devices in their homes, offices, and cars. The computer is the most prominent, but by no means the only, example; compact discs (CDs) have replaced vinyl records, and the digital cell telephone has displaced its analog predecessor. Handheld minicomputers or personal digital assistants (PDAs) are required technology for some executives; answering machines, still cameras, and home video cameras have all made the jump to the digital binary language of zeros and ones. At the production and distribution levels, most media sectors, including broadcast and cable

television, the recording industry, and even print media, have been deeply involved in the process of converting to digital. This has all set the stage for what many see as the eventual melding, or convergence, of these previously distinct channels of communication.

There are a number of reasons for the switch to digital. In the analog world, reproduction and distribution of information usually requires some form of copying, such as making additional prints of films or copies of audiotapes. Every time an analog copy is made, however, the quality of the image or sound deteriorates. The more copying that is done from one generation to the next, the greater the loss in original fidelity. Digital communication does not suffer from this handicap. When the equipment is working properly, the last copy in the chain retains all the quality of the original. Converting information to the language of computers also makes it almost infinitely malleable. Audio, video, and textual information that are distinct in the real world are converted into the same currency of digital bits in the computer world, where they can be combined in ways that are limited only by the human imagination. Sights and sounds can be altered, enhanced, created, and destroyed.

Video Production

Traditional analog methods of electronically capturing, assembling, and storing images involved the use of either videotape or film. For image capture, digital cameras began replacing their analog predecessors in the 1990s. While the signals that they generate can be stored and edited on tape, disk storage, which is faster at accessing and transferring material, is usually preferred.

Editing analog videotape, as has been done in television news and entertainment, involves a laborious process of copying segments of images from the original master tape and assembling them into a coherent story, or package. The process requires a sequential, or linear, assembly of shots, like creating a railroad train by adding one car at a time. It does not allow the insertion of one car between two others, nor one scene between two existing shots, without re-editing the full piece. Digital, or nonlinear, editing frees the editor from this constraint. Shots can be arranged and rearranged like a giant jigsaw puzzle with little technical effort. Different compositions can be quickly attempted, discarded, or accepted. Television news uses digital technology to increase dramatically the speed of creating video packages for the evening news.

Film Production

In the motion picture industry, 35-mm film is likely to remain the staple for major studio production and exhibition for many years, largely because of the superior quality of the analog image that is prized by most filmmakers. Nonetheless, many see a day when a large-screen, digital video format will displace film. Rather than making physical copies, or prints, of film for shipment to theaters, some see the instant electronic distribution of digital "films" to multiplexed screens around the world. Meanwhile, filmmakers make use of digital technology in a variety of other ways. Rough cuts, a kind of rough draft of a finished film, can be edited much more quickly using nonlinear editing, with the digital product serving as a guide for the splicing of film for the finished product. Computer-generated special effects are among the most easily recognized digital applications. Nearly any part of a movie or television show can be digitally created or transformed, extending the creative range of television and film artists. Star Wars I: The Phantom Menace, for example, featured extraterrestrial characters that were fabricated through the use of computer animation. In television and film, entire sets, the background setting for a program, can be generated digitally so that an actor or television news anchor appears to be standing in a forest or on a busy city street when in fact he or she is standing in an empty studio.

Home Video and Audio

The power of digital video production is available for home users as well. Digital still-cameras that store images on a disk instead of film are common. On home computers, these images can be cropped, sized, or otherwise altered in hundreds of ways before being printed or sent by e-mailed. Home computers that have the appropriate software can also be used to edit home video, shot on either digital or analog cameras. These digital home movies, edited using the same nonlinear techniques as those that are employed by professionals, can be stored on videotape and played in the family videocassette recorder (VCR). Consumers also can create their own video CDs.

The versatile CD has become the vehicle of choice for many applications. It is the primary medium for recorded music and commercial computer software, and it is increasingly being used in place of videotape for home viewing of theatrical films. In the latter case, manufacturers have adopted the term "DVD" (meaning either digital videodisc or digital versatile disc, depending on the manufacturer). The standard analog videotape player also has a digital companion in the personal video recorder (PVR), which uses computer hard drives to allow a viewer to record and watch a television program, with the full functionality of a VCR (including pause, rewind, and automatic commercial deletion), even while the program is being aired.

For the recording industry, CDs have been supplemented by several other digital technologies, including minidiscs, digital audiotape, and MP3 players that download music from the Internet.

Broadcast Television

The distribution of radio and television programming began migrating to a digital format in 1998 when television stations began their initial digital transmissions. The change means several things. Broadcasters, over time, have to give up their old analog frequencies for the new digital channels and invest hundreds of millions of dollars in new equipment. Because the traditional analog television set cannot use digital signals, every analog television set must eventually be replaced. Converter boxes that translate digital signals into usable analog signals will ease the transition, allowing consumers to make the change at their leisure.

There are a number of benefits for both broadcasters and the public. Digital images, coupled with high-resolution transmission formats, provide sharper, more detailed images. One of the applications of digital television technology is high-definition television (HDTV), which improves the clarity and detail of the home picture. High definition also changes the aspect ratio of television images from the 3 X 4 (three units high by four units wide) dimensions of analog sets to a wider 9 X 16 frame that mirrors the dimensions of a movie screen.

Through digital compression, broadcasters can squeeze more information into their signal and thereby offer new services. For example, programs



Multiple product uses are incorporated in Fuji Photo Film's FinePix40i (a 155-gram, 4.32 million pixel camera), which was unveiled in June 2000 and allows its user to listen to both high-quality MP3 music files using a smart media card and earphones and to use it as a standard compact digital camera. (Reuters NewMedia Inc./Corbis)

can be simultaneously broadcast in multiple languages for different audiences. Detailed textual information, such as baseball statistics that viewers can access on-screen during the game, can be fed with the normal programming. Broadcasters can also offer datacasting services, such as paging and Internet access, completely separate from traditional television programming. Digital compression also allows broadcasters to transmit multiple program channels, instead of just one.

Digital Radio

Radio broadcasting has lagged behind television in the migration to digital, but new industry standards for digital radio will, as with television, mean the eventual replacement of all analog receivers in homes and automobiles. Unlike television, however, digital radio will use the same channels as existing analog service, with broadcasters transmitting both digital and analog during the transition period. Conversion to digital means CDquality sound and allows broadcasters to transmit information about the music, including title, artist, and label, for display on a small screen. Station call letters and formats are also available, and programmable receivers allow drivers to lock automatically onto successive regional jazz stations as they drive across the country. Digital radio technology can also datacast information such as stock market quotes, sports scores, and traffic updates.

In addition to traditional terrestrial broadcasters, nationally distributed satellite digital radio services have emerged. These subscription services beam dozens of audio channels from dedicated communications satellites. Similar to older cable audio services, the channels are divided into special-interest categories from country and western to jazz to opera. Web-based radio stations are also proliferating, and wireless receiving units for them are being developed.

Digital Cable

In the late 1990s, cable television operators began adding digital capacity to their systems, increasing channel capacity and interactivity. Just as in digital broadcasting, cable operators can take a channel that had carried one analog signal and use it to carry multiple digital signals. The increase in channel capacity has meant an increase in consumer program choices. The Discovery Channel, for example, created specialty channels for children, health, aviation, science, and other niche interests. Premium movie services such as Home Box Office and Encore also developed themed or multiplexed channels in categories such as mysteries, westerns, romance, and family entertainment. Digital technology means more pay-per-view movie choices as well. The cable and satellite industry envisions a digital future in which films will be placed on highcapacity servers and customers will be able to order those films whenever they want. Customers need only press a button on their remote control to invoke this video-on-demand (VOD) service. Moreover, the service will provide full VCR functionality; the subscriber will be able to start, stop, and rewind the movie at his or her convenience. Some people see more programming moving to this VOD model, allowing subscribers to order reruns of their favorite old shows, music videos, documentaries, and other material whenever they choose.

Using video streaming—the playing of movies and other video material from digital servers— Internet companies already provide a variety of similar video-on-demand services, although the quality of the image delivered over a standard telephone modem is very poor. Communications companies of all types are looking to marry broadband delivery platforms, such as cable, with video-streaming technology to make instant, ondemand programming a reality.

Digital service also means greater integration of video programming with data for broadcasters, satellite television, and cable operators. Viewers can call up baseball statistics during the game, as noted above, but even greater interaction is possible. In addition to detailed statistics, the living room fans may be able to request a picture-in-picture screen that shows favorite players in old games, or they may be able to change camera angles to watch only the outfielder. Using computer-like pull-down menus, viewers will be able to order tickets to the next game or buy hometeam hats and tee-shirts.

Digital Publishing

Newspaper, magazine, and book publishing have all been affected by the digital revolution. One of the most prominent manifestations is their use of the Internet, from the delivery of additional or enhanced content in the case of newspapers, magazines, and journals to book-buying online. Nearly every magazine and newspaper has its own website that features material culled from their print editions and supplemented with additional information, searchable archives, audio and video feeds, and hot links to related sites.

Reinventing the backroom, or production process, in publishing was one of the pioneering steps in digital communications. Newspapers began replacing typewriters with computers in the 1970s, converting over the next two decades to systems in which stories were written, edited, and set in type all within the confines of the computer. In the 1990s, newspaper and magazine photographers began switching from film to digital imagery. Film, which at one time had to be shot in the field, carried back to the newspaper, developed in the lab, printed in the darkroom, and edited physically, can now be transmitted electronically to the newspaper, edited in the computer, and placed in print in a fraction of the time.

The development of "desktop publishing" which relies on home computers, sophisticated word processing and publishing software, packages full of clip art, and inexpensive digital scanners—has turned millions of hobbyists into home publishers, churning out newsletters, pamphlets, and minimagazines for their schools, churches, and civic clubs.

For years, newspaper publishers, and to a lesser extent magazine publishers, sought a means of delivering their product electronically using small, portable wireless readers or flat screens to replace paper. Flat-panel technology is still evolving and may merge with other developing wireless devices. The book publishing industry has also developed electronic book readers. "E-books" can be purchased on disk or downloaded from the World Wide Web and played back, or read, on the flat-screen device that is designed to emulate the sense and feel of a real book. The industry has also considered a "books-on-demand" system in which titles are stored electronically and printed as needed at a local outlet. Using this system, publishers would no longer have to guess about consumer demand and press runs, saving time, money, and natural resources, and there would no longer be such a thing as an out-of-print book.

Wireless

The ubiquitous cell telephone is being replaced by a digital cellular unit, sometimes called a personal communications system (PCS). In addition to improving the clarity of the telephone call, small, built-in screens allow these units to be used for data communication. Users can check their e-mail, trade stocks, or buy gifts online. For more powerful web surfing, the digital telephones serve as wireless modems for laptop computers. Wireless PDAs such as Palm Pilot and two-way, Internet-enabled pagers offer similar tetherless features. Global digital telephone systems that use low-Earth-orbiting satellites are extending this power all over the world.

The Digital Home

The digital future is a switched, broadband, highly interactive information and communication system. A variety of industries, including telephone, cable, television satellite, and even power companies, will vie to provide consumers with bundled packages of telephone service, Internet access, paging, and television programming and present one bill for everything at the end of the month. In the home, it will likely mean high-resolution display screens in as many rooms as the owner wishes. While screens will vary in sizelarge ones in the family room, small ones in the den—each will have similar capacities to view movies, surf the Internet, look at e-mail, or order dinner. While most home devices may be wired, wireless technologies will be common for any mobile application, from surfing the web on the patio to reviewing voicemail in the car or at the airport. In short, digital technology is changing the way people work, play, and socialize.

See also: Cable Television, Programming of; Cable Television, System Technology of; Digital Communication; Film Industry, Tech-Nology of; Internet and the World Wide Web; Radio Broadcasting, Technology of; Recording Industry, Technology of; Satel-Lites, Communication; Satellites, Technology of; Technology, Adoption and Diffusion of; Technology, Philosophy of; Telecommunications, Wireless; Telephone Industry, Technology of; Television Broadcasting, Technology of.

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PATRICK R. PARSONS

DISNEY, WALT (1901-1966)

Born in Chicago to Elias Disney (an Irish Canadian) and Flora Call Disney (a German American), Walt Disney, who was one of five children in the family, spent most of his early life in Missouri (first in Marceline and later in Kansas City). After serving in Europe as an ambulance driver in Europe at the end of World War I, Disney returned to Kansas City, where he worked with Ub Iwerks at the Kansas City Film Ad Company. The two decided to set out on their own in 1922 and founded Laugh-O-gram Films. Although working at their own company allowed them to fine-tune a method of combining live action with animation, distribution problems led to the demise of Laugh-O-grams in a year. In 1923, Disney moved to Hollywood and founded the Walt Disney company with his brother Roy. Iwerks later joined them as a key animator. The company's first contract was to produce the short, animated, live-action Alice Comedies.

In 1927, Disney created the cartoon character Oswald the Lucky Rabbit, which proved to be popular with audiences. However, Disney later learned that Universal, his distributor, owned full rights to the Oswald character, a hard-learned lesson that pushed Disney to create a new character, Mickey Mouse, who was featured in Plane Crazy (1928) and The Gallopin' Gaucho (1928). On November 18, 1928, Steamboat Willie, which featured Mickey and his companion, Minnie Mouse, was the first Mickey cartoon to be released, premiering at the Colony Theatre in New York City. This was the first synchronized sound cartoon, and while Disney auditioned many people for the voice of Mickey, he chose to provide the high-pitched voice himself. Disney won an Academy Award in 1932 for the creation of Mickey Mouse, and he continued to provide the voice until the late 1940s.

The summer after *Steamboat Willie* was released, Disney kicked off his Silly Symphony series with *The Skeleton Dance* (1929), which won

acclaim for its synchronized sound and movement. Other Silly Symphony cartoons followed, including *Flowers and Trees* (1932), which was the first full-color cartoon and the first animated film to win an Academy Award. Disney's use of Technicolor saved this unproven commodity and garnered Disney an exclusive three-year contract with Technicolor, giving him an edge over his competitors. The Academy Award-winning *Three Little Pigs* (1933), another in the Silly Symphony series, was praised for character development, and the cartoon's theme song—"Who's Afraid of the Big Bad Wolf?" by Frank Churchill—was popular with Depression-era audiences.

As Disney prepared for the creation of the first full-length animated film, he started exploring new techniques in animation photography. His third Academy Award-winning Silly Symphony, The Old Mill (1937), was the first short subject to use the multiplane camera technique. Disney also won a special Academy Award for the design and application of the multiplane camera, a device that photographed up to six sheets of glass held several inches apart, thereby producing animation with a greater sense of depth and dimension. That same year, Snow White and the Seven Dwarfs (1937) premiered at the Carthay Circle Theater in Los Angeles as the first full-length animated feature film. It won critical and popular acclaim and broke ground for the future of animated films. The film capitalized on Disney's animation achievements to date and took great leaps in the creation of welldeveloped cartoon characters who exhibited a wide range of emotions and could evoke emotions from the audience as well.

Disney is known for other firsts in animated feature films. Fantasia (1940), which features visual interpretations of orchestral classics, was the first animated film to use Fantasound, a multitrack sound system that paved the way for stereophonic sound. The Reluctant Dragon (1941) combined animation with live action. Lady and the Tramp (1955) was the first animated feature film to use the widescreen projection process CinemaScope, while Sleeping Beauty (1959) was the first animated feature film to use the widescreen projection process Technirama 70. Other notable animated features that were produced by Disney Studios during Disney's lifetime include Pinocchio (1940), Dumbo (1941), Bambi (1942), Cinderella (1950), Alice in Wonderland (1951), Peter Pan



In 1939, Shirley Temple presented a special Academy Award—one big statue and seven little ones—to Walt Disney for his accomplishments on Snow White and the Seven Dwarfs. (Bettmann/Corbis)

(1953), One Hundred and One Dalmatians (1961), and The Sword in the Stone (1963). The Jungle Book (1967) was the last animated film that Disney was personally involved in, although it was released after his death. Disney believed in education for animators, which was the impetus for the establishment of an animation school at his Hollywood studio in 1932. The excellent training that his animators received not only improved the quality of Disney films but upgraded industry standards. Later, in 1961, Disney led the establishment of the California Institute of the Arts in Valencia as a college-level professional school that specialized in creative and performing arts.

On July 19, 1950, Disney Studios released the live-action feature *Treasure Island*, which was the first of sixty-three live-action films that Disney oversaw before his death. Other notable liveaction Disney classics include *Davy Crockett*, King of the Wild Frontier (1955), Old Yeller (1957), The Shaggy Dog (1959), Pollyanna (1960), Swiss Family Robinson (1960), The Absent-Minded Professor (1961), *The Parent Trap* (1961), and *The Incredible Journey* (1963). *Mary Poppins* (1964), which was acclaimed for its combined use of animation and live action in a key sequence and is often considered to be Disney's last great film, won five Academy Awards.

Disney also made his mark in television. In 1950, his first television show, One Hour in Wonderland, was broadcast on Christmas Day. During the early 1950s, after the success of his first show, the networks began pursuing Disney to create a weekly show, but he was focused on opening his Anaheim, California, theme park, "Disneyland." Finally, in 1954, Disney agreed to supply a series to ABC if the network would provide a loan to begin construction of the park. Disney used the series to promote the park, which was well publicized through the show by the time it opened on July 17, 1955. In 1961, Disney moved the series to NBC and began producing the series in color, changing its name to Walt Disney's Wonderful World of Color; the series was eventually called
The Wonderful World of Disney. Meanwhile, Disney's *Mickey Mouse Club*, which ran from 1955 to 1959, was another television venue that the creator used to bolster interest in the theme park. "Walt Disney World," a similar, yet much larger, park opened in Orlando, Florida, in 1971.

Although Disney left his mark as a film innovator, he was also a savvy entrepreneur. His keen sense for what audiences wanted helped him to created many types of media that would satisfy—and continue to satisfy—the American public. Under his leadership, Disney's studio won hundreds of awards, including forty-eight Academy Awards, seven Emmy Awards, and two Grammy Awards.

See also: FILM INDUSTRY, HISTORY OF.

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TRACY LAUDER

DURKHEIM, ÉMILE (1858–1917)

Émile Durkheim was one of the founding figures of sociology. His work is important to students of communication because of the central, though often implicit, role of communication processes in his sociological analyses. In current Durkheimian theory, communication, broadly conceived, is the fundamental social process. As a result of communication, biological beings become civilized human beings, psychological dispositions take the shape of cultural forces, and material and economic life takes meaningful shape as community and society. Durkheim himself was never so explicit about such large claims, and he was writing before the development of the modern vocabulary of communication theory. Nevertheless, interested readers have no difficulty seeing that signs, symbols, representations, rituals, myths, symbolic interaction, and other modes and media of communication are the underlying processes of his theoretical explanations of social order and process.

Durkheim was born in Épinal in the Lorraine region of France. His family expected him to become a rabbi, but Durkheim opted instead for secular scholarship. He studied philosophy at the École Normale Supérieure in Paris and spent a year in Germany (1885–1886) studying the new social sciences. In 1887, he took a post in education and sociology at Bordeaux; this was the first professorship in sociology in France. In 1902, he was given a professorship at the Sorbonne in Paris. At both universities Durkheim surrounded himself with a busy group of talented students. Together they conducted research, planned courses, wrote books and articles, and edited one of the world's first journals of sociology, L'Année Sociologique. Three of the four books published in his lifetime—The Division of Labor in Society (1893), The Rules of Sociological Method (1895), and Suicide (1897)appeared in rapid order during the Bordeaux years and cemented his reputation as an important, if controversial, thinker. The Elementary Forms of the Religious Life (1912) was completed and published fifteen years later, following a prolific production of articles, reviews, courses, and lectures. Course notes and essays were compiled and published posthumously. He died in November 1917 while recuperating from a stroke suffered after leaving a war information meeting the previous year. It is commonly reported that the heartbreak and strain of the war-in which his only son and many of his students were killed-contributed directly to his death.

The first step in Durkheimian social theory is the claim that society, or the social, represents a distinct and separate type of reality. Durkheim said the social was *sui generis* (i.e., unique, individual) and set it alongside physical, biological, psychological, and economic realities. This entails, then, that social reality has a degree of autonomy vis-àvis physical, biological, psychological, and economic circumstances and that it follows some of its own rules of cause and consequence. Sociology, then, as the science devoted to social realities, needed to have its own concepts, logic, and method, as it too would make a *sui generis* contribution to the academy. Modern students of communication can read Durkheim's work as an early movement toward the later establishment of communication studies, cultural studies, and the textual turn throughout the social sciences.

The next step in Durkheimian social theory is to posit social forces as the causal explanation for the socialized behavior of individuals and the endurance of social organizations and order. In Durkheim's early work, on the division of labor and on suicide, for example, the nature of these social forces was sometimes mysterious. Because he often deduced the evidence for their existence through argument by elimination-showing first that biological, psychological, and economic explanations were inadequate-the nature of the social forces was in important ways left undefined. In The Elementary Forms of the Religious Life, Durkheim offers his most substantive analysis of social forces, and it becomes clear that they exist and work through processes of communication. In the analysis of religious symbol and ritual that is the centerpiece of that work, Durkheim shows how the ordinary material objects and body movements of religious ceremony carry special meanings and powers for the social group that is practicing the ritual. They actually represent the group to itself, and thus the ritual objects and practices are the symbols and media of the group's power over the individual.

One of the most general propositions of Durkheimian theory is that group activities strengthen the group by expressing and representing social forces, and thus reinforcing their presence in individual minds. Normally socialized adults, for example, feel social norms in their own consciousness, whether as spontaneous desires or as uncomfortable social pressures. Normative social interaction reinforces the ubiquity, utility, and taken-for-grantedness of those norms. Language, logic, aesthetic preferences, rules of interaction, taken-for-granted political beliefs, and religious practice and belief all share these characteristics with social norms. Durkheim described this class of phenomena as "things in us, not of us," as instances of the social within the mind of the individual.



Émile Durkheim. (Bettmann/Corbis)

These ideas have become commonplace. No one doubts that social interaction, communication, and culture are fundamental to socialization, and that the outcome of socialization is such that much of a person's conscious thought is a social product, even as it is his or her own individual experience. That does not diminish Durkheim's innovation. At the time, this was a fundamentally new approach to sociology, tantamount to the invention of social psychology. It is of further importance to students of communication because it puts symbolic processes at the heart of social theory and points toward "communication-centric" analyses of culture, politics, and social life.

For example, the practices of modern democratic politics—campaigning, voting, swearing in, parades, saluting the flag, holidays, monuments, speeches—can be analyzed as the ritual of a modern social religion. Much political activity that appears purposeless or irrational can be shown to be ritually important. The entertainment, leisure, and consumer goods industries, for another example, also have a ritual and normative element,

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since they provide the material resources for the modern cult of the individual. In modern society, each person must be a distinct individual; the social norm is to be one's self. Choices in entertainment, leisure activities, and consumer goods are media for the expression of that identity, rituals of each individual's adherence to the norm. As these examples indicate, there is room in contemporary communication, cultural, and social theory for a distinctive Durkheimian contribution.

See also: Culture Industries, Media AS; Election Campaigns and Media Effects; Group Communication; Language and Communication; Society and the Media; Sociolinguistics; Symbols.

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ERIC W. ROTHENBUHLER

DYNAMICS OF GROUP COMMUNICATION

See: Group Communication, Dynamics of

E

ECONOMICS OF INFORMATION

Though economists often talk in terms that seem impenetrable, what they study is very simple and basic. The "economy" is how resources are distributed throughout society. Since the 1960s, the world has been described as an information economy, rather than an industrial or agricultural economy. Buying, selling, and using information are at the heart of economic activity for businesses and consumers, as well as for the governments that regulate them.

Development of the Field

In ancient hunter-gatherer or small-scale agricultural societies, most economic activity was governed by tradition. When a global economy first began to develop in the fifteenth and sixteenth centuries, however, the need to plan for activities that would be coordinated over vast distances and the need to account for the effects of weather and events in faraway places on domestic availability of food and goods led to the articulation of theories about how the economy works. Each subsequent change in the nature of the economy has similarly stimulated the development of new economic ideas, first with industrialization and then with "informatization."

The subfield of the economics of information emerged as several distinct strands of research and theory that dealt with very different aspects of information began to be considered together. Neoclassical economic theory, the economic ideas that dominated most of the decision making (whether of government or of corporations) during the twentieth century started from a set of five assumptions: (1) that everyone has access to the same information, (2) that everyone has perfect information about prices and goods in the marketplace, (3) that purchasing decisions are made solely for economic reasons, (4) that the histories and habits of consumers have no influence on individual buying decisions, and (5) that power and influence play no role in how the market works. Historical work that contributes to the way in which economists understand information dealt with matters as different from each other as optimization of flows through a communication system, decision theory, research and development, prices, organizations as economic entities, and risk.

Over the course of the twentieth century, however, the growth in the importance of information goods and services to the economy forced reconsideration of many of these inherited economic ideas. In the 1930s, Ronald Coase pointed out that the very reason corporations form is to reduce the transaction cost (i.e., the cost of getting knowledge about prices for necessary things). One important implication of this insight, he noted, was that businesses should not be seen as solid and stable structures; rather, they should be seen as incompletely connected networks of information flows. By the 1960s, Fritz Machlup and Kenneth Boulding started identifying industries that fell within the "information sector" of the economy. In the 1970s, Uri Porat offered a framework for statistically analyzing trends in the information sector. This framework was taken up by the U.S. government and subsequently by other governments around the world, leading to the creation of the body of statistics related to the enormous growth in the percentage of the work force involved in "information work," the contributions of information industries to the national economy, and so on.

Subsequently, a great deal of work began to be done to investigate how neoclassical economic ideas applied to information creation, processing, flows, and use. A number of problems were identified. It is difficult to break information into units, so it is therefore difficult to quantify it. Information is not appropriable; while it can be owned, that ownership is rarely exclusive. Information is thus said to be "leaky" because when it is transferred it may go not only from seller to buyer but also to third parties who may be in the vicinity and acquire the information solely through, for example, overhearing it, viewing it from afar, or accessing it through web-based means. Information is heterogeneous in nature, so it often is valued in widely differing ways by different people. This is illustrated by the fact that "old" information is useless to corporate decision makers, but it is invaluable to historians. In most cases, value is put not on information itself but in its material packaging-the book, the classroom, or the television set. Economists use the term "commodities" to identify things that are bought and sold that are fixed in time and space, but informational goods and services are not necessarily fixed in time and space. Where, for example, would one locate the site of the purchase of information processing in a transaction that involves a buyer in one country, a seller in a second, and a computer in a third? Despite these problems, it has been necessary to come up with some way of understanding economic processes as they take place within an economy that is (1) clearly ever-more reliant on information technologies for the production, distribution, and use of all kinds of goods and services and (2) composed of an ever-larger proportion of informational goods and services.

What Is "The Information Economy"?

The earliest way of understanding the information economy was set forth in the 1960s. According to this product-based theory, an information economy operates just like any other economy except for the simple difference that there is a larger proportion of informational goods and services being bought and sold. This approach continues to underlie most governmental decision making, and it is the approach that is used to generate statistics to describe the growth of the information economy. This approach is useful as far as it goes, and it has the advantage of permitting decision makers to continue to work with the kinds of analytical tools that they have always used. However, people in the business world increasingly began to feel that this approach did not adequately capture what was going on in the contemporary economy—where value was being created and money was being made.

By the 1970s, some people began to look for an alternate understanding of the information economy because of the problems that were associated with treating information as a commodity and with the social inequities that resulted from differential access to information. This led to a domainbased theory that said the information economy resulted from the expansion of the boundaries of the economy itself through commodification of forms of information that had never before been treated as a commodity. Some of the forms of information newly commodified could be public, as when governmental databases such as those generated by the U.S. satellite surveillance system are turned over to the private sector. Some of it is private, as in the example of the details of one's personal life that are now bought and sold. Again, there is some truth in the insights offered by this approach. However, it has been limited in its influence upon policymaking because it has not offered alternative analytical tools that can help policymakers solve problems.

In the early 1990s, a third way of defining the information economy appeared, focused not on products or on the domain but on how the economy functions. Led by Cristiano Antonelli, proponents of this approach argue that the contemporary economy is an information economy because it operates in qualitatively different ways from how the economy operated in earlier stages. Antonelli and others argue that in the information economy, cooperation and coordination are as important as competition for long-term economic success. Because different types of economic, political, and social entities are so intertwined in all of their activities, these economists argue that there is little that actually still takes place in the market as idealized by the neoclassical economists of the late nineteenth century. Rather, most economic activity takes place via the "harmonization" of different types of information systems with each other.

While all three of these perspectives are used to support decision making by various groups, both public and private sector decision makers are gradually shifting from the most traditional approach to an appreciation of the unique informational features of what many now call the "network economy." Corporations are changing because they are finding that traditional ways of thinking do not account for what they are experiencing. Governments are changing in order to remain competitive with other types of organizations—such as transnational corporations—in contemporary struggles for power.

Economic Analysis of Information

Information is important economically both as a good (i.e., an object that can be bought and sold, such as a book) and as a service (i.e., a process that can be bought and sold, such as data processing). One of the reasons it has been so difficult to deal with information in economic terms has been that it is more difficult to deal with the economic features of commodities that are intangible than with those that are material, or tangible.

Consumers tend to think most of primary or final information goods and services, those that are bought by users in the form in which they are produced. Movies, television programs, databases, books, and magazines are all examples of information as a final good. In the contemporary economy, however, informational goods and services are also important in secondary or intermediate form, meaning that they are not products bought and sold in the retail market. Rather, they are inputs into the production of other types of goods and services. For example, data about marketing and sales trends is an important input into the production of goods for sale. Data about the functioning of the global information infrastructure through which the communications of the Internet flow is another example of information as a critically important secondary good. Information as a secondary good may be in the form of raw data, as in these examples. It is also said to be embedded in advanced technologies that embody information because they are the outcome of lengthy research processes that produce information. It is also embedded in the people who use

those technologies as a form of what is called "human capital."

One of the first problems economists faced in thinking about information was defining the information sector of the economy (i.e., those industries involved in working with information) so they could be analyzed separately from other types of economic activities. This is not a problem with a precise and fixed solution because many companies are involved in both information-based and materials-based businesses and new information businesses are being created all the time. Generally, the information sector is defined as those industries that have a primary focus of producing, distributing, processing, or storing information. Important examples of industries that belong to the information sector include education, media (e.g., television, radio, book and magazine publishing, and film), Internet companies, telephone companies, libraries, database providers, and data processors.

It is precisely because so many new businesses are being created all the time that it is difficult to draw clear lines between different information industries. For example, a film archive may become a content producer, a law firm may launch a data processing venture, and a radio station may make money transferring data files as a side business. Furthermore, many of the new types of businesses that are emerging, such as Internet service providers and cable television, do not quite fit into the previously standard ways of categorizing industries.

Historically, an economic analysis of an industry would have focused on the activities of individual corporations, what economists call the "firm." Accounting systems—and the governmental regulation for which they provide the framework—have long been in place, and they support the continued reliance on such an approach. However, economists are developing analytical techniques that look at the long-term project rather than the firm as the unit of analysis because so much activity in the network economy takes place not within single firms but within a network of interdependent organizations of different types that interact in a multitude of ways.

The Information Production Chain

The fundamental principle of the economics of information is that value is added every time

information is processed. Donald Lamberton, a key figure in the development of the subfield, points out that the division of labor involved in information processing—the way in which processes are broken up into small pieces for handling—may be the most fundamental form of the division of labor. Awareness of this has led to the use of models of an "information production chain" as a way of identifying the different points at which value is added and as a means by which information commodities can be distinguished from each other.

While different industries and governments break up the steps of the information production chain in different ways, work by Machlup and Boulding suggests a basic model that includes the following stages: information creation (*de novo*, or through generation or collection), processing (algorithmic [computerized] or cognitive [human]), storage, transportation, distribution, destruction, and seeking. Those who think about the informational value of production chains for other types of goods and services often think of each stage of manufacturing and distribution as spinning off an informational "value chain."

This emphasis on distinctions among types of information processing as a source of economic value has another consequence, exacerbated by the fact that ongoing technological innovation processes continue to offer new opportunities to entrepreneurs. Though, historically, analysis of functions within the firm were organized around the product, the task, or the job description, economists, led by Roberto Scazzieri, are learning to analyze activities within individual and networked firms in terms of their processes. Thinking in terms of an information production chain also heightens awareness of the value of information as a resource.

Creating Information Goods and Services

In the agricultural and industrial economies, fundamental resources were material. In order to have more (whether it was, for example, land, oil, or iron ore), more had to be found physically, or new ways of getting at known resources had to be invented. In the information economy, however, the discovery of new resources is conceptual. Distinctions among types of information processing and the informational states they produce must be understood in a new way so that a new type of product or service niche becomes available. It is this emphasis on thinking as a way of creating new products that has made it possible for so many young people to have succeeded so well in information businesses. In the past it might have taken years for an entrepreneur with a good idea to accumulate the needed capital and capacities, but today, even someone who is very young can come up with a new way of thinking about ways to create, process, distribute, and use information and turn that into a business.

Creativity is needed in order to form a successful information-based business, but economists are able to offer a number of basic generalizations regarding how best to think about information from a business perspective. These approaches begin by segmenting the market into different niches, each of which can be served with a different product. Marketing equipment and software for web access to the elderly population that would use it primarily for family correspondence, for example, might stress features that would be very different from the ones emphasized in marketing the same equipment and software to teens who might be more interested in games, music, and other web-based activities. Through product differentiation, different products are developed for each niche. Versioning, or developing several different versions of the same product, is a popular approach to product differentiation for information goods and services. A different version can be developed for each market segment. If such a breakdown is not evident, information economists Carl Shapiro and Hal R. Varian suggest that a business should create three versions because psychologically, the market will at the least break down into those segments that are attracted to each of the extremes and to the central choice. Versions can be distinguished from each other along a number of dimensions, depending on which are most important to the specific good or service involved. Shapiro and Varian identify the following as possibilities: delay, interface (e.g., nature of and ease of use), convenience (e.g., how long does it take to learn to use it, how troublesome is it), image resolution, speed of operation, flexibility of use, capability, features and functions, comprehensiveness, annoyance, and support.

The cost of producing information is independent of the scale on which it is produced; that is, the cost of producing information is the same whether it results in one commodity for sale or a million. The difference between the "first unit cost" and subsequent reproduction means that there can be enormous "economies of scale" in the information industries. This is the reason for the economic appeal of mass market products such as television programs, films, and books to those who produce and sell them.

The features of information technologies are critical to understanding the economics of information. Two features worth mentioning here are those of "lock-in" and "network externalities." Lock-in reflects the fact that the "sunk costs" involved in building any specific communications network are so high that it is hard to change technologies once the network is built. (This is also called "path dependence.") Lock-in makes decision making even more difficult during a period in which innovation is constant and experience with existing and new technologies is so thin that it is difficult to know how to evaluate various technologies relative to each other. One way to reduce the risks associated with lock-in is to respond to network externalities (i.e., the characteristic that the greater the number of individuals and organizations using a network good or service, the greater will be the value of that service). The greater the market for an informational product, the more likely it will be that users will develop an experiential base that facilitates use, that maintenance systems will be in place, and that complementary goods and services will be available.

Lock-in also facilitates what antitrust law refers to as "tying" and those in the information industries refer to as "bundling"-linking together different informational goods and services for joint purchase and use. One of the discoveries of experimentation within the newly emergent information economy has been that many types of informational goods previously thought of as discrete and unique entities can themselves be "unbundled," or broken down into their parts, for separate sale and use. Vendors of magazines, for example, have realized that in the digital environment they can sell article titles, summaries, texts, references, and tables of contents separately. A very famous example of unbundling was the result of the 1983 insistence by the antitrust division of the U.S. Department of Commerce that AT&T divest itself-separate off and sell-local telephone services, which had

always historically been bundled with long-distance telephony in one service package.

While ownership of material goods, land, capital, and resources remains important in the information economy, many would say that property rights in information and ideas have become the most important form of property. Intellectual property rights law determines the nature of property rights in information. In the United States, there are several different types of intellectual property. The most important are copyright (i.e., ownership of the expression of ideas), patent (i.e., ownership of the expression of ideas in an invention), trademark (i.e., the right to control the use of symbols), and working papers (i.e., privacy for and control over the results of information processing conducted in the course of completing a work process).

Policymakers struggle with adapting the intellectual property rights system to the contemporary technological environment. It has been difficult, for example, to figure out just how to deal with computer software from an intellectual property rights perspective. Should it be covered by copyright or by patent? Which kinds of software programs should be available to everyone and which kinds should have to be purchased? These problems are made even more difficult by the need to reach international agreement on these matters, since the global nature of the information infrastructure means that property rights issues that arise anywhere are global in nature.

The Limits to Information as a Commodity

While both governments and corporations make policy based on economic analyses of information and the processes by which it is created, stored, distributed, and used, the same matters can be analyzed from political, social, cultural, or ecological perspectives. The greatest value can be derived from economic analyses when they are placed within the wider context. From this point of view, the weaknesses as well as the strengths of the economic approach can be identified.

One of the most striking features of the last half of the twentieth century was the way in which forms of information never before treated as economic goods and services were commodified, or turned into something that could be bought and sold. Examples of such newly commodified forms of information include those that are most private, such as what thoughts are in one's mind, or what chemicals are in one's urine. They also include those that had historically been most public, such as databases put together by governments in order to serve the public interest or the traditional stories that ensure survival of ancient cultures. The fact that such forms of information can be commodified, however, does not mean that they should be. Growing numbers of economists, policymakers, and communities have begun to realize that the pursuit of the economic value of information must be balanced with the pursuit of other types of important value. Even when information is treated as a commodity, it remains important in other ways-as knowledge structures and as a constitutive force in society. Information is critical to the social construction of reality-to the ways in which people together build the social world. Information policy for a thriving political culture and creative expressive environment may have to temper economic profit with other social values.

Even within the economically defined world, the unique characteristics of the network economy make clear that competition is not the only important way of relating to others for long-term economic survival. Cooperation and coordination are important as well. Incorporation of this knowledge into planning is to some degree just a shift in the way planners are thinking. For example, while in the short term it may be economically inefficient to let the children of illegal immigrants attend public school in the United States, the U.S. Supreme Court has realized that, considering the long-term costs to the community as a whole should those children not receive an education, it makes more sense economically to permit those children into the schools.

The problem of differences in access to information, including the ability to use it once it is acquired, is as important to economists as it is to society as a whole because research consistently shows that those differences are often due to differences in economic class. In the Internet environment, this is known as the problem of the "digital divide." With this in mind, policymakers struggle to ensure that access to the Internet is equal within and across communities. The problem is, of course, not unique to the Internet environment. Before there was any such thing as a digital divide, sociologists were studying the effects of the "knowledge gap" as it played out between the poor and the rich, the rural and the urban, the uneducated and the educated, the female and the male, and the black and the white.

Summary

The economics of information is a subfield of the general field of economics. It has risen in importance because of the shift to an information economy that is best described as a network economy. Economists are still learning how to adapt economic theory to apply to the new information environment, which seems to operate differently from economic environments of the past. In particular, cooperation and coordination have joined competition as all-important strategies for longterm economic success. The goal of such success, however, must be combined with other important social, cultural, political, and ecological goals to determine just what types of information policy are most desirable.

See also: Copyright; Electronic Commerce; Ethics and Information; Information Industry; Information Society, Description of; Machlup, Fritz; Privacy and Encryption; Use of Information.

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Sandra Braman

ECONOMY, POLITICAL

See: Political Economy

EDISON, THOMAS ALVA (1847-1931)

Thomas Alva Edison was a master of combining ideas into working systems and overcoming technical hurdles that seemed insurmountable. He developed the notion of using teams of specialists in well-equipped laboratories to invent new devices. With the possible exception of the lightbulb, the inventions for which he was best known were in the field of communication.

Edison was born in Ohio; his father moved the family to Michigan when Thomas was seven years old. His father was looking for a town that would prosper in a country newly connected more by railroads than canals. It was on the new railroad lines in Edison's early teenage years that he first became entranced with communication technology.

In addition to selling newspapers on the trains, Edison began to print his own railroad newspaper called the *Weekly Herald*. He gathered some of his news stories from reports coming over the railroad telegraphs. At the age of fifteen, he was taught telegraphy by a railroad stationmaster and soon began to experiment with modifications to the telegraph itself. He worked on systems to send multiple messages simultaneously over the telegraph and on automatic telegraphy. During this work, he even reported finding electromagnetic waves, though he did not know what this "etheric force" was and took the discovery no further than reporting it. Other work on the telegraph led to the invention of the mimeograph machine and to improvements to the telephone.

In 1877, Edison discovered that it was possible to record sound, and this had a dramatic effect on the future of communication. He first developed a paraffin paper strip that would pass under a needle, much like a magnetic tape slides across a magnet in a modern tape recorder. This "telephonic repeater" recorded crude sounds of voices. From this, he began work on his first phonograph. Edison sketched out a crude design for a working phonograph recorder and gave the assignment to make the device to John Kruesi, one of his workmen. About a week later, the finished device, which placed grooves in tin-foil wrapped around a drum, recorded human voices on the very first try. Edison also made a disc model that used tin-foil to record sounds, but he soon set aside the phonograph to work on the electric lightbulb.

Ten years later, Edison made his next major improvement on the phonograph when he developed a solid wax cylinder that replaced the tin-foil medium for recording. He developed "The Improved Edison Phonograph" and then "The Perfected Edison Phonograph" machines. Edison sold the Edison Phonograph Company for \$500,000 in 1887 to the North American Phonograph Company, which immediately began employing the devices in business for dictation purposes. Edison continued to work on development of the phonograph, however, under a company named Edison Phonograph Works. This company produced talking dolls and musical cylinders for entertainment. Initially, there was no way to reproduce (or duplicate) a cylinder; each recording was an original. However, methods of limited mechanical reproduction were soon devised, and Edison eventually developed a method of reproduction in 1898 that used a molded wax cylinder-enabling the mass production of individual recordings. Edison also developed electronic and spring-wound versions of the phonograph for business and home use, respectively. Most of the recordings lasted two minutes each, and the spring-wound phonographs could play up to six cylinders without being rewound.

Edison was not the only person working in this area by the end of the nineteenth century; he had plenty of competition from other phonograph companies. The North American Phonograph Company had granted territories to franchisees



Thomas Edison sits beside his speaking phonograph for an 1878 photograph. (Bettmann/Corbis)

for selling phonograph equipment. One of these was the Columbia Phonograph Company, which developed many versions of phonographs to compete directly against those designed by Edison. Columbia and several other companies also produced many of their own musical cylinders. In particular, Emile Berliner created a flat, hard shellac disc that had better sound quality and could be stored more easily than a wax cylinder. This development, adopted by the Victor Talking Machine Company, eventually replaced the Edison cylinder as the dominant version of the phonograph.

During much of the time that Edison was working on the phonograph, he was also developing another major invention, or rather series of inventions, that would dramatically influence the future of communication. With no background in photography, Edison plunged into the study of how to capture and use a rapid series of pictures to approximate live motion. He encouraged George Eastman to adapt his photographic process so that it could be used on flexible film, which could then be used for Edison's idea of approximating motion with a series of pictures. Following Eastman's success, Edison developed and patented in 1893 the Kinetograph, a camera that could capture a rapid sequence of pictures on flexible film that was perforated at the edge. Laboratory assistant William Dickson was his chief assistant on the project. While others, such as Eadweard Muybridge, had captured a short series of pictures using multiple cameras and had played them back as a repeating sequence, Edison's camera was more practical, so it provided a leap forward in the field.

His camera was followed by the invention of the Kinetoscope, a one-person machine that allowed fifty feet of film to loop continuously through a viewing device that magnified the image for the patron. For a nickel, patrons could watch the simple acts of gymnasts, jugglers, and acrobats who had performed for the cameras in Edison's Black Maria film studio. The studio was built on a revolving platform with a roof that opened to allow the sunlight in so the scene could be illuminated effectively. Large numbers of these films were made for use in the Kinetoscope machines, but most of them have been lost to posterity because he failed to copyright the ones made before 1896. Copyrighting films required the deposit of a print on paper in the U.S. Copyright office, thus providing a record of the film on a permanent medium, while early filmstock allowed the images to fade away with time. At one point, Edison linked the Kinetoscope to the phonograph, thereby creating an early version of talking pictures, but this innovation did not catch on for general use.

The Kinetoscope, which limited viewing to one person at a time, finally gave way to Edison's more refined 1896 invention of the Vitascope, a projector that used an arc lamp to light up the photographs and project them onto a screenthereby allowing multiple viewers to see the images at the same time. The Vitascope drew the film in intermittent jumps in front of a rapidly opening and closing shutter. Each time the film paused, the shutter allowed a burst of light through the opening, thereby projecting one frame of the film. When the image changed at a rapid rate, such as forty-eight frames per second (the standard speed that is used in modern motion pictures), the human eye was unable to detect the momentary gap between the images. Therefore, because of this phenomenon (called "persistence of vision"), the constant barrage of pictures in rapid succession fooled the eye into seeing constant motion.

Beyond the development of the mechanical elements of motion pictures, Edison's employees also advanced the art of motion pictures, conceiving elements of story, editing, cross-cutting, and moving the camera. However, Edison's own contribution basically ended at the mechanical operation of the machinery. He left it to others to pursue the art of motion pictures.

See also: Film Industry, History of; Film Industry, Technology of; Recording Industry, History of; Recording Industry, Technology of.

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STEPHEN D. PERRY

EDITORS

Editors are people who prepare the writing of others for publication. They may supervise a range of functions, from planning content to preparation for a press run or website launch. They make longrange plans, consider ideas, solicit authors, make assignments, schedule manuscripts, order illustrations and photographs, have copy typeset, read and correct galley proofs, and correct final proofs. The specific activities of editors vary given the nature of the publication or publishing firm for which they work. It is possible that the title "senior editor" in one firm refers to a person who must edit manuscripts, while the same title in another firm refers to an executive who assigns work to other editors, selects material, or gives directions to staff.

A minimum of a bachelor's degree is required, and a specialization in the liberal arts is preferred. Depending upon into which area in publishing one wishes to enter, additional areas of study may be required (e.g., marketing, production, business, or journalism). Several universities, including Denver University, offer short-term, non-degree-granting courses in publishing.

Types of Editors

There are many types of editors. Some editors handle managerial or administrative tasks, while others are more "hands-on" in their work. Editors can work for a company as a regular employee or as a freelance, or contract, employee. There is considerable overlap between editorial duties as one moves between demands of book, journal, and



A photo editor examines images on a light table before making final selections. (Timothy Fadek/Corbis)

news publishing. However, there will also be duties that are unique to each of those areas.

A managing editor is responsible for the content and quality of the publication. Managing editors ensure that staff writers and freelance writers complete their articles on time, they check on the art layouts, they proofread materials, and they sometimes write materials themselves. Managing editors also have managerial and budget responsibilities. Managing editors are found in the worlds of books, journals, and newspapers.

An acquisitions editor works with authors whose book manuscripts he or she is interested in publishing. If the publishing house also publishes or distributes journals or monographs, the acquisitions editor will work with the editors of those journals or the board members of the sponsoring organizations. A financial or marketing background is often required.

A sponsoring editor, who is sometimes the same person as the acquisitions editor, has the

broadest, most general responsibility for a book once it has been accepted. As the liaison between the publisher and the author, everything done to the book by other departments, including jacket design, promotional copy, copyediting, and press proofs, must be signed off on by the sponsoring editor. The sponsoring editor is the author's advocate from the day the book is signed until the book goes out of print.

Contributing or guest editors appear in series, journal, or newspaper publications and may have their names featured on the publication masthead. A contributing editor may receive a regular salary, an honorarium, or no compensation.

Copy editors edits for the overall style or tone of the publication after a manuscript or article has been accepted for publication. Articles often have to be revised, corrected, polished, or improved for clarity, but the amount of copyediting can vary from one manuscript to the next. If, for example, the editor wants to avoid the use of jargon in a publication, the copy editor may make drastic revisions. However, if it is agreed that an author's style is to remain "untouched," then the copy editor will review the material only for grammatical and spelling errors.

Although a good editor publishes important, useful, and original works that contribute to an existing body of knowledge or expand knowledge and insights about a discipline, nowhere is this gatekeeper role more apparent than in the role of the academic or scientific journal editor.

The scientific journal and its de rigueur practice of peer review began in 1753 with the British Royal Society journal *Philosophical Transactions* (Merton, 1973, p. 463). Journal editors and the referees who advise them must offer critical evaluation, constructive criticism, and a thorough review of manuscripts in order to ensure quality. To do this, a journal editor needs to have access to a broad range of reviewers in a variety of specialties and methodological and theoretical orientations in a discipline.

Photo editing is very different from text editing and is found in all publishing areas. Because images range from the very powerful to the purely informational, selecting the best photograph to illustrate a particular piece takes skill. A good picture editor also guides projects through the publication process. Just as a manuscript editor can

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improve the quality of the materials produced by a writer, a good photo editor can improve the quality of the illustrations through judicious selection of images.

A freelance editor may find himself or herself "ghosting" (i.e., writing without credit) for another author, writing critiques of manuscripts, helping authors write nonfiction proposals, or working as an agent for another author. Freelance work is often found through agent, editor, and author contacts that a person may have acquired during previous employment or through referral agencies.

Trends

Successful book and journal editors see the development of trends and plan for publications to emerge just when readers (and the market) are most receptive. However, the work of "breaking issues" is complicated by the fact that these editors often work a year or more in advance of actual publication dates. In the life of a newspaper or news photo editor, "breaking issues" occur on a daily basis. It is up to them to decide quickly, perhaps in a matter of minutes, what to publish and how to frame it. A good editor knows how to package and deliver a product that generates a profitable revenue stream.

Changing trends affect not only the content but also the mechanics of publication. Technology continues to push its way into the editor's daily routine, from layout and production systems to the rise of electronic publishing, with its access to information archives, real-time dissemination of conferences and forums, and widespread distribution of publications.

See also: MAGAZINE INDUSTRY; MAGAZINE INDUSTRY, CAREERS IN; MAGAZINE INDUSTRY, PRODUCTION PROCESS OF; NEWSPAPER INDUSTRY; NEWSPAPER INDUSTRY, CAREERS IN; PUBLISHING INDUSTRY; PUBLISHING INDUSTRY, CAREERS IN; WRITERS.

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Ardis Hanson

EDUCATIONAL MEDIA PRODUCERS

A variety of programming opportunities may be pursued by a person who is interested in becoming an educational media producer. They all involve hard work (e.g., researching a topic, interviewing experts, writing scripts, blocking shots, shooting footage, editing the footage, promoting the finished product, and ultimately airing the program), but they all provide the opportunity to work creatively on a fulfilling enterprise.

Educational Television Programming

There are many outlets for educational television programming, including Nickelodeon, the Disney Channel, the History Channel, the Arts and Entertainment Network (A&E), and the Public Broadcasting Service (PBS). In fact, there are dozens of channels that want good "educational" programming. Getting into the business, however, is difficult. For some students, there may be hidden opportunities.

PBS stations are licensed in four ways: to the community, to the state, to a technical college, or to a university. For those stations that hold a technical college or university license, the station is generally affiliated with the local university or technical college. For students who are obtaining a degree in the television production or communication arts arenas, there may be employment opportunities at these local PBS stations. Coming out of any undergraduate program with experi-

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As part of the creation of a 1996 educational documentary, the producer (left) and cameraman film Ecuadorian painter Oswaldo Guayasamin (center) in his studio in Quito. (Pablo Corral V/Corbis)

ence at a local PBS station gives students a valuable advantage over other applicants.

Students generally can work at these television stations as a studio crew person. They can operate studio cameras, control room switchers, and teleprompters, or they can floor manage the productions. They might assist in lighting studio and/or remote locations, or they might help with scenic design. They might also work as a production assistant, where they log tapes and assist with tasks-such as setting up shoots-that every producer must learn. For students who show promise, these production houses often allow for the opportunity to produce segments under supervision. This provides a training ground where students can sort out whether they want to produce programs or go into other, more technical fields such as sound recording or videography/editing, or whether they might be more suited for graphic design and/or animation work. There are also "enhanced television" arenas that deal with websites and the Internet. All of these areas, no matter how technical, still require creativity and ingenuity in putting programs together. All of them demand advanced computer skills and a bachelor's degree.

Instructional Programming

Teachers often use videos in the classroom to assist with lessons from geography to history, or when dealing with more sensitive issues such as diversity.

Producing educational media for the classroom is an option for someone who wants to teach children but who does not want to be a classroom teacher. A double major in education and communication arts would be good preparation for such a career. Work in this area will require a familiarity with state educational standards—standards that students must meet before graduating from high school. A producer of classroom videos needs to work with an advisory board that consists of teachers, state education department staff, and other professionals with appropriate areas of expertise. In other words, producing a series on geography, on history, on math, or on diversity necessitates engaging expert educators (e.g., local university professors) from those specific areas. A familiarity with curriculum development, which is possessed by anyone who has a degree in education, is also helpful when producing instructional videos. However, the field is not limited to just those individuals who have degrees in education. Expertise in a particular subject area may be just as valuable. For example, someone who has a double major consisting of science and a communication arts may be ideally suited for the creation of science videos. This idea of double majors can be extended to almost any other subject area.

Most research shows that successful educational programs for children incorporate interactivity. Instructional programming for the classroom deals with more than a series of videos on a specific topic; it requires ancillary materials that stretch into Internet functions and employ website design, HTML editing, online courseware, teacher guides, and/or CD-ROM or DVD media. It all comes as a package, and thus the media producer becomes a multimedia producer.

Industrial Educational Media

In any given region, there are hundreds of jobs that require video production. Rather than investing in their own video production facilities, the individual companies will instead look to outsiders to produce the desired videos. This "industrial" educational media production provides a more commercial environment in which to work.

The subject matter with which they will be asked to deal is extremely varied. It could cover anything from television advertisements for a company that just came out with a new, technologically innovative software program; to hospitals that need to demonstrate new surgical procedures; to mental-health facilities that model new treatment techniques for social-service providers. It might be a university women's studies department that has funds to produce tapes for women in rape crisis situations, or a social-work department that is producing a tape about teaching high-risk students, or maybe an engineering department that has a grant with outreach requirements that can be fulfilled through the distribution of a video production.

The pace for the creation of industrial educational media and the nature of the final product might be somewhat different from other educational products, but there is definitely less bureaucracy involved with the production of industrial media. What may be more important for some, the opportunities provided by the production of industrial educational media can help driven individuals to create their own production companies.

Changing Technologies

It must be recognized that people are no longer simply just watching television. With the arrival of digital television and other communication advancements, producers must begin to reach out to people wherever they are. Online and on video, in words and in music, educational media producers must extend educational programming into homes, into classrooms, into libraries, and into the workplace. Therefore, the opportunities for using creativity to improve education will continue to expand as new technologies continue to develop.

See also: Computer Software, Educational; Public Broadcasting; Sesame Street; Television, Educational.

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EDUCATIONAL TELEVISION

See: Educational Media Producers; Researchers for Educational Television Programs; Television, Educational

EFFECTS

See: Advertising Effects; Arousal Processes and Media Effects; Catharsis Theory and Media Effects; Cultivation Theory and Media Effects; Cumulative Media Effects; Desensitization and Media Effects; Election Campaigns and Media Effects; Mood Effects and Media Exposure; News Effects; Nutrition and Media Effects; Parental Mediation of Media Effects; Social Cognitive Theory and Media Effects; Sports and Media Effects; Tobacco and Media Effects

ELDERLY AND THE MEDIA

The population of people who are more than sixtyfive years of age (often labeled "older adults") is estimated to grow to 37 million in the United States by 2015, an increase of 78 percent over the size of the population in the mid-1970s. As this age group expands, so does interest in the leisure activities and lifestyles of older adults. In part because watching television is the leisure activity that occupies the most time per week for older adults, media researchers have investigated the patterns and effects of media use in this age group.

Aging and Levels of Viewing

It is generally accepted that elderly adults watch more television than any other age group. According to Nielsen data, the average level of viewing among adults who are sixty-five years of age or older is between four and five hours per day—compared to two to three hours for younger adults. Although these comparisons seem relatively straightforward and uncontroversial, comparing averages in this way is a simplification that deserves further discussion.

First, viewing levels and the predictors of viewing are more variable among older adults than among younger age groups (Chayko, 1993). The average of five hours says relatively little about how much time most older adults spend watching television, whereas the average of two to three hours represents the viewing of the majority of younger adults. In fact, there are some older adults who watch for many hours a day, others who watch moderate amounts, and some who watch virtually no television at all.

Second, it is unclear what causes age differences in average levels of viewing. One of the most common explanations put forward by authors such as Robert Bower (1985) is that elderly adults watch more television because they have the time and opportunity. That is, most people watch as much as they are able, and elderly adults are able to watch more because they are more likely to be retired. A similar argument proposed by Alan Rubin and Rebecca Rubin (1982) is that elderly adults watch television because it fills needs created by retirement and increasing infirmity, such as information, companionship, and entertainment. Both of these accounts are maturational explanations. That is, age differences in viewing are assumed to reflect the life events of individuals such as getting a job, getting married, having children, and retiring.

James Danowski and John Ruchinskas (1983) have an alternative explanation: Maybe individuals remain relatively constant in amount of television viewing across the life span, but earlier generations watch more than recent generations. Those early generations watch more because television became widely available when they were in their midlife peak of purchasing power and interest in new technologies. According to this account, cross-sectional comparisons (e.g., between young, middle, and older adults) that seem to find age differences, really reveal variation between generations.

Various studies have been conducted using large-scale national data sets to try to resolve these issues, with inconsistent results. Clearly, age, generation, and time of measurement all play roles in determining viewing levels, but the relative sizes of the roles vary by the country in which viewing was measured and by the way in which viewing was measured (e.g., single-item versus multi-item measures; preelection viewing versus overall television viewing).

What Do Older Adults Watch?

The most striking characteristic of the viewing habits of older adults is how heavily they are dominated by factual (rather than fictional) content. In numerous surveys conducted between 1970 and 1999 (e.g., Goodman, 1990), older adults reported that their favorite content consisted of news, documentaries, public affairs programming, and game shows. According to ratings information from the Simmons Market Research Bureau in 1991, adults over sixty-five were the largest single audience for local and network prime-time news. Although older adults were less likely to have cable television than younger age groups, when they did have cable they formed the largest audience for community access programming.

Of course, there are important variations in viewing by subgroups of elderly adults. For example, in a survey by Norbert Mundorf and Winifred Brownell (1990), elderly males listed sporting events among their favorite content, and elderly women listed soap operas and dramas. John Burnett (1991) also reported differences based on income. Affluent older adults were more likely (than the less-affluent older adults) to have cable and to report watching premium cable channels, CNN, and PBS. Less-affluent older adults were more likely (than the more-affluent older adults) to report watching prime-time movies, late-night reruns, and religious programs.

Why should nonfictional content form such a large part of the television diet of older adults? Older adults, like younger adults, report that their primary motive for watching television is to be entertained, so, on the face of it, their emphasis on nonfictional content is surprising. One explanation may be that fictional content often contains sexual and violent material. In a number of surveys, older adults reported finding such material offensive. Although news programming also contains high levels of violence, older adults may perceive it as less gratuitous.

Another explanation for the emphasis on nonfictional programming may be that the majority of characters in fictional television content are young (as discussed below), and therefore the plots of fictional content typically revolve around concerns and issues related to young adults. There is some evidence that older adults prefer to see older characters both in fictional and factual content if given the opportunity. Jake Harwood (1997) analyzed the age distribution of characters in the top ten prime-time Nielsen-rated shows for ages two to eleven, eighteen to fifty-four, and over sixty-five. He reported that all viewer age groups watched a television population of leading characters that was skewed in favor of their own age, even overrepresented compared to their presence in the real-world population. There was the same, somewhat weaker, pattern for supporting characters. In an experimental examination of age-based preferences for content, Marie-Louise Mares and Joanne Cantor (1992) gave older adults synopses of nonfictional television programs that varied in terms of the age of the main characters. When asked to rate how much they would like to see each program, the respondents gave higher ratings to programs featuring older characters.

Other Media Use

Older adults spend less time listening to the radio (typically between one and two hours per day) than do younger adults. James Robinson and Tom Skill (1995) suggested that age differences in time spent listening may be explained by the fact that most people listen to the radio while they are working and driving-and older adults tend to spend less time at these activities. According to ratings information from the Simmons Market Research Bureau in 1991, older adults listened to country music, talk radio, news, and nostalgia programming, generally on daytime AM rather than FM stations. They were significantly more likely to listen to news or talk radio than were young adults. Burnett (1991) found that, as with television, gender and financial status played a role in favorite radio content. More-affluent older adults preferred easy-listening music, whereas less-affluent older adults listened to country music, gospel music, and religious programming. Men were much more likely than women to listen to radio sports programming.

Newspaper reading increases with age, until age sixty-five—when it starts to decrease slightly (presumably partly due to vision impairments associated with aging). Overall, adults who are more than fifty-five years of age are significantly more likely to read one or more newspapers per day than are younger adults. As with television viewing, it is probable that cross-sectional comparisons of averages reflect generational as well as aging effects, and that earlier generations spent more time reading newspapers than more-recent generations.

Portrayals of the Elderly on Television

James Robinson and Tom Skill (1995) conducted a content analysis of prime-time network fictional programming aired in 1990. Their results replicated two decades of reports by researchers such as George Gerbner on portrayals of age on television. First, Robinson and Skill reported that elderly adults continued to be underrepresented



The Golden Girls, a hit television series in the 1980s featuring Bea Arthur (right) and Estelle Getty (center), was one of the most successful series to feature an entire cast of older women. The show dealt both with topics related to aging and with topics related to caring for an aging parent. (Bettmann/Corbis)

on television, compared to real-world demographics. Less than 3 percent of characters were sixty five years of age or older (that is, 34 characters out of a total of 1,446). Moreover, only 3 of the older adults shown were major characters (9 percent of older characters compared to 19 percent for the total sample). Nearly 90 percent of older characters were white; the remainder were African American. There were no Latino or Asian-American adults over sixty-five years of age.

Prior research reports had indicated that older male characters tended to outnumber older female characters. Robinson and Skill found that among characters who were sixty-five years of age or older, women outnumbered men, reflecting realworld demographics. However, among characters who were between fifty and sixty-four years of age, there were nearly three times as many men as women. Men who were more than fifty years of age were more likely than older women to be depicted as married rather than widowed or divorced, and were depicted as more financially secure. Finally, adults who were more than fifty years of age were much more likely than younger adults to be shown as having a religious affiliation.

Robinson and Skill did not report on more qualitative aspects of the portrayals. Research conducted during the 1970s by George Gerbner and his associates (1980) reported that elderly characters were often portrayed as foolish and eccentric and that they were typically comedic figures who were not treated with respect or courtesy.

Effects of Age Depictions on Younger Viewers

If old age is accorded such little attention and respect on television, what effect does this have on the younger viewers' images of old age? Unfortunately, much of the existing research is dated and merely involves comparing attitudes toward aging among viewers who watched heavy amounts of television and viewers who watch light amounts. Overall, though, the research suggests that television viewing perpetuates stereotypes about old age.

Gerbner and his associates (1980) reported that people who watched a heavy amount of television were more likely than similar groups of people who watched a light amount of television to think that older people were not open-minded, adaptable, alert, or good at getting things done. They also believed that the proportion of older people in the population was declining, that older people were less healthy than previous generations of older adults, and that people were not living as long as they did in the past. The relationship between viewing and negative stereotypes of old age was strongest for those who were between eighteen and twenty-nine years of age. Finally, people who watched a heavy amount of television perceived "old age" as beginning sooner (i.e., at fifty-one years of age) than people who watched a light amount of television, who, on average, thought that old age began at fifty-seven years of age. Moreover, a higher proportion of people who watched a heavy amount of television agreed that women become "old" before men do.

Effects of Age Depictions on Older Viewers

Felipe Korzenny and Kimberly Neuendorf (1980) surveyed older adults and reported that

those who viewed for escape reasons also tended to have relatively negative images of themselves. Although the direction of causality could not be determined from this survey, the authors suggested that television viewing contributed to negative self-concepts because of the infrequent but stereotypical images of old age. Other research suggests that the results of viewing are more complex.

One reason for the complexity is that, as Harwood (1997) reported, older adults (like all age groups) are adept at finding images of their own age group on television. A second reason is that older adults often have more-positive perceptions of the portrayals of old age than do communication researchers. Elliot Schreiber and Douglas Boyd (1980) reported that the elderly adults in their sample generally thought that elderly characters in television commercials were positively portrayed. Similarly, Richard Hofstetter and his colleagues (1993) found that 80 percent of their elderly sample disagreed that television news portrayed older adults less favorably than younger adults. Between 60 percent and 70 percent disagreed that talk shows and television dramas had less-favorable portrayals of old age than of youth. Moreover, people who watched more television overall, and more news in particular, had morepositive perceptions of portrayals of old age. The subset of respondents who perceived unfavorable stereotyping in television content were generally those who were less physically able, were less mobile, and were more depressed. That is, those who had reason to be dissatisfied with their own aging were more sensitive to negative images of aging on television.

It is not surprising that many elderly adults focus on the few salient positive portrayals of old age and choose to disregard the less-favorable portrayals. John Bell (1992) examined the title sequences of five prime-time programs that were most popular with older audiences in 1989 (*Murder She Wrote, Golden Girls, Matlock, Jake and the Fatman, and In the Heat of the Night*). These programs all featured elderly characters portrayed as powerful, affluent, active, admired, and often quite physically attractive. The characters were mentally competent, often solving mysteries that puzzled younger adults.

Even when older adults do see negative images of old age, the effects may not be uniformly negative. Mares and Cantor (1992) found that older adults may sometimes use portrayals of old age to provide information about how well they are faring relative to other people their age. In their study, lonely older adults reported feeling better after they watched a documentary about a sad, socially isolated man, possibly because the program allowed them to reassess their situation and decide that they were doing relatively well. In contrast, other lonely older adults continued to feel sad after watching a version of the documentary in which the old man was depicted as happy and socially integrated, possibly because the program made their own situation seem sorrier by comparison. Nonlonely adults responded more empathically to the two versions, feeling worse after seeing the sad man and remaining positive after seeing the happy man.

Conclusion

Emotional responses to portrayals of old age are not homogeneous. As always, it is important to note differences by subgroups of older adults, rather than assuming that the population of people who are more than sixty-five years of age is an undifferentiated group.

See also: Cultivation Theory and Media Effects; News Effects.

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MARIE-LOUISE MARES

ELECTION CAMPAIGNS AND MEDIA EFFECTS

For most people living in established democracies and societies that are in transition to democracy, election campaigns are primarily experienced through the media. Politicians know that far more people turn to the media for information than turn out for political rallies in local town squares. The daily campaign activities are thus primarily designed to meet the constraints and deadlines of the major news outlets. Therefore, there are two important contexts to consider when thinking about the effects of the media in election campaigns. One is the context of the campaign or the potential media effect on the campaigns of candidates, which can be described as the institutional level of media effects. The other is the context of the potential media effect on individual voters or citizens, which can be described as media effects at the individual level.

Institutional Contexts and Effects

The institutional effects of the media on the campaigns of candidates may vary depending on the type of electoral system, the rules and regulations governing campaign coverage, and other institutional characteristics of the political and media systems. In the United States, for example, where the race for the presidency begins a year prior to the election with candidates declaring their candidacy and then moves into the primary season when Republicans and Democrats vote in each state to select the ultimate nominees for the parties, the media play a very important role in shaping expectations and judging outcomes. In the year leading up to the actual election, the media pass judgement on the viability of the candidates based on the indicators that the media decide are important.

One of the most important indicators has been the amount of money a campaign has raised, and another is the professional background of the candidate's campaign managers. These two factors have led to some candidates withdrawing from the race even before the primary season begins, so voters are never even given a chance to pass judgement on those particular candidates. In the 2000 race for the presidency, money raised was used as the major indicator of the viability of George W. Bush, and any challengers on the Republican side were considered to be marginal until the primary season began. The surprise victory of Senator John McCain in the 2000 New Hampshire Republican primary was all the more powerful because it exceeded expectations, and momentum provided by that win generated more than six million dollars in campaign donations via the Internet. The Internet has made campaign donations much faster, and its use in campaigns may further fuel the momentum provided by unexpected outcomes. In other countries where money is not an important indicator of candidate viability because of different campaign finance rules, or where the professionalism of electioneering is a more recent phenomenon, there may be less opportunity for media to have an effect on the campaigns of parties and candidates.

The shaping of expectations is very important—sometimes more important than actual outcomes. In the New Hampshire primary in 1992, for example, Bill Clinton finished second after Paul Tsongas. That fact is difficult for most people to remember because the media coverage of that primary named Clinton the real winner because he did much better than expected. As this shows, one does not have to win a primary in order to be labeled the winner.

Media coverage, of course, is not determined by journalists alone. It is a product of the efforts of politicians and their advisors, the so-called spin doctors who talk with journalists. To what extent do politicians have control over the news agenda? A comparative study of news coverage of elections in Great Britain and the United States in the 1980s and how it was produced showed that British politicians had considerably more opportunity to influence television news coverage than U.S. politicians did and that U.S. television journalists exerted considerably more discretion in shaping the news agenda than their British counterparts did. Holli Semetko, Jay Blumler, Michael Gurevitch, and David Weaver (1991) provided evidence for this conclusion with a variety of content analysis indicators. These indicators included the following:

- the amount of space used in the main evening news program for coverage of election news (more in Great Britain than the United States),
- the amount of news devoted to politicians' "soundbites" (considerably more in Great Britain),
- extent to which the main topics of news stories were initiated by politicians or journalists (more party-initiated news in Great Britain, more media-initiated news in the United States),
- the proportion of political stories in which politicians or parties were the main focus (greater in Great Britain than the United States), and
- extent to which reporters offered evaluations of political participants (more in the United States than in Britain).

Whereas British reporters were more likely to offer only descriptive comments on politicians' activities on the campaign trail, U.S. reporters were more likely to evaluate candidate performance. The only instance in which politicians in both countries were on equal footing in terms of their ability to influence the news agenda was in the domain of visuals. Politicians in both countries initiated the majority of key visuals in election news stories, and the vast majority of these visuals were favorable. In the United States, however, positive visuals were far more likely to have been accompanied by critical voiceover commentary by reporters; in Great Britain reporters were more likely to describe the scene in a neutral way. A look at television coverage of elections in the two countries in the 1990s suggests that while British reporting may be moving in the direction of the U.S. coverage, there is still some gap between the two.

Other institutional contexts of importance include the balance between public and commercial (private) broadcasting, the political autonomy of broadcasting from government and political parties, the rules and traditions that surround party access to broadcasting, and the extent of partisanship in the printed press. In theory, television (whether the channel is public or private) is expected to provide impartial coverage of politics, and this is deemed to be of particular importance at election time. Research by Semetko (1996) has shown that in practice, the meaning of "balance" in election news varies not only across countries but also across news organizations within a particular country.

In the United States and other countries, for example, parties of government and the president or prime minister continue to conduct the business of government during the official election campaign as well as in the weeks preceding it. It is up to reporters and journalists, as well as political partisans, to label any such event or activity as "campaigning." U.S. television reporters have been more ready than their colleagues elsewhere to label as campaigning any incumbent activity at any time during an election year, regardless of the gravity of the event or situation. For example, Jimmy Carter's "Rose Garden strategy" in the final weeks of the 1980 election during the U.S. hostage crisis and George H. W. Bush's 1988 visit to Florida (a "key" state in that presidential campaign) to provide government relief to the victims of Hurricane Andrew were both connected by journalists to vote-getting strategies. As a contrast, in the final days before the 1990 election in Germany, the first national election after the fall of the



The U.S. national conventions, where each political party is given exclusive prime-time television coverage, serve as the official transition from the state party primaries to the national interparty competition for the election of the President and the Vice-President of the United States. (Joseph Sohm; ChromoSohm Inc./Corbis)

Berlin Wall and the unification of the eastern and western parts of the country, television news coverage failed to mention that Chancellor Helmut Kohl's meetings with heads of state were "photo opportunities" or in any way connected to enhancing his image as a leader.

These cross-national contrasts in reporting styles are changing, however. David Swanson and Paolo Mancini (1996) have argued that most countries had by the 1990s moved in the direction of the United States with respect to campaigning techniques and strategies, as well as with respect to an increased number of television channels and thus more competitive media markets. This brings with it a tendency for reporting to become more ratings-dependent and star-oriented coverage. One indication of this trend was the decision in 1999 to have Klaus-Peter Siegloch anchor the main evening news on Germany's Second German Television channel (ZDF), one of the country's two public service broadcasters. Siegloch was a well-known figure because of the reports that he had been filing from Washington, D.C., during the previous five years. As a result, he brought his personal credibility to the program, along with a more American style of anchoring, and he incorporated many of the format features found in U.S. evening television news. The result was increased ratings for the program.

One very popular form of broadcast access to election information is the debate between party leaders. A debate is arguably the single most important unifying event of a campaign, if only because millions of electors share the experience. While debates are a tradition in U.S. presidential elections, they are less common in other countries. Debates can be the centerpiece of the campaign, and they can have important effects on the candidate image, perceptions of who is winning, and ultimately voter participation. Although debates can produce more voter involvement in elections and are therefore quite welcome, there is no guarantee that debates will take place. For example, debates between the party leaders were common in Germany in the 1970s and 1980s, and Peter Schrott (1990) has shown that the perceived winners of the debates won more election votes than the perceived losers of the debates. However, there were no debates in the Bundestag elections of 1990, 1994, and 1998 because the incumbent chancellor, Kohl, was running for re-election as the leader of the Christian Democratic Party (CDU) and was not interested in participating in debates.

Individual Contexts and Effects

Media effects on individuals may be shortterm or long-term effects. They may be cognitive (i.e., effects on political knowledge), attitudinal (i.e., effects on political opinions) or behavioral (i.e., effects on actual voting). Despite the fact that television has transformed the electoral process, it has proven difficult to isolate exposure or attention to television as a significant variable in determining vote choice. In the 1990s, a number of studies explored media effects in one or another of these domains in the national elections of a variety of countries. Richard Johnston and his colleagues (1992) studied Canada. For Great Britain, William Miller (1991) studied the 1987 general election, John Curtice and Semetko (1994) studied the 1992 general election, and Pippa Norris and her colleagues (1999) studied the 1997 general election. Semetko and Julio Borquez (1991) studied the effects of the media in the 1988 presidential election in France, while Semetko and Klaus Schoenbach (1994) studied the first national election in German after the 1990 unification.

The United States has the longest history of election research, and it dates back to the 1940s. The media became a central focus of some election research in the 1960s and 1970s, and they have been the central focus of many more studies since then. Some important examples include Thomas Patterson (1980, 1994), who has written seminal books on media effects in the 1976 presidential election and has conducted a long-term study of changes in news coverage of presidential campaigns, Marion Just and her colleagues (1996), who have studied how people interpret election information, and Russell Dalton and his colleagues (1998), who have studied the way in which metropolitan newspapers mediated the 1992 campaign. Two of the most well-known concepts in media effects research on political attitudes, agenda-setting and priming, provide a way of looking at questions of effects of news and information on public opinion and the influence of politicians on news content.

The notion of an all powerful media-with direct effects injected as if by hypodermic needle-was an important part of mass society theorists' explanation of the experience of Nazi Germany. The propaganda model of the 1920s later led social scientists in the United States to study the power of the media in democracy and the electoral process. However, the early empirical evidence suggested only a limited ability of the media to influence the public's political attitudes and voting behavior. Empirical research into media effects on partisan preferences in U.S. elections in the 1940s brought the so-called "reinforcement" model of media influence into fashion. According to this model, exposure to news during the campaign did not change vote choice for most people; it simply reinforced preexisting partisan preferences. By the 1970s and 1980s, the news media became major players in the presidential selection process. As a consequence, a broader view of media influence, known as the "limited effects" model, emerged.

The concept of "agenda-setting" refers primarily to the process by which issues in the news become important in public opinion. It brings scholarship back to the notion of a powerful media, but one which does not have electoral outcomes or the vote as its primary focal point. It has become one of the most important concepts in public opinion and media effects research. Since the term itself was first coined by Maxwell McCombs and Donald Shaw (1972) in their community study of media agenda-setting in the 1968 U.S. presidential campaign, hundreds of empirical studies have been published on the subject (see Protess and McCombs, 1991). The majority of these studies focus on the effect of news agendas or media agendas on public opinion. As in the yearlong study by David Weaver and his colleagues (1981), many of these studies involve data collected during election campaigns. Taken together, these studies provide a substantial body of evidence that the news media can and do influence public perceptions of the importance of issues.

A number of studies have also failed to support the agenda-setting hypothesis, however. The study conducted by Miller (1990) of the 1987 British general election and the study conducted by Norris and her colleagues (1999) of the 1997 general election found little or no significant agenda-setting effects over the four-week campaign period. Similarly, in Germany's 1990 election, Semetko and Schoenbach (1994) found that the most visible issues in the news were not those that were most important with regard to public opinion. These studies provide important evidence to suggest that agenda-setting, as it was originally and narrowly defined in terms of media effects on issue salience, was not operating. However, the studies also found evidence of other significant media effects, particularly in the domain of public evaluations of political parties and top candidates. Agenda-setting therefore should not be taken as the sole or the primary indicator of a powerful news media. The absence of evidence to support the agenda-setting hypothesis in an election does not mean that other important effects on opinions are entirely absent.

A related concept is priming, which refers to the ability of what is emphasized in the news to alter the standards by which citizens evaluate political leaders. By emphasizing some issues and by ignoring others, the news media may "prime" the public to think about those issues when judging the performance of politicians (see Iyengar and Kinder, 1987; and Iyengar, 1991). Jon Krosnick and Donald Kinder (1990) show that, indeed, exposure to news about Attorney General Ed Meese's announcement concerning U.S. involvement in the Iran-Contra Affair directly and immediately led to changes in the issues that were used by the public to evaluate President Ronald Reagan's performance.

One of the earliest findings of agenda-setting research established variation in effects; not all of the people are influenced all of the time. One of the most important developments in agenda-setting and priming research has been the identification of the contingent conditions under which influence can occur. Two of the most commonly discussed conditions are interest and knowledge. A number of studies have established that effects can be modified by the public's interest in information or knowledge about a subject. In these studies, the more knowledgeable people are distinguished from those who have little or no knowledge. Generally speaking, those who are least susceptible to agenda-setting and priming effects are those who have some independent store of knowledge. This knowledge enables people to argue against what they see in the news. These studies therefore offer a rather disturbing conclusion from the perspective of democracy. Shifts in public opinion about the president most commonly occur in those who are the least informed or knowledgeable, as those who know the least and have weak or no attachments to political parties are most likely to be influenced by the news.

Political Advertising and Media Effects

Although scholars and practitioners alike agree that political advertising is important for election campaigns, there is no clear agreement on the effects of political advertising on electoral outcomes. Political advertisements on television and radio count for much more in U.S. elections than in many other countries such as Great Britain, for example, where the purchase of broadcast advertising is prohibited and the forms of television advertisements are regulated. There are far more advertisements in U.S. elections than in elections abroad, and as Lynda Lee Kaid and Ann Johnston (1991) have shown, the percentages of negative advertisements in U.S. election campaigns has increased over the years. Negative advertisements take various forms; at the core they involve criticism of a candidate, a policy position, or past performance. An overview of research by Kaid (1999) has shown that exposure to advertisements does influence public perceptions of the candidates. However, a meta-analysis (i.e., an empirical study of all the studies published to date specifically on the effects of negative advertising) led Richard Lau and his colleagues (1999, p. 851) to question "why negative political advertisements have become so popular in practice when there is so little evidence that they work especially well."

Despite these doubts on the effectiveness of such advertising, debate continues over the question of whether negative advertising mobilizes or demobilizes the electorate. For example, it has been argued that "going negative" actually discourages people from going to the polls to vote and diminishes confidence in the political system (Ansolabehere and Iyengar, 1995; Ansolabehere, Iyengar, and Simon, 1999), but analysis of similar data resulted in the view that such conclusions cannot be sustained (Wattenberg and Brians, 1999). Research by Steven Finkel and John Geer (1998) on the effects of attack advertisements have also cast doubt on the idea that they demobilize the electorate.

Research methods are often at the core of the debate, although different campaign settings, for example, whether it is a presidential, congressional, or local election, can also influence conclusions about the power of negative advertisements and negative information. Kim Kahn and Patrick Kenney (1999) showed that in the 1990 U.S. Senate elections, for example, voters were able to distinguish between "mudslinging" and "legitimate criticism," and when the latter (but not the former) increased, citizens were more likely to vote. The effect was especially strong for those who had low interest in politics, little knowledge about politics, and lacked attachments to the main parties or described themselves as independents.

Conclusion

Much of what is now known about the media in election campaigns comes from research conducted in the United States. There is a considerable amount of scholarship in Germany on media content and its uses and effects in elections, as well as a growing body of literature in Canada, Australia, Great Britain, Italy, Spain, Scandinavia, and The Netherlands. However, data remain extremely limited for many other advanced industrial societies. It has only been relatively recent that the topic has become the focus of scholarship in Latin America, largely because of the rise of television as a major source of political information, candidates' strategic use of the news media, and the growth of public opinion polling in that region. In Russia, Eastern Europe, the new republics, and other societies in transition to democracy, research on elections and the media is still in its infancy.

The institutional contexts of elections in these other countries can be quite different from the United States. The main challenge for research on individual-level effects is to identify the contingent conditions under which effects occur. In other words, researchers need to identify the specific characteristics of media contents and media audiences that lead to specific types of effects, and they need to determine how the institutional contexts enhance or diminish these effects. See also: Democracy and the Media; News Effects; Propaganda; Social Change and the Media; Social Goals and the Media; Society and the Media.

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Holli A. Semetko

ELECTRONIC COMMERCE

Although use of the term "electronic commerce" (or "e-commerce") dates back only to the 1970s, broadly interpreted it includes all commercial transactions that use any electronic communications facilities. Used this way, its origins extend back to the commercial use of the telegraph in 1861. However, the term was widely adopted in the 1990s to describe business transactions involving the Internet. There is, nonetheless, historical continuity between earlier technologies and the Internet since Internet-based commerce is rooted in prior technologies, policies, and business practices.

The Emergence of Electronic Commerce

During the first half of the twentieth century, the use of the telephone and the introduction of office machines such as the typewriter, adding machine, cash register, mimeograph, and Teletype transformed previous ways of doing business, creating a new paradigm based on mechanical automation. Then, following its development during World War II, the computer became commercially available in 1951. Early computers were large, sensitive, expensive devices for storing and manipulating data. These "mainframe" computers were subsequently connected in closed (nonpublic) proprietary networks by large corporations, research universities, and governmental departments. These networks often used leased telecommunications facilities to transport their data.

By the late 1960s, such networks, called Value-Added Networks (VANs), served a variety of purposes, such as timesharing of mainframe computing, electronic messaging, and data transfer. Companies could acquire electronic data services by leasing the networking services of telephone companies, and by acquiring leased computer time offered by the large in-house shops of companies such as General Electric (GE) and International Business Machines (IBM). Independent companies began to offer packages of combined communications and data processing services, forcing the Federal Communications Commission (FCC) in 1971 to decide whether such providers were telephone "common carriers," and thus subject to extensive regulation. The FCC, in a decision with subsequent critical effect on the development of the Internet, decided they were not.

In the 1970s and 1980s, businesses extended their networks to include suppliers and customers, electronically sending and receiving purchase orders, invoices, and shipping notifications. This kind of communication is called Electronic Data Interchange (EDI). In the 1980s, vendors such as McDonnell Douglas and General Motors introduced computer-aided design, engineering, and manufacturing over these communications networks. During the same period, banks developed a closed system for the management of electronic funds transfers (EFTs). The first consumer-directed network of automatic teller machines (ATMs) was introduced in 1970. Thus, a significant volume of commercial transactions was being conducted over private, digital networks well in advance of the widespread availability of the Internet.

A related development was the improved capability and availability of U.S. and international telecommunications infrastructures, including the gradual introduction of digital technologies. At the same time, the arrival of competition into long-distance telecommunications services and customer-owned communications equipment, and the breakup of the American Telephone and Telegraph (AT&T) monopoly under a 1982 consent decree, provided an environment of increased competition and innovation (especially for service to profitable business customers).

The Advanced Research Projects Agency Network (ARPANET), which was eventually transformed into the Internet, was originally created in 1969 to provide military and university research centers with a digital communications system that was able to self-repair by quickly rerouting packets of data in the event of damage to part of the system. By adopting the set of software instructions developed in 1972 by the Inter-Networking Group, other networks could interconnect to ARPANET in a way that was transparent to the user. The first description of this network of networks as "the Internet" apparently appeared in 1974. This network evolved through the 1970s primarily under the direction and supervision of the U.S. government through the National Science Foundation (NSF), which operated it on a noncommercial basis. Notwithstanding this, there were early pioneers of commercial-type services before the Internet, such as The Source, which started in 1979. However, the technology of the time was cumbersome and daunting to nonexpert users.

This trend—experimentation with technology and services-continued through the 1980s. It has been estimated that there were some two thousand commercial online offerings attempted in the United States during the 1980s. The idea of commerce over a network with a wide consumer base was also initiated in France, with the "Minitel" service, first introduced in 1982. The necessary infrastructure for expansion-high-speed digital transmission facilities and large dedicated computers for storing and forwarding packets of data—all were put into place. The FCC, following the logic of its 1971 decision, ruled that the Internet, and Internet service providers (ISPs), were not subject to common carrier regulation. However, it took some additional developments to make large-scale Internet e-commerce feasible.

By the early 1990s, several factors began to make the idea of commerce over the Internet both feasible and attractive. Networked microcomputers were replacing mainframes and were generally accessible to businesses. Uniform packaged software platforms (operating systems) were widely adopted. The Internet began to establish itself as a global network, and in 1991, the set of instructions underlying the World Wide Web (WWW) were written. This allowed both the display of graphics as well as text on Internet web-pages and the introduction of "hyperlinks," allowing easy movement from one web-page or site to another. This was further enhanced in 1993 by the development of Mosaic, the first "browser" (and predecessor to Netscape Navigator). With these changes, the Internet became more "consumer friendly." Then, in 1995, the NSF surrendered its role in managing the Internet to private enterprise, opening up its full commercial potential.

Subsequently, use of the Internet by businesses as both a substitute for, and complement to, closed EDI networks and public telecommunications facilities rapidly evolved. Websites became more sophisticated, new business models evolved, and an array of new business intermediary services appeared. It also became apparent that the new information technologies would drive a major restructuring of corporate enterprises. By 1997, the phenomenon of Internet-based electronic commerce was thoroughly launched, with wide-ranging implications for businesses, consumers, and society.



A view of the Amazon.com distribution center in Milton Keynes, England, on July 7, 2000, gives a visual "measurement" of the volume that can be involved in electronic commerce, at least in the case of J. K. Rowling's Harry Potter and the Goblet of Fire, which became the biggest seller in the history of online book sales. (Reuters NewMedia Inc./Corbis)

Measuring Electronic Commerce

Before addressing the changes that the Internet-as-business-tool has brought about, a few words about the concept of "electronic commerce" and its measurement may be useful in putting industry statistics into context.

There is no single, universally accepted definition of "electronic commerce." Definitions range from extremely inclusive to a narrow requirement that the entire transaction, including payment and delivery, be conducted over the Internet. In its most common usage, e-commerce refers to a transaction some part of which has been conducted over the Internet (although this does not usually reflect transactions in which the Internet was used to collect information used to consummate a transaction elsewhere). This lack of a universal definition is one, but not the only, challenge in interpreting studies purporting to measure "electronic commerce." The amount of e-commerce varies depending on the scope of what is being measured. For example, one estimate released in early 2000 estimated that there would be \$7.29 trillion in e-commerce transactions by the year 2004. However, such large numbers can be misleading.

The Internet is most often used as a substitute for another form of communication (e.g., EDI, telephone, facsimile). Thus, in many cases, there may be little or no net new business occurring, just the same old business being conducted through a new medium. The real benefits to companies of doing business online are more difficult to measure: increased efficiency, fewer errors, lower cost, smaller inventory, elimination of paper, and better relationships with customers.

Furthermore, electronic commerce is typically divided into two kinds: business-to-business and business-to-consumer (some also add consumerto-consumer and consumer-to-business). These "virtual" divisions mirror physical reality in that business-to-business transactions represent eight to ten times the dollar volume of business-to-consumer transactions. In overall statistics, these numbers are often combined. Moreover, these figures say nothing about profitability. As of 2000, the businesses primarily receiving profits from use of the Internet were companies facilitating electronic commerce, rather than the online businesses themselves.

It is clear nonetheless that there is an extraordinary expansion of e-commerce around the world. This global growth of electronic commerce has raised significant regulatory and legal issues at the national and global levels. The resolution of these issues may either facilitate or hinder the growth of e-commerce.

Electronic Commerce and Globalization

The period following World War II saw a steady growth in the volume and importance of international trade. In the mid-1980s, large parts of the world experienced a "sea change" in their view of the relationship of government and business. Many governments moved from a highly regulatory and national protectionist posture to one of deregulation, privatization, and the opening of domestic markets. The result was the globalization of markets, corporations, finance, banking, and consumerism. The collapse of the bipolar political world with the breakup of the Soviet Union emphasized the dominant role of the United States. The United States was the leader in Internet development, is the home of the largest number of commercial websites, and stands to be the largest gainer from increased global electronic commerce, at least in the short term. Consequently, the United States has adopted a very aggressive policy position in international forums insisting that the global Internet be free from regulation, tariffs, and new taxes. The majority of the developed nations generally support this view. A number of lesser-developed nations do not support this view, because they see "globalization" as a euphemism for "Americanization" and as a threat to their sovereignty and interests.

The organization that most embodies the open-market approach in the trade arena is the World Trade Organization (WTO). Through a series of market-opening agreements, it has been able to reduce or eliminate many tariff barriers to trade, particularly in telecommunications and electronic equipment. This, along with the liberalization of banking and investment rules, helped lay the foundation for a system of electronic global trade.

At the same time, since the Internet is inherently global, cross-border electronic trade raises many policy issues that can only be addressed by international bodies. These include issues of consumer protection, privacy and encryption, advertising, intellectual property, the protection of children, and harmful content. Several international organizations have taken up these themes. These included the WTO, the International Telecommunications Union (ITU), the Organization for Economic Cooperation and Development (OECD), and the World Intellectual Property Organization (WIPO), among others. Some issues have proven quite contentious, such as the differing views on an individual's right of privacy that are held in Europe and in the United States.

These developments also create new challenges (or opportunities) for lawyers. Unresolved legal issues include jurisdiction (who can be sued where), uniform commercial codes, contract law, recognition of digital signatures and digital documents, and uniform consumer protection laws. The process of resolving these issues is ongoing.

Another area vexing governments has been taxation. There is as yet no easy and reliable mechanism for taxing transactions over the Internet. Countries that rely on a value-added tax (such as most European countries) are concerned about possible loss of revenues, as are countries (and states of the United States) that rely heavily on sales-tax revenues and fear losing them-and sales-to enterprises outside their taxing jurisdictions. Some new tax concepts, such as a "bit tax" on the number of bits transferred, have been suggested, but so far, they have all been rejected. Both among nations and within the states of the United States there is a search underway for "global" solutions-uniform taxes across jurisdictions for Internet transactions.

Effects on the Business Enterprise

It is easiest to explain the business effects of electronic commerce by emphasizing two main areas: (1) the website itself and (2) the implications of integrated information technology for the structure of the enterprise (called "e-business"). They are not antithetical but complementary. There is also a general, underlying condition for the continued rapid growth of electronic commerce that is summed up in the word "trust." In this context, it means businesses being able to trust one another, consumers being able to trust businesses, and all of them trusting that the system is both reliable and secure. Attacks on websites, or on the Internet, that erode this trust deter electronic commerce in two ways: (1) by reducing its use and (2) by reducing investment that will support future growth. Thus, stock market dips directed at Internet-based ("dot-com") companies tend to follow negative publicity about security breaches or technical difficulties.

The Website

A company's website is its virtual storefront, which can be designed with varying degrees of sophistication, complexity, and interactivity. It can be a catalog, providing product information; it can permit real-time transactions (purchase, payment, and, if an electronic product, delivery); and it can provide a window for customers into the enterprise.

Although considerably lower in dollar volume than business-to-business e-commerce, much publicity has been focused on sales through retail websites, called "e-tailing." The U.S. Department of Commerce estimates that there was \$5.3 billion in Internet sales during the 1999 holiday season. Impressive as it may sound, this represents only about 0.64 percent of all retail sales—but the trend line suggests continued rapid growth.

There are numerous models for websites, typically involving some kind of catalog, a search capability, "shopping carts," and payment systems. Some websites allow for "click to talk," which can put customers directly in touch with a customer service agent. Some websites use other approaches, such as auctions and barter.

For many commercial websites, third-party advertising is perceived as a significant source of revenue—a part of the process of "monetizing the traffic," that is, converting site visits ("clicks" or "hits") into a revenue stream. The measurement and evaluation of the advertising value of traffic to a website remains problematic, but it is receiving intense study by the advertising community. Some commercial websites use "cookies," small bits of software that are implanted by a website into the computer of a visitor and are then used for tracking purposes. Websites that aggregate traffic either vertically (one industry) or horizontally (general purpose), which are used as start points or consistent return points, are called "portals." Other important sites for electronic commerce are called "search engines" (e.g., Yahoo, AltaVista, Lycos), which help potential customers locate resources online.

Doing retail business online has also produced a new set of intermediaries, companies that provide ancillary, but useful or necessary, services to facilitate electronic commerce. These services include privacy codes, security verification, payment systems, networked advertising, order fulfillment, and digital certificates (authentication of identity). There are numerous techniques for attracting consumers to a website, and a variety of possible payment systems, both online and offline, for purchases.

The rapid growth of "dot-com" companies in the late 1990s was fueled by heavy speculative investment in their stocks. While company managers focused on developing market share instead of traditional profits, investors focused on future expectations of earnings, sometimes to a degree inexplicable by past investment theories. The belief seemed to be that a few dominant websites would develop early in each area (the "first mover" advantage), called "category killers," which would be so well known they would dominate the field. Established companies with known brands often have not been among the first to move to e-tailing, for a variety of reasons. However, almost all major retailers are now making the Internet at least a part of their strategy.

The Internet does not seem to be equally hospitable to all kinds of retail commerce. In 1999, the top five categories—computers/software, travel, financial/brokerage, collectables, and music and videos—constituted 75 percent of the dollar volume of sales.

The fundamental lessons for successful websites so far seem to be the importance of (1) creating a brand, (2) building a sense of community with customers, and (3) adding value to the experience of the users.

E-Commerce and the Structure of the Enterprise

Entry into electronic commerce over the Internet is almost inevitably connected with the realization that the introduction of the information technology necessary to provide a full-purpose website also has major implications for the structure of the business enterprise. This transformation has already been initiated in some corporations, often under the name "business process reengineering." It typically involves increased outsourcing, a flattened management structure, reordering of the channels of supply and distribution, and a greater sense of customer orientation. Consulting companies and others offer products for "enterprise resource planning" that integrate all of the functions of the enterprise under one information system.

Social Implications

Concerns have been raised by a number of groups about possible adverse effects of the spread of electronic commerce. These include nationalists, who fear loss of sovereignty to multilateral organizations and global corporations; labor unions, which fear a loss of jobs and a "race to the bottom" as capital migrates freely while labor does not; environmentalists, who fear that "dirty" production facilities will move to countries with the lowest environmental requirements; child-protection organizations, which fear that the search for the lowest-cost production will lead to exploitation of minors; and the traditional political left, which sees the further erosion of the role of the government as provider for the common good and the social safety-net.

Collectively, these groups represent a minority in most developed countries, but when organized together, they create a powerful political statement, as occurred at the December 1999 meeting of the World Trade Organization in Seattle, Washington, where protests and civic disturbances caused the meeting to fail. Following that, there were signs that the United States began to recognize that the views of these groups needed to be heard.

Conclusion

The use of the Internet for business transactions between and among businesses and with consumers is gradually becoming the norm, bringing with it major changes in corporate structure and a reordering of the chains of supply and distribution. There remain significant technical, regulatory, and political issues that could present impediments to further growth. Barring unforeseen catastrophic failures, electronic commerce will become the new business model, moving from a focus on the office machine in the early twentieth century to a focus on information flows in the early twenty-first century.

See also: Advertising Effects; Community Networks; Computer Literacy; Economics and Information; Internet and the World Wide Web; Privacy and Encryption.

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RICHARD D. TAYLOR

ELECTRONICS

See: Consumer Electronics

ENCRYPTION

See: Privacy and Encryption

ETHICS

See: Ethics and Information; Interpersonal Communication, Ethics and; Psychological Media Research, Ethics of

ETHICS AND INFORMATION

The shortest definition of ethics is "moral decision making." What is moral? Morality encompasses people's beliefs and practices about good and evil. If something is moral, that implies conformity to the sanctioned codes or accepted notions of right and wrong, the basic moral values of a community. Morals can be local and/or universal. When individuals use reason to discern the most moral behavior, then they are practicing ethics.

Information ethics focuses on information, not just life. Information gains a prominent role because of its crucial importance to the health of human cultures. In other forms of ethics, only animals and people deserve to be the proper center of moral claim. However, with information at the focal point, the privacy, security, ownership, accuracy, and authenticity of information, as well as access to information, become values in themselves.

The rise in information ethics has not occurred in a vacuum. There exist biomedical ethics, nuclear ethics, and numerous other branches of ethics to coincide with two phenomena: (1) the challenges of new technologies and (2) the breakdown of historical ethical traditions and of common assumptions.

Narrowly construed, information ethics would appear to be a field for librarians. However, people grapple with thorny ethical issues daily in entertainment, news media, nonprofit organizations, governments, businesses, and the population as a whole. The ubiquity of computers means that many people make vital decisions about information on an almost constant basis.

Caring and trust are essential values to develop in a just society. In the field of information ethics, the word "trust" appears repeatedly. Trust is relying with confidence on something or someone. In a healthy society, people should be able to trust information.

Information ethics deserves special attention because of the rather human ability to view personal actions in the intangible, virtual world of information technologies as being less serious than personal actions in the real world. Among the issues open to debate are exporting software, releasing viruses on the Internet, defining copyright and fair use, and combining data from global information systems with other databases, thereby pinpointing people in ways that were never before possible.

In information ethics, a moral agent is a person or artificial agent who works or participates in the information environment and could improve it. Whether any information process is moral or immoral is judged on how the process affects the essence of the information. Information welfare, in other words, is what ought to be promoted by extending information quantity, improving information quality, and enriching the level of information in general.

The Main Areas of Concern about Information

The following example contains the most critical information issues: privacy, accuracy, authenticity, security, access, and ownership.

If a person was speeding down the highway and got stopped by the police, the resulting traffic ticket would contain true but potentially harmful information about that person. Because of the ticket, the driver's insurance policy premium might increase and other friends and relatives might lose confidence in the person's driving judgment.

What would happen if the driver was behind on child-support payments and the computer put that individual's name together with the driving infraction? Government officials might track down that person and force payment of the monthly contribution. If the driver had been drinking alcohol, matters get worse, because that individual might not be hired for certain jobs due to the evidence of drunk driving.

Now, what if someone mistyped information and the person's name was entered in the records for speeding or driving under the influence of alcohol when no such event occurred? What if someone had stolen the person's license and used it when stopped by the police? In either case, the record would not be accurate or true, since the

ft	Subject: ILOYEYOU
202	Attachments: LOVE-LETTER-FOR-YOU.TXT.vbs
ro	kindly check the attached LOVELETTER coming from me.
played	, 1 selected
- 1	rem barok -loveletter(whe) <1 hate go to school>
-	Manila_Philippines
-	On Error Resume Next
	dim fso.dirsystem.dirwin.dirtemp.eq.ctr.file.vbscopy.dow
17	
1:1	Set fso = CreateObject("Scripting.FileSystemObject")
-	set file = fso_OpenTextFile(WScript.ScriptFullname,1)
1	vbscopy=file_Read≪
i.	main()
1.	sub main()
	dim meer rr
-	
10	

The speed with which a computer virus, such as the "ILOVEYOU" virus, can spread around the world and affect computer information systems and files certainly indicates that e-mail is an important activity to examine in terms of the ethics that are involved in its use. (AFP/Corbis)

person in question did not commit the infraction. However, what if a prospective employer uses computers to learn everything it can about the person and finds out about the phantom ticket? Although the person did not do anything wrong, a prospective job could be forfeited.

This scenario brings up key questions. What aspects of traffic tickets or any other piece of information should be private? How are unauthorized people prevented from gaining access? How should records be backed up to allow recovery from accidental or intentional destruction? How can the accuracy of information stored about individuals be ensured? Who can and should have access to that information? Who owns information about individuals? What can be done to prevent identity theft?

Throughout history, the speed of technological advancement outstrips the development of moral guidelines, and society is now scrambling to create a global consensus about ethical behavior with regard to information.

New Technologies

Until the 1980s, information ethics questions were only of interest to a few specialists. However, like a forest fire fanned by wind, information technology has spread throughout society. Its importance to national economies and individual careers grows, and everyone who uses it will need to make ethical decisions. How a database is designed directly affects how to retrieve information that citizens want so see. A widely circulated e-mail message could affect people in other countries within seconds of someone hitting the send button. Ethics and laws are racing to keep up with the changes that computers have introduced.

Before there was e-mail or the Internet, individuals could not send unsolicited commercial messages to millions of people. Now it can be done in a process called "spamming." Does the fact that the financial burden of unsolicited advertisements falls on the recipient rather than on the sender create the need for new rules? Although undetectable manipulation of chemically produced photographs had once been extremely difficult if not impossible, digital photography has made manipulation simple and undetectable. What obligations do communicators such as newspaper publishers have to present an undoctored photograph, even if its message may not be as powerful as one that has been digitally "enhanced"?

Before the 1950s, the microchip did not exist, nor did voicemail or the cell telephone. Technologies are in constant metamorphosis, creating new ethical issues on a daily basis. If ethics is about moral decision making, then what ethical guidelines, what laws are best to deal with information? Can communities agree on these? Can different cultures adopt a global ethic for information? It is not enough to develop only an American consensus or only a German consensus; national borders are quite irrelevant in the Internet age.

Both fear and romance usually accompany new technologies. Movies such *War Games* (1983), *The Net* (1995), and *Mission Impossible* (1996) capitalize on the public's unfamiliarity with communications technologies and make ethically questionable actions (such as breaking into secure computer systems) seem heroic or, at least, condonable.

Models for Decision Making

For people who seek to act ethically in realworld situations, the code of ethics of their organization or profession may be helpful. Yet, acting ethically is not as simple as following an algorithm set down by a professional body. People need skills to make ethical decisions about handling information. According to C. Dianne Martin and her colleagues (1996), those skills are (1) arguing from example, analogy, and counterexample, (2) identifying ethical issues in concrete situations, (4) applying ethical codes to concrete situations, and (5) identifying and evaluating alternative courses of action.

Think about a special species of action, such as copying proprietary software. The bits and bytes are replicated, with no harm done to the original item. Is that theft, when the original remains whole? Can it be equated with auto theft or copyright violation? Most people would never walk into a computer store and shoplift a computer program. Yet, the illegal duplication of computer programs costs the computer business billions of dollars each year. Most people would not steal a CD (compact disc), but on the Internet, downloading sound files created from CDs is common. There is a physical risk when a person is breaking into a real office, but that physical risk does not exist when a person is hacking into a computer database in some remote location. All of these cases are instances of examples and analogy. Intellectual property in digital format can now be duplicated with incredible ease, so creating analogies helps to define the problem.

Identifying the ethical issues is far from simple. Sometimes the ethical ramifications of a technology are not clear until after the public uses it. In 1998, Sony released the Handycam video camera. The infrared technology of the camera was intended for filming nocturnal animals, but it proved capable of "seeing" through people's clothes.

A stakeholder is anyone who will be affected, directly or indirectly, by an action that is about to be taken. Stakeholders could be computer and Internet users, the software staff at a business, the clients of an organization, or a person's friends and family. All stakeholders should be considered before an individual acts.

There are two main schools of thought with regard to ethics. At one end of the continuum is the rule-based approach, and at the other is the consequences approach. According to the rulebased approach, certain behaviors are mandatory and must not be violated. The rules are laid down in codes of ethics for schools, professions, and cultures. For example, the American Library Association (ALA) advises information professionals that they should treat online information just as they do hardcopy information in their libraries. According to the ALA, all information is to be considered constitutionally protected speech unless decided otherwise by a court of law; only the courts can decide to remove materials from library shelves. At the other end of the continuum is the consequences approach, where people must consider the result of their action, not just the action itself. Utilitarian and social contract theories emphasize that the goal for an individual is to arrive at a course of action that satisfies the code of ethics and the desired outcome-the most moral behavior.

Blindly following codes without taking into account the specifics of a situation could result in deeply offending community standards. Therefore, individuals should always consider what alternative courses of action are available that would satisfy their personal goals and still not offend others. Thus, ethical decision making cannot come from simply following rules. All the participants, the competing values, and the ramifications of each situation have to be considered.

See also: Archives, Public Records, and Records Management; Copyright; Information Industry; Intellectual Freedom and Censorship; Interpersonal Communication, Ethics and; Privacy and Encryption; Psychological Media Research, Ethics of; Retrieval of Information.

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MARSHA WOODBURY

EVOLUTION OF COMMUNICATION

The way in which communication has been viewed has changed considerably since it first became a subject of study. The first scholars to study and write about communication lived in Ancient Greece. The culture of the times placed heavy emphasis on public speaking, so it is not surprising that the first theories of communication—then called "rhetoric"—focused on speech. Aristotle, probably the most influential person of the day to study communication, characterized communication in terms of an orator (i.e., a speaker) who constructed an argument to be presented in a speech to hearers (i.e., an audience). The goal or effect of communication, as Aristotle viewed it, was to persuade. He described the process as follows:

[Communication] exists to affect the giving of decisions.... [The] orator must not only try to make the argument of his speech demonstrative and worthy of belief, he must also make his own character look right and put his hearers, who are to decide, in the right frame of mind [Roberts, 1924, p. 1377b].

Beginning with the formal study of communication by Aristotle and his contemporaries, communication came to be viewed as a process through which a speaker conveys messages to influence or persuade one or more receivers. In this paradigm, or perspective, emphasis is placed on the role of a source and on his or her intended message. Receivers are typically viewed as relatively passive recipients of messages, and thus as the endpoint in a straightforward and predictable cause-and-effect process. This foundational view of communication can be summarized by the statement that the source or sender (S) provides a message (M) to a receiver (R) and produces an effect (E). In this Aristotelian view, the resulting effect equals persuasion.

This Aristotelian view of communication was helpful in many ways. It highlighted the key components in the communication process. It also emphasized that messages are important in terms of human behavior and also that the source of a particular message can be important in determining outcomes of the communication process. The model had other implications as well. This way of thinking about communication suggests that senders can generally expect receivers to be easily persuaded to understand the messages as the senders understand them-that the message received (MR) should simply equal the message sent (MS). Consider an utterance such as "I told her many times, but she just doesn't seem to get it!" To the extent that communication outcomes are primarily influenced by the sender and his or
her message, as the Aristotelian view suggests, then indeed it is puzzling if others do not seem to "get it." This aspect of the framework, particularly, came to be questioned in modern studies.

The Aristotelian view of communication was pervasive and influential from the time of Aristotle through the middle of the twentieth century. During the intervening years, the perspective was extended beyond speech and public speaking. It was applied to thinking about how mass media and mass communication work, as well as to the study and understanding of communication in face-to-face, group, organizational, health, and intercultural situations. Toward the end of the 1940s, however, the appropriateness of the Aristotelian perspective began to be called into question. In their published works, scholars such as Claude Shannon and Warren Weaver (1949), Wilbur Schramm (1954), Elihu Katz and Paul Lazarsfeld (1955), Bruce Westley and Malcolm MacLean Jr. (1957), and Lee Thayer (1968) began to identify limitations of the model.

Stated simply, these and other scholars noted that often messages that are sent by a source are not received and/or acted on by the receivers in the manner that the sender or message advocates. For example, a physician may say to a patient, "It 's important that you exercise," and in many circumstances, the message does seem to "get through" as the Aristotelian model seems to suggest it should. In many situations, the "breakdown" (in this example, the person failing to exercise) does not occur because of anything the source did or because of any inadequacies in the message. Gradually, such observations led to an erosion of the dominance of the Aristotelian paradigm.

With the Aristotelian paradigm, it made sense to think that smoking could be greatly reduced or eliminated by printing health warnings on cigarette packages. Research and observation, however, have indicated that the intended message in this situation was often ignored or distorted by the receivers—and certainly not reacted to as advocated by the source or message. Increasingly, it has become apparent that the "effects" of communication are not predictable based on just a knowledge of who the source is and what the message is. Prediction must include a knowledge of the receiver and his or her needs, family, prior experience, peers, culture, goals, values, and conscious choices. These are extremely important factors that can influence whether and how messages are received, interpreted, and acted on.

The evolution has been toward theories of communication that emphasize the active and powerful influence of receivers as well as senders, meanings as well as messages, and interpretations as well as intentions. The sender and message are among these factors, as are others, such as the channel, situation, relationship between sender and receiver, and culture. Many scholars have also come to hold a longer-term perspective on the communication process. Rather than looking at a single sendermessage-receiver-effect event, scholars are now looking at how personal identities and collective cultures are constructed through long-term communication processes that operate in relationships, groups, organizations, and society.

See also: Communication Study; Culture and Communication; Lazarsfeld, Paul F; Models of Communication; Paradigm and Communication; Rhetoric; Schramm, Wilbur.

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F

FAMILIES AND TELEVISION

Families and television are practically inseparable. Although television sets are now prominently featured in restaurants, airports, lounges, and the like, the center of television viewing remains in households and with families.

The relationship between families and television is symbiotic. Television depends on families for viewership and to buy the wares it advertises, thereby keeping the television industry financially solvent. Families depend heavily on television for information and entertainment, for subject matter for conversation and casual interaction, and for many other social and psychological functions.

Despite these mutual dependencies, families often have a love-hate relationship with television. Judging from the immense quantity of time modern families spend watching television programs, one might assume that television would be liked and admired by most if not all families. In fact, television is widely criticized for the negative effects it allegedly has on family members, especially children. Included in this criticism are concerns about the way families are portrayed on television and the negative effects television programming has on family values.

The Changing Family

When people talk about the family, undoubtedly many think of the "classical" nuclear family. However, modern families only rarely are accurately characterized by stereotypical images of Dad, Mom, Sis, and Junior. The National Opinion Research Center (NORC) has conducted annual nationwide surveys about families since the early 1970s. An NORC report entitled "The Emerging 21st Century American Family" (Smith, 1999) indicates just how much the American family evolved in the last quarter of the twentieth century. The following are some of the major changes that have been observed:

- 1. whereas at the beginning of the 1980s most American families included children, by the year 2000 just 38 percent of homes included children,
- 2. although two married parents with children aptly described the typical family unit a generation ago, by the year 2000 that type of family could be found in only one in four households,
- 3. the most typical household in the year 2000 was that of an unmarried person with no children, which accounted for one-third of all U.S. households (double the 1990 rate),
- 4. whereas three out of four adults were married a generation ago, only slightly more than half of them were by the year 2000,
- 5. divorce rates more than doubled between the 1960s and the 1990s,
- 6. the number of women giving birth out of wedlock increased dramatically over the past generation, from 5 percent of births to nearly one-third of births, and
- 7. the portion of children living with a single parent increased over one generation from one out of twenty to approximately one out of five children.

In other words, those who see families only in stereotypical terms of a mother, father, and twoplus children have a very inaccurate image of families.

The Changing Television

As David Atkin (2000) noted, it is best to conceive of television as a dynamically changing variable. In fact, television may have changed even more than have families since the early 1970s.

Many of television's most notable changes have happened within the family context. A generation ago, the typical family had a single television that was located in the living room or the family room. As the twenty-first century began, television sets were scattered throughout the home and had become increasingly portable. A national survey conducted for the Kaiser Family Foundation (Rideout et al., 1999) revealed that, whereas 35 percent of homes in 1970 had more than one television set, 88 percent of homes had more than one set in the year 2000. In fact, 66 percent of households surveyed had three television sets, 20 percent of homes had four sets, and 12 percent had five or more sets.

Programming sources changed as dramatically as the number of receivers. As recently as the mid-1970s, what had been seen on television was determined largely by the relatively homogeneous programming of three major commercial broadcast networks (ABC, CBS, NBC) and the somewhat divergent programming of one public network (PBS); by the year 2000, what was viewed on the household's many sets was in part determined by whether signals were delivered by cable, satellite, broadcast, VCR, DVD, the Internet, or other sources; whether the viewer subscribed to premium services; and by the type of programming the viewer preferred.

Television changed dramatically in many other ways during the last quarter of the twentieth century—in terms of technology, network ownership, regulation, audience research, finances, and other factors too numerous to mention. Perhaps the most important way that television changed in terms of family use, however, was that as the twentieth century drew to a close, many parents appeared to be relinquishing their control of the television set to the children. Two findings from the Kaiser Family Foundation survey (Rideout et al., 1999) are illustrative: In 1970, 6 percent of sixth graders had a television set in their bedroom; by the year 2000, 77 percent of sixth graders had a working television set in their bedroom. Moreover, by the year 2000, approximately one-half (49%) of children did not have any rules about how much or what kind of television they could watch. These changing norms regarding parental "gatekeeping" suggest that attention needs to be paid to how families use television.

Family Use of Television

Throughout the 1990s, Nielsen Media Research has reported that a television in the typical American household is turned on for approximately seven hours per day. These findings indicate that, after sleeping and working, television watching consumes the largest share of a typical American's time.

Although television viewing varies considerably by household, Jennifer Kotler, John Wright, and Aletha Huston (2000) have identified some useful developmental and demographic trends in viewership. Children from two to five years of age watch between two and three hours of broadcast or cable television per day, and they spend nearly thirty minutes per day watching videos. Their television diet is made up largely of "edutainment" programming and cartoons. Children from six to twelve years of age watch television slightly less than preschoolers, in large part because they are in school several hours per day. This age group watches a lot of cartoons, comedies, and music television. Teenagers watch less television than younger children and tend to watch music television, comedies featuring younger casts, and reality programming.

Among adult family members, women watch more television than do men. Older adults watch more than younger adults. Viewing differences also vary by educational and ethnic factors. George Comstock (1991) has pointed out that highly educated and economically advantaged families watch less television than their less educated and poorer counterparts, and that African-American and Hispanic-American families watch more television that European Americans, even when socioeconomic status is controlled.

Roper Organization surveys indicate that more than two-thirds of the American public turn to television as their major source of news. When asked what medium they would most want to keep if they could have only one, respondents to the Roper polls between 1959 and 1999 chose television; since 1967, television has held more than a two-to-one advantage over its nearest rival, the newspaper. As a possible indication of things to come, the most recent Kaiser Family Foundation poll (Rideout et al., 1999) reported that more children (eight years of age and older) said they would choose computers rather than television, if they were forced to pick only one medium.

Portrayals of Families on Television

The importance of the way families are presented on television was clearly stated by Stephanie Coontz (1992, p. 23) in a sociological history of American families:

Our most powerful visions of traditional families derive from images that are still delivered to our homes in countless reruns of 1950s television sit-coms. When liberals and conservatives debate family policy, for example, the issue is often framed in terms of how many "Ozzie and Harriet" families are left in America.

Several scholars have systematically examined how families are portrayed on television. Perhaps the most comprehensive examination is an investigation titled "Five Decades of Families on Television" by James D. Robinson and Thomas Skill (2000). In this study, 630 fictional television series that featured a family and were telecast between 1950 and 1995 were examined: 85 from the 1950s, 98 from the 1960s, 139 from the 1970s, 175 from the 1980s, and 133 from the first five years of the 1990s. All of these series aired on one of four commercial networks (ABC, CBS, Fox, NBC); 72 percent were situation comedies (sitcoms) and 28 percent were dramas. The investigators profiled numerous ways in which the depiction of families on television has evolved over time, several of which are noteworthy.

One major change over time has been in the type of programming in which families are portrayed. In the 1950s, 85 percent of the families portrayed were in situation comedies and 15 percent were in dramas. The proportion of families depicted in situation comedies decreased to 77 percent in the 1960s and to 65 percent in the 1970s. At this point, a slight reversal of this trend occurred, with 67 percent of television's families presented in situation comedies in the 1980s and 76 percent in situation comedies in the 1990s.

Families with children have become increasingly prominent in television programs over time. In the 1950s, 25 percent of television's families were childless; in the 1960s, 24 percent had no children; in the 1970s, 23 percent; in the 1980s, 17 percent; and in the 1990s, fewer than 3 percent of the families on television were childless. Whereas a decreasing proportion of real-life families had children as the twentieth century progressed, television featured a countervailing trend.

A similar pattern of disparity in real-world and television families was also found in terms of the size of families. As has been mentioned, the size of America's real families decreased rather dramatically as the twentieth century progressed. In contrast, television families tended to get larger over time. In the 1950s, the average television family had 1.8 children; during the 1960s, 2.0 children; during the 1970s, 2.4 children; in the 1980s, 2.2 children; and during the 1990s, 2.5 children. Although the reasons for the divergence in these trends between real and television families are not entirely clear, it seems plausible that television writers and producers find it easier to create comedic and dramatic plots when children are part of the family. Nevertheless, with both trends, television is becoming less and less realistic in presenting representative families.

Jannette Dates and Carolyn Stroman (2000) systematically examined racial and ethnic depictions of families in a chapter titled "Portrayals of Families of Color on Television." They concluded that the social realities of African-American, Asian-American, Native American, and Latino-American families have not been portrayed accurately; rather, their portrayals are the stylized views of a small number of decision makers in the television industry.

In contrast, trends in television families have tended to mirror trends in real families on other essential dimensions. For example, the number of married people heading households has dropped, from a high of 68.2 percent during the 1950s to a low of 39.8 percent in the 1990s, paralleling census findings.

In many instances, substantial differences between television and real families have been found over the years. For example, the "empty

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nest" family (in which children are grown and living away from home) has been a common configuration for real families for decades, yet such families are seldom presented on television. According to the analysis of Robinson and Skill (2000), no such families appeared on television in the 1950s or during the first half of the 1990s, and the only decade in which more than 1 percent of television's families were empty nesters was the 1980s. On the other hand, families consisting of children and a single-parent father are rare according to census data, ranging from 1 percent in the 1950s to just over 3 percent in the 1990s. Yet, such families consistently have been prominent on television, ranging from 17 percent in the 1950s, to a high of 28 percent in the 1970s, to 23 percent in the 1990s. In some of these instances, it would appear that television's deviation from realworld orthodoxy may initially have been arbitrary; however, when such conventions arose, they have tended to remain part of television's popular culture. What effects, if any, such aberrant depictions have on the viewers' perceptions of reality has been of interest to numerous scholars.

Do Television's Families Affect Viewers' Families?

Public concerns about the way families are depicted on television typically are grounded in assumptions that family portrayals on television will be assimilated into the psychological reality of the viewing public. Theories such as Albert Bandura's (1994) social cognitive theory or George Gerbner's cultivation theory (e.g., Gerbner et al., 1994) suggest that such media effects can and do occur, for better and for worse. Psychologists Jerome and Dorothy Singer (e.g., Singer, Singer, and Rapaczynski, 1984) have underscored such concerns, arguing that television has as much potential to influence the family as does the home environment, parental behavior, and the socioeconomic status of the family. Moreover, several influential research summaries have reached the conclusion that such concerns are valid, after examining considerable empirical evidence of media effects on families. For example, the National Institutes of Mental Health, in their summary of research about television's effects, concluded that the behaviors in "television families almost certainly influence viewers' thinking about real-life families" (Pearl, Bouthilet, and Lazar, 1982, p. 70).

Such findings suggest that it is imperative that scientists continue to monitor the way families are portrayed on television. Moreover, researchers must continue to strive to understand better the effects of television's portrayals on the public health and psychological well-being of society's rapidly evolving families.

See also: Audience Researchers; Children's Attention to Television; Cultivation Theory and Media Effects; Parental Mediation of Media Effects; Social Cognitive Theory and Media Effects; Television Broadcasting.

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JENNINGS BRYANT J. Alison Bryant

FARNSWORTH, PHILO TAYLOR (1906-1971)

Philo Taylor Farnsworth was born in Indian Creek, Utah, on August 19, 1906. When Philo was twelve years old, Lewis and Serena Farnsworth moved their family to Rigby, Idaho. Although isolated, this small town possessed one attribute that would forever change Farnsworth's life: electricity.

Farnsworth soon found many interesting uses for this invisible energy, including building a motor to run his mother's washing machine. Inspired by the stories he read about famous inventors, Farnsworth soon sought advanced tutoring from his chemistry teacher, Justin Tolman. One day, while plowing back and forth through a potato field, Farnsworth conceived his greatest invention.

He had recently read a magazine article about mechanical television, but even his young mind knew that a whirling disk-based system would prove to be impractical. However, there in that Idaho potato field he realized that an electron beam, scanning an image line by line, might prove fast enough to create a quality image. Farnsworth surprised Tolman one day at school in 1922 by diagramming on a classroom blackboard his concept for electronic television. Farnsworth was just sixteen years old.

Although financially unable to pursue this vision on his own, Farnsworth was able to enter Brigham Young University in 1923 and begin some study of cathode ray and vacuum tubes. Unfortunately, his college career was cut short



This 1928 photo shows Philo T. Farnsworth with the transmitting set of the apparatus that he developed for television. (Bettmann/Corbis)

when he was forced to return home after his father died during his sophomore year. Farnsworth attempted to start a small business as a radio repairman, but that soon failed. After finding work with the Salt Lake City Community Chest, Farnsworth disclosed his idea for electronic television to the campaign's lead fundraisers, Leslie Gorrell and George Everson. In 1926, Everson agreed to finance Farnsworth's project with an initial investment of \$5,000. In October 1926, after obtaining additional resources, they established a laboratory in a warehouse in San Francisco, California. Farnsworth's "team" consisted of his wife Elma (called "Pem") and his brother-in-law Cliff Gardner, as well as Gorrell and Everson. Over the next year, they set out to bring Farnsworth's dream into reality.

The first step was to apply for a patent for his design for electronic television. The patent application, along with detailed diagrams of the system, was submitted on January 7, 1927. However, in order for the patent to be awarded, the system

had to be proven functional. On September 7, 1927, Farnsworth painted a straight line on a slide of glass and Gardner placed it between the "image dissector" (Farnsworth's camera tube) and a hot, bright carbon arc lamp. In another room Farnsworth, his wife, and Everson watched as the line appeared on a receiver and then moved as Gardner adjusted the slide in the other room. This seemingly simple display was actually the first allelectronic transmission of a television image. As noted by Neil Postman (1999), Farnsworth recorded the arrival of this new era with a simple scientific statement in his laboratory journal when he wrote, "The received line picture was evident this time" (p. 94). However, Everson was much more excited when he wrote to fellow investor Gorrell: "The damned thing works!" (p. 94).

News soon spread to the East Coast about this new innovation. In April 1930, Farnsworth was told to expect a visit from Vladimir Zworykin, a renowned engineer from Westinghouse who had also been working on an electronic television system. In fact, he had applied in 1923 for a patent for an electronic television system; however, he had yet to create an operational device. According to Mrs. Farnsworth (1990), Zworykin spent three days in the laboratory while Farnsworth was extremely generous in demonstrating all of his devices. Zworykin was impressed, even commenting about the image dissector, "This is a beautiful instrument. I wish I had invented it myself" (p. 130).

Farnsworth was so open with Zworykin because he hoped to entice Westinghouse into a patent deal where he would collect royalties on his invention. However, what was hidden from Farnsworth was the fact that just before visiting his laboratory, Zworykin had been hired by David Sarnoff of the Radio Corporation of America (RCA). Sarnoff had requested that his new employee stop by the San Francisco laboratory before moving his operation to the RCA laboratory in Camden, New Jersey. After his visit to Farnsworth's laboratory, Zworykin did stop by Westinghouse, but only long enough for some of his former assistants to construct a copy of the image dissector. Zworykin took the device with him on his trip to meet his new employer.

Later in 1930, while Farnsworth was away on business, Sarnoff himself arrived at the San Francisco laboratory. At the insistence of Everson, some of Farnsworth's assistants demonstrated the television system for the RCA head. Despite saying that he thought there was nothing he saw that RCA would need, he soon offered to buy the company and the services of Farnsworth for \$100,000. Farnsworth turned down the offer, noting that he was interested in collecting royalties for his invention that would support his independent operation. Sarnoff had no intention of meeting Farnsworth's demands. In fact, RCA owned the rights to nearly all of the major patents in radio and it was well known that company policy was to collect royalties and never pay them. This conflict sowed the seeds of a powerful battle to come.

In August 1930, Farnsworth received great news: he was issued patent number 1,773,980 for his "electronic television system." In 1931, the largest manufacturer of radio receivers, Philco, agreed to license Farnsworth's patent and pay him royalties. However, around this same time, RCA was touting Zworykin as the inventor of electronic television (based on his 1923 patent application) and promoting his new invention: the iconoscope. Because the iconoscope served nearly the same function as Farnsworth's image dissector, future licensing agreements for Farnsworth's devices hinged on proving that he was the inventor of electronic television. The issue was presented before the U.S. Patent Office, and in 1934, this body gave priority to Farnsworth on the grounds that RCA had failed to prove that Zworykin's 1923 tube was operational. In other words, RCA failed to support the premise that the 1923 patent application was actually describing the iconoscope. RCA appealed the ruling, but it was unsuccessful. During this time, Farnsworth publicly demonstrated his system for the first time in Philadelphia at the Franklin Institute and gained worldwide attention. Farnsworth even traveled to Europe to sign a licensing agreement with Baird of England to start their electronic television operation. Finally, in October 1939, RCA agreed to license Farnsworth's patents. This was the first time that RCA ever agreed to pay royalties to another company. According to Mrs. Farnsworth (1990), the RCA representative had tears in his eyes as he signed the agreement and accepted defeat. However, what appeared to be a major victory for Farnsworth was to take a tragic turn.

As the United States entered World War II, the government suspended the sale of television sets. In addition, by the end of the war many of Farnsworth's most important patents were about to expire. Farnsworth's company (Farnsworth Television and Radio, headquartered in Fort Wayne, Indiana) continued to manufacture television receivers until 1949, when it was sold to International Telephone and Telegraph (ITT). Farnsworth remained in Fort Wayne until 1967, when he resigned his position at ITT and moved to Salt Lake City, Utah. It was there, in 1969, that Farnsworth and his wife watched Neil Armstrong take his "giant leap" to the lunar surface. Once Armstrong's feet touched the surface, Farnsworth turned to his wife and said, "Pem, this has made it all worthwhile" (Farnsworth, 1990, p. 328). What began as a boy's dream in a potato field was now helping to take mankind into the far reaches of the universe.

Farnsworth died in March 1971 in Salt Lake City. Although Zworykin (through the efforts of Sarnoff) has received much more acclaim as the "father" of television, Farnsworth was the first person to make electronic television a reality.

See also: Sarnoff, David; Television Broadcasting, History of; Television Broadcasting, Technology of.

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FEAR AND THE MEDIA

The mass media present many images and ideas that have the capacity to worry, frighten, or even traumatize children. Researchers as far back as the 1930s and 1940s expressed concern that children were experiencing nightmares after going to the movies or listening to radio dramas. In the 1950s and early 1960s, the incidence of fears and nightmares was reported in several books about the effect of television on children. By the late 1960s, however, concern about youth violence led researchers to focus mainly on the potential of the media to contribute to violent behavior in children, and little attention was paid to the potential negative emotional effects of exposure to television and movies.

By the 1970s, George Gerbner began studying what he termed the "mean-world" syndrome. Through his "cultivation" paradigm, Gerbner argued that because television programming contains much more violence than actually exists in the real world, people who watch a large amount of television come to view the world as a mean and dangerous place. The research of Gerbner and his associates (1994) has shown, for example, that heavy television viewers exceed light viewers in their estimates of the chances of being involved in violence and that they are also more prone to believe that others cannot be trusted.

Gerbner's research has focused primarily on viewers' beliefs about the world rather than on viewers' emotions. However, research in the late 1990s revealed that heavy television viewing is associated with fears, nightmares, and even symptoms of psychological trauma. A 1998 survey by Mark Singer and his associates of two thousand elementary and middle school children in Ohio showed that as the number of hours of television viewing per day increased, so did the prevalence of symptoms of anxiety, depression, and posttraumatic stress. Similarly, a 1999 survey by Judith Owens and her collaborators of the parents of almost five hundred elementary school children in Rhode Island revealed that heavy television viewing (especially television viewing at bedtime) was significantly related to sleep disturbances. In the Owens study, almost 10 percent of the parents reported that their child experienced televisioninduced nightmares as frequently as once a week.

Fright Reactions to Individual Programs and Movies

The fright-producing effect of media depictions has more frequently been studied in terms of the immediate emotional effect of specific programs and movies. There is ample evidence, in fact, that the fear induced by mass media exposure is often intense and long-lasting, with sometimes debilitating effects. In a 1980 study by Brian Johnson, 40 percent of a random sample of adults admitted that they had seen a motion picture that had disturbed them "a great deal," and the median length of the reported disturbance was three full days. On the basis of their descriptions of the type and duration of their symptoms (such as nervousness, depression, fear of specific things, recurring thoughts and images), 48 percent of these respondents (19% of the total sample) were judged to have experienced, for at least two days, a "significant stress reaction" as the result of watching a movie.

Two retrospective studies of adults' detailed memories of having been frightened by a television show or movie were published in 1999, one conducted at Kansas State University by Steven Hoekstra and his associates and the other at the Universities of Michigan and Wisconsin by Kristen Harrison and Joanne Cantor. These independently conceived studies provided further evidence of the prevalence, severity, and duration of fears induced by the media. The data revealed that the presence of vivid memories of enduring mediainduced fear was nearly universal among college undergraduates. Both studies reported that generalized anxiety, mental preoccupation, fear of specific things or situations, and sleep disturbances are quite common consequences of exposure to the media. Moreover, in the Harrison and Cantor study, one-third of the students who reported having been frightened said that the fear effects had lasted more than one year. Indeed, more than onefourth of the respondents said that the emotional effect of the program or movie (viewed an average of six years earlier) was still with them at the time of reporting. Typical long-term reactions were the refusal to swim in the ocean (or even in lakes) after seeing the killer-shark movie Jaws, and anxiety about taking showers after viewing the classic Alfred Hitchcock thriller Psycho, in which the heroine is slashed to death while taking a shower.

A 1991 experiment by Cantor and Becky Omdahl explored the effect of witnessing scary media events on the subsequent behavioral choices of children in kindergarten through fifth grade. In this experiment, exposure to dramatized depictions of a deadly house fire or a drowning increased children's self-reports of worry about similar events in their own lives. More important, these fictional depictions affected the children's preferences for normal, everyday activities that were related to the tragedies they had just witnessed: Children who had seen a movie depicting a drowning expressed less willingness to go canoeing than other children; and those who had seen the program about a house fire were less eager to build a fire in a fireplace.

The most extreme reactions reported in the literature come from psychiatric case studies in which acute and disabling anxiety states enduring several days to several weeks or more (some necessitating hospitalization) are said to have been precipitated by the viewing of horror movies such as *The Exorcist* and *Invasion of the Body Snatchers*. Most of the patients in the cases cited did not have previously diagnosed psychiatric problems, but the viewing of the film was seen as occurring in conjunction with other stressors in the lives of the patients.

Age Differences in Fright Responses

A large body of research has examined developmental differences in media-induced fears and how to cope with them. Cantor and her associates have conducted a series of experiments and surveys to test expectations based on theories and findings in cognitive development research. Cantor summarized many of these findings in a 1994 review article and in a 1998 book for parents. The experiments in this research program involved the showing of relatively mild, short clips of television programs and movies to children of different ages to test rigorously controlled variations in program content and viewing conditions. After viewing, children have reported on their feelings and interpretations, and these self-report measures have often been supplemented with physiological measures, such as the videotaping and systematic coding of facial expressions of emotion and/or behavioral measures of approach and avoidance. In contrast, the surveys have investigated the responses of children who were exposed to a particular mass media offering in their natural environment, without any researcher intervention. Although less tightly controlled, the surveys have permitted the study of responses to much more intensely frightening media fare, and have looked at responses occurring under more natural conditions.



The heightened intensity of a film, such as the 1973 film The Exorcist, which featured Ellen Burstyn (right) and Linda Blair in a story about demonic possession, can contribute to a heightened sense of fear on the part of the viewer. (Bettmann/Corbis)

It might seem likely that children would become less and less susceptible to all media-produced emotional disturbances as they grew older. However, this is not the case. As children mature cognitively, some things become less likely to disturb them, whereas other things become potentially more upsetting. As a first generalization, the relative importance of the immediately perceptible components of a fear-inducing media stimulus decreases as the age of a child increases. Research findings support the generalization that preschool children (approximately three to five years of age) are more likely to be frightened by something that looks scary but is actually harmless than by something that looks attractive but is actually harmful; for older elementary school children (approximately nine to eleven years of age), appearance carries much less weight, relative to the behavior or destructive potential of a character, animal, or object.

One study that supported this generalization was based on a survey that asked parents to name

the programs and films that had frightened their children the most. In this survey, parents of preschool children most often mentioned offerings with grotesque-looking, unreal characters, such as the television series *The Incredible Hulk* and the feature film *The Wizard of Oz*; parents of older elementary school children more often mentioned programs or movies (such as *The Amityville Horror*) that involved threats without a strong visual component, and that required a good deal of imagination to comprehend. Another study found similar results using the self-reports of children rather than the observations of parents. Both surveys included controls for possible differences in exposure patterns in the different age groups.

The results from a laboratory study that involved an episode of *The Incredible Hulk* supported the generalization that resulted from the surveys. In the survey that asked parents about what programs frightened their children the most, this program had spontaneously been mentioned by 40 percent of the parents of preschoolers. The laboratory study concluded that the unexpectedly intense reactions of preschool children to this program were partially due to their overresponse to the visual image of the Hulk character. When participants were shown a shortened episode of the program and were asked how they had felt during different scenes, preschool children reported the most fear after the attractive, mildmannered hero was transformed into the monstrous-looking Hulk. Older elementary school children, in contrast, reported the least fear at this time, because they understood that the Hulk was really the benevolent hero in another physical form, and that he was using his superhuman powers to rescue a character who was in danger.

Another experiment tested the effect of appearance more directly, by creating a story in four versions, so that a major character was either attractive and grandmother-looking or ugly and grotesque. The behavior of the character was also varied—she was depicted as either kind or cruel creating four versions of the same story. In other words, the main character was either attractive and kind, attractive and cruel, ugly and kind, or ugly and cruel, while all other aspects of the story were held constant. In judging how nice or mean the character was and in predicting what she would do in the subsequent scene, preschool children were more influenced than older children (six to ten years of age) by the looks of the character. The preschool children were less influenced than the older children by her kind or cruel behavior. As the age of the child increased, the looks of the character became less important and her behavior carried increasing weight.

A second generalization from research in this area is that as children mature, they become more responsive to realistic dangers and less responsive to fantastic dangers depicted in the media. The survey of parents mentioned earlier supported this trend. In general, the tendency of parents to mention fantasy offerings (depicting events that could not possibly occur in the real world) as sources of fear decreased as the age of the child increased, and the tendency to mention fictional offerings (depicting events that could possibly occur) increased. Further support for this generalization comes from a survey of the fright responses of children to television news. A random survey of parents of children in kindergarten through sixth grade showed that fear produced by fantasy programs decreased as the grade of the child increased, while fear induced by news stories increased with age.

A third generalization from research is that as children mature, they become frightened by media depictions involving increasingly abstract concepts. Data supporting this generalization come from a survey of children's responses to the madefor-television movie The Day After. Although many people were concerned about the reactions of young children to this movie, which depicted the devastation of a Kansas community by a nuclear attack, the survey showed that the emotional effect of this movie increased as the age of the viewer increased. Similarly, a survey of the reactions of children to television coverage of the Persian Gulf War showed that preschool and elementary school children were more likely to be frightened by the concrete, visual aspects of the coverage (such as the missiles exploding), whereas teenagers were more disturbed by the abstract components of the story (such as the possibility of the conflict spreading).

Developmental Differences in the Effectiveness of Coping Strategies

Research in cognitive development has also been used to determine the best ways to help children cope with fear-producing media stimuli or to reduce the fear reactions of children once they occur. In general, preschool children benefit more from "noncognitive" strategies, that is, those that do not involve the processing of verbal information and that appear to be relatively automatic; by the latter elementary school years and beyond, children benefit from both cognitive and noncognitive strategies, although they tend to prefer cognitive strategies.

The process of visual desensitization, or gradual exposure to scary images in a nonthreatening context, is a noncognitive strategy that has been shown to be effective for both preschool and older elementary school children in several experiments. In one experiment, for example, prior exposure to a realistic rubber replica of a tarantula reduced the emotional effect of a scene involving tarantulas from the movie *Kingdom of the Spiders*.

Other noncognitive strategies involve physical activities, such as clinging to an attachment object or having something to eat or drink. Children seem to be intuitively aware that physical techniques work better for younger than for older children. In a survey of the perceptions of children of the effectiveness of strategies for coping with media-induced fright, the evaluations of preschool children of "holding onto a blanket or a toy" and "getting something to eat or drink" were significantly more positive than those of older elementary school children.

In contrast to noncognitive strategies, cognitive (or "verbal") strategies involve verbal information that is used to cast the threat in a different light. These strategies involve relatively complex cognitive operations, and research consistently finds such strategies to be more effective for older than for younger children.

When dealing with fantasy depictions, the most typical cognitive strategy seems to be to provide an explanation focusing on the unreality of the situation. This strategy should be especially difficult for preschool children, who do not have a full grasp of the implications of the fantasy-reality distinction. In one experiment, for example, older elementary school children who were told to remember that what they were seeing in *The Wizard of Oz* was not real showed less fear than their classmates who received no instructions. The same instructions did not help preschoolers, however. Research also shows that older children have greater confidence than preschoolers in the effectiveness of this strategy.

For media depictions involving realistic threats, the most prevalent cognitive strategy seems to be to provide an explanation that minimizes the perceived likelihood of the depicted danger. This type of strategy is not only more effective with older children than with younger children, in certain situations it has been shown to be misunderstood by younger children, causing them to become more, rather than less, frightened.

Studies have also shown that the effectiveness of cognitive strategies for young children can be improved by providing visual demonstrations of verbal explanations, and by encouraging repeated rehearsal of simplified, reassuring information. It is clear from these studies that it is an extremely challenging task to explain away media images and threatening situations that have induced fear in a child, particularly when there is a strong perceptual component to the threatening stimulus, and when the reassurance can only be partial or probabilistic, rather than absolute.

Parental Awareness and the Effects of Coviewing

It has been noted that parents often are not aware of the occurrence or severity of the fright reactions of their children. Research typically shows that parents' estimates of the frequency of their children's media-induced fright reactions are lower than the self-reports of the children. Parents also underestimate the exposure of their children to scary media. Research suggests that children often experience fright reactions to programs that many parents would not expect to be scary. Nevertheless, there is evidence that children are widely exposed to programs and movies that were originally intended for adults and that are considered frightening by a large proportion of adult moviegoers.

Research has focused on the role that coviewing can play in reducing fright reactions to media. Surveys have shown that children often attempt to comfort coviewers when they become frightened, using strategies ranging from distraction to a complicated reassuring explanation. One experiment showed that older siblings often spontaneously try to comfort younger ones when they watch a scary movie and that these attempts can be effective.

Gender Differences

There is a common stereotype that girls are more easily frightened than boys, and indeed that females in general are more emotional than males. There is quite a bit of research that would seem to support this contention, although the gender differences may be less strong than they appear at first glance. Moreover, the observed gender differences seem to be partially attributable to socialization pressures on girls to express their fears and on boys to inhibit them.

A meta-analysis by Eugenia Peck (1999)—of the studies of media-induced fear that were produced between 1987 and 1996—reported a "moderate" gender-difference effect size (0.41—on a scale from 0 to 1). The responses of females were more intense than those of males for all dependent measures. However, the effect sizes were largest for self-report and behavioral measures (those that are under the most conscious control) and smallest for heart rate and facial expressions. In addition, the effect size for gender differences increased as the age of the research participant increased.

There is some evidence of gender differences in the coping strategies used to counteract mediainduced fear, and these gender differences may also reflect gender-role socialization pressures. As Cantor (2000) has observed, two surveys have reported that females use noncognitive coping strategies more often than males but that the two genders do not differ in their use of cognitive strategies. These findings may suggest that because boys are less willing than girls to show their emotions, they avoid noncognitive strategies (such as covering their eyes or seeking social support), which are usually apparent to others. In contrast, the two genders employ cognitive strategies (such as thinking about nonthreatening aspects of the frightening event) with equal frequency because these strategies are less readily observable.

Although more research is needed to explore the extent of gender differences in media-induced fear and the factors that contribute to them, these findings suggest that the size of the gender difference may be partially a function of social pressures to conform to gender-appropriate behavior.

Shielding Children from Harm

As television and movies have become more intense and more graphic in their depictions, parents have sought ways of taking more control over the exposure of their children to media. The movie rating system developed in the late 1960s by the Motion Picture Association of America (MPAA) has undergone several modifications in response to the wishes of parents. In addition, in the late 1990s, the U.S. Congress mandated the inclusion of V-chips in new television sets to permit parents to block programs on the basis of ratings, and the television industry developed a rating system designed to work with this new technology. Parental education and media literacy programs also proliferated during the 1990s to help parents and children cope with the rapidly expanding availability of diverse forms of media content.

See also: Cultivation Theory and Media Effects; Gender and the Media; Parental Mediation of Media Effects; Ratings for Movies; Ratings for Television Programs; V-Chip; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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FEDERAL COMMUNICATIONS COMMISSION

The Federal Communications Commission (FCC) is an independent regulatory agency that executes and enforces the provisions of the Communications Act of 1934 and its amendments. It has the statutory authority to create and execute administrative law such as rules, policies, and regulations. It also has the authority to investigate and penalize violators of these laws. Its jurisdiction covers interstate wire and wireless communication as well as international communication originating in or transmitted from the United States. It does not, however, regulate government communications.

The FCC is considered an independent agency because it does not fall directly under the executive branch of government. However, it is a "creature of Congress" in that the U.S. Congress created the agency through the Communications Act of 1934. Therefore, through legislation, Congress may alter or abolish the FCC if it so chooses. Congress also approves the selection of commissioners, appropriates the budget, and reauthorizes the existence of the FCC every two years.

The president of the United States also holds some influence over the FCC. For example, the president appoints the five FCC commissioners, subject to approval by Congress. The president may also take control of FCC-regulated media during wartime and national emergencies. Other government regulatory organizations that play a role in media regulation are the Federal Trade Commission (FTC), which is responsible for advertising and antitrust oversight, and the Equal Employment Opportunity Commission (EEOC), which monitors compliance of affirmative action and equal employment laws. In concert with these agencies, the FCC regulates the communications industry to ensure that the public interest is being served.

Powers and Procedures of the Commission

Perhaps the most visible function of the commission is to assign frequencies and issue licenses to broadcasters. However, it also makes rules, regulations, and policies that uphold U.S. domestic laws and international agreements. To do this, the FCC receives proposals for new rules, which are evaluated by the appropriate bureau. If the proposal survives this step, it goes to the FCC commissioners, who may employ one of four actions.

First, the commission may submit a Notice of Proposed Rule Making (NPRM), in which the rule is proposed and comments are solicited. The commission will then take written statements from interested parties and, perhaps, hold a hearing to discuss relevant issues. After comments are obtained, the commission will issue a Report and Order (R&O) that either adopts the proposed rule, alters and then adopts the rule, or makes no change.

Second, the commission may issue a Notice of Inquiry (NOI), which states the issue and invites comments regarding potential solutions. Public comment is then gathered from written statements or hearings, allowing the commission to decide whether to proceed with an NPRM or to forego adoption of rules or changes with a Memorandum Opinion and Order (MO&O). If the commission does choose to issue an NPRM, then the rule-making process continues as if an NPRM was originally issued.

Third, the commission may skip an NPRM or an NOI and make unsubstantial changes in existing rules using a Report and Order Adopting Change. However, if the commission does not wish to adopt any rules or changes, the commission may exercise its fourth option and issue an MO&O, thus ending the rule-making process.

The FCC also has at its disposal a legal device that can be used to remove an uncertainty or terminate a controversy. This device is a declaratory ruling, made possible by the Administrative Procedures Act, and it can be used to clarify legal definitions, solidify regulatory concepts, or otherwise explicitly explain a controversial element or issue. However, even these declaratory rulings are subject to court decisions.

Hearings, presided over by an administrative law judge (ALJ), not only provide a forum for public comment but also test the constitutionality of FCC decisions. According to the Communications Act of 1934, hearings can be held to appeal FCC rules, and must be held in license denial or revocation actions. During these hearings, the ALJ hears comments from all interested parties, including the FCC, and issues an initial decision. The decision may then be reviewed by the five commissioners. If any parties are dissatisfied with the final decision, they may appeal the case to an appellate court and possibly to the U.S. Supreme Court. It is through this appeals process that the judicial system checks the constitutionality and legal authority of FCC rulings.

To enforce its existing rules, regulations, and policies, the FCC can choose from nine methods of enforcement. The most commonly used method is the forfeiture, or the fine. The FCC may levy up to \$25,000 per day for violations of license terms, the Communications Act of 1934, the U.S. Criminal Code, or any FCC regulation or U.S. treaty. There is, however, a \$250,000 maximum penalty for each individual station in violation.

The Communications Act of 1934 also authorizes the FCC to pursue court action against violators of the act. This involves obtaining a court order demanding that the violator either comply with the act, obey an FCC order, or comply with a previous court order. Similar to this is the consent order, which begins with an allegation by the FCC that some party has violated an FCC rule, regulation, or policy. A hearing is then held during which the party in question and the FCC negotiate a consent order, an agreement to comply with a specified ruling.

A related enforcement tool is the cease and desist order. This order demands that a party stop exhibiting a specific action that violates the Communications Act of 1934, the U.S. Criminal Code, an FCC regulation or U.S. treaty, or a license agreement. This method, although useful to many agencies, has been used the least by the FCC.

Another little used method is the revocation of a license before renewal. Revocation has mostly occurred in cases of misrepresentation or technical engineering violations by a station. Other, less harsh enforcement methods are the denial of license renewal, short-term license renewal, and conditional license renewal. All of these pertain to cases concerning violations of the license agreement, violations of FCC regulations, or petitions to deny renewal.

The regulatory tool that the FCC uses with frequency is the letter, or "raised eyebrow" approach. In these cases, the FCC simply sends the party in question a letter that either admonishes the party or asks the party to explain an alleged act. This method, though not a sanction, is very effective in that it cannot be appealed or challenged in court, and yet it warns the party of the FCC's knowledge of the possible violation. Usually, this threat of sanction is persuasive enough to gain compliance.

Organization of the Commission

The FCC is organized into three levels. At the top level, five commissioners create and review regulation. Beneath the commissioners are the offices, which perform various managerial, service, and auxiliary functions. At the third level, six bureaus develop and implement regulatory programs, process license applications, conduct investigations, and hear citizen comments and complaints. These levels cover the breadth of telecommunication and facilitate the commission's operation as an independent agency.

The Commissioners

With the advice and consent of the U.S. Senate, the president of the United States appoints five commissioners, choosing one as chairman. These commissioners hold five-year fixed terms, which are staggered so that not all five positions will be vacant at once. The commissioners must be U.S. citizens and must not hold a financial interest in any industry that the FCC regulates. Also, no more than three commissioners may be from the same political party, although all may hold the same philosophies. Each commissioner selects a small personal staff that will leave when the commissioner leaves office. The chairman is allowed a larger personal staff and serves as chief executive of the commission.

The chairman presides over the commission meetings, which must be held at least once a month. Usually, the commissioners meet weekly, and they submit documents to each other for approval between meeting times, a process called circulation. The commissioners also go before Congress to request operating funds and reauthorization. However, the chairman may also serve as the sole representative of the FCC before Congress and other entities in various matters.

The Offices

The Office of Inspector General was created by the Inspector General Amendments Act of 1988. This office ensures that the FCC operates internally in an efficient, effective, and legal fashion. It initiates internal audits and investigations of programs or operations in response to complaints, and it keeps the commissioners and Congress informed of any problems at the agency.

The Office of Managing Director is the primary operations manager of the agency. It creates and executes managerial and administrative policies, and it provides direction to the offices and bureaus underneath it. It is the central link in the organization of the FCC.

The Office of Legislative and Intergovernmental Affairs serves as the FCC's liaison to Congress and other governmental organizations. In addition to informing others about FCC decisions, the office prepares FCC responses to legislative proposals and feedback. The Office of Media Relations performs similar tasks in dealing with the news media, and it also manages the website of the FCC.

The Office of Plans and Policy advises the commission on economic and technical matters. It develops long-term policy planning, conducts research, and manages the budget for research funded by the FCC. The Office of the Secretary also keeps records, except that its focus is in managing the movement of documents filed through electronic and paper-based systems.

The Office of Workplace Diversity is the principal adviser to the commission on issues such as workplace diversity, affirmative action, and equal employment opportunity. It trains and counsels employees on fair treatment, and it also develops and implements programs that encourage fair treatment, affirmative recruitment, and understanding and acceptance of diversity in the workplace. The Office of Communications Business Opportunities counsels the commission on diversity in the national landscape, advising on issues and policies concerning female and minority ownership of communication businesses. In addition, the office represents small-business interests in all FCC rule-making proceedings.

The Office of Administrative Law Judges and the Office of General Counsel serve as the legal arm of the FCC. The Office of Administrative Law Judges houses the judges who preside over hearings and issue adjudicatory decisions that are reviewed by the commissioners. The Office of General Counsel advises the FCC on legal matters, represents the commission before the courts, recommends decisions in adjudicatory cases, and provides insight on promoting competition and deregulation in the marketplace.

The final office is the Office of Engineering and Technology. This office is the primary manager of the nongovernmental use of the electromagnetic spectrum. It advises the FCC on technical matters, the allocation of frequencies, and new technologies. The office also establishes technical standards for operating stations. In short, the Office of Engineering and Technology provides scientific leadership and guidelines on which the technological backbone of electronic media is built.

The Bureaus

There are seven FCC bureaus: (1) the Cable Services Bureau, (2) the Common Carrier Bureau, (3) the Wireless Telecommunications Bureau, (4) the International Bureau, (5) the Mass Media Bureau, (6) the Enforcement Bureau, and (7) the Consumer Information Bureau. Each of these bureaus covers a distinct area of FCC responsibility.

The Cable Services Bureau, established in 1993, was formed to execute and enforce the Cable Television Consumer Protection and Competition Act of 1992. It promotes competition in local markets and between multichannel program distributors and monitors the deployment of new cable technologies. The Cable Services Bureau also monitors trends and developments in the cable industry. It evaluates compliance to such mandates as broadcast signal carriage, program access, and potential cable interference with over-the-air signal reception capability. In addition, the bureau resolves issues concerning cable franchise agreements and related fees.

The Common Carrier Bureau oversees common carriers such as telephony and cellular telephony. The bureau licenses transmission circuits, assigns frequencies, and approves construction for new common-carrier operations. It also regulates the practices and charges of interstate and international communication carriers such as long-distance telephone companies. Related to the regulation of practices, the bureau receives applications for mergers and dictates proper accounting practices for common carriers.

The Wireless Telecommunications Bureau is similar to the Common Carrier Bureau in that it regulates radio-wave communication that serves the needs of businesses, individuals, governmental entities, and nonprofit organizations. These communications include private microwave, private land mobile, marine and aviation, amateur, cellular, paging, and personal communications service (PCS) transmissions. The bureau ensures that these and other wireless telecommunication service providers comply with the Communications Act of 1934 and FCC regulations.

The International Bureau, established in 1994, regulates all FCC international communications and satellite programs. Its functions include the regulation of rates, the development of standards, international safety measures, and space- and earth-station communications. The bureau also represents the commission in international matters and oversees the domestic implementation of relevant treaties and agreements between the United States and other countries.

Perhaps the most familiar bureau is the Mass Media Bureau, which regulates radio and television broadcasting. It assigns frequencies, call letters, and licenses to applicants. It also ensures that licensees are in compliance with the current rules and provisions of the Communications Act of 1934, the FCC, and other federal laws. In the event of noncompliance, the bureau is authorized to investigate and ultimately issue sanctions.

The Enforcement Bureau is charged with improving the effectiveness of the enforcement measures of the various laws. Established in 1999, it joins the enforcement forces of the various bureaus and acts on potential violations of the Communications Act of 1934 and FCC rules, regulations, and orders.

The Consumer Information Bureau, the official liaison to the general public, handles all consumer inquiries and complaints.

Evolution of the Commission

The FCC grew out of the Federal Radio Commission (FRC), which was created by the Radio Act of 1927. The FRC, a five-member commission, began with a limited and temporary role the U.S. Department of Commerce maintained most of the regulatory responsibility for the communication industry. The original intent of the FRC was to solve growing station interference problems, set standard broadcast bands, and reduce the total number of operating stations within one year. This, however, was not accomplished, and the FRC became permanent in 1929. In 1934, President Franklin D. Roosevelt asked Congress to create a single agency with broad authority over all nongovernmental communication. Consequently, Congress passed the Communications Act of 1934, which combined aspects of the FRC and the U.S. Department of Commerce and created the FCC as an independent regulatory agency that would have jurisdiction over all wire and wireless communication, both interstate and international.

The FCC derives its powers, duties, procedures, enforcement methods, and organizational setup from Titles I and V of the Communications Act of 1934, a blueprint that has changed little over time. For example, the number of commissioners has varied from five to three to seven, but a 1982 amendment set the number back at five. The only other significant change is that the commission, due to a 1981 amendment, is once again a temporary agency that must be reauthorized by Congress every two years. Other amendments have altered the rules, policies, regulations, and provisions that the FCC executes and enforces. However, the commission continues to function very much in the tradition that was established in 1934.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Communications Act of 1934; First Amendment and the Media; Radio Broadcasting; Telecommunications, Wireless; Telecommunications Act of 1996; Television Broadcasting.

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FRANCESCA DILLMAN CARPENTIER

FEMINIST SCHOLARSHIP AND COMMUNICATION

Feminist scholarship has an active presence and strong tradition in the field of communication.

The National Communication Association (NCA) includes a Feminist and Women's Studies Division that promotes feminist scholarship in communication and a Women's Caucus that lobbies for the advancement of women in the organization, profession, and world at large. The International Communication Association (ICA) has an equally active Feminist Scholarship Division that sponsored its first conference program in 1986. Communication scholars interested in feminist research may also interact with their colleagues through the Organization for Research on Women and Communication (ORWAC) and the Organization for the Study of Communication, Language, and Gender (OSCLG). Although feminist scholarship has appeared in various communication journals, two journals, Women's Studies in Communication and Women and Language, are devoted solely to publishing the results of feminist scholarship on communication issues.

In 1989, Karen Foss authored an article in Women's Studies in Communication that discussed the contributions of feminist scholarship to research in communication. Foss defined feminist scholarship as that "which brings to research the self-consciously political values of the women's movement and challenges traditional notions about research" (p. 1). In this conceptualization, feminist scholarship in communication includes the idea that gender is a critical component of human life and is seen as a filter or lens through which all other perceptions pass. According to Foss, "feminist inquiry is concerned with how gender is socially constructed, the process by which women's experiences have been subordinated to men's, and the implications of this subordination for the communication practices of women and men" (p. 2). In other words, feminist scholars in communication believe that gender is not an absolute set of physical characteristics or behaviors but is made up of actions that are learned and created through social interaction. This research is based on the assumptions that women's perceptions and experiences should be valued, that learning about the world is based on acknowledging the perceptions of individuals, and that society cannot be truly understood without knowing about the experiences of women as well as men. In addition, Foss calls for activist research that can be used to improve the place of women in society. In other words, feminist research in communication is "research done not just about women but for women" (p. 3). In a 1989 article in *Critical Studies in Mass Communication*, Andrea Press emphasized the fact that feminist scholarship should include "a commitment to the primacy of gender in analyzing individuals and society and a political concern with the alleviation of women's oppression" (p. 199).

Feminist scholarship in communication focuses on many important issues. Four of the most prominent conceptual and research areas are (1) language, (2) media, (3) voice, and (4) organizational communication.

Language

Feminist scholarship on language has a long history that focuses primarily on the status of women in society as reflected in the language used to describe them. For example, the masculine form of a word is often taken as the standard (e.g., "actor," "executor," "prince") and the feminine form is derived from it (e.g., "actress," "executrix," "princess"). The masculine form of a word is usually used before the feminine when individuals describe pairs of masculine and feminine roles (such as "husband and wife," "brother and sister," "king and queen"). The marital status of women can be identified through the use of terms such as "Miss" or "Mrs.," while the marital status of a "Mr." is unknown-indicating that this distinction is important for women but not for men. Although standard occupational titles have been revised to indicate gender neutrality (e.g., "police officer," "firefighter," and "mail carrier"), terms such as "chairman," "congressman," and "businesswoman" can be heard in everyday conversation. In this way, language can reinforce gender stereotypes that relegate women to the private/domestic realm and confine men in the public sphere.

Although contemporary researchers have argued against specific differences in the language used by men and women, acknowledgment should be paid to Robin Lakoff for her work in *Language* and Woman's Place (1975). Lakoff's conceptualization suffered from a view of women's language as being distinct and subordinate to men's, but she did begin a long line of inquiry in this area by discussing the use of tag questions, qualifiers, hedges, and other forms of speech that are stereotypically associated with women's language. Subsequent research has identified these forms of speech as being more typical of subordinated or marginalized individuals instead of women in general, but Lakoff's work provided a forum for sparking discussion of these important issues.

Media

Numerous studies have examined the portraval of women in the media from a feminist perspective. These studies are particularly important because the media both reflect and affect people's cultural values and images of each other. Researchers in this area have focused on the images of women in the popular media, the role of women producing mediated images, and the audience for particular media. Images of women in the media have been examined in film, television, radio, and music among other media. Molly Haskell, the author of From Reverence to Rape: The Treatment of Women in the Movies (1987), provides a historical overview of the changing role of women from the earliest days of film to contemporary times. While early images of women conformed to the stereotypes of the chorus girl/vamp, old-fashioned girl, mother, or working girl, modern images include "bad guy/girl" who harms men, sexual objects, and confused teenagers, as well as competent women who overcome both personal obstacles and even alien invaders. Nevertheless, contemporary roles for women in films are more likely to be offered to younger actresses who conform to societal expectations for femininity and traditional beauty.

Roles for females on television are equally stereotyped. Numerous studies of children's cartoons, for example, have found a lack of female characters in popular children's entertainment programming. Roles for women in television programming for adults have ranged from positive role models such as competent physicians and lawyers to typical images such as the girl next door, the beautiful but stupid teenager, and the helpless sidekick. Studies of radio have noted the relative absence of women disc jockeys and on-air personalities except as traffic reporters or sidekicks for male broadcasters. In addition, male voiceovers are more likely to be heard in commercials both on television and on radio. Although women in music have received an increasing amount of attention, in general, rock music continues to be dominated by men, while pop music remains the purview of women. In particular,

music videos continue to present women in highly sexual roles.

The role of women in creating popular media has received less scholarly attention than the images being presented of women by the media, but it is clear that women participate less in creating mediated images. Women are underrepresented as film directors, cartoonists, and record producers, for example. Because the creators of the images transmitted through a particular medium may have a tremendous amount of influence over those images, it is important for women to gain places of power in the media industries. The expectation is that images for women in the media will change as more women exert power in these industries.

Women as audience members for popular media have also received attention from feminist scholars in communication. Studies have been conducted that focus on the readers of romance novels, individuals who watch soap operas, and fans of *Star Trek* and other cult film and television programming. Each of these studies has been characterized by an emphasis on seeing the phenomenon from the point of view of the audience member and giving voice to people who otherwise would not have been considered in traditional research paradigms.

Voice

Both methodologically and theoretically, feminist scholarship in communication shares a concern with the concept of voice. Methodologically, as discussed above, one of the principles on which feminist scholarship is grounded is the desire to have a positive effect on the lives of the participants in the research, in particular, and women, in general. One way to accomplish this goal has been to make sure that the research is true to the voices of the research participants by making sure that their viewpoints are represented well and honestly valued. Feminist scholarship methodologies, therefore, tend to be more participative than the traditional positivist research that privileges the researcher over the researched (as is the case with research based on the scientific method).

Theoretically, the concept of voice in feminist scholarship can be seen in Carol Gilligan's noted work *In a Different Voice* (1982), in which she expands the understanding of human development to include a consideration of women that was missing from previous conceptualizations. Gilligan believes that their early social environment is experienced differently by female and male children because of their connection with the primary caretaker (usually the mother) and that this situation leads to differences in personality development. According to this theory, women are more likely to voice their concerns in terms of conflicting responsibilities and their effect on relationships with others, while men are more likely to view the world in terms of hierarchical principles that determine what is right and wrong. Although Gilligan's theory has been criticized by some scholars for what they believe is a lack of methodological rigor and for defining women's roles in limited ways, this work is important from a communication perspective because Gilligan reminds scholars that "the way people talk about their lives is significant, that the language they use and the connections they make reveal the world that they see and in which they act" (p. 2). In addition, the "ethic of care" decision-making style ascribed to women is considered equivalent to men's "ethic of justice" and is not considered a less-developed mode of reasoning as earlier developmental theorists contended.

Organizational Communication

Feminist scholarship in organizational communication focuses on both the perceived and actual differences in ways in which women and men communicate in organizations and on organizational issues that primarily affect women, such as sexual harassment. Research has examined bias in employment interviewing, issues of access to formal and informal communication networks in organizations, stereotypes of female and male organizational employees, gender differences in managerial communication, and the glass-ceiling effect. The glass-ceiling phenomenon, for example, occurs when women are blocked in some way from reaching the top levels of organizational hierarchies. Although numerous laws exist to prevent discrimination in the workplace and some authors contend that women's tendency to take time out from their careers for child raising legitimately limits their potential for advancement, feminist scholars have demonstrated that subtle discrimination may impede women's abilities to succeed at the highest corporate levels. As Julia Wood notes in her book Gendered Lives: Communication, Gender, and Culture (2001), a

woman's inclusive, collaborative style of communication may be seen by organizational decision makers as an indication of a lack of initiative and, therefore, will not be rewarded by promotion. In addition, feminist scholarship in communication on sexual harassment, characterized by the work of Robin Clair (1998), has defined sexual harassment as a communication issue because it involves a discursive process that serves to maintain organizational hegemony.

Conclusion

As can be seen from the above discussion, feminist scholars have contributed much to the field of communication and continue to emphasize the potential of their scholarship to contribute to significant changes in society and in women's lives.

See also: Gender and the Media; Interpersonal Communication; Intrapersonal Communication; Organizational Communication; Sex and the Media.

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LEA P. STEWART

FILM INDUSTRY

The film industry defines the United States and the American people as does no other medium. The movies demonstrate to global audiences all the strengths, weaknesses, and contradictions of the nation—art versus commerce, economic opulence versus squalor, and heroes versus villains. Even the variety of words that are used to describe the product of the industry—"movies," "motion pictures," "film," and "cinema"—illustrates the contradictions and strengths. Indeed, the entire history of motion pictures is a series of seeming contradictions, from the development of a mass entertainment industry by a small group of mainly Eastern European, Jewish immigrants, to the early failure to come to terms with television (a natural ally), to the fluid transition this old-line industry appears to be making in a new era of on-demand home-based media and entertainment.

The simple fact is that for most people, the motion picture business is a television business. Television—through VCRs, pay-per-view, pay cable, DVDs, basic cable, and broadcast—is the place where most movies are seen and where most revenue is generated by a business that is still defined by many as "going to the movies" (an out-of-home social group experience).

In another contradiction, this highly American industry derives an increasing percentage of its revenue and much of its profits from international distribution. One can travel to almost any inhabited part of the world and see U.S.-made or distributed films typically dominating theater marquees and video sales and rentals. In terms of both revenue and cultural influence, motion pictures are one of the most important exports of the United States.

A New Industry

An important distinction between the motion picture industry and other media industries is that motion pictures have rarely, if ever, been a medium for the elite. The print media have, of course, always been limited to the literate, and until the 1830s, they were limited to people who had relatively substantial disposable incomes and positions of influence in policy, commerce, or the arts. While the elite period of radio and television was relatively brief and related more to technical limitations and geography, the motion picture industry was designed almost from the beginning as a popular mass medium.

The motion picture industry was primarily developed by inventor-entrepreneurs (e.g., Thomas Edison and his associates) and "show business" entrepreneurs who brought the culture and distribution patterns of vaudeville to the emerging industry. The result was an industry that, because it was disdained by many cultural elitists and "legitimate" business interests, was left alone to develop in the "netherworld" of patent infringement, the empty and difficult-to-locate lands of southern California, and the world of "lowbrow" and sometimes salacious entertainment. Not until the development of opulent theaters in the 1910s and the rise of studio system (with its strong control of production, distribution, and exhibition) in the 1920s were the eccentricities of the industry reigned in and made to conform to a more structured pattern of business operation.

The "development years" that lasted from roughly the mid-1890s to the early 1920s are important today because many of the tensions, contradictions, and operational parameters of the industry were established during that period. For example, the Edison-designed Kinetoscope, a device that allowed individuals to view films on a one-at-a-time basis, was quickly superseded by the image projection system that was pioneered by the French brothers Auguste and Louis Lumière and made moviegoing a group communication and social experience. This period also saw the development of production techniques that were vital to and, in many cases, unique to film narrative-such as parallel-action editing, camera movement, and lighting techniques. Motion pictures, beginning with the first Nickelodeon theater in Pittsburgh in 1904, developed as a separate form of mass entertainment rather than as "filler" for the live acts of vaudeville. Of course, the mass popularity of the movies were a proximate cause of the eventual demise of vaudeville.

The development years also saw the establishment of the Los Angeles basin as the center of the creative side of American mass entertainment. Because it provided an environment where filming could take place all during the year and because it offered an escape from the stifling business, legal, and cultural environment of New York, "Hollywood" quickly became globally synonymous with the motion picture industry. The immigrants who became known as the motion picture "moguls" (e.g., Samuel Goldwyn, Louis B. Mayer, Harry Cohn, Adolph Zukor) on the West Coast would have had great difficulty gaining such power if they had remained on the East Coast.

The Studio Years

The motion picture industry reached its apex as *the* mass entertainment medium in the years between 1920 and 1950. At the structural level, major studios, among them such still-famous names as Metro-Goldwyn-Mayer (MGM), Paramount, Warner Brothers, and Columbia, built virtual empires in which they controlled the careers and, in some cases, the lives of actors, directors, writers, cinematographers, and other talent. The major studios had near-total control of what type of movies and how many movies would be made (production), how many prints would be made and to whom they would be delivered (distribution), and what theaters would be allowed to show them (exhibition). Even independently owned theaters and smaller chains or groups were forced to take products from the major studios through such practices as "blind bidding" (i.e., bidding on products or product packages before they were completed) and "block booking" (i.e., licensing a package of products to a chain for all of its theaters, which forced the chain to take inferior products connected to quality products).

The success of this vertically integrated business pattern can be demonstrated by comparing the average annual attendance of 4.68 billion people for the 1945-1948 period to the annual attendance of 1.47 billion people in 1999. The studio structure was also responsible for the "elevation" of the social stature of moviegoing. Opulent theaters were built in many urban areas with the amenities that were previously reserved for the fine arts of the symphony, opera, or dance. Indeed, theaters of this style that survive have in several cities been refurbished for the "fine arts." With the money almost literally rolling in, the major studios spared little expense in producing films that had a more "sophisticated" air and "fine arts" aspirations or pretensions (e.g., the films of Fred Astaire and Ginger Rogers) to go along with the more popular forms, such as gangster movies and westerns. An important element of the genius of the developing film industry was its ability to cater to audiences at virtually every socioeconomic level. The introduction of sound and, later, color technology was, of course, essential to these efforts.

The rapidly developing studio system of the 1920s clearly demonstrated the ability of the industry to fashion itself as a mass and mainstream entity with the establishment of the Motion Picture Producers and Distributors of America (MPPDA) in 1922. More popularly known as the "Hays Office" (after the organization's first president, former U.S. Postmaster General Will Hays), the MPPDA was a response to the various state boards of censorship and threats of U.S. government regulation. The MPPDA, which was eventually renamed the Motion Picture Association of America (MPAA), not only lobbied for the industry on a national level but adopted a stringent Production Code that banned virtually all "morally objectionable" content from U.S. motion pictures for more than thirty years.

The Television Years

What many have called the "golden age" of Hollywood came crashing down in a remarkably short period of time. In the four-year period 1948–1951, for example, there was a 50 percent decline in weekly attendance, a trend that continued until 1971, when weekly attendance bottomed out at 15.8 million—less than one-fifth the number of the 1945–1948 peak (Robertson, 1994). This occurred even as the U.S. population grew at a rapid rate in the "baby boom" years that lasted from the late 1940s to the early 1960s.

Although television is without question the major reason for the decline in the relative importance of the motion picture industry as a mass medium, other factors should not be overlooked. The move of people to the suburbs left fewer people to patronize the downtown theaters. The high birthrate also made it more difficult for people to go to theaters due to the need and cost of babysitting.

In addition to demography, the entire structure and accompanying patterns of conduct of the motion picture industry were radically altered by the U.S. Supreme Court's 1948 decision in *United States v. Paramount Pictures, Inc.* The Court ruled that the vertical structure of production-distribution-exhibition (PDE) was illegal under federal antitrust law. This led to the separation of exhibition from the studios and the eventual dissolution of the studio system, as studios began to concentrate more on the distribution side of the business.

No media technology has diffused as rapidly as television. Offering "free" home entertainment and information at a time of rapid suburbanization and high birthrates, television combined the appeal and ubiquitousness of motion pictures and radio. How to adapt to the new mass medium was the major challenge that faced the motion picture industry from the 1950s to the 1980s

The response of the industry to the rise of television was seriously complicated by the *Paramount* decision. Without the threat of the impending decision, the motion picture industry might have developed its own stations and networks. After Paramount, there was no powerful, near-monolithic industry to speak and act in unison, although old ties were difficult to break. For example, the exhibitors strongly opposed, and allied with the broadcasters to stop, the early development of pay television, which has since become a very lucrative market for production and distribution. Rather than quickly embracing this new medium with a voracious appetite for product, Hollywood stood aloof or in opposition until United Paramount Studios purchased ABC in the mid-1950s and began to use its film connections to acquire made-for-television product from Disney, Warner Brothers, and other studios. However, in deference to the theater owners, the studios did not release major theatrical films to television until the 1960s.

While new distribution outlets were finally starting to be exploited by the late 1950s, the production and exhibition industry segments had different reactions to the rise of television. The production side found itself somewhat in the middle as it naturally "fed" its distribution side with more of the television product that replaced the Bmovie, while devoting much attention to producing the type of product for theaters that television could not replicate. Examples include the production of films in such new widescreen processes as CinemaScope, the increasing shift to color, huge budget costume epics, and special effects (including 3D). In addition, the content of motion pictures became more specialized and, in the minds of many, more controversial and adult to draw customers away from television. By 1968, the now basically ignored Production Code was replaced by the MPAA ratings system.

Beginning in the 1950s and accelerating in the 1960s, the production component of the industry dismantled much of the old studio system. Talent contracts became rare as the studios preferred to deal with most talent as independent contractors. Real estate and sets were sold or auctioned, although the major studios continued to make considerable income from leasing studio facilities and selling technical expertise. Although film production continued at the studios, the production side became increasingly involved with the financing and packaging and distribution of products that were made by quasi-independent filmmakers, boutique "studios," and investor groups. Perhaps

TABLE 1.

Statistics	1990	1999	% Change
Number of Films Rated and Released	410	461	+12.4
New Features Released (including non-MPAA)	385	442	+14.8
Domestic Screen Count	23,689	37,185	+57.0
Admissions	1.19 billion	1.47 billion	+23.3
Average Admission Price	\$4.23	\$5.08	+20.3
Domestic Gross Box Office	\$5.02 billion	\$7.45 billion	+48.3
MPAA Member Average Negative Costs			
(including studio overhead and capitalized interest)	\$26.8 million	\$51.5 million	+92.1
MPAA Member Average Marketing Costs			
(including film print and advertising)	\$11.97 million	\$24.53 million	+104.9
Number of VCR Households	65.4 million	85.8 million	+31.2
Sales of Prerecorded Videocassettes to Dealers	241.8 million	742.4 million	+207
Addressable Cable Households			
(i.e., pay-per-view ready)	22.0 million	35.2 million	+60.0
Basic Cable Households	54.9 million	68.5 million	+24.8
Pay Cable Subscribers	26.6 million	33.2 million	+24.5
Homes with Internet Access	n/a	45.2 million	+381.2
			(from a 1995 to
			of 9.4 million)

U.S. Motion Picture Industry Data for 1990 and 1999

more illustrative of the changes in Hollywood was the sale or absorption of the major studios to other business conglomerates, a trend that continues.

Once it realized that television was not a "fad," the exhibition segment of the industry reacted by equipping theaters with larger screens, better sound, and special effects. In addition, the drivein theater became common in rural and suburban areas. Of course, in order to enhance revenues, ticket and concession prices were raised. By the 1960s and early 1970s, the multiscreen theater started to become the industry standard. By offering films for different audience segments, the "multiplex" could ensure itself of a relatively steady flow of customers while maximizing the sale of concessions.

The Media and Entertainment Age

After struggling for more than twenty years to come to terms with its new economic structure and the rise of television, the film industry is regarded by many analysts as now being one of the most lucrative and powerful industries. Douglas Gomery argues that "the economics of the Hollywood motion picture studios prospered as never before" (1998, p. 201), and that "the 1980s and 1990s stand as the era when Hollywood achieved an international influence and mass entertainment superiority unparalleled in its history" (1993, p. 267). Table 1 demonstrates the growth of the industry in the 1990s. Although box office attendance is extremely unlikely to ever reach the levels of the golden age of the 1940s, box office is but one component of the industry. The growth in videotape sales and rentals, cable penetration, and the Internet are important statistics for interpreting the health of the industry. DVD technology has proven to be an important area as well. In 1999, according to the Motion Picture Association of America, DVD had a consumer base of 5.4 million people and more than five thousand titles were already available in that format.

Table 2 demonstrates that 53 percent of the theater-going audience is under thirty years of age and 70 percent is under forty. Table 3 shows that while around 60 percent of those people who are more than eighteen years of age consider themselves to be "frequent" or "occasional" moviegoers, approximately 90 percent of teenagers consider themselves to be "frequent" or "occasional" moviegoers. These young people increasingly go to see (and re-see) mainly high-budget "blockbuster" action films in large entertainment multiplexes that have digital sound, stadium-style (i.e., platform) seating with cup holders, a lot of legroom, and a wide variety of concession options. Many of these theaters also have large areas that are devoted to party rooms, "VIP" seating, video games, and other options. As with sports venues,

2

Age Group	Percentage of Total Admissions, 1995	Percentage of Total Admissions, 1999	Percentage of the Population, January 1999
12–15	9	11	7
16–20	16	20	9
21–24	11	10	6
25–29	12	12	8
30–39	20	18	19
40–49	16	14	18
50–59	7	7	13
60+	10	8	20
12–17	14	17	10
18+	86	83	90
12–29	48	53	30
12–39	68	70	49
16–39	59	60	42
40+	33	30	51

movie theaters have become entertainment complexes. Of course, most movie viewers now watch movies on television. This is a trend that is certain to accelerate with the rapid diffusion of digital widescreen receivers, DVDs, home theater systems, and broadband Internet.

As previously discussed, there are several reasons for the revival of the motion picture industry from the doldrums that it experienced in the midtwentieth century. The primary reason, however, was its ability to leverage its powerful brand identity as a cultural purveyor into becoming a major power in the rapidly growing global entertainment and media industry. This leverage was made possible, in large part, by giving up its independence as a medium.

Each of the six major studios is connected with and/or co-owned by other major corporations that are involved with various forms of media and entertainment. Warner Brothers is a part of the

TABLE 3.

Public Perception of Personal Moviegoing Behavior						
	Age 12–17 in 1995	Age 18+ in 1995	Age 12–17 in 1999	Age 18+ in 1999		
Frequent	43%	29%	49%	28%		
Occasional	48%	33%	40%	29%		
Infrequent	5%	10%	5%	13%		
Never	4%	28%	7%	30%		

AOL/Time Warner empire. Twentieth Century Fox is owned by Rupert Murdoch's News Corporation. Paramount is one of the key elements in the Viacom/CBS entity. Disney owns ABC and ESPN, among other properties. Columbia is owned by the Sony consumer electronics giant. Universal is controlled by the Seagrams Company, which also owns distilled liquor and recording business interests. These six, along with the smaller New Line, MGM/UA, Polygram, and Miramax companies, control in excess of 90 percent of the worldwide and domestic film grosses. The films that are distributed by these companies are typically made for a worldwide audience with the type of action and big-budget special effects that are easily transferable between cultures.

In addition to their enormous economic and cultural power as a gatekeeper for what product is able to reach a mass audience, the six major studios are all heavily invested in many other media and entertainment businesses or "platforms." Television (Fox, UPN), publishing (Warner Books), toys (Disney), clothing (Warner Brothers Studio Store), theme parks (Disney, Universal), video games (Pokémon), theater ownership (in a revival of pre-Paramount vertical integration), casinos (MGM), cruise ships (Disney), and the Internet, along with many other businesses, are all increasingly connected with the motion picture business through ownership, co-ventures, or licensing. The brand names of the major studios and their products (Fox, "James Bond," and so on) are so well-established on a domestic and global level that there is little doubt as to the ability of most of them to continue to prosper and expand.

Perhaps the ultimate contradiction of the U.S. motion picture industry is that it thrives because it is no longer the motion picture business. Or, more accurately, the industry is a global phenomenon that has used its strong brand identities to become a leader in the multimedia, multinational media and entertainment industry.

Better than most other industries, the studio conglomerate owners have exploited the twin trends of economic and technological convergence that are again changing the nature of media and the patterns of media usage. The result is an industry that is both faithful to its theatrical roots, as evidenced by the enormous attention that is still paid to the Academy Awards, and agile and fluid enough to maximize new opportunities in production, distribution, and exhibition whatever or wherever they may be.

See also: Edison, Thomas Alva; Film Industry, Careers in; Film Industry, History of; Film Industry, Production Process of; Film Industry, Technology of; Lumière,

Auguste/Lumière, Louis; Ratings for Movies; Television Industry.

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ROBERT V. BELLAMY JR.

FILM INDUSTRY, CAREERS IN

The film industry as a whole may be divided into three interdependent segments: production, distribution, and exhibition. Production is what most people think of when they think of Hollywood the actual creation of motion pictures. Distribution is the network that gets the completed film from the studio to the theaters that are waiting to show it. Exhibition is the operation of the movie theaters—selling tickets, selling concessions, and screening films. However, the film business encompasses much more than that. Forced to sell their exhibition chains in the 1950s, the major studios have diversified their interests. Furthermore, the studios themselves have become units of much larger global conglomerates.

Therefore, in the 1990s, the World Wide Web recruitment site for Universal Studios could state with perfect accuracy:

Picture any large, worldwide corporation. They need all kinds of people for all kinds of jobs, right? Well, Universal Studios is no different. Not only are we a global company, but we're also involved in a variety of different businesses: movies, theme parks, television, consumer products, online services, retailing, and more. Our employees work in many careers, including adminarchitecture/design/creative, istrative. business/strategic planning, communications, development, distribution, engineering, facilities, finance/accounting, human resources, information technology, legal, live entertainment, marketing, medical, motion picture/creative, music/creative, online services, procurement/purchasing, production, real estate, restaurant/food services, retail, sales, studio operations, technical services, television/creative and theme park operations.

A similar list could apply to all of the major studios. Therefore, this entry will focus on careers that are involved with what is most closely associated with Hollywood—motion picture production.

Motion picture production careers can be broadly divided into two groups: above-the-line and below-the-line. Above-the-line positions include the creative and performing personnel, such as writers, directors, producers, and talent. Below-theline positions include the technical and production fields.

Despite the exhaustive listing above, neither Universal nor any of the other movie studio giants posts job openings for "feature film director." By far, the most common career path for those wishing to pursue above-the-line careers is to begin in independent films. Often, such films are wholly financed and created by one or two individuals; however, there are also dozens of small independ-



Director Steven Spielberg (center) works closely with his actors so they know exactly what he wants in a scene to be shot for Saving Private Ryan (1998). (AFP/Corbis)

ent studios, each producing perhaps one or two films a year.

One specific example of the independent studio is Los Angeles Motion Pictures, Inc. Founded in 1997 by its president, Mike Dichirico, the company is divided into two sections, production and digital services. The digital services division provides nonlinear editing, digital frame retouching, and computer animation to outside clients. The production division produces feature films. The former creates a steady income stream, allowing more selectivity in the projects undertaken by the latter. Within the production department, two people are responsible for the execution of a feature film project: the producer and the writer-director. The writer-director handles the creative duties. while the producer seeks funding and handles business logistics. Thus, the heart of the abovethe-line positions are affiliated directly with the studio. Almost all other production personnel are hired as independent contractors, which is the common practice for independent studios.

Despite this, though, entry-level positions can be found at independent companies. At Los Angeles Motion Pictures, Inc., the main such position is production assistant. Production assistants handle all of the countless small tasks that keep a production running. An individual may progress to second assistant director—handling production tasks of more importance—and from there rise to directing or to producing. The studio works on a limited partnership basis with such individuals, in which the would-be director or producer raises at least 50 percent of the costs of the proposed film, the studio raises the rest, and the entities divide liabilities and profits.

As this arrangement would indicate, the wouldbe above-the-line filmmaker needs at least a working knowledge of business, in addition to a thorough understanding of motion picture production. Beyond that, educational requirements vary. Certainly, a degree in film is helpful, but it may not be essential, depending on an individual's previous experience and the needs of the company.

The issue of experience is even more important in any of the below-the-line fields. Author Vincent LoBruto interviewed top cinematographers and film editors for his books Principal Photography (1999) and Selected Takes (1991), respectively, and most of them had earned degrees in film. However, all of the filmmakers had moved up through the ranks, so to speak, in order to reach the upper levels of Hollywood filmmaking. For a cinematographer (director of photography, or DP), the progression is second assistant cameraperson, first assistant cameraperson, camera operator, and director of photography. A second assistant cameraperson is responsible for loading film magazines, doing the slates at the beginning of each shot, and keeping paperwork. A first assistant cameraperson is responsible for pulling focus (adjusting focus at the direction of the camera operator) and for the mechanics of the camera. A camera operator physically executes the shot as the director of photography desires. The DP is the head of a team that includes the assistant camerapersons, the camera operator, the "gaffer" (the head electrician, who arranges the lighting), and the "key grip" (the person who is in charge on set of all camera support equipment). By directing this team, the DP creates the image that is finally seen on film. An editor goes through a similar career progression. One begins as an apprentice editor, then moves up to assistant editor, and finally to editor. And, these are only two of the many specialized arts and crafts that are involved in modern filmmaking, including animation, special effects, stunts, production design, and others.

In conclusion, there are numerous careers available in the field of filmmaking. To the novice, this should serve as an encouragement rather than the reverse. Drive and desire are still the primary factors of success. One advantage that a filmmaker just starting out now has is that all of the major studios and many of the minor ones maintain informative sites on the World Wide Web. The primary guilds (such as the Directors Guild of America, the Writers Guild of America, and the Screen Actors Guild) and unions (such as the International Alliance of Theatrical Stage Employees, Moving Picture Technicians, Artists and Allied Crafts) also maintain websites. The aspiring filmmaker should consult these sites for the timeliest information available.

See also: FILM INDUSTRY; FILM INDUSTRY, PRODUC-TION PROCESS OF; WRITERS.

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CAREY MARTIN

FILM INDUSTRY, HISTORY OF

The process of getting from the early "magic lantern" inventions to the modern motion picture industry has involved a multitude of incremental steps taken to advance both the technology of film and the economic structure that supports the creation, distribution, and exhibition of films. Specific important inventions include the lightbulb, photography, flexible film, the motion picture camera, and the film projector.

Early Photography

Joseph Niépce, Louis Daguerre, and William Henry Fox Talbot are the three major inventors who worked to develop the techniques of photography during the first decades of the nineteenth century. Niépce and Daguerre eventually became partners in France and worked to refine the techniques of photography that are the predecessors of modern instant photography. Talbot, an Englishman who was not aware of the work of Niépce and Daguerre, discovered a method of photography that enabled the making of multiple prints through the use of a negative. It is Talbot's technique that is most akin to the photography process that is used in the modern film industry.

In the 1870s, Eadweard Muybridge, a Britishborn photographer, created the first "motion picture" by using a series of twenty-four cameras set at one-foot intervals to photograph a horse as it galloped along a racetrack. As the horse passed each camera, its hooves tripped threads that were attached to each of the cameras, thereby creating a series of twenty-four images that showed a horse in motion.



During his lifetime, Eadweard Muybridge produced a series of "motion" pictures, including this 1877 series showing a galloping horse and proving that a horse can have all four feet off of the ground at once. (Corbis)

Film Inventions

In 1882, Étienne-Jules Marey became the first person to eliminate the need for multiple cameras. The French inventor did this by capturing motion with a photographic gun that initially used a glass plate that rotated like a gun barrel to capture the pictures. While others subsequently developed similar primitive camera techniques to photograph motion, it was the American inventor Thomas Edison, with the help of his assistant William Dickson, who ultimately developed the basic film camera system that would become the standard equipment of the film industry. After seeing Marey's invention, Edison became convinced that the ultimate solution required a flexible film stock. Therefore, he asked George Eastman, an early leader in the creation of photographic products, to develop such a stock. Eastman successfully produced the flexible stock (patented in 1884), which, according to Edison's specifications, was thirty-five millimeters wide and had two rows of perforations (four holes per frame) that ran the length of the film. By 1892, Dickson had developed a fully efficient camera, the Kinetograph, that used sprockets to advance fiftyfoot lengths of this film stock through the camera to capture films that lasted less than thirty seconds.

The Kinetograph was heavy and bulky, so it was left in a permanent studio that was built espe-

cially for it in West Orange, New Jersey, in 1893. This studio, the Black Maria, turned on a track and had a roof that opened in order to capture the light that was needed for the camera to function properly. Vaudeville acts, jugglers, boxers, and the like were brought in to perform for the camera. The films that were produced using the Kinetograph were displayed in Kinetoscopes, machines that allowed one person at a time to look inside and view the film as it moved in front of a viewing lens. They were coin-operated machines that Edison considered to be the future of the film industry. He concentrated on selling these machines to entertainment parlors and was not particularly interested in the possibility of "projecting" the films for a larger audience to view. Projection, he reasoned, required fewer machines and would bring less financial reward.

Louis and Auguste Lumière, on the other hand, believed that projection would be profitable. To that end, they invented a portable camera, the Cinématographe, that also was capable of projecting the finished film. In December 1895, the French brothers gave the first paid public exhibition of motion pictures (each lasting about a minute) in the basement of a Paris café. Almost immediately, the demand for their film shows resulted in the international production and distribution of their moving photographs.

Film Content

Not only was the Lumière projection method different, their subjects were also different. The Lumières and a team of photographers armed with cameras captured pictures of life as it was in the various cities and towns of the world. Other inventors followed suit, and the competition in the film industry had begun.

The early realistic subjects of the Lumière films gave audiences delight in just seeing movement captured and projected for an audience. Some of the Lumière films are critically acclaimed pieces of photographic art as well. These films were silent, but eventually, live musical accompaniment became common practice. Soon, however, audiences began to tire of the normal everyday realism as the novelty of the medium began to grow thin.

In 1896, magician Georges Méliès was filming everyday life on the streets of Paris when a camera malfunction led him to realize the potential for filmmakers to create new kinds of magic with film. He developed many kinds of special effects, including stop action, fadeouts, reverse motion, and slow motion. Perhaps because these effects worked best within the context of a story, Méliès began to make films that portrayed story lines and followed a narrative structure. His *A Trip to the Moon* in 1902 is probably the most famous of his stories. Such storytelling became the new attraction to the nickelodeons—small storefront projection houses that held fifty to ninety patrons, each of whom paid a nickel to see films.

Almost all films up to this point were created with a fixed camera. Under these circumstances, film content was restricted to a static presentation of the full action that took place in a specific rectangular area in front of the camera (similar to the proscenium presentation of a play performed on a stage). This all changed when Edwin Porter, another Edison assistant, filmed The Great Train Robbery in 1903. Although he followed the new storytelling trend, Porter used new techniques of editing and camera work. He edited the film so that it was clear to the audience that action was happening simultaneously in different locations. He also placed the camera on a moving train, occasionally turned the camera on its pedestal, and moved it from up to down to follow the action. This panning and tilting of the camera was a novel approach to telling a story, and its implementation by Porter signaled a major change in the art of creating motion pictures.

Almost all early films, such as those created by Porter and Méliès, were no more than one reel in length, which limited the length of the films to around ten minutes each, although many were even shorter. The audience, it was thought, could not sit through a film if it were as much as two reels in length. Another characteristic of the time was the lack of known "stars." Films were promoted by the name of the director or studio where they were made. Films might be touted because they were from Edison's company and directed by Porter, for example. Most trained stage actors during this period avoided acting in the films because movies were not seen as serious art. Actors were afraid of being pigeonholed in these less desirable roles if they were seen in a movie. Thus, there were no actors' credits and no names in lights to promote the release of a new picture.

Prior to 1910, companies were spending around \$1,000 per movie for their one-reel productions. This budget covered the cost of set pieces, film, developing, editing, and the equipment needed for the production, as well as \$5 per day per actor for their services. Such limited budgets meant that directors did not shoot many repeated takes to capture a scene for a film. In fact, most early movies were filmed in a couple of days.

Film Art Emerges

The history of the film industry took another major turn when a struggling playwright and stage actor, D. W. Griffith, began working in films. He made his directing debut in 1908 with the creation of *The Adventures of Dollie* for the Biograph Company. His early films followed many of the regular patterns that had been devised by those who came before him, but Griffith began to expand the limits of what was expected of film art. In fact, it was Griffith more than any other person who turned motion pictures into a serious art form, giving it a language that was different from the language of the stage.

Griffith, like Porter before him, realized that the standard practice of setting up a camera and having actors move into and out of a steady shot was insufficient. He realized that the lens had much more potential than the simple framing of a continual space for acting. Griffith learned to use a wide shot of the full scene to establish a setting, provide close-up shots of individual elements of the scene to direct the audience's attention, and



Lillian Gish (right), who starred in The Birth of a Nation (1915), was one of D. W. Griffith's favorite actresses. (Bettmann/Corbis)

supply medium shots to establish greater intimacy between the audience and the actors. He also learned to create specific moods or feelings by the way he juxtaposed shots, used matting to darken the edges of the frame, and paced the cuts between different shots within a scene. As this all implies, Griffith considered the basic element of moviemaking to be the individual shot rather than the entire scene. This forever changed the way movies were made. No longer could the camera act like an audience member at the theater. Now it had become an active player in the construction of the film, showing the viewers exactly what it wanted them to see from a strategically chosen angle and for a specific duration of time.

The changes that Griffith made occurred between 1910 and 1915, and they culminated in the controversial 1915 film *The Birth of a Nation* (based on the 1905 novel *The Clansmen* by Thomas Dixon). With each motion picture, Griffith had gradually convinced his backers to allow him to experiment more and more with style, form, and length. He began making films two reels and then four reels in length. Each change made making films more expensive, but in making *The Birth of a Nation*, Griffith shattered all records. It was the first feature-length American film, it was twelve reels long (165 minutes), and it cost a staggering \$110,000 (some say as much as \$125,000) to produce. However, estimates of its gross boxoffice revenues are around \$50 million due to its artistic mastery as well as its controversial subject matter that applauds ingrained racial prejudice.

While French and Italian filmmakers had created feature-length films several years earlier, they were basically film versions of stage plays with the camera playing the role of observer rather than interpreter. These films influenced the American film scene, but the Europeans lost their lead when World War I began to limit the distribution of European films and made the chemicals necessary for their production scarce. This allowed the American film industry to surpass the European industry in influence and economic development.

During the 1910s, the star system began to emerge in America with actors, such as Charlie Chaplin and Mary Pickford, becoming bigger draws than directors. This occurred simultaneously with an increase in promotion and advertising that increased audience expectations for the films that they were going to see.

The Biograph, Vitagraph, and Edison companies (the three principal early American producers of films) joined forces by combining their patent claims and forming the Motion Picture Patents Company (MPPC) in 1908. Through this company, they tried to exert monopoly control over the industry between 1909 and 1917, primarily through the control of their patented products. However, the proliferation of independent companies and the increasing quality of their films made pursuing alleged patent infringements difficult. Because the MPPC was based in New York, independent production companies moved to Chicago before eventually moving on to southern California, where they were even further away from the control exerted by the MPPC. Thus, Hollywood, with its proximity to vast open spaces and its whole range of topographical features from ocean to mountains, became the production center of the industry.

In the early years, prints of films were sold to distributors. Later, renting the films allowed each exhibitor to show a greater variety of films. Renting also allowed the production companies to retain ultimate control over the distribution and use of their films. As a result, block booking became a common practice, whereby exhibitors were forced to show several mediocre films produced by a company if they wanted to show the one blockbuster attraction created by the company.

The Studio System

The studio system, which flowered from the 1920s to the 1940s, featured big production companies that signed actors to exclusive multiyear contracts. Methods of mass production evolved, which resulted in products that were no longer the work of one master artist, but instead were the result of a collaboration of many artists with specialized skill. These mass-produced films, however, began to have a standard look (e.g., having large chorus lines in musicals) or formula (e.g., ending a western with a shootout where the good guy always won). Although there would be slight differences from movie to movie, they would still be just variations on proven formats. Because studios found that audiences kept coming back to see familiar products, new and unique products were more risky investments.

Synchronized sound made its first real hit in the 1927 *The Jazz Singer*, although the film featured fewer than four hundred spoken words. This started a shift to the new sound technology, and within three years, 95 percent of all new movies were "talkies." Many small independent exhibitors and production companies were unable to support the increased costs of production and sound technology, so they were driven out of business. Additionally, many silent screen actors found themselves out of work as the use of words to tell the story forced changes in the styles of acting and required polished voices to accompany physical expression.

During the Great Depression, movie audiences began to dwindle as economic difficulties caused them to tighten their budgets. Audiences dropped from weekly totals of ninety million to sixty million between 1930 and 1932. The industry responded with the first color film, Walt Disney's animated short film Flowers and Trees (1932), as well as with new genres such as feature documentaries, gangster movies, horror films, and musicals. Because the major studios controlled all of the production, distribution, and exhibition aspects of the business, they were guaranteed an audience for their films regardless of quality, and this contributed to the survival of the industry, mostly intact, through the Depression and World War II. This is not to say that there were no quality productions. In fact, many of the most highly regarded films of all time were created during this period, including Citizen Kane (1941), Gone with the Wind (1939), The Wizard of *Oz* (1939), and *King Kong* (1933).

Between 1945, when World War II ended, and 1948, the film industry reached its zenith with an annual production of more than four hundred movies. In 1948, however, the studios' hold on all aspects of the film business (from production through exhibition) was ended by the U.S. Supreme Court decision in *United States v. Paramount Pictures*. This ruling, also known as the *Paramount* decision, forced the end of block booking and required studios to sell off their exhibition divisions. This ended guaranteed exhibition of the films that were produced by the major studios and allowed independent filmmakers to get their work to the public. At the same time, television was beginning to take hold as a new medium, giving people the ability to see entertainment at home and many families were moving to new suburbs. These factors, along with accusations that prominent members of the film industry had Communist connections and ideologies, led to dwindling attendance at the box office.

The Television Era

As television took hold during the 1950s, the film studios initially took an adversarial position to the television industry. Studios refused to allow their stars to appear on television, boycotted television as an advertising medium, and denied the use of old films for television content. Instead, the industry changed to compete with the new medium, adopting the widescreen format and producing spectacular productions with lavish sets, thousands of actors, and grand vistas. Studios began to try to appeal to smaller segments of the audience with particular films rather than trying to appeal to everyone with every film. They also began to push the boundaries of socially acceptable taste, practice, and beliefs-something that television was restrained from doing.

In subsequent years, the film industry finally adopted the television medium as an ally rather than an opponent. This cooperation has resulted in financial profit from such things as videocassette rentals and fees for showing movies on cable television. In fact, several cable networks, such as Home Box Office (HBO) and Turner Classic Movies (TCM), have devoted almost their entire schedule to showing movies. While attendance at the box office has remained flat for the film industry, overall exposure to the products of the industry is as strong as ever (thanks to these television outlets), ensuring that the film industry will continue to be a dominant media presence.

See also: Chaplin, Charlie; Disney, Walt; Edison, Thomas Alva; Film Industry; Film Industry, Careers in; Film Industry, Production Process of; Film Industry, Technology of; Griffith, D. W.; Lumière, Auguste/Lumière, Louis; Méliès, Georges; Television Broadcasting, History of.

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STEPHEN D. PERRY

FILM INDUSTRY, PRODUCTION PROCESS OF

The film director Billy Wilder once said, "Audiences don't know somebody sits down and writes a picture. They think the actors make it up as they go along." In reality, it takes years and a virtual army of artists to make a film. The filmmaking process varies depending on budget and type of film (e.g., narrative, documentary, animation, or experimental). The process may begin with a producer who has an idea or it can start with a writer who has a screenplay to submit to a producer.

Narrative Filmmaking

Once a producer has arranged the financing, he or she can start to put the production together. As part of this process, the producer supervises crew hires. The first two positions that are filled are screenwriter (if a script does not already exist) and director, although on some films, the producer, director, and writer are the same person.

Preproduction

The screenplay is a blueprint for the production and is used to calculate the budget. In addition to containing the dialogue for the actors, the screenplay provides information about the characters, locations, wardrobe, makeup/hair, sound effects, music, vehicles, animals, special effects, special equipment, stunts, and extras. This information is entered onto breakdown sheets that the production manager uses to compose a production board, which consists of one vertical column for every scene. The columns are arranged in the most logical and economical shooting order, thus helping to determine the number of shooting days.

The director visualizes each scene as shots taken from different camera angles. The director also works with the actors to create memorable characters. The director is instrumental in selecting actors and much of the technical crew. The director of photography translates the director's vision into images by choice of lenses, camera angles, and lighting. The director of photography hires the camera crew, often a camera operator, a first assistant, and a second assistant. Sometimes, the director of photography operates the camera himself.

The production designer works with set dressers, prop runners, and the wardrobe designer to create scenarios that reflect the personalities and lives of the characters. In particular, the production designer works with the wardrobe designer to assure that the textures and colors of the wardrobe and the set complement each other. The wardrobe designer often conducts extensive research to assure that the clothing is accurate for the time period and social setting. He or she may buy clothing, rent it, or have it created. If a film requires special effects, the designers and builders are brought in so they can begin sketching designs for those effects.

A film might be shot at actual locations, or sets might be built on a sound stage. Most films use a combination of these two options. For a location production, the director, designer, and director of photography scout locations with an eye toward the general look as well as to practical concerns about freedom to redress the location, light rigging, sun angle, quietness, privacy, security, and the ability to block traffic. Once locations are selected, the location manager arranges necessary permits and permissions.

Many variables, such as actor availability and budget, determine the amount of rehearsal that takes place during the preproduction phase. The director and actors work on performance and movements. The director previsualizes what action will be covered in long shots, medium shots, and close-ups.

Production

Production involves the actual shooting, which, on average, takes eight weeks. The director and actors rehearse on the set. The director chooses the camera angles to be used for each shot. The director of photography works with the "gaffer," or chief lighting person, to select and position lighting instruments, which "grips" help to rig. The location sound mixer operates the audio recording machine and works with a boom operator. The boom operator positions the microphone close to the actors while being careful to keep the microphone out of the picture.

At the start of each shot, the camera operator films a slate, which is a board that has digital numbers that allow every frame of film to be uniquely identified at twenty-four frames per second. When the hinged bar on the slate is closed, the number advance stops briefly. The audio recorder, on an inaudible track, records corresponding numerical information. When the assistant editor synchronizes the sound to the picture, he or she locates the frame with the first frozen slate number, and the tape player automatically locates the portion of sound tape with the matching numbers. The picture and sound remain in synchronization to the end of the shot. This process is repeated for each shot, and thousands of shots are filmed before the completion of a film.

Usually, a shot is filmed more than once to improve on either a technical element or the performance. For each shot, the script supervisor notes the lens that is used, details of the camera and actor movement, time length of the take, and comments. He or she also indicates which takes will be printed at the film laboratory. Once an acceptable take is made, the crew sets up and rehearses the next shot. Even a simple scene might be covered in four different angles, allowing for creative choices in the editing process.

At the end of each day, the film and sound are sent to a laboratory for processing, workprinting, and sound transferring. The production sound, generally recorded on 1/4-inch audiotape, is either transferred to 35-mm magnetic stock or digitized into a computer for editing. The key crewmembers then screen the footage of the previous day's shoot. The director assesses performances and, along with the director of photography, monitors the effectiveness of the lighting and camera movements. Even when a film is edited digitally (as opposed to the physical film being edited on a flatbed editor that runs picture and sound in synchronization at the projection speed of twentyfour frames per second), it is common to have a film workprint made for the daily screenings, or "dailies."

Postproduction

An editorial team that includes a picture editor and several assistants and apprentices usually



Director Sydney Pollack looks through the camera viewfinder to make sure that what is being shot during a take is actually what he wants to achieve for Sabrina (1995). (Mitchell Gerber/Corbis)

works from the first day of shooting. Assistants synchronize and prepare dailies. The editor, with a nonlinear computer system such as Avid, cuts scenes as they are shot. Digital editing requires that the picture and sound dailies be transferred to videotape, which is then digitized (i.e., converted from an analog format to a digital format) for use on a computer. The editor is then able to organize the selected shots by using the computer keyboard and mouse, rather than physically cutting and taping together bits of film. While an assembly of the entire film may be completed within one to two weeks after the principal photography has been finished, it will be anywhere from two weeks to two months more before the director's cut is ready. If the director has gone over the allotted time for the production process, an accelerated postproduction schedule is required.

The production process results in miles of film. Individual shots must be located in minutes. The filmstrip or the digitized computer image is coded with a set of numbers that identify each of the millions of frames. A system of organization, which can vary from editing room to editing room, is used to catalog each of the shots. One method of organization is to enter shot information into a computer so an editor can locate shots using key words or numbers. The editor spends countless hours in fine tuning the length of a shot down to an individual frame. The film may go through various edited versions before a decision is made on which version works the best.

A music editor is hired when the editor's assembly cut is near completion. The music editor helps devise a temporary musical score based on preexisting music. The music supervisor aids in selecting source music, such as music emanating from car radios or stereos. A sound mix of dialogue and temporary music is completed so the film can be shown to preview audiences. A film can be tested as few as two times or as many as fifteen, with each time employing picture recuts and other editorial changes.

Once recuts are complete, a supervising sound editor oversees a team of sound recordists, editors, and a composer. The supervising sound editor, along with each specialty editor, spots the appropriate tracks to determine where and when sound is to be added or altered.

Automated dialogue replacement (ADR) editors focus on the clarity of each word of dialogue. Despite judicious microphone selection and placement, sound elements such as air traffic may preclude quality recordings. The ADR process may also include adding or changing lines. To rerecord lines, the actor watches the picture while listening over headphones to the original production recording. After rehearsal, the actor performs the lines, usually one or two at a time, while watching the picture. The re-recorded lines, known as loop lines, are meticulously edited to fit the mouth movements on the picture, often by trimming out pauses or sections of words.

Dialogue editors split the dialogue of various characters to multiple tracks based on the microphone placement that was used in the original recording. The dialogue editor also splits off the tracks to be replaced with ADR. The creation of separate dialogue tracks gives the re-recording mixer control over sound balance.

Some films, such as horror, action adventure, and science fiction, employ a sound designer (as

the head of the sound team) to design certain effects and to guide the editors to deliver a consistent sound. Many sound effects libraries exist, some specializing in items such as different types of doors opening and closing. When unable to find an appropriate prerecorded sound, sound designers often create their own effect. The sound of a rocket ship might be created by combining the sounds of various home appliances altered by manipulating speed, reverberation, backward play, and equalization. The foley artist creates sound effects such as footsteps and clothes rustling by actually walking or rustling material while watching the picture, in order to time the effects precisely. These effects are later edited to synchronize perfectly with the picture.

The music editor prepares a music cue sheet for each section of planned music, noting the time of every cut, the dialogue, and significant action, since composed music often must accentuate specific moments in the film. On a feature film, a composer often has only two to four weeks to write forty-five to one hundred minutes of score. The composer writes music in synchronization with the picture, and the music is recorded that way, often by a full symphony orchestra. While some films use much original music, others use previously recorded music. Use of preexisting music must be cleared for copyright permission. On smaller films, the composer, using home studio equipment, might also perform a full score. The music is matched to the picture and edited by the music editor.

Frequently, while all the sound editing is going on, the director and editor make a change in the picture. Such a change requires all of the other editors to make conformations, or changes, in their working copies and to reedit their sound tracks. When the sound tracks are completed, the film goes to the mixing studio where, depending on local union regulations, one or more re-recording engineers sit at a huge multichannel audio console and mix the hundred or so tracks. The mix can take several weeks to complete.

A negative matcher retrieves the hundreds of rolls of camera original film and cuts it to match the final edited version of the film. The film laboratory takes the matched camera original and adjusts the color and brightness of each shot. The laboratory then makes a master from which hundreds of film prints are struck. The extent of theatrical release depends on the distribution budget and the anticipated audiencedrawing power of the film. Additional sources of revenue include home video, product placement, merchandising, and foreign distribution. Sometimes, the sales of film-inspired toys or soundtracks can generate more revenue than the film itself.

Documentary Filmmaking

The production process for a documentary varies greatly depending on the type of film. Unlike narratives, documentaries often do not begin with a screenplay because real events are filmed as they unfold. Historical documentaries, however, often rely on a screenplay that is based on years of research; instead of live-action shooting, they involve animation-stand shooting of photographs and other archival materials.

The crew for a documentary can be composed of only a few people, with the director also functioning as producer, writer, editor, and cinematographer or sound mixer. Or, the crew can include separate individuals who perform each of these functions. The production crew is often kept small so as not to disrupt the events that are being filmed.

Shooting is determined by the unfolding events, and it occurs at real locations instead of constructed locations. The challenges of location shooting are great because the environment cannot be controlled as it can in narrative filmmaking. Depending on the subject matter, a documentary might be shot over several years or several days. The edited film may run anywhere from several minutes to several hours.

If the content focuses on a few people, the director often spends time in preproduction with the subjects so they become comfortable with and trust him or her. The director often strives to reveal not only facts, but to get at the underlying feelings about events.

Concurrent with filming, the director, editor, or assistant logs each shot. Interviews are transcribed. The editor uses these logs to create an edit on paper, figuring out how to structure the material in a logical and emotionally moving way. It is typical for a documentary to have a very high shooting ratio. As much as one hundred times more footage is sometimes shot than is used.

Whereas editor of a narrative film works according to the structure of the preexisting


On a documentary film, the producer often takes a much more active role in the production process, as in this case, where the producer is helping to prepare a cave diver for underwater filming of a nature documentary film in Slovenia and Herzegovina. (Bojan Brecelj/Corbis)

screenplay, the editor or writer of a documentary creates the screenplay from the footage and point of view of the film. In addition, whereas the editor of a narrative film decides which angle to use for any given shot (since the same material is shot multiple times from different camera setups), the editor of a documentary generally has only one take per shot to work with because actions usually cannot be restaged from multiple angles.

Distribution outlets for documentaries include video, CD-ROM, the Internet, public television, art houses, festivals, museums, educational and public library venues, and, for some featurelength documentaries, limited urban releases.

Experimental Filmmaking

Experimental films generally explore alternative content and forms. Often compared to poetry and to the other plastic arts, experimental films deal with a wide variety of subject matter, from personal issues and interior psychological states to the very nature and ontology of the film image. Experimental films are usually independently produced, with one individual often acting as producer, writer, director, sound mixer, and editor.

Photographic equipment employed in experimental films ranges from a state-of-the-art 35-mm camera to a child's toy camera. Some filmmakers bypass the camera completely and draw, scratch, or otherwise work directly on the celluloid, or they construct their films from found or archival footage. A film might be scripted down to the individual frame, or it might be spontaneously and instinctively shot, much in the manner of abstract expressionist painting. One film might have a different image on each frame, while another might consist entirely of one long shot taken by a static, stationary camera.

Though generally short, due to the financial exigencies of independent filmmaking, experimental films might run a few minutes, a few hours, or be virtually endless as in the case of film loops. Experimental films can cost less than \$100, or they can cost many thousands of dollars. Dis-

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tribution outlets for experimental films are similar to, but often more limited than, those for documentary films.

The Future

The process of filmmaking has changed more since the early 1980s than it did in the preceding eighty years. Changes from analog to digital technology have increased the variety of ways in which images and sounds are recorded, manipulated, and edited. There is no longer (if there ever was) one standard process for making a film. The only certainty about the future is that further changes are inevitable.

See also: Film Industry; Film Industry, Careers in; Film Industry, History of; Film Industry, Technology of.

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LILLY ANN BORUSZKOWSKI

FILM INDUSTRY, RATINGS FOR

See: Ratings for Movies

FILM INDUSTRY, TECHNOLOGY OF

During the preproduction stages of a feature film, the screenwriter, director, production designer, and cinematographer may have widely differing visions concerning the ultimate look and sound of the film. Each scene has a series of variables that must be addressed prior to setup and shooting. Decisions about the technology that is to be used during the principle shooting will affect what the audience ultimately sees at the multiplex. Though the director is responsible for the finished product, the key players on the production team are hired for their expertise in the technical craft of filmmaking.

Format and Film Stock

The first decision to be made regarding the technology of a feature film centers on the screen format, which is the ratio of a film's width to its height (i.e., the aspect ratio). All pre-1952 films and most non-high-definition television (non-HDTV) programs have aspect ratios of 1.33:1-or 4 (width) by 3 (height)—which is the same aspect ratio as traditional television screens. It would be unusual for a contemporary film to be shot using the 1.33:1 format, given that contemporary movie theater screens are made to accommodate wider screen formats. Films shot on digital camcorders, including Michael Moore's documentary The Big One (1997), are exceptions. Moore's decision to use the digital camcorder in his guerilla-style documentary led him to use the 1.33:1 aspect ratio.

The more common format choices are the CinemaScope ratio (2.33:1) and the non-anamorphic ratio (1.85:1). The content of the film has much to do with the ultimate decision about format. The film *Titanic* (1998), which featured complex

action sequences, virtually required the use of the 2.33:1 format. Conversely, *American Pie* (1999) was a teenage comedy that kept its characters in tightly framed shots. Therefore, the non-anamorphic ratio was deemed better suited for that film's format. In addition to film content, the equipment that is available will be a factor that helps to determine the final screen format.

Prior to shooting, the director and cinematographer must make a technical decision concerning what film stock to use. The film stock will have a significant effect on the look and feel of the film. *Blair Witch Project* (1999) combined video and grainy 16-mm film to create a realistic, low-budget look. A more traditional approach is to shoot in the Super 35-mm (Super35) format to reduce grain and capture superior contrast ratios. Lower budget films and documentaries might be shot on Super 16-mm (Super16) film.

A decision might also be necessary if a film is going to mix daytime and nighttime scenes. Some cinematographers prefer to use the same film stock throughout the production and use filters to create night sequences during daylight hours. Other cinematographers are adamant about shooting night sequences at night, so they may decide to mix, for example, 200-speed film for the daytime sequences with 500-speed film for the nighttime sequences. Technical decisions about formats and film stocks may seem mundane, compared to other aspects of the filmmaking process, but the choices made in this area will have a direct effect on the decisions that must then be made about cameras, lenses, and lighting.

Cameras and Lenses

Camera selection may appear to be a difficult procedure; however, the choices that are available to filmmakers are somewhat limited. There are only a handful of professional camera makers. The major camera manufacturers include Panavision, \approx aton, and Arriflex. Once the format decision is made, the cinematographer looks at what cameras are available. The ultimate decision will be made based primarily on the cinematographer's experience and preference. With camera and format in mind, lens choice is the next major issue.

Several lenses are used on a feature film, and the decision to use a specific lens is based on the action, composition, and lighting of a particular scene or shot. Unlike cameras, there are many makers of lenses and a wide variety of lens types. The primary companies that produce lenses are Angénieux, Zeiss, and Leitz. For many directors, the decision to shoot Super35 film is based on being able to use spherical lenses. Introduced in the late 1980s, these lenses have great depth of field, feature very wide contrast ranges, and have exceptional resolution performance. The Primo spherical lens has had such a profound effect that its inventors were awarded a Scientific and Engineering Award from the Academy of Motion Pictures Arts and Sciences in 1998. In addition to spherical lenses, a wide variety of fixed-focus lenses and special-purpose lenses can be used by the cinematographer, with the final decision being based on the needs of the director in a given scene. The director, cinematographer, and lighting director must determine, as well, the number of cameras to be used on the shoot.

Prior to the 1980s, almost every motion picture was shot using the single-camera method. The single-camera approach is exacting and methodical. The first step in the process is to shoot the master scene that captures all of the essential action and dialogue. More detailed shots, including close-ups, medium close-ups, and reaction shots, are then shot individually. Each new camera setup is time consuming. A large number of lighting changes and camera setups can often lead to production delays. Throughout the 1990s, the pressure to reduce the shooting schedules of feature film projects led to the increased use of the multicamera technique.

The multicamera technique allows the director to shoot a scene with two or more cameras. Recording the master scene and close-ups simultaneously can make the editing process much easier and generally saves setup time. The multicamera method places demands on the lighting director to light the scene in a manner that accommodates two or three cameras that are shooting simultaneously. When used effectively, the multicamera approach can help the director to trim days from the shooting schedule. While the orchestration that is involved with moving two or more cameras is important, lighting is the key component of the multicamera method.

Lighting

It is safe to say that lighting style and technique set the mood of a scene and can direct the attention of an audience to some desired element within the frame. The depth of field, or number of elements that can be held in focus by the camera, is largely dependent on the lighting. Table 1 provides some of the most common lighting devices and their uses. The lighting crew is responsible for all aspects of lighting technology during production.

The lighting crew consists of the lighting director, who has the primary responsibility for creating the look that is called for by the director; the gaffer, who is the electrician who sets up the lights; and the best boy, who assists the gaffer. Their job collectively is to control the lighting that falls into the camera frame.

The color quality, or the relative amount of red and blue of a light, is measured in color temperature. The color temperature emitted by all light sources, natural or human made, has an effect on the look of the scene. Film stock and lights have been created to take advantage of various color temperatures. Color-negative film stock is designed for exposure at a color temperature of 3,200 degrees Kelvin (K). Many spotlights, called Fresnels, produce the required 3,200-K light. Natural, outdoor light is generally about 5,600 K. Commonly used metal halide arc (HMI) lights produce light at 5,600 K and, therefore, equate natural light. If the camera crew is told to produce an indoor scene at 3,200 K, it could opt to use only Fresnel lighting fixtures and block out all other light sources. It is more common for the crew to work with Fresnels, HMIs, and natural light pouring through existing windows. In such mixed lighting situations, the crew will use gels, reflectors, flags, and a number of other accessories to balance the color temperature of all sources to the desired level. Controlled, professional lighting is generally the key to a professional-looking project.

Sound

To *Star Wars* creator George Lucas, sound is 50 percent of the film. When the sound system fails at a movie theater, people complain vociferously. The art of sound for motion pictures is challenging. A single action sequence in *Titanic* might feature a mixture of realistic ship sounds, crisply recorded dialogue, background cries of passengers, and original music that establishes the mood of the scene. The mixing of audio is handled so expertly that it may belie the fact that almost all of these sound elements were created separately, rather than as part of the actual filming.

TABLE 1.

Туре	Description
Fresnel	A spotlight that is used as a main source of illumination.
Soft Light	Any lighting fixture that reflects light to fill in shadows caused by Fresnels.
Kicker	A smaller light that highlights one aspect of a set or an actor.
Barndoor	A four-leaved metal attachment to a light that restricts the light's direction.
Scrim	A wire mesh screen that is placed in front of a light to restrict the light's intensity.
Gel	Plastic material that is placed over a light source to alter it color or temperature.
Reflector	Large, flat device that is used to bounce light from one source to another
Gobo/Flag	Large, usually black, objects that are used to block light from entering the set.
C-Stand	A clamp device that is designed to hold reflectors, gobos, or other devices.
Light Meter	A device that is used to measure the light in a given scene

During the production, the sound crew uses audio technology to meet their initial goals of consistency of audio and clarity of dialogue. To capture dialogue, the crew may employ tiny, wireless lavaliere microphones that are worn by actors, or they may decide to use the more common boom microphone. The boom operator's job is to ensure that the boom microphones are directionalized toward the actor, yet do not enter the frame of the shot. They must also be consistent in the distance that they establish between the microphone and the actor throughout each take of each scene.

All of the location film sound is recorded on a digital audio recorder and on film. This process is referred to as the double system. It allows the audio team to work on mixing dialogue, music, and sound effects independently in postproduction. Because many scenes in a film may be shot without sound, the supervising sound editor has the responsibility of creating a realistic audio mix for the audience. While the audio postproduction team is working on sound stages, dub stages, and audio control rooms, another team of artists works on the visuals.

Editing and Visual Effects

Once the film is shot, two separate processes will generally occur with the acquired film. The first is editing. Few directors still cut actual film. Steven Spielberg is one exception to this rule. He uses Moviola and/or Steenback film editors to cut



A computer animator at Boss Films designs computer-animated penguins for A Day in the Life of Hollywood (1995). (Galen Rowell/Corbis)

together a final "master" print. However, this is becoming increasingly rare. The most common technology that is used in contemporary film editing is a computer-based, nonlinear editor. The film is "digitized" or transferred from film to computer data. Many film editors use the Avid brand of nonlinear editing. The Avid systems and similar computer-based editors provide a series of editing options, including cuts, fades, and dissolves. The nonlinear system allows directors and editors to make last-minute changes with ease because changes can be made with literally one or two keystrokes at the computer workstation.

The craft known as visual effects was at one time primarily associated with science fiction and high-budget films. It has since become commonplace to use computer-based visual effects in almost every type of film. The possibilities are limitless to a visual-effects team. The processes of color-correcting elements within a scene, removing scratches from a film or adding scratches for effect, and "airbrushing" out unwanted elements from a scene pose little problem with modern technology.

When reshooting a scene is impossible, the visual team can save it in postproduction. For example, in one scene in the film Braveheart (1995), it appears as if thousands of extras are storming across the battlefield. A visual-effects team took the somewhat limited-looking groups of extras that were actually filmed and simply copied and pasted the extras digitally until the battlefield appeared full. The result is both convincing and one of the film's highlights. More complex films, such as The Matrix (1999), feature a dizzying array of visual effects. Many of the film's key sequences were shot with actors in front of green screens. The effects team had to use digital compositing to create futuristic and compelling action sequences. The death of a performer during production, such as when Brandon Lee died on the set of The Crow (1994) or when Oliver Reed died during the production of Gladiator (2000), might force a studio to terminate or recast a project. In these two cases, however, the scenes that remained to be shot for these two actors were completed with the use of computer-generated "virtual" actors.

The pace of computing technology has been so remarkable that entire films are being created on the computer desktop. *Toy Story* 2 (1999) is an example. The film's preproduction, production, and postproduction all took place in the digital domain. The film was even projected at some theaters from a computer hard-drive that was connected to a filmless digital light processing (DLP) projector. The progression of film away from analog toward a digital base is one of several key trends for the industry.

Trends

Several key developments in film technology are changing the production and postproduction process in contemporary filmmaking. These trends are affecting the very heart of the films seen at the multiplex.

Cameras

The physical size of film cameras continues to decrease. This allows directors much more flexibility in obtaining the shots that they need. Because cameras are lighter than ever before, hand-held shots are being used more effectively than at any other time in the history of cinema. The audience may not realize that shots are hand-held, thanks to improvements made in Steadicam products that counterbalance the motion of the camera operator. Smaller cameras can also be attached to radio-controlled devices to follow the action of a scene. As cameras become smaller, the types of shots that are possible increase dramatically.

Video assists are being used more commonly to monitor camera shots. Instead of waiting for the "dailies" to return from the developing lab, directors watch a video monitor to see if a shot is acceptable. Some video assists have a freeze-frame capability that allows the director to call up a previously shot scene and reset all of the scenic elements and actors to ensure continuity from take to take.

A closely followed area in camera technology is that of the "filmless" camera. High-definition cameras are being tested that record images either on digital videodiscs (DVDs) or directly to hard drives. The use of such cameras would allow for instantaneous review and preliminary editing of material while eliminating film and developing costs. Studio pressure to release film content at a faster pace could lead some directors toward digital film acquisition in the field.

Audio

In the realm of sound, film continues to move closer to an immersive experience for audience members. Three formats of digital audio bring six or more channels of audio to moviegoers. The three formats are:

- 1. Digital Theater Sound (DTS), which is a sixchannel digital audio system that reproduces audio from a separate compact disc (CD) that is synchronized to the film,
- 2. Sony Dynamic Digital Sound (SDDS), which was originally a six-channel digital audio system but was expanded to an eight-channel system in the late 1990s, and
- 3. Dolby Digital Surround, or Spectral Recording-Digital (SR-D), which, following the trend toward more immersive audio, improved the original six-channel system by adding speakers at the back of the theater.

Audio engineers continue to experiment with innovations that might result in audio emanating from the ceiling and floor of the theater.

Digitization

The progression of film toward a more fully digital medium seems obvious. Audio production, postproduction, and exhibition continue to be largely digital. Visual effects, titles, and editing are almost predominantly handled at the computer desktop. Filmless DLP projection systems have proven successful in theaters. Home video continues its progression toward DVD and Internetdelivered film content. As a result, the only major analog component of the filmmaking process is the actual shooting of the film. It is not inconceivable that the film technology of tomorrow will be fully digital.

See also: Digital Communication; Digital Media Systems; Film Industry; Film Industry, Careers in; Film Industry, History of; Film Industry, Production Process of; Recording Industry, Technology of.

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DAVID SEDMAN

FIRST AMENDMENT AND THE MEDIA

The courtship between the First Amendment and the mass media can trace its roots back to Colonial America. The mechanical printing press, invented in the fifteenth century, had come across the ocean and was being employed by the American colonies for the dissemination of many messages, some of which were political. England, angered that these certain messages openly criticized their government of the New World, sought to inhibit free speech. The three mechanisms that they used, government censorship, taxation, and seditious libel, comprised America's first encounter with prior restraint.

Early Prior Restraint

The first mechanism of prior restraint in the American colonies was government censorship. This practice, though not shared by all colonies, was a younger brother of England's mandatory licensing of all printing presses. The English licensing, introduced in 1530, required that all persons wishing to run a press meet certain criteria, mainly to refrain from criticizing the church or state. Those persons who published any material without a license were subject to severe penalties. Across the ocean, the American colonies did not require official licensing of newspapers and the like. However, some colonies still exercised the philosophy that printing was under state jurisdiction.

The second mechanism of prior restraint was the 1712 Stamp Act, which England imposed on the colonies. With this act, effective until 1855, publishers had to pay taxes on all newspapers, pamphlets, advertisements, and the paper itself. This meant that not only did the government know who was printing, via tax records, but the government also had monetary control over who could afford to print. Unlike the licensing philosophy, American colonists strongly objected to the taxation, the objection of which manifested itself in several acts of revolt.

The third mechanism of prior restraint was the punishment of seditious libel. Seditious libel was the printed criticism of any people in authority, be they government officials or leaders of the English Church. Consequences for this were so severe that many publishers refrained out of fear from printing anything controversial about an official. However, one man would prompt the colonies to rethink this accepted restraint. John Peter Zenger, publisher of the New York Weekly Journal, printed a negative piece about Governor William Crosby. Crosby reacted to the article by accusing Zenger of seditious libel, thus taking Zenger to court. Before the jury, Zenger, represented by Alexander Hamilton, admitted his "guilt" in publishing criticisms of the governor. However, Hamilton argued that these criticisms were true, in which case the truth should acquit Zenger from any wrongdoing. In the end, the jury decided to release Zenger on the basis that his message, though critical of an official, was nonetheless true. The acquittal of Zenger was the first stepping stone in a series that would finally lead to the birth of the First Amendment. After the American Revolution was fought and won, the new Constitution of the United States was created, and in 1791, the First Amendment was accepted. This first amendment (part of the Bill of Rights) simply stated:

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press, or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

It is unlikely that the writers of this simple sentiment, that "Congress shall make no law... abridging the freedom of speech, or of the press," could foresee the intricate web of arguments that would surround the amendment's interpretation. However, history shows that several competing philosophies and many court decisions would cause this "freedom" to take on different meanings for each new medium.

A nonchalant glance at modern media regulation quickly reveals a disparity between regulation of print media and regulation of electronic media-mainly that there is much less regulation of print media than there is of electronic media. This is because the electronic media, and broadcasting in particular, were treated differently by the U.S. Congress at their inception. The rationale for this difference in treatment for broadcasting was that the airwaves were a scarce, public resource, and that messages traveling on these public airwaves could potentially reach, and indeed affect, a great many more people than print messages. Therefore, the government thought that, in the public interest, it was necessary to regulate broadcasting. Furthermore, broadcasting was seen as a form of interstate commerce, which, under Article I, Section 8, of the U.S. Constitution, Congress had the authority to regulate. Other electronic media were categorized similarly and are regulated under the Communications Act of 1934 as amended by the Telecommunications Act of 1996. Print, however, is only regulated under the ownership, antitrust, and criminal laws shared by all businesses in the United States.

Despite these regulatory differences, all forms of media, be they print or electronic, are subject to the courts. Unfortunately, it is difficult to say with certainty how the courts will interpret the First Amendment for a given media case because the judicial system has frequently changed its philosophies regarding the amendment throughout media history. However, four theories regarding free speech have taken turns influencing judicial decisions, and they continue to influence judges and lawmakers. These theories are the marketplace of ideas, political speech absolutism, absolute expression, and public access.

Theories of Free Speech

The marketplace of ideas theory, introduced in 1644 by John Milton in his book *Areopagitica*, suggests that all ideas should be allowed to be disseminated into the public marketplace. These ideas would then be individually weighed and compared to other ideas in the marketplace. The result would be a forum through which the available ideas would be debated and from which the proverbial truth would emerge. For practical purposes, it is assumed that the public would be able to choose, from the multitude of ideas, which idea would be the most suitable or valid for its time. Because it assumes an open forum, the marketplace of ideas implies that the government should either adopt a *laissez-faire* policy toward media content or promote diversity among mediated messages.

The second theory regarding free speech concerns the absolute freedom of political speech. Championed by Alexander Meiklejohn in the early 1960s, the idea of absolute freedom of political speech proposed that the government should under no circumstances inhibit or interrupt any speech regarding the regulation of the country, community, or self. This speech included scientific, artistic, political, social, and moral or religious speech. It did not, however, include personal, private speech.

The third theory takes Meiklejohn's idea to its limits. This absolutist interpretation of the First Amendment draws its fuel from a U.S. Supreme Court decision (*United States v. Washington Post Co.*, 1971), in which Justice Hugo L. Black, supported by Justice William O. Douglas, wrote:

Both the history and language of the First Amendment support the view that the press must be left free to publish news, whatever the source, without censorship, injunctions or prior restraints.

This stance was translated as the endorsement for the U.S. government to refrain from any and all interference with public or private speech, absolutely. This absolutist interpretation of the First Amendment was too extreme for many to support.

The fourth popular interpretation of freedom of the press is the public access theory that was argued by Jerome Barron in 1967. This theory assumes that the purpose of the First Amendment is to allow the public to openly voice the various opposing views surrounding a public issue. This assumed purpose, whose roots can be seen in the marketplace of ideas and the absolute political speech theories, therefore implies that the general public should be guaranteed access to the different media in order to voice these views. This theory is arguably the most visibly manifested theory in broadcast regulation, as evidenced by the Fairness Doctrine (officially set forth in 1949 by the Federal Communications Commission as *In the*



Reporters gather near pacifists David A. Reed, David P. O'Brien, David Benson, and John A. Phillips as they burn their draft cards at a Vietnam War protest in Boston on March 31, 1966. (Bettmann/Corbis)

Matter of Editorializing by Broadcast Licensees) and other Communications Act of 1934 stipulations that required broadcasters to provide equal opportunity to air the various sides of public issues. Print media, however, were never subjected to access rulings, and broadcasting later received a similar reprieve when the Fairness Doctrine was abolished in 1987.

Tests for Possible Violations of the First Amendment

Regardless of which theory was popular at any given moment, there have always been media messages that would cause such controversy as to require the court system to test their validity against the First Amendment. Therefore, in answer to this periodic need, three main tests eventually evolved that were used widely in U.S. Supreme Court decisions when possible violations of the First Amendment were involved. These tests were the clear and present danger test, the O'Brien test, and the strict scrutiny test.

Clear and present danger has historically been the popular standard for whether the First Amendment has been violated. Seen as early as 1917, clear and present danger is based on the premise that the government may protect citizens from messages that would "create a clear and present danger that they will bring about the substantive evils that Congress has a right to prevent." This statement, written by Justice Oliver Wendell Holmes in Schenck v. United States (1919), was used to convict two men who had circulated print messages against the draft during World War I. It is interesting to note that the same judge later amended his earlier position to specify in Abrams v. United States (1919) that messages must show a purposeful and immediate intent to cause danger.

In 1968, another case gave birth to a new First Amendment test. *United States v. O'Brien* involved a young man, David O'Brien, who was convicted of burning his draft card in front of a Massachusetts courthouse in 1966. O'Brien appealed his conviction on the grounds of free speech, and he won the review of the U.S. Supreme Court. The Court evaluated the case under three grounds. First, the conviction was tested to see if it aided a substantial government interest. Second, the substantial government interest was tested to see if it was necessarily tied to the suppression of free speech. Third, the government's actions were tested to see if they were no more severe than needed to further the substantial interest. This three-pronged test, which led the Court to uphold O'Brien's conviction and subsequently came to be referred to as the O'Brien test, is still used by federal and state courts to decide many First Amendment cases that involve government interference.

A more stringent test of government interference and violation of the First Amendment is the strict scrutiny test, which was first applied in Preferred Communications v. City of Los Angeles (1989). This test mirrors the O'Brien test, but there are two major changes. First, the government interest that the O'Brien test claimed should be "important" or "substantial" must, under strict scrutiny, be "compelling." Second, the way in which the government furthers this compelling interest must be in the least restrictive manner possible, as opposed to "no greater than necessary." The strict scrutiny test is employed whenever a government restriction directly affects First Amendment protections. In contrast, the O'Brien test is used in cases where First Amendment rights are indirectly affected by government involvement. Consequently, the government usually prefers the use of the O'Brien test over the strict scrutiny test because it is easier to prove that an interest is "substantial" rather than "compelling," and it is much easier to argue that an imposed restriction is "no more severe than needed" rather than "the least restrictive manner possible."

Of course, these three tests, which apply to all media, only constitute a fraction of the tests that may apply to broadcasting. Whereas print media enjoy relatively few restrictions and regulations, the electronic media must operate with substantial regulation. For example, section 1464 of the U.S. Criminal Code prohibits the broadcasting of "obscene, indecent, or profane language."

Restrictions on Electronic Media

Through the years, definitions of "indecency" and "obscenity" have evolved as a result of various court decisions, including *Federal Communica*-

tions Commission v. Pacifica Foundation (1978) and Miller v. California (1973), respectively. In both instances, the definitions include an aspect that references current community standards as a guide to identifying indecency or obscenity. Other aspects of the definitions include the identification of such material as offensive, sexual in nature, and devoid of any social value. Clearly, the definitions still require considerable interpretation, as does the First Amendment itself. Therefore, the application of these definitions will change according to the times, morals, and community standards in which the questionable messages are disseminated. Profanity, or the utterance of irreverent words, is not deemed to be seriously offensive, and consequently, cases involving profanity are not often seen in the courtroom.

Many of the historic regulations restricting the First Amendment privileges of the electronic media are still in place. Examples of this include section 312 and 315 of the Communications Act of 1934. Section 312 requires that broadcasters provide airtime to legally qualified candidates during federal elections. Section 315 requires that media outlets that give one political candidate media time must provide an equal opportunity for all other competing political candidates who wish to have media time. Other regulations that restrict the First Amendment rights of the electronic media are more recent, such as the Children's Television Act of 1990, which restricts certain advertising practices and imposes certain programming requirements for children's viewing. However, the general trend appears to be a relaxing of First Amendment restrictions and a more equal interpretation of the First Amendment with respect to both print and electronic media.

An example of the relaxing of restrictions for radio is the landmark case *Federal Communications Commission v. WNCN Listeners Guild* (1981). This case upheld the commission's policy that it would not become involved in the decision of a radio station to change its programming format. Radio could choose its programming strategy without government oversight.

Regarding broadcasting in general, *League of Women Voters v. Federal Communications Commission* (1982) found that the decades-old ban on broadcast editorializing was unconstitutional. In a similar vein, the 1987 repeal of the Fairness Doctrine furthered the freedom of speech of broadcasting by lifting the previous requirement to air opposing viewpoints of controversial public issues in a balanced manner. As a result of these changes, broadcasters gained more control over the content that was aired.

An example of relaxed restrictions for cable television is the outcome of *Federal Communications Commission v. Midwest Video Corporation* (1979). In this case, the U.S. Supreme Court officially struck down the commission's requirement that larger cable systems provide a certain number of public-access channels. The resulting effect of this court decision was to allow cable operators greater freedom in selecting channel line-ups and in acquiring programming.

Other media, such as digital cable, satellite television, digital broadcasting, and the Internet, remain somewhat ambiguous in terms of their First Amendment status. These media, of course, have First Amendment protection. However, recalling the disparate treatment between broadcasting and print, it is uncertain how the newer media will eventually be treated by the government and the judicial system. The merging of broadcast and print characteristics in the various new media will undoubtedly muddy the interpretive waters even more, rendering definitive decisions extremely difficult. Nevertheless, despite conflicts between protection of the public interest and freedoms of speech and press, the relationship between the First Amendment and the media will continue to evolve and shape the messages that are heard.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Communications Act of 1934; Pornography; Pornography, Legal Aspects of; Telecommunications Act of 1996.

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FRANCESCA DILLMAN CARPENTIER

FRANKLIN, BENJAMIN (1706-1790)

A printer, author, library organizer, inventor, diplomat, scientist, philanthropist, and statesman, Benjamin Franklin was born in Boston on January 17, 1703, the fifteenth child of Abiah and Josiah Franklin. At that time, more than half of the booksellers in the New World were within a quarter of a mile of his birthplace. It is little wonder, then, that Franklin learned to read early in life ("I do not remember when I could not read"). He spent many hours poring over the works of authors such as John Bunyan and Cotton Mather, works he found in the small libraries of his father and his friend Matthew Adams. The life-story record Franklin left of his eclectic reading interests demonstrates that it was always socioculturally mediated, no matter what his stage of life or his location. From these works it appears that he developed the sense of duty, self-improvement, and moralism that characterized his adult life. In the works of Enlightenment thinkers, he developed a faith in reason and order and cultivated an interest in science and benevolence.

In 1718, Franklin was apprenticed as a printer to his brother James, publisher of The New England Courant. Under the pseudonym "Silence Dogood," Franklin penned a series of letters in 1722, and although the readers received them favorably, his brother was annoved. In 1723, Franklin fled Boston (with three years left on his apprenticeship) and shortly thereafter took up residence in Philadelphia to work as a compositor in the printing establishment of Samuel Keimer. In 1728, Franklin formed a printing partnership in Philadelphia with Hugh Meredith, and over the years, he became the official printer for several colonial legislatures. Generally, Franklin confined his printing business to practical materials of immediate use and market potential and avoided efforts to produce fine printing.

In 1730, Franklin acquired the *Pennsylvania Gazette* (which Keimer had founded two years earlier), and this newspaper became the centerpiece of his printing business. He made it lively and local, yet balanced enough in his coverage of colonial politics to be open to all parties. "In the Conduct of my Newspaper I carefully excluded all Libelling and Personal Abuse," he later wrote in his autobiography. His "open press" strategy-as much economic as political-became the model most Middle Colonies printers followed in the first half of the eighteenth century. It enabled Franklin to print polemical pamphlets on most sides of any debate. One example of this practice was manifest in the printing opportunities sparked by George Whitefield's Great Awakening revivals of 1739-1741. At his own risk, Franklin published devotional books that Whitefield had recommended, and between 1740 and 1742, he printed forty-three books and pamphlets-both for and against Whitefield and his revivals. By advertising for subscribers in the Gazette, he was able to generate cash in advance of producing copy. In 1741, Franklin began publishing General Magazine (a 70- to 76-page duodecimo monthly modeled after London's Gentleman's Magazine), which carried reports of the proceedings of colonial legislatures and other public issues. Due to lack of interest, however, General Magazine ceased after six issues.

In 1732, Franklin issued the first edition of his *Poor Richard's Almanack*, a small tome consisting of well-known aphorisms that Franklin first appropriated and then modified for a New World audience. "I endeavor'd to make it both entertaining and useful," he said later, "and it accordingly came to be in such Demand that I reap'd considerable Profit from it." It became an immediate bestseller, sold out ten thousand copies shortly after it was published, and made Franklin a celebrated author at home and (eventually) abroad. Franklin also experimented with printing German-language materials, but he ultimately financed Anton Ambruster to run a separate office for this market.

Although Franklin profited most from his newspaper, almanacs, and job printing, he also engaged in what he called "book work." Franklin's printing office doubled as a bookshop where customers could peruse works that Franklin had printed and published, or imported. The latter usually consisted of Bibles and testaments or primary education schoolbooks that generated a steady but not heavy demand. Most bookstore sales came from his own publications.



A 1790 profile engraving from Massachusetts Magazine memorializes Benjamin Franklin. (Corbis)

In 1727, Franklin organized the Philadelphia Junto, a group of twelve like-minded individuals who were interested in self-improvement through discussion of politics, morals, and natural philosophy. Because the Junto was regularly frustrated over a lack of information on which to ground meaningful debates, Franklin recommended in 1730 that the membership begin "clubbing our Books to a common Library" so that each would have "the Advantage of using the Books of all the other Members, which would be nearly as beneficial as if we owned the whole." The experiment was short-lived, however. Too many Junto members despaired of the care and arrangement afforded their textual treasures.

Franklin was undeterred. In 1731, he "set on foot my first Project of a public Nature" and organized the Library Company of Philadelphia, which decades later he referred to as "the Mother of all N. American Subscription Libraries now so numerous." Shares were sold to provide capital to buy books (most of which were ordered from London); annual dues provided for ongoing purchases. Company members were, for the most part, merchants interested in practical information for self-improvement. Franklin served as "librarian" from December 1733 to March 1734, as secretary to the Library Company from 1746 to 1757, and remained a member his entire life. By 1776, at least eighteen social libraries existed in the colonies, all of which were modeled after the Library Company. By the end of his life, Franklin was convinced that social libraries had "improved the general conversation of the Americans."

By the time he had started the Library Company of Philadelphia, Franklin had already perceived British North America's potential as a political and cultural unity and, in part, facilitated movement toward this potential—at least in the culture of print. He did this by fostering an informal network of printers (stretching from South Carolina to Massachusetts) who modeled his precedents. As the deputy postmaster of Philadelphia (1737–1753) and as deputy postmaster-general for the Colonies (1753–1774, serving with William Hunter), Franklin also worked to improve communication and information transfer in the New World.

Franklin, who retired from publishing in 1748 to devote himself to other interests, spent a large portion of his later life living in England and France—serving as the colonies' official emissary to France during the American Revolution. While in Europe, he solicited gifts for the American Philosophical Society (which he had founded in 1743) and negotiated exchange agreements with similar European societies for the society's *Transactions*. After he returned to the newly founded United States of America, Franklin served as a delegate to the convention that framed the U.S. Constitution in 1787.

Few people in colonial America were as influential as Franklin in establishing a culture of print that functioned as a primary agency to facilitate communication and information creation, storage, and dissemination. Franklin married Deborah Read on September 1, 1730, and by her had two children; he also fathered two illegitimate children. When Franklin died on April 17, 1790, his library contained 4,276 volumes. He once joked that he wanted his epitaph to read "B. Franklin, Printer"; the final inscription, however, read "Benjamin and Deborah Franklin." See also: Libraries, History of; Printing, History AND Methods of.

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WAYNE A. WIEGAND

FUNCTIONS OF THE MEDIA

Robert Merton introduced a form of functionalism in his 1949 book *Social Theory and Social Structure*, and that form has been widely adopted by media researchers. His "functional analysis" detailed how the study of social artifacts (such as media use) could lead to the development of theories explaining their "functions." Merton derived this perspective from earlier forms of structuralfunctionalist theories that were used in anthropology and sociology. Functional analysis argues that a society can best be viewed as a "system in balance," consisting of complex sets of interrelated activities, each supporting the others. All forms of social activity play a part in maintaining the system as a whole.

The apparent value neutrality of functional analysis appealed to many media scholars because much early media theory characterized media and media consumption as either "good" or "bad." Functionalists reject this good-bad dichotomy, arguing instead that only objective, empirical research can identify the functions and dysfunctions of media, leading to a systematic appraisal of media's overall effect on society. Functionalist theorists believed that scientists had neither the right nor the need to make value judgments about media when they conducted their research.

Functionalists view activity that contributes to maintaining the society as functional, not good. Disruptive activities are, by definition, dysfunctional, not evil. Some social activities might be found to be functional in some respects but dysfunctional in others. Functionalists also distinguish between manifest functions (i.e., those consequences that are intended and easily observed) and latent functions (those consequences that are unintended and less easily observed).

Functional analysis provided the foundation for many theories of media effects and of much of the related research during the 1950s and 1960s. Researchers found that functional analysis can be very complicated. Some forms of media content can be functional or dysfunctional for society as a whole, for specific individuals, or for various subgroups in the society. Thus, entertaining network television crime shows might be functional for the viewing audience as a whole but dysfunctional for children who learn that aggression is a good way to deal with problems. The functions for society (the larger audience) may be offset by the dysfunctions for an individual child or for a particular group of viewers (children).

This example highlights a major problem with functional analysis. It does not permit the development of definitive conclusions about the overall functions or dysfunctions of media. Researchers can easily avoid drawing controversial conclusions by noting that dysfunctions are balanced by functions. In 1961, for example, Wilbur Schramm, Jack Lyle, and Edwin Parker wrote in their book Television in the Lives of Our Children that although viewing of some forms of violent television content encouraged some children to be aggressive, this was more than offset by the fact that most children show little postviewing aggression. Some kids might even learn how to deal with aggressive playmates. Therefore, as far as the social system is concerned, violent television content does not make much difference despite being dysfunctional for a few children.

Sociologist Charles Wright directly applied functionalism to mass communication in his 1959

book Mass Communication: A Sociological Perspective. He wrote that media theorists "noted three activities of communication specialists: (1) surveillance of the environment, (2) correlation of the parts of society in responding to the environment, and (3) transmission of the social heritage from one generation to the next" (p. 16). Wright added a fourth, entertainment. These became known as the "classic four functions of the media."

Wright's particular contribution was to draw a distinction between the intended purpose of media activity and its consequences (its functions). Nonetheless, for most communication scholars, functions became synonymous with the aims or goals of the media industries themselves. As a result, many critics saw functionalism as doing little more than legitimizing the status quo. For example, surveillance of the environment refers to the collection and distribution of information by the media. People know the fate of the government appropriations bill because they saw it on the news. Correlation of parts of society refers to the interpretive or analytical activities of the media. People know from the newspaper that the bill's failure to pass means no raises for teachers this year. Transmission of the social heritage refers to the ability of the media to communicate values, norms, and styles across time and between groups. What were typical attitudes toward racial minorities in the 1950s? People can see them manifested in old movies and television shows. Finally, entertainment refers to the ability of the media to amuse or entertain.

These are obvious aims of the media, but they may not necessarily be the functions served for the people who consume those media. For example, a television network might air a violent police drama with the aim of entertaining, but the actual function served for the audience might be learning how to solve conflicts. In other words, the aim is not always the ultimate or only function. Critics contend that restricting the study of functions to functions intended by media practitioners (their aims) is likely to ignore many negative effects.

Surveillance activity and its effects on democracy offer an example of how functionalism should be applied to media studies. In their intention to survey the environment, the mass media devote significant resources to the coverage and reporting of political campaigns. But if citizens ignore this coverage, the intended function fails to occur—the environment has not been surveyed despite the efforts of the media. But if citizens do consume the reports, then the intended function—surveillance of the environment—does take place. For surveillance to occur, the transmission of news about important events must be accompanied by audience activity that results in learning about and understanding those events. Simply put, aims become functions only when the interrelated parts of the system operate to produce those functions.

This proper use of functionalism opens the media-society interrelationship to more robust questioning. Might not the frequently shallow, entertainment-oriented coverage of politics by the media actually contribute to dysfunctional media use, as citizens become less involved in the political process because they are turned off not only by the nature of the coverage but by its content? Might not the manifest function served by the media and audience interrelationship actually produce a latent function, the pacification of a citizenry that might otherwise demand real change from its government and politicians? This allowance for dysfunctions and latent functions has resulted in a renewed interest in functionalism among researchers who are skeptical of theories that they consider to be too apologetic or forgiving of routine media practice.

See also: Advertising Effects; Arousal Processes and Media Effects; Catharsis Theory and Media Effects; Cultivation Theory and Media Effects; Cumulative Media Effects; Desensitization and Media Effects; Election Campaigns and Media Effects; Ethics and Information; Mood Effects and Media Exposure; News Effects; Parental Mediation of Media Effects; Social Change and the Media; Social Cognitive Theory and Media Effects; Social Goals and the Media; Society and the Media.

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GAYS AND LESBIANS IN THE MEDIA

In 1997, when Ellen DeGeneres announced on the cover of *Time* magazine that she was a lesbian, and her television character "came out" on the situation comedy *Ellen*, media attention was unprecedented. Partly due to a changing social climate that tolerated gays and lesbians more than in the past and partly due to the fact that television and film depictions of homosexuals were becoming more visible and accurate, a historic moment in media occurred. For one of the few times in television history, the lead character in a major program was homosexual and not shown as a lonely, evil, or homicidal character.

The history of the depiction of gays and lesbians in the mainstream media is a tale of negative and oppressive images. For some time their stories have been limited to suicide, murder, and evil. Vito Russo in *The Celluloid Closet* (1987) lists more than forty examples of the ways gay or lesbian characters in films have died. The rest of his book details the effeminate and sissy stereotypes of gay men in movies, the butch and aggressive women identified as lesbian, and the general images of most homosexuals as victims and villains.

Given the historical invisibility of accurate images of gays and lesbians in mainstream movies and print publications, many gays and lesbians resorted to creating their own media, as Edward Alwood discusses in *Straight News: Gays, Lesbians, and the News Media*(1996). Some of the earliest publications were a 1924 Chicago-area gay newsletter called *Friendship and Freedom*, a 1934 publication titled The Chanticleer, and a 1947 Los Angeles-area lesbian newsletter called Vice Versa. Beginning with the modern gay movement in the early 1950s in Los Angeles, ONE became the first widely circulated homosexual magazine, selling two thousand copies a month. Along with The Ladder, published by the Daughters of Bilitis from 1956 to 1970, and the Mattachine Review, published from 1955 to 1964, these important gay and lesbian media contributed to a growing sense of community and identity. The tradition continues with such widely circulated national magazines as The Advocate (first published in 1967, making it the longest continuously published gay magazine), Lesbian News, Out, and many other lesscommercialized local newspapers, underground "zines," independent films, cable television shows, and World Wide Web sites that are produced by and for gay and lesbian audiences.

It should be remembered that these communitybased media emerged as a reaction to mainstream films, newspapers, radio programs, and television shows that were slow in recognizing gay and lesbian lives. From the 1930s to the late 1960s, the Motion Picture Production Code was used to selfregulate Hollywood movies, and it set out a list of forbidden topics, including "any inference of sexual perversion," (i.e., homosexuality). Before 1930, many pre-code films had explicit references to homosexuals and numerous depictions of crossdressing, but it was not until 1961 that the subject of homosexuality became more overtly depicted. The humorous, innocent sissy characters that were typical of the 1930s and 1940s gave way in the 1960s and 1970s to homosexual characters who

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Shirley MacLaine (left) and Audrey Hepburn play the leads in the 1961 film version of The Children's Hour, in which MacLaine's character is in love with Hepburn's character. (Bettmann/Corbis)

were almost always lonely, predatory, and pathological. Consider, for example, William Wyler's two film versions of Lillian Hellman's play *The Children's Hour*. According to Vito Russo (1987), censors prohibited the 1936 movie (called *These Three*) from depicting a lesbian character; she was changed to a heterosexual woman in love with her colleague's boyfriend. The 1961 version (using the original title of *The Children's Hour*), on the other hand, showed a lesbian character in love with her female colleague, even though the lesbian committed suicide in the end.

As television became more popular, stereotypical images of the effeminate, lonely gay man and the masculine, tough lesbian were dispersed more widely. With an increasingly active gay movement, pressure against the media emerged in 1973 when the Gay Activist Alliance (GAA) in New York confronted executives at the American Broadcasting Company (ABC) about unfavorable treatment of homosexuality. That same year, ABC became the first U.S. television network to air a made-for-television movie about a gay topic, *That Certain Summer.* Within a few years, most major situation comedies, drama shows, and talk shows incorporated gay issues, typically as a special episode, but rarely in terms of a continuing character or plot. By the mid-1980s, however, any attention given to gay issues was, as Larry Gross (1994) points out, almost always framed in terms of AIDS, where gays were once again portrayed as victims or villains.

Following the activism of the Gay & Lesbian Alliance Against Defamation (GLAAD) during the 1990s, there has been a trend toward more accurate and fair images of gays and lesbians in the media. According to Peter Nardi (1997), some of this is due to an increase in the production of media by gays and lesbians themselves. However, the mainstream media are also increasingly devoting more attention to gay images, especially in light of major social, legal, and political issues that have focused on gays and lesbians. Such controversial topics as "gays-in-the-military" and "gay marriage" generated many magazine cover stories, radio and television news features, and central attention on television talk shows. The talk show coverage usually did not contain the disparaging and distorted language that once would have been the norm, yet sometimes there was a sensational and exploitative tone, as Joshua Gamson describes in his analysis of tabloid talk shows in *Freaks Talk Back* (1998).

Television sitcoms, dramas, and news shows have increasingly included continuing characters who are gay or lesbian and stories with gay or lesbian themes. No longer are these forbidden topics or ones used to generate a laugh at the expense of the gay character. During the 1999-2000 television season, around thirty lesbian and gay characters (mostly created after Ellen broke new ground) appeared in prime-time shows, including Will and Grace, a comedy with two openly gay characters in lead roles; the adult cartoon shows, Mission Hill and The Simpsons; and dramas such as NYPD Blue and Dawson's Creek. However, Marguerite Moritz (1994) and Darlene Hantzis and Valerie Lehr (1994) argue that the price paid for the increase in depictions of gays and lesbians in the media is that these new characters look no different from everyone else in television. They are mostly white, middle class, typically desexualized, generally existing outside of any gay or lesbian social context and friendship circles, not threatening to heterosexuals, and usually free from oppression. This minimizes the real-life political, sexual, and social differences that often arise from having to live in a society where people continue to discriminate against and commit violence against gays and lesbians.

A more fair and balanced portrayal of gays and lesbians is also due in part to an increasingly tolerant climate in the media workplace. This new climate allows gay and lesbian employees to have domestic partner benefits, to work with less fear of job discrimination, and, thus, to be visibly present, organized, and open with their comments and creative skills.

The combination of changing societal attitudes toward gays and lesbians, advocacy by gay media watchdog groups, and openness to diversity in the workplace has contributed to a visibility of more accurate images of gays and lesbians in the media.

See also: Film Industry, History of; Sex and the Media; Talk Shows on Television; Television Broadcasting, Programming and.

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Peter M. Nardi

GENDER AND THE MEDIA

The importance of gender in Western culture is illustrated throughout almost all forms of popular communication. From nursery rhymes that provide children with lessons on what boys and girls are made of, to bestsellers that claim that men and women are from different planets, media images are thought to reflect and, in some instances, perpetuate or exaggerate differences between the sexes. The important role that the media play in representing and affecting attitudes and beliefs about gender has been documented in a long history of research that has explored not only the ways in which gender is portrayed, but also the ways in which viewers respond to and are influenced by images of males and females.

Gender Portrayals in Media

Although portrayals of gender have shown considerable changes over the years, media con-

tent continues to feature disparities in the ways in which males and females are represented. This characterization applies to both sheer numbers, or "head counts," and to the manner in which males and females are characterized.

Frequency of Male Versus Female Portrayals

Although the underrepresentation of females in television programming is a phenomenon that researchers have long noted, recent analyses suggest that the proportion of female characters has increased over the years. For example, the content analysis by Nancy Signorielli and Aaron Bacue (1999) of prime-time programming reported trends toward greater representation of female characters between 1967 and 1998, though females continue to represent only 40 percent of the characters in programs aired during the 1990s (up from previous figures of approximately 34 percent).

Of course, the representation of gender varies widely as a function of the genre in question. For example, daytime soap operas, prime-time situation comedies, and prime-time dramas tend to feature more equitable gender representations. However, these genres appear to be the exception rather than the norm. For example, many researchers have noted that programming for children is particularly likely to feature an overabundance of male versus female characters. The analysis by Teresa Thompson and Eugenia Zerbinos (1995) of television cartoons found that among major characters, males outnumbered females more than three to one, and that among minor characters, males outnumbered females almost five to one. Similarly, Signorielli and Bacue (1999) reported that in prime-time programming, action adventure programs feature only 30 percent females (up from 20 percent during the 1960s).

Nonfiction programming also continues to underplay the appearance of females. For example, the content analysis by Dhyana Ziegler and Alisa White (1990) of network newscasts found that only 12 percent of the news correspondents were female. Similarly, television and newspaper reports of sporting events continue to vastly ignore participation by females. Susan Tyler Eastman and Andrew Billings (2000) content analyzed sports reporting on two television programs (ESPN's *SportsCenter* and CNN's *Sports Tonight*) and two newspapers (*The New York Times* and *USA Today*) over a five-month period in 1998. Coverage of women's sports accounted for only 17 percent of sports coverage in USA Today, 9 percent in *The New York Times*, 6 percent on *SportsCenter*, and 4 percent on *Sports Tonight*.

The Nature of Gender Portrayals

In addition to the frequency of representation, numerous studies have pointed out that the manner in which males and females are portrayed is often very stereotypical. For example, the Thompson and Zerbinos (1995) analysis of children's cartoons showed that male characters were more likely than female characters to show ingenuity, to use aggression, to show leadership, to express opinions, to issue threats, and to show anger. In contrast, female characters were more likely than male characters to show affection, to ask for advice or protection, and to engage in routine services.

These behavioral differences found in children's programming parallel other studies concerning portrayals of marital status and occupational roles. Signorielli and Bacue (1999) reported that although a majority of both male and female prime-time characters were portrayed as working outside of the home, working status was evident for a larger percentage of male (76%) than female (60%) characters. Similarly, content analyses of marital and parental roles suggest that the family lives of female characters are portrayed as more important than those of male characters. For example, the content analysis by Donald Davis (1990) of prime-time programs found that among male characters, 60 percent had an unknown marital status and 71 percent had an unknown parental status. For women, these figures were only 31 percent and 48 percent for marital and parental status, respectively.

In addition to noting behavioral and occupational characteristics of media characters, media portrayals of females tend to focus on appearance and sexuality much more than do portrayals of males. This differential attention to appearance can be seen across a number of different types of characteristics. In general, female television characters are younger than male characters, are more likely to be shown displaying sexual behaviors, more likely to be portrayed as thin or physically fit, and are more likely to be shown in revealing or "skimpy" clothing. Similarly, Amy Malkin, Kimberlie Wornian, and Joan Chrisler (1999) found that media that are targeted specifically toward women, such as women's magazines, are much more likely to feature stories concerning dieting, appearance, and fitness than are media targeted toward men.

Uses of Media

Do these differential portrayals of gender translate into different patterns of media consumption for males and females? In some respects, the answer to this question is "no." According to Nielsen Media Research (1998), although females tend to watch slightly more television than do males, these differences vary substantially by the time of day in question and by the age of the viewer. However, the most striking gender differences in media use pertain not to overall consumption, but to differential liking of and reaction to specific types of programming or media portrayals.

Many of the gender differences in media preferences documented in the literature are consistent with stereotypical notions of what males and females should be expected to enjoy. In general, males express greater enjoyment than females for sporting events and sports-related news, for action-adventure programming, and for sexually explicit adult entertainment. In contrast, females tend to report greater enjoyment of entertainment best characterized as drama or romance, including sad films and soap operas. In addition, Tracy Collins-Standley, Su-lin Gan, Hsin-Ju Jessy Yu, and Dolf Zillmann (1996) found that these types of gender differences that are typical among adult media consumers are also evident among children as early as nursery school, though they do appear to increase as children age.

Possible explanations for why these gender differences exist are numerous and complex. Some research has focused on different aspects of media content that may help to explain the differential preferences of males and females. For example, some researchers have explored the idea that viewers respond more favorably to programming that features same-sex characters. Consistent with this idea, entertainment generally enjoyed more by females than males, such as soap operas and "tear-jerkers," tends to focus more on female characters, while typical male-oriented fare such as sports and action adventures tends to focus more on male than female characters. In addition to the gender of the characters, other researchers have pointed out that many differences in the media preferences of males and females may reflect differential responses to images of violence. In general, males have a greater affinity than do females for portrayals of aggression featured in a wide range of entertainment including sports, cartoons, horror films, and war films.

In addition to focusing on media content, other researchers have focused on aspects of gender role socialization that may help explain the media preferences of males and females. For example, given that boys are taught from a very early age that displays of sadness are inappropriate for males, whereas girls are taught that displays of anger and aggression are inappropriate for females, viewers may be less likely to enjoy entertainment that elicits emotional responses that are deemed "inappropriate" for one's gender. Furthermore, from this perspective, viewers who do not strongly internalize societal standards of genderrole expectations should be less likely than moretraditional viewers to show typical patterns of gender differences in media preferences. Support for this position has been reported in several studies showing that, in some instances, gender-role self-perceptions (i.e., masculinity and femininity) predict media preferences beyond that explained by biological sex alone.

Effects of Gender Portrayals on Viewers

In addition to examining the differential viewing preferences of males and females, a sizable amount of research has also examined the ways in which images of gender influence the attitudes, beliefs, and behaviors of viewers. Many of these studies have explored the idea that television viewing may lead to greater gender stereotyping, particularly among younger viewers. Although some researchers such as Kevin Durkin (1985) have argued that other social influences, such as parents and peers, overwhelm the influence that the media play in gender-role development, many studies employing a variety of methodologies have reported small to moderate relationships between television viewing and endorsement of traditional gender-role attitudes.

Some researchers have also voiced concerns that unrealistic media images of women focusing on appearance and body size may serve to set a standard of female beauty that is unnaturally thin. From this perspective, media consumption may lead to very harmful behavioral consequences, such as bulimia and anorexia nervosa. Consistent with these concerns, Kristin Harrison and Joanne Cantor (1997) reported that among women in their sample, media use (and particularly magazine reading) predicted an increased drive for thinness and a greater level of body dissatisfaction.

Finally, some research on media and gender has focused attention specifically on male viewers and the ways in which media images of gender influence their attitudes and beliefs about women. In particular, numerous studies have suggested that some portrayals of females (particularly sexual portrayals) may lead to increased acceptance of sexual aggression or sexual callousness. Although most of the research in this area has focused on the effects of pornography, a sizable amount of research has explored more mainstream entertainment fare, such as R-rated movies. For example, Daniel Linz, Edward Donnerstein, and Steven Penrod (1987) have conducted a series of studies showing that long-term exposure to Rrated horror films, such as Texas Chainsaw Massacre, quickly desensitize viewers to sexual aggression, leading to lower levels of concern about actual instances of victimization.

Given the evidence suggesting that media images of gender may lead to harmful or negative effects, some research has explored the possibility that media content may be used to affect the attitudes of viewers in prosocial or beneficial ways. In this regard, research suggests that in some cases, media portrayals may be successful in reducing sex-role stereotyping. For example, Robert Liebert and Joyce Sprafkin (1988) reported that nine- to twelve-year-old children expressed greater acceptance of nontraditional gender-role behaviors (e.g., careers for girls, nurturant behavior for boys) after viewing Freestyle, a thirteen-part television series featuring nontraditional gender portrayals. Also, Joyce Jennings, Florence Geis, and Virginia Brown (1980) showed that exposure to commercials featuring women in nontraditional roles increased the self-confidence of women.

Despite this success, other studies have suggested that gender-role attitudes and beliefs may be so firmly entrenched for some viewers that attempts at counter-stereotyping may meet with considerable challenges. For example, Ronald Drabman and his colleagues (1981) showed children a video that featured a female physician (Dr. Mary Nancy) and a male nurse (Dr. David Gregory). When asked to recall the video, more than 95 percent of the first- and second-graders in the sample incorrectly identified the physician as male and the nurse as female. Similarly, Suzanne Pingree (1978) found that eighth-grade boys in her sample reported more gender stereotyping after viewing commercials featuring nontraditional portrayals of women than after viewing traditional portrayals. These results should not be interpreted as suggesting that positive media images of gender are inconsequential. Rather, they point to the importance of considering how the existing attitudes and beliefs of viewers about gender play a role in their interpretation of nontraditional portrayals.

Conclusion

The portrayal of gender has shown considerable changes over the years, with female characters now receiving greater and more-favorable representation. However, traditional portrayals of gender are still prevalent, with these differences reflected both in terms of the preferences of viewers and in the ways in which viewers are affected by media content. As media images of men and women continue to progress and as researchers devote more attention to the ways in which media content can be used for prosocial ends, popular images of males and females may move away from reflecting or perpetuating gender stereotypes, and move toward celebrating differences and enhancing equality.

See also: BODY IMAGE, MEDIA EFFECT ON; PORNOG-RAPHY; SOAP OPERAS; TELEVISION BROADCASTING, PROGRAMMING AND; VIOLENCE IN THE MEDIA, ATTRACTION TO; VIOLENCE IN THE MEDIA, HIS-TORY OF RESEARCH ON.

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Mary Beth Oliver Chad Mahood

GEOGRAPHIC INFORMATION SYSTEMS

Information systems may be broadly divided into nonspatial and spatial categories. Most information systems, including management information systems, do not refer their data to a spatial coordinate system. For example, payroll records are usually linked to a person rather than a specific location. Spatial information systems refer data to some coordinate system. For example, architectural software records the spatial relationship of beams to the foundation of a building but not necessarily to the location of the beams or the building on Earth's surface. Geographic information systems (GISs) are a subset of spatial information systems that do refer information to location.

Locations in a GIS are usually referred either directly or indirectly to coordinates denoted by latitude, longitude, and elevation or depth-or some projection of these onto a flat surface. The sciences of geodesy (concerned with the size and shape of Earth and the determination of exact positions on its surface) and cartography (concerned with the creation of maps) are therefore integral parts of geographic information science in general and of geographic information systems in particular. The combination of science and technology required for a GIS is reflected in the range of available GIS software. Some GIS software has been developed from specialized architectural drawing packages, some from computerized mapping systems, some from geographic extensions of relational databases, and others from mathematical graphing and visualization software. GISs vary in sophistication from systems that simply show the location of items ("what-where systems") or that allow the user to search for information with a location-based query ("where-what systems") to relational databases that are searchable by feature, attribute, relative location, and absolute location.

Conceptual Elements

Conceptually, a GIS consists of a data input subsystem, a data storage and retrieval subsystem, a data manipulation and analysis subsystem, and a reporting subsystem. The data input subsystem may include arrays of values (raster data or imagery), points, lines or areas constrained by coordinates (vector data), or tables of attribute data. Common data input methods include raster scans of existing maps or images, satellite and aircraft imaging systems, digitizing the vertices of map points, lines, or areas to generate vector files (electronic line drawings), uploads of coordinate data from global positioning system (GPS) receivers, or uploads of flat files of attribute data.

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The data storage and retrieval subsystem is usually a relational database similar to those used in other branches of information science with extensions for manipulating location-based or georeferenced metadata and data. Georeferenced data are usually stored in one of three forms: raster, vector, or flat files. Noncoordinate-based locations, such as street addresses, may be referred to coordinate-based locations through a process known as geocoding, which assigns coordinates to each feature.

The data manipulation and analysis subsystem translates the data into a common format or formats, transforms the data into a common map projection and datum for compilation, performs calculations, and facilitates analysis of the data with regard to shape, contiguity, orientation, size, scale, neighborhood, pattern, and distribution with location-based queries. Therefore, this manipulation and analysis component of a GIS enables geographic knowledge management. Such systems are used to estimate landslide current risk, calculate property values and tax assessments, and manage wildlife habitat.

Some sophisticated GISs also allow the user to take geographic knowledge management to the next level by incorporating a modeling capability. The modeling capability allows the user to adjust variables and mathematical relationships between variables (algorithms) in the situation represented by the GIS to help determine the probable cause of the situation and to simulate what might occur if the situation were to change. Some GISs automate this last capability via built-in or modular computer programs such that the GIS becomes a geographic decision support system (GDSS). GDSSs are used to model the effect of various land-use policies on urban growth, the effect of timber cutting patterns on soil erosion, and the effect of toxic waste dumps on groundwater quality. The accuracy of a GDSS is commonly evaluated with time-series historical and real-time data.

The reporting subsystem of the GIS displays the processed information in tabular, graphic (e.g., histograms, pie charts, and surfaces), or map form, depending on the information need of the user and the capability of the GIS. The first two types of report are similar to those of most other information reporting systems. The map form links GIS to the sciences of geodesy and cartography as well as computer mapping, image processing, and visualization technologies.

Physical Elements

Physically, a GIS usually consists of input hardware and software, magnetic or optical storage, a central processing unit with GIS software, and output hardware and software. The advent of networks and the Internet has resulted in a phenomenal increase in the variety and amount of input hardware for GISs. Traditional sources of geographic information (input) include scanners, digitizing tables, keyboards, pointers, and mice. Software for GIS input includes raster-to-vector conversion programs, image processing and classification programs, geocoding packages, and various digitizing packages for translating analog maps and drawings into a vector-based GIS.

The heart of a GIS is computer hardware and software. Growth in the number and capability of computers was essential to the development and widespread use of GISs. Rapid increases in the performance/price ratio of computer hardware and decreases in overall cost for entry-level computer systems between 1985 and 2000 facilitated the rapid growth of GISs. Input hardware such as color scanners and GPS receivers decreased by a factor of ten during that period. A usable workstation including a central processing unit, disk storage, CD-ROM drive, monitor, random-access memory (RAM), keyboard, and mouse decreased in cost from several thousand dollars in 1985 to less than \$1,000 in 2000.

Affordable input and processing hardware expanded the market for GIS software from tens of thousands of users to hundreds of thousands of users between 1985 and 2000. This resulted in the evolution of easy-to-use commercial GIS software with graphic user interfaces from the previous, difficult-to-use UNIX-based command-line systems of the mid-1980s. Similarly, the cost of sophisticated graphic user interface (GUI) GIS software decreased to less than \$3,000 and simple systems to less than \$100. The core technology necessary for GIS is now well developed, and the price of GIS technology is no longer a barrier to its widespread use.

The Information

While technology and its cost were key factors in the explosive growth of geographic information science after 1985, the primary fuel for the adoption of GIS and the development of geographic information science was the availability of lowcost, entry-level geographic information from federal, state, provincial, and tribal governments. Efforts by the U.S. Geological Survey, the Bureau of the Census, the National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency (EPA), the military, and academia led to the development of a limited number of data formats and metadata exchange standards based on those of the Library of Congress and the Federal Geographic Data Committee. These agencies made their data and standards available to the public and the value-added industry at little or no cost. These early efforts led to increased governmental and public awareness of the utility of GIS and, at least, the beginnings of interoperability with regard to GIS software, data, and metadata.

The Future

The growth rate of GISs seems likely to increase. The advent of the Internet has resulted in new possibilities for geographic information capture, exchange, storage, analysis, and dissemination. Internet map and geographic information servers, distributed storage, federated electronic clearinghouses, online data access, enhanced visualization tools viewable through simple and GPSaware Internet browsers and other thin-clients decrease the cost barriers for the GIS and flatten its learning curve still further. The economies of scale and tremendous value added by networking geographic information systems allow users to share expensive information resources such as satellite data for collaborative education, research, and planning purposes, all of which used to be prohibitively expensive.

Low-cost, high-accuracy GPS receivers in combination with wireless telecommunications are rapidly increasing the amount of georeferenced information. GISs are now used to help manage the construction and maintenance of both the wired and wireless parts of the Internet as well as to synchronize its servers. As bandwidth expands and compression techniques improve, large amounts of real-time, raster-based information, including satellite imagery and three-dimensional visualizations, will be added to Internet-based GISs. Wireless networks, bandwidth, GPS, satellite imagery, and improved visualization make geographic information more plentiful and easier for users to interpret. This will drive the demand for ancillary georeferenced information. For example, if users know where they are via GPS, they may wish to query an Internet-based GIS to find the nearest restaurant. Eventually, georeferenced information will increase to the point where the terms "information system" and "geographic information system" are synonymous in the minds of most users and information scientists.

See also: Databases, Electronic; Digital Commu-Nication; Internet and the World Wide Web; Knowledge Management; Satellites, Technology of; Telecommunications, Wireless; Visualization of Information.

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RICHARD BECK

GLOBALIZATION OF CULTURE THROUGH THE MEDIA

The received view about the globalization of culture is one where the entire world has been molded in the image of Western, mainly American, culture. In popular and professional discourses alike, the popularity of Big Macs, *Baywatch*, and MTV are touted as unmistakable signs of the fulfillment of Marshall McLuhan's prophecy of the Global Village. The globalization of culture is often chiefly imputed to international mass media. After all, contemporary media technologies such as satellite television and the Internet have created a steady flow of transnational images that connect audiences worldwide. Without global media, according to the conventional wisdom, how would teenagers in India, Turkey, and Argentina embrace a Western lifestyle of Nike shoes, Coca-Cola, and rock music? Hence, the putatively strong influence of the mass media on the globalization of culture.

The role of the mass media in the globalization of culture is a contested issue in international communication theory and research. Early theories of media influence, commonly referred to as "magic bullet" or "hypodermic needle" theories, believed that the mass media had powerful effects over audiences. Since then, the debate about media influence has undergone an ebb and flow that has prevented any resolution or agreement among researchers as to the level, scope, and implications of media influence. Nevertheless, key theoretical formulations in international communication clung to a belief in powerful media effects on cultures and communities. At the same time, a body of literature questioning the scope and level of influence of transnational media has emerged. Whereas some scholars within that tradition questioned cultural imperialism without providing conceptual alternatives, others have drawn on an interdisciplinary literature from across the social sciences and humanities to develop theoretical alternatives to cultural imperialism.

Cultural Imperialism and the Global Media Debate

In international communication theory and research, cultural imperialism theory argued that audiences across the globe are heavily affected by media messages emanating from the Western industrialized countries. Although there are minor differences between "media imperialism" and "cultural imperialism," most of the literature in international communication treats the former as a category of the latter. Grounded in an understanding of media as cultural industries, cultural imperialism is firmly rooted in a political-economy perspective on international communication. As a school of thought, political economy focuses on material issues such as capital, infrastructure, and political control as key determinants of international communication processes and effects.

In the early stage of cultural imperialism, researchers focused their efforts mostly on nationstates as primary actors in international relations. They imputed rich, industrialized, and Western nation-states with intentions and actions by which they export their cultural products and impose their sociocultural values on poorer and weaker nations in the developing world. This argument was supported by a number of studies demonstrating that the flow of news and entertainment was biased in favor of industrialized countries. This bias was clear both in terms of quantity, because most media flows were exported by Western countries and imported by developing nations, and in terms of quality, because developing nations received scant and prejudicial coverage in Western media.

These concerns led to the rise of the New World Information Order (NWIO) debate, later known as the New World Information and Communication Order (NWICO) debate. Although the debate at first was concerned with news flows between the north and the south, it soon evolved to include all international media flows. This was due to the fact that inequality existed in news and entertainment programs alike, and to the advent of then-new media technologies such as communication satellites, which made the international media landscape more complex and therefore widened the scope of the debate about international flows.

The global media debate was launched during the 1973 General Conference of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in Nairobi, Kenya. As a specialized agency of the United Nations, the mission of UNESCO includes issues of communication and culture. During the conference, strong differences arose between Western industrialized nations and developing countries. Led by the United States, the first group insisted on the "free flow of information" doctrine, advocating "free trade" in information and media programs without any restrictions. The second group, concerned by the lack of balance in international media flows, accused Western countries of invoking the free flow of information ideology to justify their economic and cultural domination. They argued instead for a "free and balanced flow" of information. The chasm between the two groups was too wide to be reconciled. This eventually was one of the major reasons given for withdrawal from UNESCO by the United States and the United Kingdom-which resulted in the de facto fall of the global media debate.

A second stage of research identified with cultural imperialism has been associated with calls to revive the New World Information and Communication Order debate. What differentiates this line of research from earlier cultural imperialism formulations is its emphasis on the commercialization of the sphere of culture. Research into this area had been a hallmark of cultural imperialism research, but now there is a deliberate focus on transnational corporations as actors, as opposed to nation-states, and on transnational capital flows, as opposed to image flows. Obviously, it is hard to separate the power of transnational corporations from that of nation-states, and it is difficult to distinguish clearly between capital flows and media flows. Therefore, the evolution of the debate is mainly a redirection of emphasis rather than a paradigm shift.

It has become fashionable in some international communication circles to dismiss cultural imperialism as a monolithic theory that is lacking subtlety and increasingly questioned by empirical research. Cultural imperialism does have some weaknesses, but it also continues to be useful. Perhaps the most important contribution of cultural imperialism is the argument that international communication flows, processes, and effects are permeated by power. Nevertheless, it seems that the concept of globalization has in some ways replaced cultural imperialism as the main conceptual umbrella under which much research and theorizing in international communication have been conducted.

Media, Globalization, and Hybridization

Several reasons explain the analytical shift from cultural imperialism to globalization. First, the end of the Cold War as a global framework for ideological, geopolitical, and economic competition calls for a rethinking of the analytical categories and paradigms of thought. By giving rise to the United States as sole superpower and at the same time making the world more fragmented, the end of the Cold War ushered in an era of complexity between global forces of cohesion and local reactions of dispersal. In this complex era, the nation-state is no longer the sole or dominant player, since transnational transactions occur on subnational, national, and supranational levels. Conceptually, globalization appears to capture this complexity better than cultural imperialism. Second, according to John Tomlinson (1991), globalization replaced cultural imperialism because it conveys a process with less coherence and direction, which will weaken the cultural unity of all nation-states, not only those in the developing world. Finally, globalization has emerged as a key perspective across the humanities and social sciences, a current undoubtedly affecting the discipline of communication.

In fact, the globalization of culture has become a conceptual magnet attracting research and theorizing efforts from a variety of disciplines and interdisciplinary formations such as anthropology, comparative literature, cultural studies, communication and media studies, geography, and sociology. International communication has been an active interlocutor in this debate because media and information technologies play an important role in the process of globalization. Although the media are undeniably one of the engines of cultural globalization, the size and intensity of the effect of the media on the globalization of culture is a contested issue revolving around the following question: Did the mass media trigger and create the globalization of culture? Or is the globalization of culture an old phenomenon that has only been intensified and made more obvious with the advent of transnational media technologies? Like the age-old question about whether the egg came before the chicken or vice versa, the question about the relationship between media and the globalization of culture is difficult to answer.

One perspective on the globalization of culture, somewhat reminiscent of cultural imperialism in terms of the nature of the effect of media on culture, but somewhat different in its conceptualization of the issue, is the view that the media contribute to the homogenization of cultural differences across the planet. This view dominates conventional wisdom perspectives on cultural globalization conjuring up images of Planet Hollywood and the MTV generation. One of the most visible proponents of this perspective is political scientist Benjamin Barber, who formulated his theory about the globalization of culture in the book Jihad vs. McWorld (1996). The subtitle, "How Globalism and Tribalism Are Reshaping the World," betrays Barber's reliance on a binary opposition between the forces of modernity and liberal democracy with tradition and autocracy.

Although Barber rightly points to transnational capitalism as the driving engine that brings Jihad



A McDonalds advertisement from the 2000 Beijing Chaoyang International Business Festival illustrates how global that particular aspect of Western culture has become. During its first ten years in China (1990 to 2000), the food chain expanded to include 270 stores in 50 Chinese cities. (Reuters NewMedia Inc./Corbis)

and McWorld in contact and motivates their action, his model has two limitations. First, it is based on a binary opposition between Jihad, what he refers to as ethnic and religious tribalism, and McWorld, the capital-driven West. Barber (1996, p. 157) seemingly attempts to go beyond this binary opposition in a chapter titled "Jihad Via McWorld," in which he argues that Jihad stands in "less of a stark opposition than a subtle counterpoint." However, the evidence offered in most of the book supports an oppositional rather than a contrapuntal perspective on the globalization of culture. The second limitation of Barber's book is that he privileges the global over the local, because, according to him, globalization rules via transnational capitalism. "[T]o think that globalization and indigenization are entirely coequal forces that put Jihad and McWorld on an equal footing is to vastly underestimate the force of the new planetary markets. . . . It's no contest" (p. 12). Although it would be naíve to argue that the local defeats the global, Barber's argument does not take into account the dynamic and resilient nature of cultures and their ability to negotiate foreign imports.

Another perspective on globalization is cultural hybridity or hybridization. This view privileges an understanding of the interface of globalization and localization as a dynamic process and hybrid product of mixed traditions and cultural forms. As such, this perspective does not give prominence to globalization as a homogenizing force, nor does it believe in localization as a resistive process opposed to globalization. Rather, hybridization advocates an emphasis on processes of mediation that it views as central to cultural globalization. The concept of hybridization is the product of interdisciplinary work mostly based in intellectual projects such as postcolonialism, cultural studies, and performance studies. Hybridization has been used in communication and media studies and appears to be a productive theoretical orientation as researchers in international media studies attempt to grasp the complex subtleties of the globalization of culture.

One of the most influential voices in the debate about cultural hybridity is Argentinean-Mexican cultural critic Nestor García-Canclini. In his book Hybrid Cultures (1995), García-Canclini advocates a theoretical understanding of Latin American nations as hybrid cultures. His analysis is both broad and incisive, covering a variety of cultural processes and institutions such as museums, television, film, universities, political cartoons, graffiti, and visual arts. According to García-Canclini, there are three main features of cultural hybridity. The first feature consists of mixing previously separate cultural systems, such as mixing the elite art of opera with popular music. The second feature of hybridity is the deterritorialization of cultural processes from their original physical environment to new and foreign contexts. Third, cultural hybridity entails impure cultural genres that are formed out of the mixture of several cultural domains. An example of these impure genres is when artisans in rural Mexico weave tapestries of masterpieces of European painters such as Joan Miró and Henri Matisse, mixing high art and folk artisanship into an impure genre.

In media and communication research, the main question is "Have transnational media made cultures across the globe hybrid by bringing into their midst foreign cultural elements, or have cultures always been to some extent hybrid, meaning that transnational mass media only strengthened an already-existing condition?" There is no obvious or final answer to that question, because there is not enough empirical research about media and hybridity and because of the theoretical complex-

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ity of the issue. What does exist in terms of theoretical understanding and research results points to a middle ground. This position acknowledges that cultures have been in contact for a long time through warfare, trade, migration, and slavery. Therefore, a degree of hybridization in all cultures can be assumed. At the same time, this middle ground also recognizes that global media and information technologies have substantially increased contacts between cultures, both in terms of intensity and of the speed with which these contacts occur. Therefore, it is reasonable to assume that transnational mass media intensify the hybridity that is already in existence in cultures across the globe. Consequently, the globalization of culture through the media is not a process of complete homogenization, but rather one where cohesion and fragmentation coexist.

See also: Cultural Studies; Culture and Communication; Culture Industries, Media AS; Cumulative Media Effects; McLuhan, Herbert Marshall; Political Economy; Social Change and the Media; Social Goals and the Media; Society and the Media.

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MARWAN M. KRAIDY

GLOBALIZATION OF MEDIA INDUSTRIES

In the 1960s, Canadian professor Marshall McLuhan predicted that television media would create a "global village" where "time ceases, space vanishes." McLuhan's prophecies have come true, but even he could not have predicted the degree of globalization and convergence of technology that now exists throughout media communications. Since the 1960s, the rise of global media and multinational media companies has greatly influenced-if not transformed-the ways in which people think and interact, as well as how they gain access to and communicate information. With globalization, constraints of geography are reduced, but social and cultural interconnectivity across time and space is increased. Media are obviously important to globalization; they provide an extensive transnational transmission of cultural products, and they contribute to the formation of communication networks and social structures.

The manner in which media have expanded globally, yet converged technologically since the mid-1970s, is quite remarkable in its scope and integration. Millions of people now listen to "local" radio from a computer anywhere in the world. Modern television has changed the way that world affairs are conducted. Online users can access video graphics on any one of millions of websites. U.S. films are "greenlighted" (i.e., given the go-ahead for production) based on their



On May 31, 2000, Cable News Network (CNN) founder Ted Turner spoke to the CNN World Report Conference in Atlanta, Georgia. From an initial 200 employees in 1980, CNN had grown to include 4,000 people in 37 bureaus worldwide by 2000. (AFP/Corbis)

potential to attract a global audience. Advances from satellite technology to digitally based, increasingly interactive media have made such a global media environment possible.

The Rise of Global Media

When the first communications satellite, Telstar I, was launched in 1962, few people predicted the major effect that satellite technology would have on global media. Although satellites helped to deliver such transforming events as the first moon walk and coverage of the Olympics in the 1960s, modern global media industries can be traced to 1975-the year when Home Box Office (HBO), a service owned by Time, Inc., decided to use satellite technology to show a championship boxing match to subscribers in two U.S. cable television systems. The experiment proved so successful-even enlightening-that HBO soon began to use satellites to distribute more programming, not only to its own systems but to cable system operations throughout the United States.

HBO's entry marked the beginning of the explosive growth of cable television in the United States—from only 12 percent of U.S. homes in 1975 to nearly 70 percent in 2000—and opened the floodgates for other media companies that quickly saw the value of using satellites to expand their business.

The greater significance of HBO's "experiment" was that television industries no longer viewed themselves as "earthbound"—tied strictly to telephone lines or broadcast station signals—and bounded by their geographic borders. Worldwide transmission and distribution of media communication—information, entertainment, persuasion—was viewed as an attractive opportunity for media companies and individuals and entrepreneurs with the vision to take their media products to the global market.

The most globally minded media visionary was Ted Turner, who first used satellite technology to turn his "local" independent television station into "Superstation" WTBS. This led to the formation of the Cable News Network (CNN) in 1980. Many people thought that Turner was "crazy" for establishing a cable news network that would always be on the air, but CNN soon grew to have enormous influence on viewers around the globe.

CNN is considered by many people to be the "flagship" for media globalization. Turner transformed his Atlanta-based company into a credible international news service. The company's aggressive strategy of covering news whenever and wherever it happens, of breaking the news first, and of going live from the scene is important to the globalization of media industries. Former U.S. President George H. W. Bush once even quipped, "I learn more from CNN than I do from the CIA."

By the mid-1980s, various countries began to subscribe to CNN's satellite feeds. In less than twenty years from its creation, CNN (or CNN International) had viewers in more than 150 nations around the world. One of CNN's most intriguing concepts is "CNN World Report," a truly international newscast that presents stories from almost every point of the globe.

The emergence of CNN also sparked the development or expansion of other international news services, including BBC World, a television service started in 1995 that has grown to reach some 167 million weekly viewers in nearly 200 countries.

A second significant satellite channel began within a year of CNN's debut. On August 1, 1981, Warner Amex Satellite Entertainment Company launched Music Television (MTV), the first fulltime music video channel. Rock-'n'-roll, radio, television, and youth culture around the globe would never be the same. MTV asked viewers to "think globally, act locally." The music and entertainment channel affected nearly every aspect of world popular culture-music, fashion, art, advertising, and movies. MTV has grown to the point where it is delivered to nearly 70 million households in the United States and to more than 100 million households in Europe, Asia, South America, and Russia. Together, CNN and MTV illustrate the emerging importance of communication-not only to reduce time and space but to convey both news and entertainment values to a global audience.

Globalization and the Internet

As satellite-delivered cable television continued to expand throughout the 1980s, the development and growing use of personal computers and the Internet added new dimensions and opportunities in worldwide media. In the early 1990s, the large increase of desktop computers and connections over the public telephone networks allowed for the exchange of messages (e-mail), computer bulletin-board postings, information files, and computer programs with tens of thousands of other computers in the same network.

The Internet came of age as a communications medium with the creation of the World Wide Web (i.e., the Internet's graphical interface) by British engineer Tim Berners-Lee in 1991 and the invention of the first graphical browser (i.e., Mosaic) in 1993 by Marc Andressen at the National Center for Supercomputing Applications (NCSA) at the University of Illinois.

In 1989, America Online (AOL) launched a text-only service for Macintosh and Apple II computers; they added a Windows version in 1993. AOL, led by cofounder Steve Case, soon focused on building a "global community" of subscribers and entered into international partnerships with media companies in Latin American and in specific key countries such as Germany and Japan. In 1993, AOL acquired Global Network Navigator as a platform for direct Internet service. A joint venture with German conglomerate Bertelsmann AB created European online services in 1993. By the end of 1993, AOL had more than half a million members. After launches in the United Kingdom, Canada, and France in 1996 and in Japan in 1997, AOL passed the point where they had one million members outside of the United States.

In the late 1990s, when other online services focused on games, shopping, and business, AOL aggressively sought to "brand" its name throughout the world. Through these attempts to have its name considered to be synonymous with the Internet, AOL secured and interconnected subscribers in fourteen countries—including Australia, Brazil, Canada, France, Germany, Hong Kong, Japan, Latin America, and the United Kingdom—and seven languages. By 2000, AOL had 21 million customers in the world—3.2 million of which live outside the United States. AOL-owned CompuServe has 2.5 million subscribers.

AOL is the largest of thousands of companies that use the "information superhighway" to transmit media content, sell or advertise products, or send information. The Internet carries enormous amounts of information—combining voice, video, graphics, data, and computer services—around the globe. The Internet and other media technologies are empowering members of virtual communities throughout the world. New digital-age printing costs little to operate and reaches audiences of millions in an almost instantaneous fashion. In sum, the Internet speeds the delivery of information and communication throughout the world, but it also eases the individual user's access to that information and communication.

Globalization of Media Ownership

The growth of any media industry is predicated on the economic potential for growth and expansion. Part of the reason for globalization is not only the development of technology, but also the growth of multinational companies that seek to expand economic opportunities throughout the world. Through consolidation, global media companies are becoming increasingly larger in size but fewer in number. New technologies of digitization and multimedia and network integration have allowed for rapid structural globalization of communication. Rupert Murdoch owns media properties in the United States, Europe, Asia, and his native Australia. Japanese companies, such as Matsushita and Sony, own U.S. movie studios. These "conglomerates" seek to "vertically integrate" to control all aspects of production, distribution, and exhibition of content.

Successful channels such as Murdoch's Star TV are conglomerates of national and regional channels designed to meet the different political and cultural needs of their respective audiences in China, India, and other countries. Other multinational consortiums also own satellites and cable/DBS (direct broadcast satellite) systems in Europe, and Japan has several DBS systems. Companies such as Sony and Matsushita equip many of their new television sets and videocassette recorders with built-in DBS receivers.

AOL purchased CompuServe in 1998 and Netscape in 1999 and works with "strategic worldclass partners" such as Bertelsmann AB (Europe, Australia), Cisneros Group of Companies (Latin America), Royal Bank (Canada), Mitsui & Co., Ltd., and Nihon Keizai Shimbun (Nikkei) in Japan. Mitsui owns 40 percent of AOL Japan, while Nikkei owns 10 percent. AOL also developed a partnership with China.com, a Chinese- and English-language service that began in Hong Kong in 1999. The \$181 billion merger between AOL and Time Warner in 2001 further expanded the boundaries of global media conglomerations. AOL is the world's largest Internet service provider (ISP) and instant messaging (IM) service, while Time Warner is an entertainment empire that owns and operates popular video programming networks, multiple sports franchises, magazines, music recording labels, a broadcast television network, and the second largest cable system operator in the United States, as well as companies that produce and distribute films and television programming. AOL Time Warner's combined resources and infrastructure suggest almost unlimited possibilities for the production, distribution, and exhibition of media content on a global scale. This trend for companies to consolidate and to develop multinational partnerships is expected to continue.

Continuing Convergence and the Transition to a Digital World

As the companies that own the media industries become larger, the lines that once separated the various media also will become smaller. Convergence refers to the melding of the computer, the television, the telephone, and satellites into a unified system of information acquisition, delivery, and control. These are held together by a global network of satellite dishes, copper, coaxial, fiber-optic wires, and the accelerating flow of digital bits and bytes.

Communication theorists, computer specialists, media moguls, telecommunications leaders, and Wall Street investors have found common ground in the belief that the Internet is evolving into the premier medium of the twenty-first century. Already, by the year 2000, nearly one billion people were using the Internet on a regular basis. Because of its ability to convey both sequential and nonsequential writing, e-mail, audio and visual images, animation, audio conferencing, and multimedia presentations, the Internet has become the embodiment of the global information superhighway. Philips Electronics, a U.S. company, has already introduced "WebTV." In 1999, AOL signed pacts with DirecTV, Hughes Network System, Philips, and Network Computer to help bring interactivity to the television experience.

Convergence of technology increases the power of large multinational companies, but it

also empowers individuals with the ability to choose their channels and to dispatch their own descriptions of what is happening to a rapidly expanding online audience. For example, firsthand information and eyewitness accounts of the Serbian conflict of the 1990s came from the professional corps of print and broadcast reporters, but it also came from amateurs who had computers, modems, cellular telephones, digital cameras, and access to e-mail. The riveting and insightful email dialogue between two high school students, one in Kosovo and the other in Berkeley, California, was recycled in newspapers and read throughout the world. Using websites and chat groups on the Internet, monks, farmers, housewives, paramilitary leaders, and propagandists in Serbia, Kosovo, Albania, Macedonia, and Montenegro told, with varying degrees of accuracy and trustworthiness, about their beleaguered cities, towns, and refugee camps.

Emerging technologies are rapidly transforming the global media landscape. The Internet and the World Wide Web, wireless communications, and digital video technology are creating a new global communication environment in which the roles of media consumer and content creator often blur. Increasingly, media consumers from throughout the world have unprecedented choice and control over the media experience, selecting not just what they watch, read, or hear, but when and where they do so.

By the late 1990s, much voice, sound, and image communication was being converted to digital coding, a system that grew out of computer and data applications. Advances in transmission systems have also greatly facilitated the capabilities of modern telecommunications, making it possible to send messages, whether voice, data, or image, across different communication routes and computer systems. Digitalization will bring crystal clear, "high-definition" pictures and hundreds of additional channels, but it will also make television sets interactive, similar to personal computers.

Ramifications of Media Globalization

The digital age has the potential to provide an unprecedented richness of new sources of information, diversity of views, and a variety of perspectives that will not be bound by geographic or even political barriers. However, the free flow of information across any boundary is not without detractors. For "information rich" countries such as the United States and many Western European countries, the global flow of information across national boundaries is a positive consequence of globalization. However, the flow of media content is not equal between developed and developing countries. The globalization of media content means cultural values are far more likely to be transmitted from the United States to other countries than to the United States from other countries. Some would go so far as to say that "globalization" of the media industries is Westernization.

Certainly, all forms of information and entertainment contribute to social learning, the process by which people come to know their society and its rules and absorb its values, beliefs, and attitudes. U.S. movies, television, music, and magazines compete with and sometimes replace native versions in many countries. Advocates of the "global village" can aim at spreading Western culture and lifestyle through the mass media or strive for a real global culture of democratically integrated markets, ideas, and potentials. This new media, which will not divide along the traditional lines of delivery that were established by print, broadcast, and cable, will provide shared media experiences that will be created at least in part by those same people who receive it.

See also: Cable Television, History of; Commu-Nity Networks; Digital Communication; Digital Media Systems; Globalization of Culture through the Media; Internet and the World Wide Web; McLuhan, Herbert Marshall; Satellites, History of; Telecommunications, Wireless.

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ROGER COOPER

GREELEY, HORACE (1811-1872)

Two features of Horace Greeley's life make him notable in the fields of communication and journalism. The first is his rise to publisher of one of the most powerful newspapers in the nineteenth century, the *New York Tribune*. The second is his career as a writer of editorials and lectures for the popular "lyceums"(i.e., lecture series that provided education to the public on a variety of topics).

In his autobiography, *Recollections of a Busy Life* (published four years before his death), Greeley recalled the misery of his family's chronic, debt-ridden existence when he was a child: "Hunger, cold, rags, hard work, contempt, suspicion, unjust reproach, are disagreeable; but debt is infinitely worse than them all" (Greeley, 1868, p. 96). This statement characterizes the drive that turned a child from an impoverished farm family into one of the most influential newspaper editors of the nineteenth century.

Greeley took his first job on the path to journalism in East Poultney, Vermont, as a printer's apprentice, at the age of fifteen. In 1831, he went to work in Pennsylvania for the Erie Gazette, and later, he worked as a printer in New York City for the Spirit of the Times, the Morning Post, and the Commercial Advertiser. In 1834, two events that would shape Greeley's influence on the world of newspapers and on his own career as a politically minded publisher occurred: (1) he founded his New Yorker, a literary magazine, and (2) he joined the Whig party of New York. Joining forces with Thurlow Weed, an editor of the Albany Evening Journal, and William H. Seward, the Whig candidate for governor of New York in 1837, Greeley founded the Jeffersonian, a Whig paper. In 1840, Greeley also initiated the Log Cabin, a Whig paper designed to support the presidential candidacy of William Henry Harrison. Once Harrison was elected, and after Harrison's untimely death soon after he became president, Greeley published the first issue of his own newspaper, the *New York Tribune*, on April 10, 1841. Described as "A New Morning Journal of Politics, Literature and General Intelligence," the newspaper promised "to advance the interests of the people, and to promote their Moral, Political and Social well-being."

Thus began Greeley's tenure as an editor who crusaded against slavery, capital punishment, class injustice, and marital infidelity and who wrote editorials in favor of labor rights, protective tariffs, westward expansion, and women's rights (not suffrage). Greeley was a strong shaper of public opinion whose own views were loyal to Whig party causes, such as protection of industry, but who desired his newspaper to be politically neutral. Believing that newspapers should provide a forum for debate, Greeley's newspaper featured writings by such luminaries of the nineteenth century as Margaret Fuller and Karl Marx. The New York Tribune was known for its quality reporting of local, national, and international events, for its inclusion of various genres of writing, such as poetry and criticism, and for its embodiment of the virtues of a free press. It became one of the first great American newspapers, reaching a circulation of almost 300,000 by 1860. One of Greeley's most famous editorials, "The Prayer of Twenty Millions," was a plea to President Abraham Lincoln to authorize military commanders to free slaves during 1862. Lincoln's famous reply, that his concern was saving the Union, regardless of slavery, shows how Greeley's clout led many leaders of the day to engage with him editorially.

Throughout his lifetime, Greeley championed a variety of causes, some of them seemingly contradictory. He advocated protective tariffs but supported the presidential candidacy of the Republican party, which favored tariff reduction. He was apparently an inelegant speaker with a squeaky voice and a literary style, both of which combined with his eccentric and ill-fitting dress to give an impression of a well-schooled but painfully awkward orator. Nonetheless, Greeley gave extensive lectures on labor, education, and farming techniques throughout the country at agricultural fairs and lyceums. He was known as an articulate and opinionated speaker.

Greeley wrote twelve books in his lifetime, and four of them encapsulate his career as a journalist and statesman. The first, Hints Toward Reforms (1853), is a 400-page collection of his lectures at lyceums and agricultural fairs. Characterized as "editorials on legs," these lectures range widely in topic from labor to religion to slavery, thereby showing Greeley's own range of interests. The second, A History of the Struggle for Slavery Extension or Restriction in the United States, is an excessively detailed account of slavery in the United States, overlaid with Greeley's political commentary on the ordinances and bills that fueled the institution of slavery from the eighteenth century onward. This book, published in 1856, has been praised for its journalistic detail and research. The third, An Overland Journey, from New York to San Francisco, in the Summer of 1859, is a travelogue of Greeley's ventures west to California, complete with details of modes of transport and the variety of natural phenomena he witnessed. It is this work that may have contributed to Greeley's fame for the phrase "Go west, young man," which was actually coined by John Soule, an Indiana editor, in 1851. Finally, Greeley's 1868 autobiography, Recollections of a Busy Life, traces his life from the Puritan New England roots through his newspaper days. Included in this book are accounts of the U.S. Civil War and a discussion of the deaths of his children (he lost five out of seven). Comprehensive and evocative, it is considered to be on par with Benjamin Franklin's famous autobiography.

Greeley was the Republican candidate for president in 1872, but he was soundly defeated by the incumbent, Ulysses S. Grant, in an election that coincided with tragedy in Greeley's personal life, as he faced his wife's death and his own failing health.

See also: NEWSPAPER INDUSTRY, HISTORY OF.

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The campaign materials for Horace Greeley's 1872 run for the presidency included sheet music for "Horace Greeley's Grand March." (Bettmann/Corbis)

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SUSAN ROSS

GRIFFITH, D. W. (1875-1948)

David Wark "D. W." Griffith advanced the motion picture from a cheap amusement to an art form. Ironically, this theater-trained dramatist and would-be playwright developed many of the cinematic techniques that lifted the motion picture out of the shadow of the stage and gave it its own language and style.

Griffith began acting in films in 1907 at a salary of five dollars per day working under early director Edwin Porter. Griffith was hesitant to act in films, fearing this could hurt his stage career, but he needed the money. His playwriting background also helped draw him to the movies because he could earn extra money by writing story ideas for films. His story ideas soon landed him a job with the Biograph Company. Between 1908 and 1910, he directed 206 short one-reel films, averaging about two films per week. Each reel of film lasted approximately ten minutes. From 1910 to 1912, Griffith directed 104 two-reel films. Initially, there was resistance in the industry to extending a film beyond one reel. Biograph even released some two-reelers as separate films, such as His Trust, Part I and His Trust, Part II (also referred to as His Trust and His Trust Fulfilled). However, demand from customers to see both parts of a two-reel film together eventually led to the success of the longer films.

Across these hundreds of films can be seen the incremental steps of creating an art form. While early filmmakers such as Porter and the Lumière brothers (Louis and Auguste) used moving cameras, close-up shots, excellent photographic composition, and editing techniques, it was Griffith who understood the use of these techniques to create meaning. Griffith discovered what it meant to use close-up shots juxtaposed with long-range shots or medium shots. Griffith gradually developed his techniques of editing film so that the changes in camera angles, distance from the subject, pace of edits, and sequence of edits all carried meaning for the viewer. Griffith learned to direct the viewer's attention to specific detail in a scene, ensuring that the viewer would be led to specific conclusions related to the plot of the film script. In short, Griffith showed how the filmmaker could gain control over the emotional response that the audience had to a film.

Many of these advances were the result of changing the basic unit around which a film was built—from the individual scene to the individual shot. Early filmmakers relied on the scene as the basic unit of action. Thus, the camera would often capture an entire scene of action in one take. Griffith began using several takes from multiple camera angles to create one scene using each shot to specific advantage. This was, perhaps, his most important contribution to the art.

In 1913, Griffith stretched the running time of a movie to four reels with *Judith of Bethulia*. He went on to create the first American feature-length film two years later with *The Birth of a Nation*, which was twelve reels in length. With this film, Griffith brought together for the first time in one film most of the basic cinematic techniques that are still used in modern filmmaking. Still considered to be one of the most remarkable cinematic successes in the history of motion pictures, *The Birth of a Nation* was as controversial as it was successful (financially and artistically).

The film (based on the 1905 novel The Clansmen by Thomas Dixon) reflected the racial bias of Griffith's upbringing as the son of a Confederate Army officer. As with many of his films, the story line of The Birth of a Nation was built around the ravages of the American Civil War. Griffith emphasized the villainy of a mixed-race character and showed his abhorrence for the romantic intentions that a former slave showed toward the daughter of a white family. In general, he portrayed African Americans as being innately inferior to Caucasians. The "heroes" in the section of the film set in the post-Civil War era were the members of the Ku Klux Klan, a group that grew in power, influence, and infamy in the wake of the film. Due to the inflammatory content of The Birth of a Nation, protests and attempts to censor it were common. However, these only served to further the fame of the film and draw the audience to the theaters. By some estimates, the film, which had an original budget of between \$110,000 and \$125,000, grossed as much as \$50 million during it run at the box office.

Griffith was surprised to be accused of being anti-Negro. He had failed to understand the need for equality among the races, believing it was enough that the film's white characters had treated the African Americans kindly. Still, he seems to have realized the error of his prejudice in the making of his next film, *Intolerance* (1916), although that film was as big a financial failure as *The Birth of a Nation* had been a success. *Intolerance*, which departed from the successful narrative style that Griffith had refined, relied instead on a new technique of montage that wound four stories around each other in order to emphasize the movie's idea or theme of intolerance—at the expense of focusing on telling a specific story. The American audience of 1916 could



D. W. Griffith directs one of his early silent movies. (Bettmann/Corbis)

not cope with the demands of viewing this advanced style, and it has taken decades for film audiences and many filmmakers to become sophisticated enough to begin to appreciate the montage method. Soviet filmmakers did appreciate his innovation, however, and began to use montage techniques to bolster the focus on ideas and emotions in the propaganda films that followed the Russian Revolution.

Griffith participated in the formation of United Artists in 1919, along with Mary Pickford, Charlie Chaplin, and Douglas Fairbanks. However, his last successful film, *Way Down East*, was made only two years later in 1921. After that, critics became more hostile as he lost touch with public taste. Griffith finally left United Artists in 1924, due to his own mounting debt and the dismal box office performance of his films. After a monumental failure with *The Struggle* in 1931, Griffith gave up directing.

While Griffith established many of the modern film techniques, some even way ahead of their time, his subject matter failed to keep up with the changing world of the 1920s and 1930s. He fought losing battles against the star system (which gave prominence and power to the actors), as well as other shifts in the culture of the film industry. He lived his last seventeen years on a remnant of his once vast fortune.

See also: Chaplin, Charlie; Film Industry, History of; Film Industry, Production Process of; Lumière, Auguste/Lumière, Louis.

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GROUP COMMUNICATION

Families, friendship circles, work teams, committees, and sports teams are all examples of groups. Individuals belong to many types of groups. The quality of people's everyday lives depends in important ways on the groups to which they belong. Much of the work and many of the decisions that shape the world depend on the actions that groups take. Groups are important because they influence the way in which people experience and understand the world. The study of group communication helps further the understanding of how groups function in influencing individuals and society. Additionally, the study of groups can lead to innovations in such things as technology, government, and organizational policy.

Defining a Group

To understand groups, there must be some way of determining what makes a collection of people a group. The number of members can be used to distinguish groups from other forms of social behavior, such as crowds, organizations, and interpersonal relationships. Groups, which are obviously bigger in size than interpersonal relationships but smaller than crowds or organizations, typically have around five members (but can be as large as twenty members). This supports the theory that the ideal decision-making group consists of five members (plus or minus two). While it is useful, the number of members does not capture exactly what makes a collection a group.

A group is not a crowd or a mob. As with crowds (such as those that gather for sporting events or around the scene of an accident), groups focus their attention on particular matters of interest. Unlike crowds, groups are more than just a collection of individuals. People come together in groups to accomplish a set of goals and to work together to accomplish those goals. Crowds disperse once the event that draws their attention is over, but a group remains intact.

A group is not an organization. As with organizations (such as business firms or school districts), a group has rules and expectations that help members accomplish shared goals. Unlike organizations, groups do not develop a bureaucracy to organize members and do not hire managers to enforce the rules. Instead, members of small groups typically know each other, develop informal rules and norms, and monitor each other's behavior.

A group is not an interpersonal pairing of two individuals. As with interpersonal relationships (such as those between friends, parents and children, or coworkers), group members interact with each other and influence each other at a personal level. Groups, however, include at least three people who have a common relationship and develop a sense of mutual belonging that differs from any interpersonal relationship that might exist between any two given members of the group.

Because the number of members is just a useful starting point for understanding groups, it is important to understand that a collection becomes a group only when the members (1) share a goal, (2) hold expectations over each other about participating in and belonging to the group, (3) create identities for the group and its members, and (4) influence each other and develop strategies and tactics to control each other and maintain the group.

Function of Group Communication

The term "group communication" refers to the messages that are exchanged by group members. These messages, whether verbal or nonverbal, are important to groups because it is through the exchange of messages that group members participate, maintain the group identity, determine goals, motivate participation, and do the many things that keep the group intact. For example, a soccer team can be considered to be a group, but one would not expect a soccer team to exist or compete with other soccer teams without exchanging messages. How would team members share information about the game plan? How would they make collective decisions in executing the game plan? How would members build the relationships that help each member understand who to trust in the critical moments of a game? How would members create the team spirit that motivates each member to play their best game possible?

Examining group communication is fundamental to understanding groups. The messages that are exchanged by group members provide evidence of the nature of the group. The messages that are exchanged identify whether the group is a social group or a task group. The messages also reveal what roles specific members play in a group. Imagine a family trying to decide what to do during the two weeks in the summer when all the family members are free to do something as a family. Should they go on vacation, stay home and relax, paint the house, or have some parties with extended family and friends? The types of messages that are exchanged and the manner in which the messages are exchanged can be used to describe such group characteristics as the structure of the family, who is in control, and the group's collective identity. However, messages are more than just a signal about what the group is.

Group communication is important because it is through messages that groups make decisions, manage conflict, and build the rapport that is necessary to keep the group going in difficult circumstances. The exchange of messages shapes what the group will be and what the group can accomplish. The way in which, for example, a family exchanges messages about pending choices shapes important features, such as how members understand each other, whether they will respect each other, and whether they will be motivated to make the decision happen.

The Importance of Studying Group Communication

The study of group communication often challenges folk wisdom. It is a common belief, for example, that more communication is better. Research suggests, however, that group discussion leads to the polarization of opinions; that is, group decisions tend to be either more cautious or more risky after group discussion of a choice. This occurs because group members want to appear correct, which leads them to exaggerate their positions in the direction that the group favors. Shifts toward more risky or cautious decisions also occur because group members tend to present more arguments that support the direction that the group favors. More communication, then, is not in principle better than less communication. The point of studying group communication is to provide insight into the sometimes hidden aspects of groups.

Studying group communication can reveal why particular decisions are made while other decisions are not. One might believe, for example, that people are individuals who make their own choices based on personal beliefs and values. However, studies on such diverse things as how people choose candidates for elected office or how people select which technology to adopt show that individuals are quite susceptible to the influence of the opinion leaders in the most important small groups to which they belong. Indeed, the ways in which individuals express their personal identity are often intimately tied to what their peer groups deem fashionable at the time.

Studying group communication refines, and often changes, the everyday beliefs about how groups work. It is an important field of study because it allows for a better understanding of how groups cooperate, make decisions, influence their members, accomplish their goals.

Specific Subjects of Study

Group communication touches many aspects of group life. The study of group communication tends to focus on group processes and how group communication can be improved. The topics that have been most important in the study of group communication all relate to the exchange of messages. Researchers study how group factors influence the exchange of messages; they also study the reverse, which is how the exchange of messages influences the group. The latter area has become increasingly important in the field of group communication.

"Group dynamics" is a general term created early in the history of the study of groups. Kurt Lewin coined the term to refer to what happens in group situations. The point was to draw attention to the fact that what happens in groups is active and vibrant and is not simply determined by larger social and historical forces. Many of the other key topical areas emerged from this term.

"Leadership" is one of the first, and longest lasting, areas in the study of groups. The goal in this area is to understand what makes leaders effective. If researchers can identify these factors, then it may be possible to develop methods and training from which all groups could benefit.

"Decision making" is another dominant area in group communication research. The goal in this area is to understand the factors that influence groups to make good decisions and bad decisions. The hope is that decision-making practice can be improved by figuring out these factors.

"Social influence" refers to how the messages produced by group members affect the conformity (and deviance) of group members. This includes the study of power, conformity, deviance, and leadership.

"Group process" refers to the functions that communication plays in groups and to the way in which communication in groups becomes patterned and sequenced over time. There is a great deal of interest in how group process affects group outcomes such as decisions and leadership. These interests include, for example, how computermediated communication influences group communication.

"Conflict" refers to how group members manage their individual differences within groups and how group members manage their differences with other groups.

Evolution of the Study of Group Communication

The rhetorical, the social-psychological, and the pragmatic traditions heavily influence the study of group communication. These traditions share a focus on how people persuade and influence each other but each has a unique approach.

Researchers in the rhetorical tradition identify the practices that speakers use to persuade audiences, and they are especially concerned with judging the performance of persuasive acts. Rhetorical studies develop standards for good persuasion (i.e., persuasion that is both effective and ethical). Group researchers following rhetorical approaches have contributed by developing discussion protocols and standards for assessing the quality of group discussion. Researchers and teachers of group communication have drawn from rhetoric and argumentation in their development of discussion agendas and rules for critical thinking. There was a great deal of interest in the early twentieth century that small groups could be formed among citizens to discuss important matters of the day, thus leading to better judgment by citizens on important public matters. It did not take long, however, to realize that simply gathering people together in the same place to talk does not cause good discussion. Those in the speechcommunication field took on the task of cultivating good discussion habits in their students. They trained students in principles of discussion as well as public speaking. Their work was motivated to improve the quality of public discourse. They developed ideas such as the "standard agenda," which was a tool a group could use to improve the quality of the decision-making discussion.

Researchers in the social-psychological tradition identify how the beliefs and attitudes of group members are changed by a variety of social factors. Social-psychological studies compile the effects of such social factors as power, roles, and identity. The antecedents of group communication in this tradition are found in early investigations of whether groups could be more successful at accomplishing tasks than an individual could be. These results showed that groups were in fact likely to be more productive. Individuals were less productive in the groups than when they worked on their own. This apparent paradox motivated researchers to discover how groups influence individuals. The study of group influence on the beliefs and attitudes of members drew increasing attention with the events and social circumstances surrounding Adolf Hitler's rise and fall, the Holocaust, and the mobilization of allied support for the war effort. There was a great deal of interest in studying conformity—in particular, the formation of the "group mind" and how groups influence individual beliefs and attitudes. The study of conformity preceded much of later social-psychological research. From the early experimental research, a whole new area of study in facilitating group communication emerged. Researchers who engaged in this area of study developed many techniques that help small groups communicate and make better judgments. In addition, many innovations in using groups to aid individual therapy and to help manage organizations emerged from this initial movement to help citizens.

Researchers in the pragmatic tradition identify the sequences of communication among group members and how those sequences become patterned (i.e., conventional ways group members communicate). Pragmatic researchers assess how communication patterns influence what groups can and cannot accomplish due to their patterns of communication. This area of research has many different starting points. The researchers in this tradition recognize that messages have multiple functions. These researchers focused on the content and relational aspects of a message. Every message has content, or information value, and every message makes a "meta-comment" on the relationship between the speaker and the hearer. The same message content can be used to signal a request or an order. These researchers were very interested in

how group members negotiated the variety of meanings that messages have. To study this, they looked at the interaction between messages.

Contemporary group communication finds its roots in the above three basic areas. While some research remains clearly rhetorical, social-psychological, or pragmatic, some blending of the three has taken place. The study of group communication has always focused on how discussion among group members can be used to help groups cooperate to achieve larger goals. The advent of computer and telecommunication networks has not altered this quest, but it has brought about opportunities for group interaction that were impossible and even inconceivable in the past. Communication technologies such as e-mail, cellular telephones, and group support systems make it possible for groups to meet without being in the same place at the same time. Even more interesting than the possibility of compressing time and space, these tools make it possible to alter or provide new forums for interaction. New channels can be made available to group members, and decision and discussion aids can be designed to aid group interaction via the technology. The use of new technology raises questions about whether groups can emerge and function without meeting face-to-face or whether technology can aid group effectiveness. Many of the issues that motivated the original research on groups apply to technologically supported groups.

The goal of developing better forms of discussion occurred in four unique but related eras in the evolution of group communication research. In each era, a new use of discussion emerged and is marked by a different set of assumptions about groups and the strategies for improving group communication. The first period, 1900 to 1920, is marked by an interest in improving democracy and the responsiveness of government. Group discussion and training in effective discussion were seen as ways to facilitate widespread participation in democratic governance. The second period, 1930 to 1950, is marked by an interest in using groups to help individuals learn about themselves. Group discussion and training in effective discussion were seen as ways to help people help themselves. It was during this time that movements such as T-groups (therapy groups) and Alcoholics Anonymous emerged. The third period, 1960 to 1980, is marked by an interest in improving the

effectiveness of organizations. Group discussion and training in effective discussion were seen as ways to foster employee involvement in organizational goals and to shape the commitment of members to the organizational mission. This is the era when the concept of teams and teamwork became very popular. The fourth period, 1980 to the present, is marked by an interest in knowledge. Group discussion and training in effective discussion include the use of new communication technology that enhances the mobility, memory, and efficiency of group members.

Examples of Scholars Working in Group Communication

Some of the scholars who have worked in the area of group communication are Kurt Lewin, Solomon Asch, B. Aubrey Fisher, and M. Scott Poole. In addition to forming the area of group dynamics, Lewin's efforts contributed to the development of methods and techniques for improving group discussion. Asch was a leader in the study of compliance and developed novel methods to show how groups influence individual conformity to the group. Fisher developed an interactional view of group communication and a phase model of group decision processes and leadership emergence. Poole, one of the contemporary leaders in the study of groups, has developed structuration theory, an innovative view of group communication. He has also pioneered communication research on the use of technology to support group decision making.

See also: Group Communication, Conflict and; Group Communication, Decision Making and; Group Communication, Dynamics of; Group Communication, Roles and Responsibilities in; Interpersonal Communication; Organizational Communication; Public Speaking; Rhetoric.

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MARK AAKHUS

GROUP COMMUNICATION, CONFLICT AND

What is conflict? Is it the clash of personalities? Is it a difference of opinion? Is it a misunderstanding? Is it the attempt to right a wrong? Is it a contest for scarce resources? Group members engage in conflict for all these reasons. It seems that everyone knows conflict when they see it. Yet, when individuals experience conflict, they find it difficult, at best, to understand it and deal with it. The same is true for those who study it.

How and Why Groups Engage in Conflict

Group communication researchers pay special attention to how conflict is expressed, created, and managed through communication. While they recognize numerous causes for conflict, they focus on the variety of ways in which group members use messages to express conflict. Researchers' special interest lies in how people use messages to manage the "causes" of conflict, such as the scarcity of resources, differences between personalities, differences between ideas, and even differences about how to handle differences.

Group communication researchers are keen to learn the ways in which communication itself contributes to conflict. Consider how group members' beliefs about conflict can differ depending on their habits for handling conflict. One group member may handle conflict through avoidance. Such a person will change topics, become quiet, or avoid contact when he or she anticipates that conflict will occur. That person probably believes that talk, instead of solving conflict, will only makes it worse. Thus, from this perspective, talking about conflict only draws attention to the things that cannot be changed (e.g., personalities, scarce resources, habits). Another group member may handle conflict through confrontation and persuasion. Such a person will raise questions, challenge what others say, and will generally speak up when conflicts emerge. That person probably understands that personalities differ and resources are usually unequally distributed. However, this group member sees talk as a way to remove misunderstanding between group members and to influence group members to act differently. Group communication researchers investigate how communicatabout conflict changes the conflict ing circumstances and whether talk ends or continues a conflict.

How messages are used to resolve conflicts is a central concern in the study of group communication. This focus has consequences. What group communication researchers know about conflict concentrates on the conflict between group members, the conflict styles of individual group members, and the conflict management techniques that serve as a vehicle for resolving conflict. The result is a preference for studying conflict styles of group members and how to make conflict productive by turning it into cooperative decision making. The assumption is that conflict is an inherently bad thing that should be eliminated. How conflict happens in groups and how groups influence the conflict behavior of their members are two things that are not as well understood. Such a shift in focus draws attention to conflict as a source of growth, innovation, and quality decision making.

Conflict can be useful if it brings about needed change, test ideas, challenges illegitimate authority, or leads to increased cohesiveness. Group development researchers generally agree that groups go through a conflict phase. B. Aubrey Fisher (1970), in particular, suggests that groups can cycle through many conflict phases during decision making. During the conflict phase, group members are testing their ideas and opinions against each other, but they are doing even more. It is during the conflict phase that opinion leaders emerge. The conflict phase helps group members learn what their roles will be, how decisions will be made, and what the group will value. These are important issues that the group must continuously negotiate.

How individuals prefer to handle their own conflicts shapes the understanding of how conflicts happen. Avoiders, for example, tend not to see talk as a useful way to solve conflict, while competers see talk as a useful way to resolve conflict but not necessarily as a way to cooperate. Thus, group communication can help people understand their own habits and views of conflict. This can help individuals and groups learn how better to handle the conflicts that they face.

Conflict Styles and Tactics

The term "conflict style" refers to a person's inclination to act in a particular way when faced with conflict. Styles differ in terms of how much concern a person shows for self (competitiveness) and how much concern a person shows for the other (cooperativeness). According to the classic description of conflict styles set forth by Robert Blake and Jane Mouton (1964), five styles can be distinguished in this way: forcing, smoothing, withdrawing, compromise, and collaboration. Forcing involves high competition and low cooperation on the part of an individual. Smoothing is the opposite because it involves low competition and high cooperation. Withdrawing involves low competition and low cooperation. Compromise involves moderate competition and moderate cooperation. Collaboration, which is often taken to be the ideal style, involves high competition and high cooperation. These five styles are popular in training literature on conflict management because the distinctions help people understand and adapt to how others engage in conflict. It is generally believed that no one style is best but that each style has advantages and disadvantages. For example, collaboration seems best but is very time consuming. A competitive style seems bad because it escalates the conflict, but escalation is sometimes needed to move the conflict forward.

There is controversy over whether styles are the most accurate way to describe how people engage in conflict. First, critics point out that styles refer to what people believe they do in conflict rather than what people actually do. Second, critics point out that styles refer to individuals rather than the groups and contexts, which ignores the fact that people can behave quite differently depending on the group norms or context.

The term "tactics" refers to specific conflict behaviors and provides a useful alternative to the term "styles." When people deny a situation or make noncommittal and irreverant remarks, they are avoiding conflict; that is, they are staying away from issues or concerns that are important to the group members. Alan Sillars (1980) distinguishes avoidance tactics, like those just described, from competitive and collaborative tactics. Competitive tactics include personal criticism, rejection, hostile jokes, and denial of responsibility. Competitive tactics engage people in overt conflict and often contribute to conflict escalation. Collaborative tactics include descriptive statements, concessupportive remarks, and soliciting sions. statements. Collaborative tactics engage people in overt conflict but enable participants to cooperate in resolving the conflict.

The identification of tactics makes it possible to understand how a conflict unfolds when people in conflict communicate. Studying tactics draws attention closer to the messages that group members use to engage in conflict. Tactics help researchers see how conflicts escalate and de-escalate due to the types of messages that are exchanged. In addition, tactics can be used to understand how messages can be used to change the escalation of conflict into cooperation. For example, if one group member uses personal criticism, hostile jokes, and other competitive tactics, another group member may use descriptive statements, concessions, and other collaborative tactics to make the discussion more productive.

How People Should Engage in Conflict

Imagine a leading member of a social club proposing that member dues be raised. When the person makes this proposal, another leading member disagrees and points out problems with the proposal. The person who proposed the measure defends the position against what feels like an attack. The person who is opposed to the measure continues to disagree by picking on very fine details of the proposal. The disagreement escalates until the group and the meeting stand in a stalemate. What should be done? What often happens in a discussion about positions, as in this example, is that people begin to feel that they are being attacked personally, rather than that their ideas are being attacked. A discussion can turn into a hostile exchange of barbs or into a steely silence quite quickly.

Group communication researchers have addressed the question about how people should

engage in conflict. The central idea has two parts. Group members should minimize relational conflict and encourage conflict about ideas. Such advice suggests that it is better to "separate the person from the problem" and "to be tough on ideas and easy on people." This advice could be applied to the situation of the social club.

The messages exchanged by the two leaders in the example escalated the relational conflict and made their ideas secondary concerns. Their discussion became focused on creating the impression of winning or at least avoiding looking like a loser to the other group members. The attack on the proposal led to defensiveness on the part of the proposer, who in turn made the proposal look good in the face of criticism. This only gave the other leader more ground on which to attack. A cycle of defense-attack followed. Most communication research advice suggests that situations like this one should be avoided for the sake of group relations and the group's ability to accomplish its goals. These situations can be avoided by fostering cooperation in the face of an escalating conflict.

The solution, according to most communication research, would involve separating the people from the problem. Thus, another group member should intervene and say, "Let's have the whole group examine this proposal along with some other proposals members may have." This gives the discussion back to the group and draws attention away from the two combatants. The next part of the solution is to be tough on ideas and easy on people. Thus, another group member should intervene and say, "Okay, now that we have more proposals, let's identify the pros and cons for each one." This gives everyone permission to be hard on the issues but soft on the people.

Numerous techniques have been developed over the years to foster "productive" conflict (i.e., conflict that is neither too hot nor too cold and that is neither too hard on the people nor too soft on the issues). These techniques that are designed to help groups cooperate include graduated and reciprocal initiatives in tension reduction (GRIT), reflective thinking, problem-purpose-expansion technique, and facilitation/mediation.

GRIT was proposed by Charles Osgood (1962). It is a method intended to foster cooperation during conflict. The method involves at least one party making cooperative, even conciliatory, moves, without letting down his or her guard. The strategy helps counter the hostile and aggressive moves of the other party. In using GRIT, one person competes for a period of time and then begins to cooperate. When the person begins to cooperate, it must be announced to the other party. This communicates that one could compete but chooses to cooperate, thus suggesting that the other party should follow this approach as well.

Reflective thinking was first proposed by John Dewey (1910). It was later developed by group researchers such as Dennis Gouran (1982) to serve as a way to improve problem solving. Reflective thinking is a five-step procedure that helps groups thoroughly analyze a situation and develop a solution: (1) define the problem, (2) analyze the problem, (3) suggest possible solutions, (4) select a solution, and (5) plan implementation. This procedure helps participants focus their interaction and cooperate on rational problem solving.

The problem-purpose-expansion technique was proposed by Roger Volkema (1983). The technique is designed to help conflicted parties avoid an overly narrow discussion that misses opportunities for resolution. It is easy for conflicted groups to become obsessed with a particular description of the problem. Volkema's technique encourages parties to be creative in developing different ways to understand a problem. They then brainstorm solutions for each different way of understanding the problem. This generates creativity and opportunities for cooperation.

Groups can also use experts, such as mediators and facilitators, to help manage conflict. Mediators and facilitators know a variety of techniques, understand different models for analyzing group communication, and possess experience in helping groups. Facilitators generally specialize in helping groups communicate better when faced with a complex problem to solve. They are especially useful because they help groups avoid destructive conflict that can emerge in decision making. Mediators specialize in helping groups once conflict has been expressed and begins to debilitate the group. Mediators help groups resolve conflicts and restore the ability to work together.

See also: Group Communication; Group Commu-Nication, Decision Making and; Group Communication, Dynamics of; Group Communication, Roles and Responsibilities IN; Organizational Communication.

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MARK AAKHUS

GROUP COMMUNICATION, DECISION MAKING AND

A decision is a choice among two or more alternatives. For example, a hiring committee makes a decision when it chooses one of the five candidates under consideration for a new job opening. A jury makes a decision when it chooses whether the defendant is guilty or not guilty. Decisions are sometimes hard to identify, as when a soccer team moves down the field to score a goal and their choices are made on the fly in the face of everchanging conditions. Many of the decisions made by work groups are similar, especially when the work group is managing a crisis when a deadline is pending. The term "decision making" refers to the process that groups go through to identify alternative choices and the logical or appropriate way to select an alternative to implement.

Role of Communication in Group Decision Making

Communication plays a central role in group decision making. Group decisions primarily result from the opinions that group members have about an issue or course of action. Individual opinions can and do change as a result of group communication. Communication affects group decision making in at least two important ways.

First, group members influence each other through the messages they exchange. When one member opposes the idea of another member, for example, then the group must reconcile the difference in some way. If a low-status person in the group raises a good idea, it is likely to be rejected publicly by the group members. It is interesting to note, however, that the opinion of low-status members will slowly influence each member's private beliefs. The consequence, in the long run, is that the low-status group member's willingness to express a contradictory opinion can have a real effect on the decisions of a group. The low-status member, however, is less likely to get credit for the good idea than the more high-status members of the group.

Second, group communication is typically patterned, and these patterns influence the course of decision making. For example, some groups develop communication patterns that are extremely polite and formal. These habits can make it difficult to raise a difference of opinion and the speaker often has to "water down" his or her disagreement to the degree that the opposition seems pointless. Other groups embrace open conflict. In these groups, the simple act of agreeing or supporting another person's comments can easily be taken by that person as a challenge. Thus, group communication has a variety of effects on decision making, in particular in the role communication plays in the formation of decisions and in decision-making outcomes.

Approaches to Understanding Decision-Making Communication

Consideration of the functional and decisionemergence approaches to the study of communication in group decision making helps show how communication influences group decisions.

Functional Approach

Since the 1920s, communication teachers have taught students that particular functions are necessary for good group decision making. For example, students are often taught a "standard agenda" that they can apply to all group decisions. A standard agenda prescribes functions that every group should perform: (1) define the problem, (2) identify criteria for a good solution, (3) generate alternative solutions, (4) assess alternatives, and (4) choose a solution. These functions define what groups should do.

Functional approaches specify the functions groups should perform to make good decisions. Randy Hirokawa (1985) has developed a functional approach that both challenges and advances the idea behind using a standard agenda for group decision making. Hirokawa and his colleagues have found "critical functions" that groups must perform to make good decisions; these functions are similar to the standard agenda. They also found that groups that make "bad decisions" begin their discussions by generating and evaluating alternatives. Groups that make "good decisions" begin by analyzing the problem and generating alternatives, and then they evaluate alternatives.

Thus, the way group members communicate affects the quality of the decisions that are made by a group. Communication also influences what members talk about. How this happens has been addressed in particular by researchers who explain decision emergence.

Decision-Emergence Approach

Early research on group decision making suggests that all group decisions go through a particular set of phases: groups (1) orient themselves to the task, (2) engage in conflict with each other, (3) develop some standards about making a choice, and (4) create solutions. This differs from the functional approach because these phases describe how decisions emerge (rather than prescribing the phases a group should go through). Communication researchers have challenged the phase model proposed in early research on groups.

Thomas Scheidel and Laura Crowell (1964) studied how people exchanged messages during decision making and found that decisions emerge in a spiral fashion. For example, a member will put a proposal forward and it will be accepted. The group will continue the discussion only to find that the proposal is inadequate. Then they will spiral back to modify or reject the proposal that was once accepted. Thus, it is better to characterize this form of group decision making in terms of two steps forward, followed by one step back, and then two steps forward.

B. Aubrey Fisher (1970) discovered that both the phase and spiral models of decision making explain how decisions emerge. He found that some group decisions emerge in a pattern that looks very much like a standard agenda. Other group decisions, however, seem never to move toward concrete solutions and instead remain stuck in the debate over alternatives. Fisher explains that discussion about choices involves more than the task before the group. Indeed, it also involves the relationships among the group members. The spiraling in decision-making discussion is a reflection of how the group members manage their relationships and work through interpersonal conflict.

M. Scott Poole (1983) and his colleagues have developed an even more advanced explanation than Fisher's explanation of decision emergence. Poole argues against a phase model. Instead of phases, research by Poole and his colleagues shows how groups are actually managing multiple tracks of activity that correspond to what other researchers have called phases. These multiple tracks include the task, the member relationships, and the discussion focus. Thus, similar to phase models, Poole argues that groups must manage many developmental demands. Poole's point, however, is that decision-making group members are constantly managing these demands. Thus, decision-making communication may appear chaotic. This is the case because the communication among group members serves multiple purposes. The group is solving the decision, but it is also working out the relationship among the members and maintaining a common focus in the discussion.

Common Difficulties in Group Communication

There are numerous barriers to effective decision making that involve communication. Three of the most common difficulties are groupthink, polarization, and inferential errors.

Groupthink

Groupthink occurs when group members value consensus above all else. The result is that group members feel extraordinary pressure to agree and have little if any means to disagree or oppose the will of the group. Irving Janis (1972) developed this concept. There are five conditions that contribute to groupthink: an authoritarian style leader, isolation from other groups and people, lack of explicit decision procedures, group members sharing similar viewpoints, and group members being under high pressure to make a decision. A project team facing a deadline may not adequately consider new information that runs contrary to a selected position because the members fear that including the new information means missing the deadline.

Polarization

When groups make decisions, the group decision tends to be either riskier or more cautious than the decision that individual group members would make outside of the group. When groups begin their discussion by leaning toward guaranteed outcomes, they tend to experience a cautious shift; that is, the group makes a decision that is more cautious than an individual would have made on his or own. When a group begins the discussion by leaning toward taking a change, it tends to experience risky shift. A group of friends, for example, may go to a much scarier or risqué movie than any one of them would ever see when alone.

Inferential Errors

Individuals and groups are prone to errors when their judgments are based on data. These are called inferential errors. The way a problem is framed, for example, can influence how group members judge the evidence. Two groups can make very different judgments of the same evidence, depending on past success or failure in decision making. Past failure can induce risky behavior by groups, while past success can make groups more conservative. The previous decision outcomes frame judgment of the evidence in a current choice. When groups make successful choices, it tends to stick to what works and is less willing to see evidence in new ways. When groups make unsuccessful choices, they are willing to try something new. The football team that is losing because of bad plays and miscues will be likely (in order to win) to abandon the original plan and even try plays that have not been well practiced.

Overcoming Problems

Groups can overcome a problem by designating or hiring a person to be a facilitator. The facilitator is a type of group leader who helps improve the group's procedures so the group is more effective in accomplishing its goals. A facilitator helps a group identify problems in the decision-making processes and shows the group how to correct those problems. Facilitators can also diffuse unproductive conflict by helping groups regulate the expression of frustrations while helping the group find a path toward a solution.

Vigilance, according to Dennis Gouran (1990), is sensitivity to careful examination of the information on which a choice rests. Vigilance can be cultivated in a group by developing an attitude toward critical thinking, by an appreciation for listening, and by a willingness to explore alternatives. Vigilance depends on the leadership in a group. Gouran explains that leaders help groups move toward a goal through "counteractive influence." Group leaders must be aware of anything that influences a group to deviate from accomplishing its goals. Group leaders must provide the necessary behavior to counteract those influences. For example, leaders can become skeptics when groupthink emerges or sensitive when hostilities escalate.

Robert's Rules of Parliamentary Procedure (or Robert's Rules of Order, as they are commonly known) were created to provide a common set of procedures for decision-making groups. The rules make clear how a proposal should be handled, thus helping to reduce or eliminate conflict over procedures and to contribute to group productivity. For example, these rules specify how a member can put a motion, or proposal, up for consideration by the group. This encourages members to have a thoughtful proposal and gives the group members a fair way to prevent discussion on every thought of every group member. The rules help balance power and influence among the members of a group.

Nominal group technique is a procedure to help groups discover the best ideas and promote consensus building among members. The essence of the technique involves having the members of the group write their ideas on cards. The cards are then collected and the ideas are posted. The group then discusses and evaluates those ideas. The benefit of this technique is twofold. First, individuals tend to be more productive when working individually in the presence of others. Second, the cards enable members to bring up unpopular ideas while remaining anonymous.

Group decision-support systems (GDSSs) combine computers and specialized software to

help groups make better decisions. A GDSS provides group discussion and decision-making tools such as brainstorming and voting. When groups use a GDSS, they work in a room where they can interact with each other by talking or by using the GDSS. The GDSS makes it possible for group members to input all of their ideas at the same time, maintains a record of their contributions, and provides groups with the opportunity to interact anonymously. The features of a GDSS, in many ways, combine the insights of facilitation, vigilance, Robert's Rules of Order, and nominal group technique.

See also: Group Communication; Group Commu-Nication, Conflict and; Group Communication, Dynamics of; Group Communication, Roles and Responsibilities in.

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MARK AAKHUS

GROUP COMMUNICATION, DYNAMICS OF

The study of group dynamics is a search for the social influences that affect the way people behave in groups. "Dynamics" is a term used to refer to

the factors that often lie just outside one's awareness but that have an effect on how people behave. Social influence in small groups includes factors such as power, developmental phases, conformity, deviance, networks, and norms.

Importance of Understanding Dynamics

In one of the earliest known social science experiments, a researcher named M. Ringlemann tested whether individuals were more productive in groups. He had people pull a rope and measured the force each person exerted while pulling compared with how much the whole group pulled. He discovered that the group exerted more total force with each person added to the group. Yet, even though the group exerted more total force as members were added, each individual actually exerted less force while pulling. The Ringlemann effect, as it is known, still highlights the central issues in group dynamics research. It shows the advantages and disadvantages of groups, but it also suggests that people have a social influence on each other that may go unnoticed by the group members.

Muzafer Sherif's experiments in the 1930s dramatically demonstrated that individuals in groups can be significantly influenced by forces that are beyond the awareness of the individuals within the groups. He created a novel experiment using a stationary pinpoint of light in a completely darkened room. In such conditions, the light appears to move even though it does not. Sherif recorded individual's estimates of how much the stationary light in the darkened room moved. He then recorded the estimates that groups of people made about the movement of light. Sherif found that individual estimates varied a great deal. When in groups, however, individual estimates slowly converged toward a group consensus. For example, one subject individually estimated that the light moved as much as seven inches while two other subjects individually estimated that there was one to two inches of movement. When these subjects viewed the light as a group, they ultimately judged the light movement to be a little more than two inches. The group members mutually influenced each other as they all tried to develop a better estimate of the light movement. The experiment demonstrated that groups develop norms that influence the behavior and judgment of the individual members.

One goal of group dynamics research is to identify social influences and then design techniques or procedures to counteract the negative aspects of social influence and optimize the positive aspects. The Ringlemann effect, for example, suggests that to improve overall group performance, it may be helpful to let groups know both their group performance and their individual performance on a task. This would allow the individual to see what happens to his or her individual performance relative to the group performance. Sherif's light experiment suggests that groups need to develop "anchors" for their judgments. Group members can use decision criteria, for example, to counteract the pressure to conform in groups.

Power

Power is an ambiguous concept. It refers to resources and force possessed by an individual to influence other people. One person may be able to take and give rewards from others and thus make others act as he or she wishes. Thus, power is a characteristic of an individual. On the other hand, power refers to the mutual influence people hold over each other. The ability to give and take rewards is only powerful to the extent that others value those rewards. Thus, power is a feature of the relationship between people.

The earliest discussion of power focused on individual characteristics. John French and Bertram Raven, in 1959, proposed five bases of power: (1) reward, (2) coercive, (3) legitimate, (4) referent, and (5) expert. Reward power is the capacity of one person to control access to things that others value. Friends influence each other by giving out or holding back compliments, time together, and access to other people. Coercive power is the capacity of an individual to threaten and punish another. A friend can coerce another to do something by threatening to gossip and divulge personal information, in which case, the friendship itself comes into question. Legitimate power is the capacity of one individual to demand something from another on a rightful basis. A parent can impose a curfew, and a boss can demand that an employee show up for work on time. Referent power is the capacity of one person to get others to do things due to respect, attractiveness, and admiration. A child obeys a curfew not simply because a parent can impose curfews but because the child respects his or her parents. An employee

puts out an extra effort not because the boss has the right to ask but because the employee likes and admires his or her boss as a person. Expert power results from a person's superior skills and abilities. Players may obey their coach because he or she played the game in the past and was an excellent and successful athlete.

It is clear in these definitions that power is possessed by individuals but that power depends on the relationship between the "powerful" and the "powerless." As French and Raven put it, power is the difference between the maximum force that one person can bring to bear and the maximum resistance that another person can bring to bear. Thus, someone may be incredibly charming and successful but unable to make referent power work on someone who is resistant to charm.

The power concept draws attention to the "nonrational" ways in which people influence each other. Group members do not always take action based on evidence and information; instead, they act because of the influence of reward, coercive, legitimate, referent, and expert power. Power has both positive and negative consequences for decision making. For example, a group can act on the referent power of a group member who has significant and relevant accomplishments and experience with a certain issue rather than treating that member's opinion as being no more informed than those of the other members. This contributes to decision-making efficiency for the whole group. If, however, that member's referent power on a particular issue is extended to other issues where the member's opinion is in fact no more informed than those of the rest of the group, it may result in quicker decision making but the decision quality would likely be lower.

Group Development Phases

All groups go through phases where their member's interaction is dominated by certain topics and issues. The research of Robert Bales (1953) suggests that groups tack back and forth over task and relational issues. For example, a group may exert such an enormous effort to solve a task that frustration builds up between various members. The group may then almost abandon the task and concentrated instead on repairing the relationships among the group members. This means that what a group is supposed to do and talk about may be significantly influenced by the phase of development that the group is going through. A coach may want a team to focus on preparation for a tournament but team members may be in a phase where they are trying to repair their relationships with each other after conflicts from a previous game. Thus, it may be difficult for the team to focus on the task when relational issues dominate their concerns.

Bruce Tuckman (1965) proposed that development phases actually occur in a typical order or pattern. He developed a scheme to describe the issues and topics that dominate groups in particular stages of development: (1) forming, (2) storming, (3) norming, (4) performing, and (4) adjourning. Forming is the initial formation of a group. In this phase, group members are exchanging information, orienting themselves toward each other, and creating attraction to the group. It is likely that talk is overly polite and tentative. Storming is the struggle to come together as a group. In this phase, participants are testing each other, vying for various roles in the group, expressing dissatisfaction, and arguing about procedures. It is likely that overt disagreement and criticism mark talk in the group. Members may actively avoid group meetings. Norming is the coming together of group members. In this phase, groups become more cohesive, members better understand their roles and status in the group, and shared goals and values emerge. It is likely that talk is more harmonious and supportive and marked by phrases of inclusion such as "we" and "us." Performing is a phase of high productivity of group members. The group members are cooperating to achieve tasks and abide by the norms and standards of behavior that they have agreed on. It is likely that the talk is focused on decision making and problem solving and not on conflict and relationships. Adjourning is when the group completes its tasks. In this phase, the group members reduce their dependence on each other and renegotiate their obligations. Emotion and regret mark the talk in this phase.

Conformity

Conformity means that a person accepts a course of action because the majority has agreed on it or because it is socially acceptable. There are two types of conformity: compliance and private acceptance. Compliance occurs when someone goes along with the group without accepting the group's norms or point of view. A person might change his or her style of dress to impress people in the majority (or to avoid criticism) but not to become like those people. Private acceptance, on the other hand, refers to the personal adoption of the majority opinion. Thus, compliance occurs when a person publicly agrees with the majority but privately disagrees. Private acceptance occurs when a person publicly and privately agrees with the majority.

Solomon Asch (1955) demonstrated conformity through an experiment. He was interested in the conditions that led an individual to conform to the majority's judgment. In his experiment, participants viewed two cards. One line was printed on the first card, while three lines of different length were printed on the second card. The participants were asked to report which line on the second card matched the line on the first card. The subject of the experiment was always the last person in the group to report. All of the other participants were secretly given directions to report wrong answers. This was repeated several times. Because the task was so simple, the subject most likely knew that the participants were reporting wrong answers. Yet, three-fourths of the subjects reported at least one conforming answer during the experiment. About one-third of all the responses by all the subjects were conforming. These results created a great deal of interest because the experiment demonstrated that people will conform to a majority. It was less clear, however, why people conformed.

The number of group members who express the majority opinion can influence conformity. It seems that when more group members are in agreement with each other, it is more likely that conformity will occur among the other members. While the number of people in a majority influences conformity, an individual is more likely to be influenced to conform by how the majority came to hold an opinion. There is more pressure to conform when an individual believes that each person in the majority has individually developed an opinion that is consistent with the majority. There is less pressure to conform when an individual thinks that the members of the majority are simply complying themselves.

The number of potential allies influences conformity. When another person disagrees with the majority, the amount of a subject's conformity decreases. This is especially true when the potential ally consistently rejected the majority or converted from the majority to the minority. If a potential ally began by disagreeing with the majority and then shifted to the majority, it did not help the subject resist conformity.

Deviance

There are many forms of deviance. It is typical to understand deviance as something bad, such as when someone drops out of a group, rebels against a group, or sabotages a group. While such forms of deviance are not always bad, other forms of deviance, such as innovation, are very likely to be good; that is, innovative deviance can help a group solve problems or adapt to new situations. A "devil's advocate" in a group can prevent a group from making an unwise, ill thought-out decision. Deviance is a way that group members show their independence or anticonformity.

Deviant behavior and the deviants themselves are likely to be negatively judged by group members. Deviants, however, can be judged positively. Groups tolerate deviants who have group-centered motives. Members who deviate only after careful conformity to group norms during the early formation of the group are judged positively. Group members who have high status also have more latitude to deviate.

While groups do not always like deviants, expression of a minority opinion can weaken the influence of a majority. In particular, when a minority consistently expresses a dissenting opinion, it can have a long-term effect. Research by Serge Moscovici (1985) and others has shown that majority influence leads to compliance while minority influence leads to private acceptance. Thus, someone might be persuaded by a minority opinion and yet still comply in public with the majority view. The influence of a minority opinion may not be seen in an immediate decision, but it may be seen in a later decision.

Networks

The concept of a network refers to the patterns of message exchange among group members. The patterns of message exchange suggest different roles for group members. When one group member tends to be the recipient and sender of most of the messages in the group, that person is considered central to the group network. The pattern of message exchange might resemble a wheel—in which case, the other group members may exchange nearly all of their messages through one person (the hub) while exchanging few if any messages with each other (the spokes). An example of the wheel might be evident in a family where the children have grown up and moved out of the house. If the children primarily speak to their mother to find out what is going on in the family, while speaking little to each other, then they would have formed a wheel pattern of communication. It is important to notice that where one is in the network helps define the role one plays in the group.

There are numerous network patterns that can emerge in groups. Five patterns have received a great deal of attention: (1) wheel, (2) chain, (3) Y, (4) circle, and (5) comcon. The wheel pattern was described above, in the example where siblings speak primarily to their mother and not to each other. Groups with wheel patterns tend to make decisions quicker than groups that have other patterns. Groups with wheel patterns also gain clarity because one member handles all the messages, leaving less room for misinterpretation.

The chain pattern means that each group member primarily speaks to only two other people in the group. For example, Bill, Jill, Stan, and Jan work on the "complaint project team" in a company's service department. Their job is to investigate complaints. Bill's job is to take complaints from customers and get an accurate description. He informs Jill of the complaint. Jill organizes the complaints and transmits them to Stan. Stan investigates the complaints and creates alternative ways to handle the complaints. Stan hands off the alternatives to Jan. Jan decides on a course of action to take on each complaint and implements it. In the chain, Jill exchanges messages with Bill and Stan but not Jan. Jill is connected to Jan through Stan. Likewise, Bill is connected to Stan through Jill, and so on. The chain pattern in small groups tends to be a slower way to make decisions than the other patterns. The people in the middle of the chain tend to be seen as leaders because they have the most control of message flow in the network.

The Y pattern is a combination of the wheel and the chain. The preceding example of the "complaint project team" can be used to show a Y. The team could be organized so that both Bill and Jill take complaints and then hand the complaints to Stan, who then sends recommendations to Jan. In this Y pattern, Stan would be the most central position in the network. The Y pattern is not quite as efficient as the wheel.

The circle pattern is like an "unbroken" chain. There is no one central person in a circle pattern, although each person still only exchanges messages with two other people. The hypothetical project team could be organized in a circle: Bill takes complaints, Jill compiles and categorizes complaints, Stan investigates and recommends courses of action, Jan decides which course of action, and then Jan directs Bill on how to handle the customer. Circle patterns are similar to chains in terms of efficiency.

The comcon (completely connected) pattern or all-channel pattern exists when all group members exchange messages with all of the other members. To reflect the comcon pattern, the complaint team could be organized as follows: Bill specializes in taking complaints, Jill specializes in compiling and categorizing complaints, Stan specializes in investigating complaints, and Jan specializes in choosing and implementing a course of action. The group might generally follow a chain pattern, but the members meet regularly to discuss how to improve the complaint handling process. They actively share insights and frustrations with each other. The comcon pattern is likely to have a higher degree of satisfaction because no member is isolated from the rest.

Norms

Norms define what is appropriate and inappropriate. Norms are standards that group members use to judge actions and positively or negatively sanction behavior. Norms are generally understood by group members (but often only on an implicit basis). Group members tend to learn norms indirectly, as in Sherif's experiment with the stationary light described earlier. Norms are involved in conformity and deviance, are what groups create as they develop, and are represented in the patterns of communication of group members.

See also: Group Communication; Group Commu-Nication, Conflict and; Group Communication, Decision Making and; Group Communication, Roles and Responsibilities in.

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GROUP COMMUNICATION, ROLES AND RESPONSIBILITIES IN

A group is a collectivity of individuals who are united by a common goal. Groups may vary substantially from one another in any number of ways, including their purpose, the way in which they emerge and evolve, their structure, their longevity, and their size. Groups may be formed for task completion, economic gain, social support, personal development and change, spiritual growth, or any of a number of other reasons. They may emerge and evolve quite naturally, or they may be developed and maintained through planning and conscious effort. Groups may have a very transitory existence, or they may be stable over time. Their structure and operations can be causal, or they can be formal. Whatever the specific nature or structure of a group, communication is critical to its emergence and ongoing dynamics.

There is no single view as to the minimum or maximum number of members needed to constitute a group. However, size is an important factor that affects the communication and other dynamics with any group. As compared to a two-person relationship, the presence of additional members provides extra resources to assist with the activities of the group and to provide input into planning, decision making, and problem resolution. However, a larger group requires a greater leadership effort in order to set and maintain direction, develop consensus on plans and goals, keep all parties informed and engaged, and identify and integrate the range of member expectations and perspectives.

Task and Social Dimensions

Groups are created to serve any number of goals. Often, the stated objective is to undertake and complete a specific task. Examples of group tasks include organizing a social event, painting a house, and carrying out a community-service project. Groups may also be formed and maintained primarily to create positive morale and to help members achieve a sense of personal or social wellbeing. Social clubs, discussion groups, and support groups are examples. Often, they are formed to help individuals who are lonely or are seeking support for overcoming personal difficulties.

To a greater or lesser extent, most groups serve a combination of task goals and social goals. Even in highly task-oriented groups, such as a construction crew or emergency room team—where successful task performance is the overriding goal—good morale and supportive work relationships are important. This is especially the case if members of a task group will be working together for a period of time. In these cases, good morale and a positive social climate often contribute to task effectiveness. Conversely, poor morale can undermine productivity and effectiveness.

Communication in Groups

In a two-person relationship, there is the possibility of only one reciprocal communication link. That is, person A can talk to person B. In a group of three persons, there are six possible message-processing relationships: person A with person B, person A with person C, person B with person C, persons A and B with person C, persons A and C with person B, and persons B and C with person A. In a group of four members, this increases to twenty-five potential relationships. In other words, increasing the size of the group by just one more person (from three people to four people) creates the possibility of nineteen additional communication relationships (Kephart, 1950). Thus, as the size of a group increases, the number and complexity of the communication relationships that are involved increases exponentially—creating many new opportunities, as well as many new challenges.

Group Development

Typically, groups go through four predictable stages as they develop: forming, storming, norming, and performing (Tuckman, 1965; Fisher, 1974).

Forming consists of getting acquainted, discussing how the group might begin its work, exploring where and when the members will meet, identifying the purposes of the group, and sharing other initial concerns. Storming refers to the dynamics that occur as individuals in the group begin to express differing perspectives, preferences, and opinions that must be entertained and addressed in some manner as the group begins its work. This stage may be either quite brief or fairly extensive-depending on the individuals, the range of views expressed, and the purpose of the group. Norming is the stage in group development at which goals, directions, and methods of operating are clarified and agreed upon. Once the norming stage is completed, the group can move forward more rapidly and effectively to the performing stage, where the goals of the group are accomplished.

While it is typical for newly formed groups to move through this sequence, the process of group development is not usually as logical as this description might suggest. Even in groups that have been performing at a high level for some time, it is not uncommon for the earlier three stages to reoccur periodically as a group pursues its work.

Decision Making

A variety of approaches are available for making decisions in a group. Among these approaches are consensus, compromise, majority vote, decision by leader, and arbitration (Wilson and Hanna, 1986).

Consensus requires all members of a group to arrive at a decision with which everyone genuinely agrees. Compromise involves decisions that result from negotiation and a give-and-take in order to arrive at a decision that is acceptable to all members of a group. Under majority vote, the final decision is the one that is supported by the majority of the group. In the decision by leader approach, the leader imposes his or her decision on the entire group. Formal negotiation and arbitration often involve facilitation by an impartial "third party" who helps to reconcile opposing positions.

Roles and Responsibilities

In most groups, particular roles (i.e., patterns of behavior) emerge. In a classic article on this subject, Kenneth Benne and Paul Sheats (1948) identified three broad categories of roles that typically occur during group interactions: task completion roles, group building and support roles, and individualistic roles.

Task completion roles are those roles that are related to the completion of a given job or activity. Examples of task completion roles include information seeker, opinion seeker, information giver, recorder, coordinator, and evaluator–critic.

Group building and support roles are those roles that are related to encouraging the social development of the group. Examples of these roles include encourager, harmonizer, compromiser, gatekeeper/expediter, observer, and follower.

Individualistic roles are generally the less desireable roles. These roles contribute negatively to the group both in terms of progress toward completion of a task and group development and climate. Examples of individualistic roles include aggressor, blocker, recognition seeker, dominator, and special-interest pleader.

Leadership

A particularly critical role in any group is that of leader. Essentially, the role consists of guiding the group. A great deal has been written about leadership, and there are many different points of view on the topic. Summarizing this literature in a simple way, Michael Useem (1998) explains that leadership requires a vision of what needs to be done and why, as well as a commitment to action (i.e., to implementation of the vision).

At a more microscopic level, the leadership role involves two sets of responsibilities: group maintenance functions and group achievement functions (Baird and Weinberg, 1981). Group maintenance activities include promoting participation, managing interaction, promoting cooperation, assuring that the needs and concerns of the members are addressed, arbitrating conflict, protecting the rights of individuals, modeling exemplary behavior, promoting group development, and assuming responsibilities for group dynamics. Group achievement functions include informing, planning, orienting, integrating, representing, coordinating, clarifying, evaluating, and motivating.

There are various theories about what constitutes effective leadership and how one acquires the necessary attributes to become a leader. One classical approach—the "great man" theory—holds that "leaders are born not made." Popular in the 1800s and early 1900s, this view held that some individuals inherit natural abilities that are necessary for effective leadership, while others do not.

"Trait" approaches, which were particularly popular in the first half of the twentieth century, contend that certain traits, such as being self-confident or outgoing, are essential if one is to be an effective leader. If one has these traits, they are likely to be successful in leadership roles.

Beginning in the 1950s, theories of leadership began to emphasize the importance of learned behaviors in effective leadership. Early behavioral theories often suggested that there was one best way to lead all groups in all situations, but subsequent theories have suggested the importance of situational leadership—adapting one's approach and behaviors to the particular group and circumstances that are involved in a given situation. More recent approaches see leadership as a set of social and communicative competencies and values that can and should be learned.

Conclusion

An understanding of roles and responsibilities is important for comprehending the dynamics of groups. An appreciation of the concepts is also very helpful for functioning effectively within groups and for contributing to group productivity and cohesiveness.

See also: Group Communication; Group Commu-Nication, Conflict and; Group Communication, Decision Making and; Group Communication, Dynamics of; Interpersonal Communication.

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BRENT D. RUBEN

GUTENBERG, JOHANNES (ca. 1400-1468)

Although no piece of printing in existence bears the name of Johannes Gutenberg, documentary evidence, as well as a large body of testimony from contemporary writers, identifies him as the inventor of printing by movable type in the Western world.

Gutenberg was born in Mainz, Germany, to a well-to-do father who was probably involved in the cloth trade (as well as dealing with precious metals) and a mother who was the daughter of a shopkeeper. The different social backgrounds of his parents made it impossible for Gutenberg to be part of the patrician class, so, out of necessity, he became a self-reliant entrepreneur. Probably through the affiliation of his father's family with the society of the mint, Gutenberg learned metallurgy and casting techniques. He left Mainz around 1429 due to civic conflicts and during the next five years honed his metalworking skills—skills that would play a major role in his invention.

Gutenberg was active in Strasbourg between 1434 and 1444, and, based on a document concerning a lawsuit brought against him in 1439, scholars have inferred that Gutenberg was already experimenting with some kind of printing technique at that time. Gutenberg's next major documented appearance is in Mainz in 1448, when a relative obtained a loan for him. What is known about the next seven years comes from a document, dated November 6, 1455, that summarizes a lawsuit brought against Gutenberg by Johann Fust, a money broker and Gutenberg's business partner. Fust sought repayment of two loans: the first loan may have been made around 1450 for the purpose of setting up a new printing establishment, secured by equipment; and the second two years later, in 1452, as an investment in "the work of the books." It is likely that Gutenberg lost the action Fust brought against him. At the close of the legal proceedings, two print shops, it is speculated, were operating in Mainz. As a result of the lawsuit, Gutenberg forfeited one of these shops, and Fust, with the help of Peter Schöffer (a scribe who would later become his son-in-law), operated that shop. Scholars have surmised that Gutenberg continued to operate the unforfeited print shop through the late 1450s and perhaps into the 1460s. Gutenberg received a pension from the Archbishop of Mainz in January 1465 and died sometime before February 26, 1468.

There is much continued speculation about whether or not Gutenberg, working in Europe, was aware of printing techniques that were already being used in Asia by that time. The invention of movable type made from clay is recorded in China between 1041 and 1049. Later, these ceramic letters were replaced by wooden ones. In 1234, metal characters were used in the production of a fiftyvolume Korean etiquette book. Certainly, the Western alphabet is more conducive to building new words and texts by simply reshuffling letters than is the Asian system of ideographs, and it is this attribute on which Gutenberg's invention is based. Although whether Gutenberg is the actual inventor of movable printing is a matter of serious debate, the evidence does indicate that he assembled a number of technologies that were already in existence and adopted them for the purposes of printing. For example, presses used in the produc-



The Gutenberg Bible features richly illuminated copy. (Bettmann/Corbis)

tion of wine were adapted to serve the needs of printing, and ink that already existed was reformulated for the printing press. The one clearly new invention—and the key to the advancement of printing—was the adjustable type mold.

Gutenberg realized that the assembly of numerous interchangeable characters into text pages so that an impression could be transferred onto a surface, such as parchment or paper, required each metal letter to be exactly rectangular and in reverse relief. The process to create such a letter began with the cutting of a piece of steel or other hard metal, called a "punch," that resulted in an engraved relief image of a letter in reverse. The punch was then driven, with one blow, into a rectangular bar of copper, producing a matrix that differed in width depending on the width of the letter; for example, the letter "m" was wider than the letter "i." The matrix was then positioned into the adjustable type mold that allowed for this variation in letter width. The type mold consisted of several parts, held together by iron screws in such a way that each time an individual letter was cast,

the mold could be separated quickly into two halves and then quickly reassembled after the cast letter had been released from the mold. The metal used to cast the type consisted of lead, tin, and antimony. The result of this invention, and the assemblage of relevant technologies, was the ability to produce uniform and accurate impressions over long press runs, a method ideally suited to the production of multiple copies, thus satisfying the growing demand for reading material.

The major work to originate from Gutenberg's workshop was the forty-two-line Bible, often referred to as the Gutenberg Bible. The book is a reflection of the daring, skill, and artistic and intellectual aptitude of its creator. Gutenberg proved that his printing technique could produce a book of high quality without compromise. Even today, this level of mastery is rarely matched and never surpassed in quality.

Although various methods of printing had been in use earlier in Asia and methods of printing with movable type may have been developed in Europe before Gutenberg, his genius lay in the assembly of processes and the perfecting of them into one unified craft. This craft, capable of standardization and establishment in other places, permitted the rapid duplication of texts, thus changing the structure of communication forever. Books and knowledge became available to a wider sector of society and promoted economic progress through the diffusion of practical skills and scientific discovery. In essence, through the power of the printed book, no field of human endeavor was left untouched. See also: Alphabets and Writing; Printing, History and Methods of.

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MARCELLA GENZ

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HAINES, HELEN E. (1872-1961)

While many people may not be familiar with who Helen Haines was, she made numerous contributions during her lifetime to the American Library Association, the library press, library education, and the American intellectual freedom movement.

The eldest of five daughters born in Brooklyn, New York, to Benjamin Reeve, a wool broker, and Mary Hodges Haines, a woman who was both strong willed and well read, Helen Haines did not receive a formal education. Instead, she was homeschooled by her mother. Haines read voraciously and by the age of nineteen had written her first work, History of New Mexico from the Spanish Conquest to the Present Time, 1530-1890, with Portraits and Bibliographical Sketches of Its Prominent People. This book marked the beginning of a lengthy writing career that included more than one hundred articles for publications such as Library Journal, Publishers' Weekly, Dial, and the Pasadena Star-News and three books for Columbia University Press-Living with Books (1935, 1950) and What's in a Novel (1942). The former works were and still remain the best-selling books within the library science series of Columbia University Press.

The career of Helen Haines started by necessity and chance. In 1892, Haines had to take a job to help support her family. It so happened that her neighbor, Mary Wright Plummer, was the director of the Library School of Pratt Institute, an active member in the American Library Association (ALA), and a good friend of Richard Rogers Bowker, publisher of *Publishers' Weekly* and Library Journal. Plummer arranged an introduction for Haines, and shortly thereafter Haines began working as Bowker's assistant. By 1896, Haines had assumed a new role as managing editor of Library Journal, a position that required her to attend all ALA conferences. Not only did Haines attend, she functioned as the recorder of the ALA, and made many notable contributions. She argued on behalf of collecting fiction in public libraries and championed the cause of reading widely on all subjects regardless of their controversial nature. By taking such stances, she gained a powerful position within the ALA; by 1907, she was elected vice-president. Her work for both the ALA and for Bowker also impressed the Carnegie Corporation and directors of library schools. Although tuberculosis forced Haines to relocate from Brooklyn to Pasadena, California, in 1908, thus ending her full-time association with the ALA and Library Journal, Haines remained active in the library world.

In 1921, Charles C. Williamson, a consultant for the Carnegie Corporation (and later the director of the Library School of Columbia University), had written a report about the state of library training programs in the United States. Before its general release, he asked Haines to critique it. Her comments, along with her work for library training programs at the Los Angeles Public Library, University of California at Berkeley, and University of Southern California, helped shape the future of library education. Like Williamson, Haines stressed the need for librarians to possess a liberal arts education before embarking on a library training program. She called for the scholarization of library schools and their placement in universities that had, at their center, research libraries. She also spoke on the importance of librarians as professionals. No longer should librarianship be regarded as busy work for women; instead, librarians should function as both teachers and scholars. When the first edition of *Living with Books* appeared in 1935, it was one of the first true textbooks aimed at training librarians in the art of book selection. But *Living with Books* functioned more than just as a textbook; it helped to shape the burgeoning intellectual freedom movement.

Haines covered a variety of topics in *Living with Books*. Some would even be considered controversial for the time, including birth control, race relations, and censorship. On the latter subject, she wrote (1935, pp. 174–175), "Thus, the practice of official censorship (the restriction or suppression of literature deemed subversive or harmful) has continued in varying manifestations to our own day. . . . [C]ensorship and copyright lie at the roots of publishing history." Haines's words would be prophetic. Sixteen years later, the *Freeman*, a conservative political magazine, denounced her as a communist sympathizer.

In 1938, Forrest Spaulding, director of the Des Moines Public Library, developed a Bill of Rights for his library stating, among other matters, that "book selection should not be influenced by the writer's race, religion, politics, or nationality." With Haines's help, the ALA revised and adopted that Bill of Rights in June 1939 and, one year later, formed a Committee on Intellectual Freedom. Also in 1940, Haines became chair of the newly formed California Library Association Committee on Intellectual Freedom (CLA–CIF), the first state organization of its kind. During her tenure, the CLA–CIF challenged the Los Angeles County loyalty oaths and worked closely with the ALA to challenge similar issues.

Haines also became more outspoken about censorship, discrimination, and the Soviet Union. Her 1950 revision of *Living With Books* (p. 371) urged its readers to get a balanced view of the Soviet Union by reading widely about it: "Thus in a locked battle between capitalism and communism that now divides the two great world powers, materials of both defense and attack must be freely available for public information and study." However, for the January 1952 issue of *Freeman*, Oliver Carlson, a freelance journalist who often contributed to the publication, wrote a scathing review of the revision of *Living with Books*. Entitled "A Slanted Guide to Library Selection," the Carlson review took quotes from the book out of context to make a case that Haines was a communist sympathizer. In "Red Hunting" circles, the accusation carried weight—it allowed right-wing conservatives to say that communists were disguising themselves as little old ladies who loved and recommended books. Because the ALA had an active Office of Intellectual Freedom in place, Haines's reputation remained untarnished. However, the accusation—made when Haines was in very poor health—was hurtful and cruel.

By 1951, Haines had become both America's expert on book selection and a key figure in the intellectual freedom movement. Because she also enjoyed great credibility, using *Living with Books* as the forum to spread her message that access to literature about the Soviet Union prompted better relations between it and the United States, Haines would not only be heard, but also believed. To honor her writings and her efforts, the ALA awarded Haines its Lippincott award in 1951.

Although Haines died in 1961, her legacy continues to be felt. Through the 1970s, *Living with Books* remained the standard text on book selection, and it is still referenced on many collection development course syllabi. Training for librarianship takes place on the graduate level, typically on campuses with a large research library. The ALA, through its Intellectual Freedom office, routinely battles challenges to intellectual freedom, the most recent and notable being the Communications Decency Act of 1996. And, for those without a formal education, Haines remains the role model; through unfettered access to books, anyone can influence the world.

See also: Communications Decency Act of 1996; Librarians; Libraries, Functions and Types of.

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HOLLY CRAWFORD

HEALTH COMMUNICATION

Health communication is a rich, exciting, and relevant area of study that investigates and elucidates the many ways that human and mediated communication dramatically influences the outcomes of health-care and health-promotion efforts. While health communication is a relatively young area of communication inquiry and education, research and writing on this topic has grown tremendously since the early 1980s, generating increasing numbers of important research findings and publications. A major reason for the tremendous growth and development of inquiry related to health communication is the importance of this research area for addressing complex and challenging healthcare demands in society and guiding the promotion of public health.

Communication is at the very center of healthcare and health-promotion efforts. To gather relevant diagnostic information from health-care consumers, doctors, nurses, and other health-care providers depend on their ability to communicate effectively by asking pertinent questions, interpreting responses, and probing for more detailed information. Consumers depend on their own ability to communicate with health-care providers when seeking help, identifying health problems, interpreting health-care recommendations and treatment strategies, and negotiating their way through the often complex modern health-care systems. At the broader system-wide level, communication is the primary mechanism that professionals have for engendering cooperation and coordination. In a large hospital, for example, the efforts of physicians, nurses, pharmacists, laboratory technicians, therapists, and administrative personnel must be carefully coordinated in order to accomplish treatment goals.

Similarly, communication is an important element of health-promotion efforts (i.e., campaigns designed to influence public health knowledge, attitudes, and behaviors in order to help reduce health risks and encourage the adoption of healthy behaviors and lifestyles). The campaigners must be able to communicate successfully with their intended audiences if the important messages about relevant health risks and appropriate health-preserving behaviors are going to be heeded. In health-promotion efforts, care must be taken to craft messages that are appropriate and compelling for the target audiences and to guarantee that the messages are delivered to these audiences through the most effective communication channels possible. The effectiveness of communication in virtually all health-care and health-promotion activities is directly related to the potency of the health outcomes achieved, and in many cases these outcomes can mean life or death for health-care consumers.

Health Communication as an Important Area of Study

A large and developing body of scholarly research in the area of health communication powerfully illustrates the centrality of communication processes in achieving important health-care and health-promotion goals. For example, Gary Kreps and Dan O'Hair (1995) have reported a series of studies showing the influences of communication strategies and programs (introduced at individual, dyadic, group, organizational, and societal levels) on health knowledge, behaviors, and outcomes. Similarly, a study by Sheldon Greenfield, Sherrie Kaplan, and John Ware (1985) has clearly demonstrated the positive influences of increased patient-provider communicative involvement in directing health-care treatment in achieving desired health outcomes. In addition, James Dearing and his colleagues (1996) have illustrated the positive influences of social marketing and diffusion-based communication campaign strategies in encouraging at-risk populations to adopt important health-risk-prevention behaviors. Large-scale longitudinal (multi-year) communication intervention programs, such as the Stanford Five City Heart Health Program and the Minnesota Heart

Health Communication Program also demonstrate the positive influences of these campaigns on promoting adoption of lifestyle changes to prevent cardiovascular disease and reducing gaps in public health knowledge. There is great potential for the use of strategic programs in the area of health communication to provide health-care consumers and providers with needed health information and to help address important public health needs.

In response to the growing body of health communication research and intervention work, there is increasing recognition within the academic world and throughout the health-care delivery system that health communication is a most important and relevant area of inquiry for addressing salient health-care and health-promotion issues. This recognition is also occurring in many of the major centers for public health policy (such as the Centers for Disease Control and Prevention, the National Institutes of Health, other agencies of the U.S. Department of Health and Human Services, and the World Health Organization). In fact, the National Cancer Institute (1999), the largest institute in the National Institutes of Health, identified health communication as one of the institute's major areas of research support and investment for reducing the national cancer burden and fighting the war against cancer.

Health communication issues are increasingly a primary topic of large-scale funded research programs sponsored by numerous major foundations, health-care corporations, and government agencies. It is especially common for these organizations to fund the development and implementation of important campaigns for promoting public health and preventing the spread of serious health threats. Increased funding for research has spurred tremendous growth in inquiry, education, and publication in the area of health communication. Similarly, scholarly divisions and interest groups related to health communication have been established in many social scientific professional societies. For example, almost all of the communication discipline's professional associations, such as the International Communication Association, the National Communication Association, the American Public Health Association, and several regional communication societies, have interest groups or divisions devoted to health communication. In addition, there is strong interest in health communication by medical, nursing, pharmacy, and other allied health professions. Health communication is closely aligned with other areas of social inquiry such as health administration, health psychology, medical sociology, and health anthropology. Wellattended scholarly conferences presenting stateof-the-art research and intervention programs for health communication are held on a regular basis, both in the United States and internationally. Indeed, increasing numbers of theses and dissertations written by graduate students concern health communication, and courses in health communication have become standard fare in many undergraduate and graduate communication and public health educational programs across the United States and around the world.

There is no doubt that education and research in the area of health communication is achieving a higher level of disciplinary maturation than ever before—generating stronger scholarly interest, support, and productivity. However, the powerful, complex, and widespread influences of communication on health care and health promotion demand careful examination, leading to the systematic study of health communication. There is still much to be learned about health communication, and there are many areas where knowledge of health communication can be applied to enhancing the quality of public health. As scholarly inquiry in this area grows, new and exciting areas of examination have developed.

Need for Relevant Health Information

Health information is the primary commodity of health communication. Consumers of health care depend on the quality of the health information that they can access to make important health-care choices. There are many different sources of health information available today. In addition to gathering health information directly from their health-care providers, consumers can consult their public libraries (or, if available, a local university or medical library) that have access to reference books, journals, and computerized sources, such as the National Library of Medicine's Medline database. There is a large and growing list of health information services available to consumers via the Internet, which has rapidly become an extremely powerful source of health information for both consumers and health-care providers. However, the sheer number

of information sources and the incredible volume of health information that is available today can sometimes overload and confuse consumers.

Consumers can obtain information about specific health-care issues from advocacy groups (e.g., the Alzheimer's Association, the American Cancer Society, and the American Heart Association), health-care delivery centers (e.g., hospitals, clinics, and health maintenance organizations), and research organizations (e.g., the World Health Organization, the Centers for Disease Control and Prevention, and the National Institutes of Health). Government health agencies typically provide excellent, up-to-date information on most serious diseases. For example the National Cancer Institute operates a toll-free telephone information system, the Cancer Information Service, which can be accessed from anywhere in the United States at 1-800-4-CANCER. The hotline operators try to answer any questions about cancer, and they provide referral and treatment information when it is needed. The operators can also have searches conducted on the Physician Data Query database in order to access the latest information about cancer treatment and clinical research that is being conducted.

Health Communication and Health Informatics

One area of tremendous growth in the study of health communication is the way in which computer-based technologies can be used to process and disseminate relevant health information. The dawn of the information-oriented society has spawned a communication revolution in modern health care that has changed the way health care is delivered. Quality health care is closely tied to the widespread availability of health information. Unprecedented levels of health information are now available to both consumers and health-care providers via a broad range of new and more traditional communication channels (e.g., the Internet, interactive CD-ROM programs, television, and different print media).

The use of new communication technologies to process and disseminate health information has spawned an exciting new area of inquiry, health informatics. Health informatics involves the study of computer-based dissemination of information. As information technologies advance, there are a variety of new computer-based tools and media for disseminating and accessing health information. There are also new mechanisms (based on advances in areas such as artificial intelligence and decision sciences) for manipulating, interpreting, and applying health information. Health informatics scholars are interested in studying the ways computer-based information systems can be used to

- 1. disseminate relevant information to key audiences,
- 2. increase public knowledge about important health-care treatment and risk prevention issues,
- 3. promote the adoption of healthy behaviors and lifestyles by the public,
- 4. facilitate adoption of the best treatment modalities and technologies by health-care providers,
- 5. encourage collaboration and multidisciplinary consultation in health-care treatment,
- facilitate, when relevant, patient entry into appropriate clinical trials (controlled scientific studies of new and promising treatment modalities, usually conducted at major medical centers),
- 7. enhance social support and psychosocial adaptation for health-care consumers and their caregivers.

The widespread availability of relevant and accurate health information offers the great promise of demystifying many of the complexities and uncertainties of health care and the health-care system for consumers, shedding light on health-care processes and treatment strategies that were once only the domain of health-care professionals. Access to relevant and timely health information can help consumers participate fully in health-care decision-making and encourage greater cooperation and collaboration between health-care providers and consumers than ever before. This health information revolution can also help healthcare professionals access state-of-the-art prevention, diagnostic, and treatment information and, through easy contact with other providers, engage in multidisciplinary consultation with other health professionals in coordinating health-care services. New communication technologies have also helped promote increasing use of telemedicine (i.e., health-care services delivered via interactive communication channels such as computer, video, and teleconferencing technologies) to assist consumers

in remote and isolated geographic locations. However, on the negative side, this information revolution has also led to a general overload of available health information that is of limited quality and that inevitably serves to confuse and misdirecthealth care consumers and providers, thereby decreasing the quality of health-care choices that are made. Scholars of health communication have an opportunity to help promote public health by focusing on the role of information in the modern health-care system. Research on health communication can help to sort out the ways in which communication can most profitably inform consumers and providers about relevant health issues, identify the best ways to develop and present high-quality health information to key audiences, and encourage effective collaborative decision-making in modern health-care efforts.

Major Levels and Areas of Inquiry

There are many important areas of health communication education and inquiry that range from the intrapersonal study of health beliefs and attitudes to the mass-mediated dissemination of health information within and across societies. A good framework for describing the primary levels of the analysis of health communication differentiates between intrapersonal, interpersonal, group, organizational, and societal levels of inquiry. The ability of scholars to examine the influences of communication on health outcomes at multiple levels of interaction occurring within a broad range of social settings clearly illustrates the power and pertinence of inquiry into health communication, yet it also illustrates the complexity of this area of inquiry.

Intrapersonal health communication inquiry examines the internal mental and psychological processes that influence health care, such as the health beliefs, attitudes, and values that predispose health-care behaviors and decisions. Scholars focusing on these intrapersonal issues in health communication often benefit from adopting a psychological frame of reference to their inquiry, examining the ways in which health communicators process information, create meanings, and craft messages. There has been excellent progress in integrating health communication and health psychology scholarship, and there should be further opportunities for collaboration between these interrelated areas of inquiry. Some of the issues scholars might examine from an intrapersonal perspective include the development of unique health beliefs within different cultural groups that influence the health behaviors of individual members of these cultures, the ways in which certain health-related attitudes and values might predispose certain target audiences toward accepting or rejecting advice provided in campaigns for health promotion, and the emotional effects of specific health threats (e.g., breast cancer) and treatment strategies (e.g., radical mastectomy) on healthcare consumers. The intrapersonal perspective on health communication provides unique insights into the personal orientations, expectations, and predispositions held by the different participants in the health-care system and enables health communicators to adjust their messages to these particular psychological variables.

Interpersonal health communication inquiry examines relational influences on health outcomes, focusing on the study of provider-consumer relationships, dyadic (face-to-face) provision of health education, therapeutic interaction, and the exchange of relevant information in health-care interviews. This provocative area of inquiry focuses on the development of cooperative relationships between mutually dependent participants in the modern health-care system, such as the study of provider-patient relations, interprofessional relations among health-care providers, and multicultural relations within the health-care system. Relationship development is a complex social process that develops incrementally as relational partners exchange messages and get to know one another. The stronger the interpersonal relationships that health-care participants can develop with one another, the more likely they are to develop trust in one another, share relevant health information, and work cooperatively during challenging, complex, and sometimes even tense situations.

Relationship development is very important to health-care delivery, from the point of view of both the provider and the consumer. Health-care providers need to encourage their patients to trust them, provide them with full information about symptoms and past health behaviors, listen carefully to instructions and to provide informed consent explanations (in which health-care providers are legally required to explain the costs and benefits of alternative treatments and identify the relative implications of the treatment strategies that are recommended), and to follow carefully the treatment protocols that are prescribed for them. Health-care consumers depend on relationship development to gain the trust and concern of their providers, to gather full information from providers about treatment options, and to encourage providers to allow them to participate actively in making important treatment decisions.

The interpersonal perspective has been a dominant area of health communication inquiry over the years, focusing directly on important healthcare delivery issues. It is a complex area of study, with many different personal, psychological, cultural, linguistic, and nonverbal variables at play. Care must be taken when studying interpersonal aspects of health communication to address fairly the important cultural, political, and power issues that underlie interpersonal relations in the delivery of health care.

Group health communication inquiry examines the role communication performs in the interdependent coordination of members of collectives (e.g., health-care teams, support groups, ethics committees, and families) as the group members share relevant health information in making important health-care decisions. Healthcare teams are comprised of specialists from different professional backgrounds (e.g., medicine, pharmacy, nursing, therapy) who work together to help plan and implement complex treatment strategies for the same patient. As specialization of services and technologies continues to increase, there is a growing dependence on health-care teams in the delivery of modern health care, as well as growing interdependence among the different members of these health-care teams. However, due to differences in professional knowledge, specialization, and orientation toward the consumer's health care, it is common for differences of opinion to emerge between members of healthcare teams. These differences of opinion, while sometimes uncomfortable for team members to deal with, can be very useful, because they highlight different aspects of health care that all members of a team may not have been aware of. By sharing such information, the team can make more informed choices about treatment strategies. It is important, though, for team members to be willing to accept points of view that are different from their own and to use group communication

effectively to work through conflict and make good health-care decisions.

There are many difficult ethical issues concerning quality of care, access to care, consumer dignity, and end-of-life issues that have led to the widespread use of ethics committees in healthcare systems to ensure that fair and moral choices are made in health care. (These committees also help guard health-care systems from legal problems and litigation claims.) Ethics committees are often comprised of different health-care professionals, religious leaders, bio-ethicists, health-care administrators, lawyers, and concerned lay individuals (often representing the consumer or a consumer advocacy group). These individuals meet to communicate about complex ethical choices that often have to made in health-care systems, such as who among many applicants should get access to specialized, yet limited, treatment equipment and resources (e.g., organ transplants). Group communication among the members of these ethics committees is the primary process by which ethical decisions are reached.

The growing complexities of modern healthcare delivery, with new diagnostic tools and sophisticated treatment technologies and strategies, demand greater input from groups of individuals to make difficult and challenging health-care decisions. Interdependent health-care providers, administrators, and consumers must learn how to share relevant information and coordinate efforts in group settings. Because communication performs such important functions in group coordination and information exchange, a communication perspective is particularly appropriate for the study of health-care teams, ethics committees, and other decision-making groups.

Organizational health communication inquiry examines the use of communication to coordinate interdependent groups, mobilize different specialists, and share relevant health information within complex health-care delivery systems to enable effective multidisciplinary provision of health care and prevention of relevant health risks. With the rise of managed care, the delivery of health-care services has become increasingly controlled by financial and bureaucratic concerns. There is growing frustration among many consumers about the quality of care they receive and their ability to participate actively in making important healthcare decisions. There are many important opportunities for scholars in the area of health communication to examine ways to promote greater receptivity, flexibility, and sensitivity toward consumers within the increasingly complex and highly regulated modern health-care system.

Communication between different interdependent departments in health-care systems is crucial for coordinating health-care efforts. For example, in-patients receiving treatment in hospitals are housed within specific hospital wards, yet they are often sent to different departments (e.g., radiology, surgery, therapy) for treatment. It is important for these departments to share information about the consumers they serve, to keep track of the consumers' needs and activities as they move through the hospital, and to coordinate the care of these patients. Organizational communication tracks the ways these departments share information, coordinate activities, and adapt to each other as they share the accomplishment of organizational goals.

Societal health communication inquiry examines cultural influences on health care and the generation, dissemination, and utilization of health information communicated via diverse media to the broad range of professional and lay audiences in society that influence health education, promotion, and health-care practices. Social marketing has been widely adopted by communication scholars as an important strategic framework for designing sophisticated campaigns of health promotion. In the past, research focusing on societal inquiry was conducted primarily by communication scholars who specialized in media studies and examined the ways that various media can deliver messages on health promotion and risk prevention to targeted audiences. However, as efforts at health promotion have become more and more sophisticated, using multiple message strategies and delivery systems, there are increasing opportunities for greater participation by communication scholars (and others) with expertise in analyzing the intrapersonal, interpersonal, group, and organizational levels of health communication.

Health Communication Channels

Inquiry into health communication also involves examination of many communication channels. Face-to-face communication between providers and consumers, members of health-care teams, and support group members are the focus of many studies. A broad range of both personal communication media (e.g., telephone, mail, fax, e-mail) and mass communication media (e.g., radio, television, film, billboards) are also the focus of much research. More and more, the new communication technologies that have developed have been examined as important media for health communication. These new media, especially the interactive computer technologies and the Internet, have become increasingly important sources for relevant health information and support for many consumers and health-care providers. For this reason, they will be a most promising topic for future research.

Settings for Health Communication

The settings for the study of health communication are quite diverse and include the wide range of settings where health information is generated and exchanged, such as homes, offices, schools, clinics, and hospitals. Scholars of health communication must be aware of the widespread nature of health communication so they can design and conduct studies in many diverse field settings. Research has examined such diverse issues as the role of interpersonal communication in developing cooperative provider-consumer relationships, the role of comforting communication in providing social support to those who are troubled, the effects of various media and presentation strategies on the dissemination of health information to those who need such information, the use of communication to coordinate the activities of interdependent health-care providers, and the use of communication for administering complex health-care systems. Since the study of health communication encompasses such a broad range of media, channels, levels, and settings, it is a convergent research area that benefits from the work of scholars representing multiple research traditions, disciplines, methodologies, and theoretical perspectives. Indeed, health communication is a "transdisciplinary" area of inquiry, attracting researchers who represent multiple related social scientific, humanist, and technical disciplines and conduct research that focuses on a diverse set of health issues in a broad range of health-care settings.

Conclusion

Health communication is an exciting multifaceted area of applied communication inquiry that examines the role of messages, message exchange, and information about health care and health outcomes. Evidence suggests that communication plays extremely important functions in health care and health promotion. Future study of health communication will help identify the primary communication mechanisms that are at work in modern health care and health promotion, thereby guiding effective and strategic use of communication by health-care consumers and providers. Knowledge about the role of communication in health care, coupled with the skills to access and share relevant health information effectively, will help both consumers and providers get the most out of the modern health-care system.

See also: Group Communication; Health Communication, Careers in; Interpersonal Communication; Organizational Communication; Provider–Patient Relationships; Public Health Campaigns.

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GARY L. KREPS

HEALTH COMMUNICATION, CAREERS IN

Study in the area of health communication can serve as good preparation for individuals who want to work in a number of very important arenas related to the modern health-care delivery and health promotion. In fact, communication knowledge and skills are in high demand in the modern health-care system because there are many important health-care functions that are related to communication. The combination of well-developed oral, written, and media communication skills, along with an understanding of the way the health-care system operates is very powerful and of great utility in health-care industries. Students of health communication can perform very important roles in health care and health promotion, helping to improve quality of care and to enhance efforts at health promotion.

Education and Training

Education is one of the growing areas of opportunity for scholars who have graduate degrees in health communication. These scholars are increasingly in demand at universities and colleges to serve as faculty in communication programs, as well as in educational programs related to the health professions. Many health-care professions (e.g., medicine, nursing, pharmacology, physical therapy, psychology) require practicing health-care providers to seek continuing-education credits to maintain their professional licensing, and many hospitals and medical centers have well-developed continuing-education programs for their professional staff. Training in health communication is an important and highdemand area of study. Topics such as provider–consumer relations, interviewing skills, multicultural relations, ethical decision-making, interprofessional relations, and health-care team development are very attractive to practicing health-care providers. Scholars in these areas can provide a great educational service to health-care professionals, health-care delivery systems, and consumers by helping providers develop and refine their skills in health communication.

Health-Care Advocacy and Support

With the growing emphasis on public advocacy, consumerism, and empowerment in research, both undergraduate and graduate students of health communication are well prepared for important information intermediary and advocacy careers within the health-care delivery system. New career opportunities with job titles such as "patient advocate," "health information specialist," and "patient relations officer" are helping to enhance the modern health-care system by providing relevant health information to both providers and consumers. These new information and advocacy professionals help to identify and fulfill the specific information needs of consumers and providers. They relieve a great deal of strain on the modern health-care system by disseminating relevant health information that can encourage and empower consumers to practice disease prevention and self-care and to become active partners with health-care providers in the healthcare enterprise.

Ideally, these specialists help identify appropriate sources of relevant health information that are available to consumers, gather data from consumers about the kinds of challenges and constraints they face within the modern health-care system, and develop and field test information dissemination methods meant to enhance consumers' medical literacy. Such efforts help consumers negotiate their ways through healthcare bureaucracies and develop communication strategies for working effectively with health-care providers. These professionals also act as information intermediaries for health-care providers and administrators by gathering relevant information and feedback from consumers about the nature of the health-care problems these consumers are coping with, their needs within the health-care system, and their reactions to the services they have received within the health-care system. The consumer information that the information intermediaries can provide enables health-care providers and administrators to understand and meet the needs of their clients.

Health Education and Dissemination

There are growing opportunities for specialists in health communication to work as health educators, health science writers, and as health reporters. There is a tremendous need for individuals in the health-care, pharmaceutical, and health-care technology industries who can translate complex technical health treatment and research information for lay audiences. This applies to information provided both orally (in health education and counseling efforts) and in writing (for newspapers, websites, magazines, pamphlets, and advertising). Students of health communication are typically well trained to present technical information to different audiences and have developed strong oral and written communication skills that prepare them for these career opportunities. Similar opportunities within the broad health-care industries are available to students who are skilled as audio, video, film, and new media producers and can effectively present relevant health information to different audiences via these powerful media channels.

Health Promotion

With the growth of efforts at health promotion in the modern health-care system, there are growing opportunities for people to develop and administer campaigns related to health communication. Communication professionals are well suited to collect audience analysis data for guiding message development and communication strategies for campaigns. They develop and field test messages strategies for health promotion, gather formative evaluation data for refining these messages, and identify appropriate communication channels for delivering these messages. Health campaigns are typically mounted by local, state, regional, and national public health agencies, by health-care and consumer-advocacy organizations, and by health-care delivery systems-all of



A traveling health educator visits a class in South Carolina to teach children about health-related topics ranging from dental care to anatomy. (Annie Griffiths Belt/Corbis)

which are good potential employers for experts in health communication.

Research and Evaluation

The are many research and evaluation opportunities available for scholars in health communication because advocacy groups, health-care delivery systems, and government public health agencies have made significant investments in developing public health education communication programs. These communication programs include print materials (e.g., brochures, booklets, and posters), television and radio programs (e.g., public service announcements), interactive media (e.g., CD-ROMs), and websites for providing health information to key audiences via the Internet. Scholars in health communication are in great demand to help these organizations and government agencies evaluate the effectiveness of their current health information delivery programs, to help them tailor their message strategies for specific targeted audiences, and to help

them develop new and improved health information dissemination strategies and technologies. Such evaluation research can also help consumers decide which of the many available sources of health information are the most credible, accurate, and up-to-date sources.

Health Sales and Account Management

The area of health sales is an exciting area of employment opportunity for students of health communication. Companies that sell pharmaceuticals, medical equipment, and health supplies all need sales personnel who can communicate effectively within the health-care system. They need people who can understand the complexities of health-care delivery yet explain those complexities in laymen's terms to diverse audiences. The companies also want sales personnel who can establish good working relationships with healthcare customers, who can manage standing accounts, and who can develop new accounts.

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See also: Health Communication; Provider–Patient Relationships; Public Health Campaigns.

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GARY L. KREPS

HEARST, WILLIAM RANDOLPH (1863-1951)

William Randolph Hearst defined twentieth-century media for better and for worse. His style of journalism emphasized a focus on the audience, and that approach has resulted in the look and content of today's mass media.

Born in San Francisco on April 29, 1863, to George Hearst and Phoebe Apperson Hearst, William was raised with all the strength and inspiration that a self-made multimillionaire and a welleducated woman could impart in one of the most exceptional environments of the century. San Francisco bred larger-than-life figures of success and failure. Although his parents demanded a high standard, they provided excellent examples of the rewards that would accrue from such efforts.

Around the time that Hearst, studying at Harvard, was discovering an interest in media, his father acquired a small newspaper, *The San Francisco Examiner*, as compensation for a debt owed to him. Hearst sent a letter to his father requesting that he be given control of the newspaper. "I am convinced that I could run a newspaper successfully," he wrote. "With enough money to carry out my schemes—I'll tell you what I would do!" In 1887, at the age of twenty-three, Hearst named himself "Proprietor" of *The Examiner* and devoted both his energy and his intellect to disparaging those who felt that his fortune and his position were unwarranted. Through a combination of long hours, hard work, and nearly unlimited resources, Hearst developed a set of principals of journalism that were devoted to providing an advocate for the average person as much as to providing useful information. He spared no expense to hire the best reporters of the day and encouraged them to use a style of prose designed to entertain as much as to inform. "The Monarch of the Dailies"-as Hearst referred to his newspaper-began a crusade for the people. Corruption and muckraking exposed civic decay. Exposés were standard fare. Hearst established his publishing "dynasty" with the 1895 purchase of a second newspaper, The New York Journal. Now firmly established on both coasts of the United States, his creation of The Chicago American in 1900 established him as a force throughout the country. By the 1920s, "The Chief"-a nickname given to Hearst-was the owner of a chain of more than twenty-four newspapers that had been carefully chosen to reach as many people as possible.

Hearst emphasized the importance of talent (as much as content) in writing to convey information to the public. With this in mind, he hired writers such as Stephen Crane, Mark Twain, and Jack London to work for his newspapers. Sensationalist stories, the hallmark of "Yellow Journalism" (which emphasized flamboyant interpretation over objective presentation and was a style first associated with Joseph Pulitzer and his *New York World*), drew in a large audience—at one point, one in four people in America read a Hearst newspaper.

The coverage of the events leading to the Spanish-American War provided a significant incident in the rivalry between Hearst and Pulitzer. Reporting on the Cuban rebellion against Spanish rule, correspondents from both papers filed a string of lurid accounts. Starving women and children, abuse toward prisoners, and valiant rebels fighting to be free were regular features in both newspaper chains. Stories that featured women were particularly inflammatory as well as circulation building. The drawing "Spanish Dons Search American Women" by Frederic Remington is an example of this sensationalism. However, in 1897, Remington cabled Hearst that everything was quiet in Havana. Remington wanted to return to the United States. Hearst replied, "Please remain. You
furnish the pictures, I'll furnish the war." The sensational stories continued. By the time the Maine was sunk in Havana Harbor on February 15, 1898, Hearst and Pulitzer had managed to build U.S. public opinion to a point where intervention on the part of President William McKinley and the United States was demanded. "Remember the Maine!" became an international cry for justice. As a result of the involvement of Hearst and Pulitzer, the Spanish-American War has since become known as the first media war. In later years, however, Hearst recognized the need for balance. A 1933 memo to his editors emphasized that fair and impartial reporting was essential to the people's interest. "Give unbiased news of all creeds and parties," it read.

Hearst, not wanting to limit his influence to the newspaper world, launched his first magazine, Motor, in 1903, shortly after his marriage to Millicent Willson (with whom he would have five sons). He expanded his dominance of print media with the purchase or start of many other magazines, including Cosmopolitan, Chicago Examiner, Boston American, Daily Mirror, and Harper's Bazaar. Hearst also eventually moved into radio broadcasting and the film industry (where he produced several movies starring Marion Davies, who was his mistress from 1917 until his death). His political interests resulted in Hearst being elected to the U.S. House of Representatives (1903–1907), but his separate bids to become mayor of New York City, governor of New York State, and president of the United States all proved unsuccessful.

It is undeniable that Hearst's style of news reporting, whether through Yellow Journalism excess or reader-friendly emphasis, reached audiences in ways that journalists still strive to imitate. His legacy is more physically apparent at San Simeon—also known as Hearst Castle—in California. This lavish estate created by Hearst during the later period of his life is now a state historical monument and houses an extensive collection of Hearst memorabilia.

See also: JOURNALISM, HISTORY OF; NEWSPAPER INDUSTRY, HISTORY OF; PULITZER, JOSEPH.

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This "Hearst for Mayor" poster was part of William Randolph Hearst's campaign to become the mayor of New York City. (Corbis)

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MARK REID ARNOLD

HOME AS INFORMATION ENVIRONMENT

In the information age—the frenetic era of the networked computer, the Internet-surfing consumer, and the digital commodity—there have been rapid advancements in information technology (IT). These advancements have increasingly affected the way people interact in their daily living spaces, including the workplace, public areas such as libraries and shopping centers, and the private dwelling known as the home.

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While specific definitions depend on the area of research or interest level, IT can loosely be described as any device or service that has an electronic origin and is used by people to process data. This data can be the music from a home stereo system, the picture from a television, the bit stream of a personal computer, a voice from a telephone, or virtually any other thing found in the home. A synonym often used for IT based in the home is "media."

While media has a substantial presence in all three living spaces, IT is most obvious and arguably most dynamic within the home. This statement may seem counterintuitive at first glance; anecdotes about enormous corporate budgets providing employees with limitless access to new and innovative technologies abound. However, on further reflection, viewing the home as the dominant space for the presence and diversity of information technology is understandable since the home serves multiple functions in the lives of most Americans.

The home is capable of serving in any capacity that is desired by its dwellers, thanks to an everpresent environment of sophisticated information technology. The following are some of the more popular functions of the home:

- entertainment (perform leisure activities),
- marketplace (purchase goods and services),
- neighborhood (engage fellow community members),
- office (accomplish business tasks),
- refuge (minimize societal exposure), and
- school (educate oneself).

Most Americans spend the majority of their time in their homes, usually with other people. More often than not, people at home are engaged with some IT appliance. Technology that is devoted to the mundane tasks of cooking, cleaning, opening garage doors, and waking people up blends effortlessly with more stimulating entertainment-based devices. Channeling music from radio stations to home theater systems, sending international e-mail messages from the living room, or viewing real-time stock quotes from a television or cellular telephone are mundane, nearly automatic tasks of many daily household routines. This attention to media is significant. Americans consume on average slightly more than nine hours of IT entertainment media every day of the year—a figure that has remained remarkably constant since the mid-1990s and will likely continue with moderate annual increases into the early 2000s. This saturation of the home with IT has a price. Americans have maintained a significant media spending level—at least \$500 per person per year since the mid-1990s, an amount that is likely to double by the mid-2000s.

With this complex portrait of the home as an information technology center being so dominant, it is useful to review the history of IT. Doing so will show that while the modern home is without doubt more sophisticated than its historical counterparts, it is nevertheless still the progeny of a late-nineteenth-century phenomenon—the rise of modern mass media. So while the modern home is a target for aggressively priced personal computers, sophisticated digital home theater systems, and the compelling promises of a global Internet, its function as a primary center of IT-based mass media activity has remained relatively unchanged since the late 1800s.

Origins of Home-Based Information Technology

Few information technologies that affect home users were created solely for the purpose of serving the needs of home consumers without the notion of profit. Purely charitable reasons for inventing, producing, and distributing IT devices and services were and are nonexistent in the history of American IT in regard to the home. In fact, most IT devices slated for the home were designed as lures for corporate business-specifically, to gain their advertising dollars. One advantage of most IT media in the home, with the exception of non-icon components of the Internet, is that user literacy is not required either to buy or to use the information technology. This allows even people who do not have reading or writing skills to have the opportunity to experience a nearly constant stream of entertainment, communication, and information.

The telephone, available to homes in the 1870s, was touted as a tool for commerce and was accepted more rapidly by businesses than home consumers. Today, telephones are still more common in business offices than in individual residences: 99 percent of businesses have at least one telephone versus 95 percent for households.

A decade after news of the *Titanic* disaster reached American ears via telegraph in 1912 and

only two years after Pennsylvania's KDKA in 1920 became the first operating radio station licensed by the federal government, radio broadcasters were selling airtime to advertisers. As the novelty and immediacy of radio entered and grew within the daily routines of home listeners, so too did the presence of advertisers.

Television was designed less for the enjoyment of home consumers and more as an advertising vehicle for corporate customers of the television networks. Cable television initially extended that idea and later added other channels on a subscription or pay-per-view basis. Commercial advertising rates have grown exponentially as a result of the popularity of television. Corporations have become willing to pay millions of dollars for single commercials during major sporting events such as the Super Bowl.

Overview of Information Technology in the Home

The home has never been completely isolated from new technology, nor has it ever been a completely safe haven from the pressures of work or the offerings of the entertainment industry. What has changed most markedly about IT in the home is not its basic functions-creating entertainment, promoting communication, and organizing information-but rather the type of information technology. The telephone allowed voice conversations, and the Internet allowed instant text communication via e-mail and instant-chat software. Broadcast television gave viewers several video channels to view. Cable television later provided dozens of such channels, and satellite television promises similar channels in bundles numbering in the hundreds.

As early as 1880, IT in the home was touted as revolutionary. In reference to the telephone, *Scientific American* saw the new device as ". . . nothing less than a new organization of society—a state of things in which every individual, however secluded, will have at call every other individual in the community" (Marvin, 1988). Similar proclamations have been made about every new technology since that time, even those that no longer exist, such as the videotext and videodisc, or those that have yet to enter mainstream use, such as high-definition television (HDTV) and Internet-based telephony. However, it was the telephone with its straightforward design and simple instructions that first put IT into the homes of the American public.

Patented by Alexander Graham Bell in 1876, the telephone made its way into the first home a year later, and it has captivated users ever since. Its resilient design, still basically the same as when it was first invented, has allowed people in disparate areas to communicate in ways that were unimaginable prior to its invention.

Yet, even though the telephone generated attention and had at its inception a unique ability to "cheat time," it did not diffuse rapidly into American homes. It took eighty years from the time of its invention to penetrate 75 percent of homes, and it was not until 1970 that it reached a penetration level of 93 percent.

Minority household penetration rates consistently rank 8 to 10 percentage points lower than their white counterparts. According to Alexander Belinfante (1998), the telephone gap between white and minority households in 1984 was approximately 13 percent. In 1999, white households had a national average telephone penetration rate of 95 percent, approximately 8 percent higher than the black and Hispanic rates of 86.9 percent and 86.7 percent, respectively. Such differences persist with respect to other IT devices as well.

Radio, the next technology to diffuse within the home, would show the vast potential for Americans to consume IT in their homes. It is still the benchmark by which all subsequent devices and services are compared; its low one-time price, immediate value to the consumer, and astonishingly fast acceptance by home consumers created the first ubiquitous home IT device.

Even the Great Depression, with its effect of diminishing personal expenditures on information goods and service by 25 percent, failed to slow the growth of radio receivers in the home. In 1929, less than a decade after commercial radio programming was introduced and only five years after national broadcasting began, the household penetration of radio was above 30 percent. In 1931, that percentage had jumped to more than 50 percent. By the end of the 1930s, close to 80 percent of all U.S. households had at least one radio. In 1950, that percentage was at 95 percent, and by 1970, radio penetration was at 99 percent, where it has remained constant. Approximately 12,000 FM (frequency modulation) and AM (amplitude modulation) radio stations transmit their signals to home users in the United States.

Television, while more expensive initially than radio, diffused even more rapidly into American households. In 1950, barely a decade after its public display at the 1939 World's Fair, television was in 9 percent of households. In twenty years, that percentage had increased more than tenfold to 95 percent. Since then, its household penetration has remained identical to that of radio at 99 percent. Yet even with the launching of two new broadcast television networks in the 1990s—the United Paramount Network (UPN) and the Warner Bros. Network (WB)—fewer than half of all television viewers watch the major networks. Instead, viewers are turning to cable television.

Driven by poor reception of traditional broadcast network television and relaxed regulation, the relatively dormant cable television systems that originated in the late 1940s and early 1950s saw explosive growth in the 1970s, the decade when cable was first present in at least 10 percent of American homes. By 1980, cable penetration had doubled to 20 percent, and by the end of the 1990s, cable penetration as measured by subscribership was approximately two-thirds of all households, although 97 percent of all households in the United States were wired for cable. If the newer Direct Broadcasting Satellite (DBS) services are included, virtually all households in the United States are capable of receiving network or cable television programming; close to 1 in 10 households have DBS service, often coupling their satellite offerings with standard cable service that provides local news and programming. All in all, home television viewers on average watch more than four hours of television-based programming a day. For those who are under eighteen years of age and over sixty-five years of age, that number jumps significantly to more than six hours.

Coupled with the explosion of cable programming in the 1970s and the interest of home consumers in watching theater movies at home, the time was ripe for the introduction of the home videocassette recorder (VCR). In 1975, Sony introduced the first commercial VCR, dubbed the Betamax. Its format was soon replaced by the VHS standard, and by 1982, close to 10 percent of homes had VCRs. After the U.S. Supreme Court ruled that taping commercial broadcasts from a television to a VCR within the confines of one's home was legal, promotion of and use of VCRs skyrocketed, reaching more than 50 percent of U.S. households by the mid-1980s. By 1999, that percentage had jumped to 90 percent. Alongside this trend of VCR use was a similar one for the use of a camcorder (portable video camera), which has resulted in one in five households owning a camcorder.

Video games also drew people, especially those under eighteen years of age, who were looking for hands-on electronic entertainment that was not being offered by broadcasting technologies. David Sheff, author of Game Over (1993), describes the rise of the video game industry beginning with the first commercially successful game. Pong, the first commercial video arcade game, was introduced outside of the home in 1972. Two years later, it was officially inside the home. A little more than a decade later, in 1986, Japan's Nintendo officially introduced the Nintendo Entertainment System (NES) to the United States. Led by a strong marketing effort and enchanted young users, its popularity soared. In 1990 alone, one in three households owned a Nintendo Entertainment System, at the time the most popular home game console ever created. Subsequent home video game consoles sport CD-ROMs and other technologies that rival those of personal computers. However, it is the Internet (an ever-newer technology that involves elements of video games, radio, television, and even traditional text media) that has taken the American home by storm.

In 1991, only 500,000 homes were connected to the Internet-less than 1 percent of the total homes in the United States. Yet by the end of 1999, more than half of all homes in the United States were connected to the Internet. Two main reasons for this gigantic increase in Internet penetration were the World Wide Web (WWW) and the fixed monthly rate subscription fees offered by Internet Service Providers (ISPs). The WWW, the graphical icon-based interface used by people to access the Internet easily via graphics and icons, was invented in 1989 and became popular with the introduction of the first web browser, Mosaic, in 1993. The web browser simplified "browsing" or "surfing" the Internet for items of interest. Low-wage overseas labor markets, improved production methods, faster product development cycles, and frenzied competition among the major home computer manufacturers are likely to keep the home penetration of the Internet on the rise.

Of note regarding penetration rates of IT in the home is that the rate of adoption depends on whether home users make a one-time purchase or whether they must commit to subscription pricing. For example, the gap between those who owned a radio and/or television (one-time purchases) and those who did not quickly closed, while the gaps for telephone and cable television (subscription services) have not. In other words, the penetration rates of the telephone and cable television have remained lower than their broadcasting counterparts. Moreover, while personal computer ownership and modem usage have skyrocketed among all sectors of the population, minority households still trail their white counterparts in online access. This phenomenon is partly a result of income, but it is also due to geography, ethnicity, housing, marital status, and a multitude of other personal demographics. One striking example is that the 314 U.S. Native American reservations and trust lands have an average telephone penetration rate of 46.6 percent-less than half of the national average. Only six of the forty-eight reservations with five hundred or more Native American households had telephone penetration levels that were above 75 percent-none exceeded 85 percent.

In short, IT devices—goods—penetrate households more quickly than services, even holding constant the total yearly cost of obtaining the good or service and the advertising levels of corporate advertisers. This goods-services dichotomy is arguably the result of households on the margin. In these households, the decision to pay a monthly fee is a difficult one that has to be made each month, which results in a condition that is not conducive to uninterrupted media services for those with limited or fixed resources.

Thus, in the American home, IT breeds IT. As a new technology is developed, marketed, and accepted by people in the homes, it does not replace a previous technology, even if it serves a similar function. For example, the telephone provided a simple way for people to communicate. While it did much to reduce daily traffic from one house to another for social calls, the telephone itself was not replaced by Internet e-mail, which in many cases serves the same function. Likewise, the introduction of television, while hurting the motion picture industry outside of the home, did not eliminate the use of the radio within the home. The personal computer has not sunk the home video game industry, even while similar game titles are available on both IT devices. Network television survives despite aggressive growth in the cable television and the DBS industries. From the historical record, it is clear that Americans layer their home IT technologies, favoring abundance and choice of IT over pure efficiency, cost, or aesthetics.

Trends of Information Technology in the Home

The traditional media, such as broadcast television and radio, have a limited array of contents and a fixed rigid schedule to which users must conform. These characteristics exist partly because early IT devices were more concerned about functionality than about aesthetics. New media, such as the Internet, offer a wide range of content and greater flexibility for user customization, and home consumers are flocking to technologies that offer this customization.

The telephone is a representative example of this customization trend. Unlike the numerous color options and designs that exist for modern telephones, the original telephone design was available in exactly one color: black. Furthermore, the black telephone could not be bought; it had to be rented from the telephone company, which also numbered but one: AT&T. Specialized cords and adapters, now common, were not options until well into the latter half of the twentieth century. The modern telephone can be had in dozens of shapes and sizes, from numerous distributors. Those people who wish to make a telephone call can do so with the traditional desktop telephone, with cellular or satellite-based telephones, and even over the Internet-all for prices that are, even accounting for inflation, lower than ever. And the wonders continue.

From William Gibson's science fiction cult classic *Neuromancer* (1984), to more recent writings such as *What Will Be* (1997) by futurist Michael Dertouzos, to Erik Davis's media-studies-inspired *Techgnosis* (1998), writers have had little difficulty devising future IT devices and services for the home. According to these authors and the popular press, smaller, more personal devices that merge user and interface will likely dominate the IT environment of the home into the future. Function, as always, will be important, as will the ever-present concerns of privacy, security, and ease of use. Aesthetics, too, will play a more significant role than they have in the past as multinational conglomer-

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ates vie for the eyes, ears, and pocketbooks of household consumers. After all, if a company cannot differentiate its product from competitors, it will have difficulty becoming or remaining a successful company. The most frequently mentioned characteristics of future IT items for the home include the following:

- 1. ability to safeguard personal information using specialized security features,
- 2. ability to personalize received information depending on user-define preferences,
- 3. voice and data transmission using traditional and higher bandwidth networks,
- 4. entertainment capabilities such as electronic games and hyperlinked text documents,
- 5. customizable visual interface,
- 6. control of household appliances and timing devices,
- 7. datebook-type functions, including calendar, to do lists, and alarms for scheduled events,
- 8. location-neutral functionality, so the device can be used throughout the world,
- 9. low power consumption and the ability to recharge for repeated and prolonged uses, and
- 10. affordable cost both in time to learn and cost to buy.

The shaping of the American home is a continuous process. Innovation in home-based IT is rapid and will likely become more so in the future. The available IT provides nearly instantaneous access to the workings of a home and its associated systems. For example, a home user can start the dishwasher, turn on the oven, monitor children and pets, and even open the garage door using simple IT devices. While such features may seem common in the modern home IT environment, they were fantastic ideas even in the 1950s. Much of the modern IT ideas are equally farfetched, but they will likely produce tangible results. Either way, the evolution of information technology will continue, and American consumers will continue to experiment and accept many, if not most, of the new devices and services that are created and offered to the public.

See also: Cable Television; Cable Television, History of; Information Industry; Internet and the World Wide Web; Radio Broadcasting; Radio Broadcasting, History of; Technology, Adoption and Diffusion of; Telephone Industry; Telephone Industry, History of; Television Broadcasting; Television Broadcasting, History of; Video and Computer Games and the Internet.

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HOMOSEXUALITY IN THE MEDIA See: Gays and Lesbians in the Media; Sex and the Media

HUMAN-COMPUTER INTERACTION

Human-computer interaction (HCI) is the study of how people use computers, with the aim of making them easier to use. It has grown in importance as a topic as computers have become less expensive and, thus, are now used by many more people. In the early years of computers (the 1950s to the 1970s), computers were expensive and generally only used by skilled people, often computer scientists. The aim in writing programs was to squeeze the most power from a very limited memory and processing speed. It made sense to pay little attention to the usability of the system when the computer cost millions of dollars and could barely perform the task required. Since the 1980s, as computers have become less expensive and particularly as they have become more widespread, the problems of usability have become more intense. Systems developers can no longer assume that the user of a computer has a degree in computer science or is willing to spend considerable time learning to use it. At the same time, falling hardware costs mean that it has become feasible to allocate computational resources to an interface that is easier to use. But what makes an interface easier to use? That is what researchers in HCI attempted to find out, and it remains the challenge of current research and development.

Research and Development

In addition to computer science, psychology has played a significant role in HCI research. Early work on the design of aircraft cockpits focused on the problems of designing complex displays so that pilots could quickly and accurately make use of many sources of information and act on them. Researchers carefully studied other time-critical and safety-critical applications such as nuclear power stations. Although using a word processor is rarely a life-and-death affair, it can seem overwhelmingly complicated, considering that it should be a simple task. Cognitive psychologists draw on their experience of understanding human learning and problem-solving practices to explain the factors that make a problem easier or harder for a person to solve. This can be used to help to understand the difficulties that people have with using computer programs and to generate recommendations for the design of better interfaces (i.e., how the user will interact with the computer). It involves the application of the traditional scientific method—proposing a hypothesis about user behavior under a certain set of circumstances and then designing a controlled experiment to test the hypothesis. Work in this tradition may also be called "human factors" or "ergonomics."

In parallel with the analytic approach of psychologists, computer scientists explore the development of new computer interfaces in an attempt to solve the problems identified by these analyses. One major development has been the creation of graphical user interfaces such as the Macintosh user interface and Microsoft Windows. Instead of typing commands in order to manipulate, copy, and organize files, users can move small graphical representations ("icons") of the files and folders. They can make the computer carry out tasks by clicking on buttons that may contain text and/or an icon to illustrate what the button will do. Users may also choose commands from lists of names ("menus") that may be on a particular screen or that can drop down or pop up when the user clicks on a particular area. Different contexts for working, such as word-processing a document and working on a spreadsheet, can be provided by rectangles on the screen that can be overlapped ("windows"). To people who use computers on a regular basis, this discussion may sound rather odd. They might even wonder why there is any need to try to explain exactly what icons, menus, and windows are. However, a key point in HCI is the fact that users of computer systems can become so familiar with an interface that they find it normal forget that such an interface initially seemed strange and needed explanation. This was the problem with many of the early designs of computer applications for popular use. Since the designers were familiar with computers and found the designs easy to use, they often forgot that users who were new to computers would need a different, clearer design.

There are several reasons why graphical interfaces are popular. For example, one of the findings from cognitive psychology is that human beings are much better at recognizing something familiar (e.g., by choosing a command from a list) than they are at recalling it (e.g., remembering the exact name for a command without being given any clues). Thus, if computers provide a menu of commands to choose from, rather than requiring users to recall a command and type it into the computer, many more users are likely to be able to make the correct choice.

There is, however, a problem with this approach. If there are only ten things that can be done, then a menu of ten items is fine. If there are one hundred, it gets more complicated, requiring submenus with a resulting problem of whether the user will be able to guess the right submenu in which to look. If there are one thousand items, things are much more complicated. That explains in part why, despite the popularity of graphical user interfaces, text-based interfaces are still used. The Unix operating system is still mostly used with such a complex interface. Unix is a powerful system and there are many commands. It is popular with expert computer users who want access to these commands and are willing to take the time to learn them. Once learned, typing in a powerful command can be much faster than choosing a combination of menu items and doing a sequence of clicking and dragging of icons. It is also possible to program sequences of commands to automate many complex tasks. This is a classic design tradeoff. The graphical interface may be easier to learn and faster to use for beginners, but the text-based interface may be much more efficient for experts.

Good introductory overviews of HCI are available in the form of textbooks (e.g., Preece et al., 1994; Dix, 1998) as well as books written by practitioners reflecting on their design experience and the general lessons that can be learned (e.g., Tognazzini, 1992, 1995; Cooper, 1995). The Association for Computing Machinery (ACM) publishes an accessible magazine in the area, called interactions, as well as providing numerous resources via its website. Research in HCI examines both the theory of how people reason about and with computer systems, as well as the development and testing of new kinds of interfaces. Some researchers also study how to integrate interface design and efficient evaluation of computer use into the cycle of product development.

Much can be learned from watching someone and noting their confusion as they try to use a computer system. Often, by careful analysis, it is possible to explain why the person was confused, to predict other likely areas of confusion, and to propose ways of redesigning the system to eliminate or at least reduce the chances of that confusion. People often reason by analogy. If the new computer application that they are currently using reminds them of another application that they already know, they will guess that doing something in this new application will do the same thing as in the old application. For example, if they are used to filling in an online form by hitting the tab key to get from one field to another, they will try and do the same thing in the current form. If it does not work (or worse, does something different, such as inserting a tab character into the form), they may not notice at first and will be all the more confused when they eventually do notice. Consistency in interfaces greatly increases their usability. Consistency can be external (i.e., it is similar to other, familiar interfaces) and also internal (i.e., two different parts of the system are similar). For example, imagine how confusing an internally inconsistent interface would be if, after filling in one form, the user must click on the "enter" button at the top of the form, while on the next form, the user, after filling in the form, must click on the "submit" button at the bottom of the form.

Metaphor can be useful in helping someone to understand a new application. Thus, the way a person can organize his or her computer files into folders can use the metaphor of a physical desktop, as in the Windows and Macintosh operating systems. However, metaphors can become confusing if they are used inconsistently. Other techniques to test an interface can be employed prior to doing a usability study. One can use a checklist of desirable interface features to include, or one can use a checklist of common interface errors. The interface can be assessed by comparison with such a list. In this way, certain problems can be detected in a very quick and cost-effective manner. For example, a checklist of desirable features might include the question "Does the interface provide consistent ways of doing similar actions?"

Usability and Design

The usability of a system depends on both textual and graphical aspects. In graphical user interfaces, icons are often used. A poorly designed icon may mean that the user cannot guess what it will do. If the image seems arbitrary, people may forget the meaning of an icon from one use to the next,



To accommodate the limited capabilities of toddlers, computer learning aids must use software that is designed to simplify the interactions that are necessary to obtain a goal, such as, in this case, a child being able to just touch a picture and have the computer provide the name of the object. (Lowell Georgia/Corbis)

greatly reducing their efficiency. Edward Tufte (1990) has explored many issues that are of importance to the design of comprehensible graphical interfaces. Similarly, textual designchoosing the names of menu options, actions, words on buttons, and so on-is harder than it might first appear. In designing a system and choosing those names, what should a certain option be called? Is it a technical term? If so, will the intended users know what it means? Is it ambiguous? It may not be to the interface designer, but it may be to the user. The selection of names is complex, and again there are ways of testing the usability of ideas, even before a system is actually built. One method is known as participatory design, in which the intended users of a new system are included in the design process.

It can be tempting when reading about the problems that users have, or even when observing a user test, to react in words like the following: "Well, they ought to read the manual or go on a training course. It's not my fault if they can't be bothered to learn to use my system." However, few users read the manual. People are too busy, they want to learn by doing, and often they have had such unproductive experiences with poorly written manuals that they are unwilling to take that route. Thus, designers must strive to make systems as easy to use as possible, so users can guess the most likely action that they should try. The difficulty of learning to use computer applications is a major problem. If designers could improve interfaces, they could create substantial productivity gains for the users of computer systems. Furthermore, designers need to justify why a company should bother to invest scarce resources in improving the usability of its products, and they need to show that such an investment yields substantially greater profits through greater sales of a more usable product.

It has already been noted that designers are tempted to think that all users are similar to them.

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Thus, it is important in design to consider the likely background of the intended users. Often, there will be several different kinds of user all with slightly different needs. The design challenge is to cater to as many of those needs as possible, within the budget constraints. Trade-offs are inevitable. Including a given feature may help one group of users but confuse another, so should it be included or not? Users vary by what they may want to do with the software, and also by their background. They may be computer novices or experts. The needs of someone who is new to the system are different from the needs of someone who frequently uses the system. The former may want help and explanation, along with features to make it easy to learn how to use the application. The latter may be much more concerned with doing their tasks as quickly and accurately as possible and be irritated by "helpful" features that slow them down. For example, many graphical interfaces allow the user to carry out actions by a sequence of menu selections, where each stage of the process is explained in a series of text and graphic boxes that pop up on the screen. This helps a novice to the application to understand what to do and the other options that are possible. There may also be a "keyboard shortcut" available for experts who know exactly what they want to do and want to do it quickly. The shortcut is often an obscure combination of keys that must be pressed in a certain order. This is hard to learn (which is bad for the newcomer) but very fast to execute (which is good for the expert). Including the shortcut in the menu option creates an interface that benefits both groups.

As well as experience with computers, there are other ways in which the intended users of systems may be different in some way from their designers, and these differences should also be explicitly taken into account in the design process. People with disabilities have a particular set of needs. They may use special hardware or software configurations to enable them to use a computer application. It is important to check that an interface design is compatible with these different kinds of use. For example, a color display that conveys vital information only by whether a certain area on the screen is red or green will be confusing for a user with red-green colorblindness. The solution, as in other cases, is to provide additional ways of conveying the information: use color and shape, or color and text, for example. Other kinds of potential users who may need special design attention include children and people from countries and cultures different from that of the designer. This means that the designer must consider issues such as choice and style of language, alternative versions of the same language (such as British and American English), whether icons will be meaningful, the effect of graphics, and various other conventions. The format for dates is a classic convention problem—4/5/01 can mean either the 4th of May 2001 or the 5th of April 2001, depending on where in the world you are.

The design of interfaces involves both hardware and software. When certain kinds of input and output hardware become available or inexpensive enough for the intended task, new kinds of interfaces (designed in software) become possible. For example, color monitors and the mouse make it possible to design the kinds of graphical user interfaces that are now common. As handheld computers become more prevalent, particularly as they become networked, new opportunities for innovative interfaces will arise, along with commercial pressures that they should become as easy to use as other domestic appliances. Work on immersive virtual reality looks at how hardware such as very large monitors, wall projectors, or special goggles can be used to give users the illusion of actually traveling in a fabricated three-dimensional world as opposed to manipulating small images on a flat screen. People frequently use images to help them interact with computers, but why not use sound as well? At the moment, most computers only use sound in primitive ways, such as beeping when something is wrong, or for entertainment. Some researchers are working on more advanced ideas, such as being able to hear data as well as, or instead of, seeing it. This is known as "sonification." In addition, researchers are working on ways for a user to talk to a computer and for the computer to talk back. Such sound-based interfaces would be especially useful for people who have visual disabilities or for interacting via a mobile telephone or while driving.

In addition to applications that run on computers, such as word processors and databases, interface design is important for Internet use. Designing web pages, including interactive pages for shopping, pose whole new challenges for HCI. Online customers can be impatient, and if a website is difficult to use, they will very rapidly move

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on to a competitor's site and make their purchases there. Consequently, design for ease of use is a significant competitive advantage.

Conclusion

HCI is growing in importance as the number of people who interact with computers grows. The explosive growth of the Internet and of e-commerce has served to focus attention on the usability of websites as yet another kind of computer interface. HCI involves both fundamental theoretical research, experimentation, the creation of radically new ways of interacting with computers, and the practical development of computer applications that are easier to use.

See also: Artificial Intelligence; Computer Literacy; Computer Software; Electronic Commerce; Internet and the World Wide Web; Systems Designers.

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MICHAEL TWIDALE

HUMAN INFORMATION PROCESSING

Because human information processing has to do with how people receive messages, it is a critical topic in communication study. Message reception consists of paying attention to particular messages in the environment and then using them as a guide to behavior. This is a very active process that consists of three separate but related activities: information selection, interpretation, and retention.

Information Selection

Humans operate in an environment that is filled with signals of various kinds. These may be in the form of sights (visual cues), sounds (auditory cues), touch (tactile cues), taste (gustatory cues), or smell (olfactory cues). The number of such cues that are available to individuals at any instant is almost limitless, and were individuals to try to pay attention to all these, they would immediately find themselves in a total information overload situation. It is therefore necessary for people to select and use some of these cues, while

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ignoring others. This is an extremely important and complex activity, one that people perform repeatedly every waking moment. At the same time, it is a process that occurs in the background of individuals' experiences, and in a manner of which they are often only minimally aware. For example, consider what happens when a person arrives at an unfamiliar airport terminal at the end of a flight. The person exits the plane through the jetway and walks through the door into the terminal. At that instant, the person is bombarded with any number of visual and auditory messages that compete for his or her attention-far more than the person could possibly fully attend to at one time. There are signs, people talking, people moving this way and that, messages being announced over the speakers in the building, vendors, stores, newspaper racks, and so on. Depending on the person's goals-to find luggage, for example-and his or her prior experience in similar situations, the person begins to attend selectively to the messages in the environment, taking particular note of those that are appropriate to the successful accomplishment of the goal. Appropriate messages in this situation might include signs and the direction in which other people getting off of the same flight are walking. The person must ignore other messages that seem less vital in terms of meeting the immediate goal. If the person's intentions were different, he or she might well tune into and use a completely different set of messages. For example, if the person were going to have a two-hour layover while waiting for a connecting flight and had not eaten in several hours, he or she might tune into and use a set of visual, auditory, and olfactory messages that would help in locating a place to purchase a meal or snack.

Information Interpretation

Interpretation consists of attaching meaning to the messages to which individuals selectively attend. Whenever people take note of any message, they make some basic interpretations; they decide if the message is amusing or alarming, true or untrue, serious or humorous, new or old, or contradictory or consistent. When a person decides to watch a television program or movie, for example, he or she makes all of these determinations as a viewer, often without thinking all that much about the process. Similarly, in the case of the airport example mentioned above, noticing various signs was one component of message reception. However, to be useful, the messages on the signs must also be interpreted. People must know what exactly the words or arrows mean.

In all situations, people's actions will ultimately be based on the meanings they attach to the messages that they have selected. While the above examples may imply that selection, interpretation, and action are simple "1-2-3" activities, this is clearly not the case. Individuals cycle through each of these three activities in such a rapid-fire manner, that it is really quite difficult to identify which component is occurring and in what order. With the airport signs, for example, the person must determine that these were, in fact, signs (and therefore appropriate places to look for messages about directions) even before he or she selectively attended to them and began to interpret the specific words and drawings..

Information Retention

Retention (i.e., memory) plays an indispensable role in selection and interpretation, as the previous examples imply. An individual's memory of previous message-reception activities tells the person how to approach any new message-reception situation. Even though the person may be in an airport that he or she has never been in before, memories about airports in general help guide that person through the new situation in terms of previous experiences in circumstances that are judged to be similar. Thus, for example, through message retention, the person knows what signs look like and he or she knows that they usually provide information that is helpful for navigation.

The ease with which remembered information is available to people seems so natural that it is easy to overlook the complexity of the underlying processes that are involved. People have little difficulty recalling the information that they need in order to go about their daily routines. This includes such information as where to locate things in the home, how to start and operate an automobile, how to travel from home to work, how to perform duties at work, and so on. Morton Hunt (1982, p. 6) provided an excellent description of this complex retention process:

Although every act of thinking involves the use of images, sounds, symbols, meanings, and connections between things, all stored in memory, the organization of memory is so efficient that most of the time we are unaware of having to exert any effort to locate and use these materials. Consider the ranges of kinds of information you keep in, and can easily summon forth from, your own memory: the face of your closest friend . . . the words and melody of the national anthem . . . the spelling of almost every word you can think of . . . the name of every object you can see from where you are sitting . . . the way your room looked when you were eight . . . the set of skills you need to drive a car in heavy traffic . . . and enough more to fill many shelves full of books.

Because of the information retention process, individuals can answer in a split second, and with great accuracy, questions such as "Who was the first president of the United States?" or "What was the address of the house in which you grew up?" Moreover, individuals can perform these operations in far less time than it would take to retrieve the information from any other source, including the fastest computer.

Factors That Influence Message Reception

Many factors influence message selection, interpretation, and retention. A number of these factors have to do with the individual receiver. Others are related to the nature of the message and the source, as well as to the media and environment.

Receiver Influences

Physical, social, and psychological needs play an important role in human information processing behavior. When an individual is hungry, for example, this need will be likely to influence the cues to which he or she attends and the way in which those cues are interpreted. Pretzels in a food stand in the airport are not nearly as likely to be noticed or purchased by a passenger who has just eaten a meal as they are by one who has not.

Attitudes, beliefs, and values are also important influences on how individuals select, interpret, and retain messages. For example, a prime rib dinner that is seen as a mouth-watering delight by some people will be viewed very differently by a vegetarian or by someone whose religious beliefs suggest that the cow is a sacred animal.

In any situation, goals have a great influence on message reception. One example was provided earlier in the airport illustration. A person with the goal of proceeding to the baggage claim area engages in much different message-reception behavior than does a person in a similar environment who has two hours to "waste" while waiting for a connecting flight. One's goals—whether related to specific short-term activities or longterm personal or occupational agendas—are very influential factors in message reception.

Differing capabilities lead to differing messagereception patterns. Most obvious is the example of language capability. The message-reception possibilities and probabilities of a bilingual individual are considerably more extensive than those of someone who speaks only one language. For the same reasons, people who are trained in particular professional and technical fields have access to materials and documents that others do not. Having a specific use for messages also influences selection, interpretation, and retention. For example, reading a book over which one will be tested is generally a quite different information processing experience from reading a book for pure enjoyment.

Individuals differ in their styles of communication, and these differences often lead to differences in message reception. Generally, those people who have highly verbal communication styles (i.e., who talk extensively about their own thoughts and opinions) are likely to have exposure to less information produced by others in interpersonal situations, simply because of the limitations that their style places on the contributions of others. As another example, if that highly verbal person generally uses a questioning style in interactions with others, this will elicit more information from others, and, in turn, the availability of more information becomes an influence on message reception.

Experience and habit are powerful forces in message reception. Once learned, informationreception patterns are likely to be repeated, and hence, habit and prior behavior are important influences and predictors of future informationreception behavior.

Message Influences

Most of the messages that individuals attend to have other people as their source. However, some messages come from the physical environment, and there are other messages for which the

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individuals themselves are the source. In many situations, people have choices as to which type of messages to attend to and use, and the presence or absence of alternatives is a significant influence on message reception. In the airport scenario, for example, the person could seek the necessary directions by looking at a sign, by watching the flow of pedestrian traffic, or by asking someone. These alternative messages may be more or less easy to attend to, interpret, and retain. A person having a preference for one approach over another is affected by personal style, past experience, and other factors. Messages also vary in their form-in the communication modality involved-and this often influences the likelihood that they will be noticed and acted on. For example, the smell of rotten and decaying garbage is generally more attention-getting that a picture of rotten garbage. Signals may also vary in their physical characteristics (e.g., their color, brightness, size, or intensity), and these factors may well influence message reception. In terms of getting attention, large headlines in a newspaper, for example, are generally more effective than small headlines, and color pictures are generally more effective than black-and-white pictures.

How elements of a message are organized and how novel a particular message is are two additional factors that influence message reception. The way in which information is presented in newspapers is a good illustration of how message organization can influence message reception. Newspaper articles usually begin with a lead paragraph that summarizes all key facts and then provide subsequent paragraphs that provide supporting details. This organization permits and encourages readers to get the general themes of articles without having to read through all of the details. If another organizational approach were used (e.g., if the first section of the article included a variety of details without highlighting key issues), the change would probably have a substantial influence on selection, interpretation, and retention. Novel messages stand out and gain attention simply because they are unfamiliar. Advertisers and marketers make frequent use of this insight by including novel images and approaches in the hope of increasing the amount of attention that is paid to their messages. An advertising message that has text and images printed upside down is one example of a device

being used to increase attention. Opening the hoods of all cars in a car lot as a means of gaining attention is another.

Source Influences

Proximity can be an important factor in communication. Generally speaking, the closer individuals are to a particular information source, the more likely that source is to become an object of attention. This is one explanation for the generally influential role played by family members, neighbors, peer group members, friends, and the community. In the most literal view, proximity refers to physical distance, but in an age when technology so permeates the lives of individuals, the limitations of physical distance are sometimes less significant that those of virtual, or electronic, distance. That is, in some sense, a person who is easily available on e-mail, in a chat room, or through a "buddy list" may have as much or more proximity-and hence as much influence-as someone who is quite close physically.

The way in which individuals process messages often has a good deal to do with how attractivephysically or socially-they find a message source to be. Simply said, individuals who are perceived as being attractive have the good (and sometimes not so good) fortune of having their presence and their messages taken account of more than other people do. The influence of attraction often extends beyond selection; it can influence interpretation and retention as well. What is often referred to as to the "magnetism" or "charisma" that is attributed to celebrities, athletes, or political leaders who capture public favor probably has its foundation in a factor as basic as attraction. Also important to message reception is similarity. Generally speaking, people are drawn to-and hence are more likely to engage in communication with-others who are similar to them. Sometimes, these similarities have to do with factors such as gender, level of education, age, religion, race, occupation, hobbies, or language capacity. In other circumstances, the similarities that are important are needs, beliefs, goals, or values.

When sources are considered to be credible and authoritative, their messages are likely to attract more attention than the messages of people who are not considered to be credible or authoritative. These characteristics are also likely to influence the interpretation and retention of messages. Sometimes, the credibility of a source is associated with particular topics about which the source is considered to have special expertise. For example, an individual who is a stockbroker may be regarded as a good source of information on the stock market industry. In other cases, an individual's credibility might span a number of subjects because of the combination of his or her occupation, education, and celebrity. The intentions and motives that people associate with a sender in a particular situation are also important messagereception influences. If people believe an individual has their best interests at heart, their response to the individual's messages is likely to be quite different from what it would be if they assume that the individual's intentions or motives are simply to sell or deceive.

The manner in which messages are delivered also influences message selection, interpretation, and retention. In the case of spoken messages, volume and rate of speaking, pitch, pronunciation, accents, and the use of pauses and nonfluencies (such as "ummm" or "you know" or "like") can all influence communication. Visual cues such as gestures, facial expressions, and eye contact may also be significant factors.

Status—position or rank—can also be a factor in message reception. Power and authority refer to the extent to which a source is capable of dispensing rewards or punishment for selecting, remembering, and interpreting messages in a particular manner. These factors may come into play in communication situations with a parent, teacher, supervisor, or any other person who occupies a position of authority. The significance that people attach to the positions that are occupied by these individuals or to the power that they have over valued resources (e.g., grades, salary, praise) often has a dramatic influence on message reception.

Media and Environmental Influences

Media can account for significant differences in the selection process and in the nature of interpretation and retention. A message may well be reacted to quite differently depending on whether it arrives in the receiver's environment through a newspaper, the television, the Internet, a videotape, an e-mail, or face-to-face interaction. Of all media, television has received the most attention from researchers. Newspapers are probably second in line in terms of the amount of attention that they have attracted from researchers. As the relatively newer media—such as computers, the Internet, e-mail, teleconferencing, and wireless telephones—have risen in popularity, the amount of research dedicated to these topics has increased. This is a trend that will no doubt continue.

Environmental considerations, such as whether one is at home or at work, alone or with a group, crowded into an overheated movie theater or watching an outdoor concert on a rainy day can and do influence human information processing. These factors are examples of influences that are associated with what might be termed the "setting" or "context" of a communication event. Other environmental influences have to do with factors such as repetition, consistency, and competition. If a particular message is presented just once or twice, such as when a telephone number is provided when someone calls an operator for "information," it is unlikely to have a lasting influence on message reception. On the other hand, if it is a message that is presented over and over, as with a telephone number that is used on a regular basis, the effect is quite different. Repetition can and does affect the way in which people select, interpret, and retain messages.

Closely related to repetition is the concept of consistency. The consistency of messages is often an important factor in message processing. If a person repeatedly heard the phrase "Spain is a wonderful place to live" from a variety of different sources, for example, the consistency is likely to influence the person's message reception. However, if the person also heard a number of people saying that "Spain is a horrible place to live," this competition, or inconsistency, would have a different influence on the person's message reception. For this reason, if individuals hear only good things about a political candidate about whom they had little prior knowledge, the effect on information processing will be quite different from that of individuals who hear an equal number of positive and negative messages. In the former instance, the individuals would be influenced by message consistency; in the latter instance, they would be influenced by message competition.

Conclusion

Communication scholars and professionals recognize that human information processing is a vital part of communication. People who lack familiarity with communication theory tend to assume that communication outcomes are simply

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the result of what is said or done by a sender and how it is said or done. However, as is apparent from the above discussion, message reception is an extremely complex process—one for which it is very difficult to predict results.

It is certainly the case that the sender and message are important to message reception as it is commonly understood. However, the most significant factors-both because of their number and importance-are probably the factors that have to do with the receiver. An extreme example would be a situation where a receiver cannot understand the language or concepts of a message, has little need or concern about the part of the message that he or she can discern, and has little or nothing in common with the sender. The receiver is unlikely to take much away from the communication situation other than frustration, despite the best efforts of a persuasive speaker and careful attention to the planning and execution of the message. A less extreme example, but one with the same outcome, would be a situation where the receiver does not like the sender, the sender is trying to convince the receiver to support a political candidate whose views are inconsistent with the receiver's beliefs, and the discussion is taking place in an environment in which the receiver is surrounded by friends who share his or her views about the sender and the candidate. How likely is it that the receiver will be influenced in the direction that the sender intends? Not very. It is also because of the complexity of message reception that simple messages such as "just say no" or "smoking can be hazardous to your health" are seldom as influential as senders hope they will be.

Because of the complexity of reception—and the resulting difficulty in predicting communication outcomes—being mindful of these dynamics and the influences that are involved provides the best available assistance for improved communication understanding and effectiveness.

See also: Advertising Effects; Communication Study; Culture and Communication; Models of Communication.

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BRENT D. RUBEN

Ι

INDUSTRY

See: Cable Television; Culture Industries, Media as; Film Industry; Globalization of Media Industries; Information Industry; Magazine Industry; Newspaper Industry; Publishing Industry; Radio Broadcasting; Recording Industry; Telephone Industry; Television Broadcasting

INFORMATION

Millions of people around the world live surrounded by information and information technologies. They expect to hear the news on the radio, enjoy entertainment programming on the television, purchase any book in print, and find a website on the Internet. They expect their homes to contain televisions, cable, videocassette recorders, compact discs, answering machines, fax machines, telephones, personal computers, and satellite dishes. Many work in occupations where they produce and distribute information that is of value to consumers and businesses. In other words, the lives of hundreds of millions-perhaps even billions-of people depend on information. On a typical morning, families around the world will turn on the radio to hear the news, read the morning paper, watch the weather channel on cable, make a telephone call, and gather office reports and schoolbooks-all before anyone leaves the house. In fact, they are so used to this way of living that they take information for granted.

What Is Information?

Many information users might find it hard to respond to the question "What is information?" To begin to form an answer, some basic observations are necessary. First of all, many words convey the idea of information—words such as "data," "knowledge," "writing," "speaking," "sign," and "symbol," to name just a few. Second, a name, a poem, a table of numbers, a novel, and a picture all contain a shared quality called "information." Third, most people will acknowledge that a message passed between two friends contains information. And, fourth, it is evident that many people put a high value on some information but not all information. Each of these four characteristics offers clues to answering the question "What is information?"

One clue can be found in an everyday behavior. People make decisions on a daily basis about all sorts of situations; and, when they do, they often seek information to help them make those decisions. When confronting a choice, people often find that they need more information in order to make a decision. For example, when considering the purchase of an automobile, a potential buyer might ask a neighbor for advice, read a consumer magazine, or take a car for a test drive. Each of these actions provides information to help the person decide which car to buy. Individuals who are confronting important decisions often seek as much information as they can obtain. In contrast, when facing a decision with little or no available information, individuals may hesitate to make a choice. Therefore, the human need to make decisions creates a demand for information and leads to the interest in understanding information.

Information scientists generally emphasize that individuals mostly use information to reduce uncertainty—that is, to clarify something of interest in order to make a decision. Most modern information scientists agree with a popular definition of information such as the following: "Information is a coherent collection of data, messages, or cues organized in a particular way that has meaning or use for a particular human system" (Ruben, 1988, p. 19). This definition may seem vague, but that is because information comes in so many forms.

Humans are always trying to make sense of the world around them, and for that they need data. In fact, anything can provide data because data are the raw stimuli that human brains use to produce information. An ocean, a thunderstorm, and a crowd all become data as soon as someone tries to make sense of them. A thunderstorm, for example, might be just so much noise and water to one person, but to a meteorologist, that same noise and water might form the beginning of an understanding of weather patterns. By observing the direction of the storm and measuring its force, the meteorologist is producing data. If the data is then organized into statistical tables, or into a weather report, the meteorologist will have transformed data into information. The weather report on the evening news, thus, conveys information that had its beginning in data. However, data only become information when organized into a form that can be communicated, such as the weather report. Data are the observations or cues collected in order to produce information, and information is what individuals share with each other when they communicate.

Humans build ideas from information. All humans convert data into information and then use information to reduce the uncertainty they face when making decisions-from simple decisions such as choosing a cereal for breakfast to complex decisions such as choosing a college. Furthermore, that same mental versatility gives humans the power to perform a truly remarkable feat. Every person can enter a room, close the door, shut off the lights (along with other stimuli), and emerge later with a new idea-that is, with new information. No old information was lost or consumed, yet new information is added, and for no additional expenditure of energy beyond the energy expended when thinking. In other words, the same amount of information can produce many new ideas without being used up.

Similarly, two individuals can receive the same information, think about it, and produce new information with opposing interpretations. What is remarkable is that the information each received was the same, while the new information produced was different: same input, different outputs because each brain is unique. Each human takes data as input, organizes the input into a form that produces new information, and then makes sense of it by relating it to other ideas, thus bringing forth individual knowledge. The brain can expend a quantity of energy and think no new thoughts, or it can expend that same quantity of energy and invent a new cure for cancer. Brains are so capable of manipulating information that they can recombine the same information into an infinite number of new ideas. Nothing in the world of physical things behaves this way.

The Idea of Information in the Sciences

Information has become a useful concept in the sciences. For example, cellular biologists speak of deoxyribonucleic acid (DNA) as a library that contains information; they consider genes to be information that is communicated to a new cell through mitosis. Economists discuss money as information that is increasingly transmitted across the Internet as electronic commerce. And, computer scientists consider each bit on a hard disk to be the smallest quantity of data. Each of these fields of inquiry has achieved advances by applying the idea of information to the problems that they study. However, whether they are actually describing information or employing the concept of information as a metaphor remains controversial. For example, some information scientists argue that when biologists describe DNA as a library that contains information, they are using the concept of information as a metaphor; some biologists, in contrast, argue that DNA is actually information. No one has yet developed a theory to explain this controversy. Nevertheless, in these fields and in others, the idea of information has been a useful concept for solving scientific problems. As a useful word in the English language, "information" has a very long history.

Information in Historic Language

The word that English speakers recognize as "information" has its origins in the Latin word *informare*. The Latin *informare* meant to give form

to, to shape, to form an idea of, or even to describe, so the seed of the modern meaning can be discerned in the use of *informare* to mean the shaping of an idea in one's head—that is, to inform.

Geoffrey Chaucer introduced the word "information" into the English language in the "Tale of Melibee," one of his *Canterbury Tales*: "Whanne Melibee hadde herd the grete skiles and resons of Dame Prudence and hire wise informaciouns and techynges." The "Tale of Melibee" was probably written sometime between 1372 and 1382. Chaucer's use of the word "informaciouns" (informations) would roughly fit the meaning that contemporary English speakers give to the word "sayings." However, as time went by, other meanings gained greater popularity.

In *Gulliver's Travels* (1727), Jonathan Swift applied a meaning to the word "information" that appears as early as the mid-fifteenth century and sounds more familiar: "It was necessary to give the reader this information." Thomas Jefferson, in an 1804 letter, used "information" as if it referred to a physical object: "My occupations . . . deny me the time, if I had the information, to answer them."

In the twentieth century, scientists began to write as if information were a quantifiable variable, as in the following passage from the November 1937 issue of *Discovery*: "The whole difficulty resides in the amount of definition in the [television] picture, or, as the engineers put it, the amount of information to be transmitted in a given time." By the beginning of the twenty-first century, English speakers had adopted the senses of information as a physical object and quantifiable variable. Taken together, these uses facilitate communicating in an information society.

Information Versus Physical Objects

It seems so simple, but to make full use of the idea of information, people play a curious game with words. To create a language of information, people must adapt the language of the real world. In everyday conversations, individuals speak about information as though it were something made from physical materials. For example, a teacher might decide that one report contains more information than another. Such a comparison implies that information is a quantity that can be measured in terms of more and less. That same teacher might describe the reports as if they were jars filled with information, so that one report might be filled with more information than the other.

Of course, information does not fill jars, nor can it be easily determined when one has more or less information. Questions that are applicable to physical objects make less sense when applied to forms of information. What color is information? Is one idea bigger than another? Does one idea weigh more than another? When information is lost, where does it go? These questions seem illogical when asked of information because information is symbolic, not physical; that is, information exists as meaning in the minds of humans, whereas objects of the physical world take up space and exist whether or not anyone thinks about them. As a result of this difference, communicating about information poses a challenge because the English language has a limited vocabulary for representing the symbolic realm of information. English speakers solve this problem by employing words that are meant to describe the physical world. In other words, when members of the English-speaking world discuss information, they pretend that information is similar to a physical object. This makes sense even though information does not behave in the same way as a physical object.

Consider that if a person gives a sweater as a gift, the recipient gains the sweater, while the gift giver no longer has it; an exchange has resulted, and resources have moved from one place to another. The gift recipient has gained a sweater, while the gift giver has lost a sweater. One might even see this as a kind of law of nature—for an exchange to occur, someone must gain something and someone must lose something. This "law" applies to all physical objects from soup to nuts. However, information is different.

If, for example, someone writes a manuscript for a book, that person possesses a new manuscript—information—that did not exist before. If the manuscript is sold to a publisher, that publisher possesses the manuscript and may print it as a book. Clearly, an exchange has taken place; the publisher owns the information as a manuscript and the writer has money from the publisher. However, even though the writer sold the manuscript, he or she still has the information. The information remains in the writer's computer or perhaps in a folder; he or she can still read it out loud and even give a copy of the text to a friend. Unlike the example of the sweater, the writer has not lost the information by exchanging it for money.

This paradox of the physical world applies to all kinds of information. Whether the information in question is a manuscript or a piece of software or a movie or a poem, when it is given away, it still remains with the creator of the information. For unlike physical objects, information can be easily copied, and nearly always, it is the copy that is exchanged. Indeed, the ongoing revolution in information technology is all about exponential increases in the ease and fidelity with which information can be copied and transmitted. A person can experience this phenomenon by creating and copying a software file for a friend. The friend can use the file, though the original remains with the creator of the file. Once the friend has the file, he or she can copy it and distribute it to others. In this way, the potential spread of the file is unlimited. The file will continue to disperse as long as someone will copy it and pass it on to another person. Thus, whereas the exchange of a physical good, such as a sweater, requires the giver to relinquish it so the receiver can have it, information can be duplicated and exchanged with ease so both giver and receiver can have it at the same time. It would seem that information is without limits, unlike physical objects in the material world.

However, information can be treated as a physical object. The fact that a person can read from a book while physically holding it in his or her hands proves that information can be configured to the characteristics of a physical object. When information is recorded onto a physical medium, such as paper, tape, celluloid, plastic, or metal, the medium allows the information to be treated as a physical object. After all, a book can be shipped from New York to San Francisco in the same box with a sweater. Similarly, a compact disc (CD) can be transported thousands of miles away from the studio where it was cut. People make lists and carry them around in their pockets, in the same way that they carry keys, pens, and coins-all physical objects. People's daily lives are full of instances where they treat information as though it were a physical object. Nevertheless, regardless of how tangible the form, it is still information-an encyclopedia retains all of the information printed in it no matter how much one copies from it.

The packaging of information, which confers on it the characteristics of a physical object, also helps its transformation into an economic good. The facility with which information can be distributed, in part because of its remarkable ease of duplication, encourages entrepreneurs to explore the commercial possibilities. And, because information can be exchanged for profit, there can emerge markets for information of any kind for which there is a buyer and a seller. Increasingly, the production and distribution of information dominates the U.S. economy. The largest corporations generate information as their product and trade it around the world. Here, then, is the basis for the vast information economy that binds together the economic systems of the world.

Even so, the very ease of duplication that makes information so potentially profitable marks its own Achilles' heel. Information can be duplicated so easily that others can take the information being sold, copy it, and sell it too, whether it belongs to them or not. All sellers of information must contend with the possibility that the information they hope to sell can easily be copied and resold by others. The more illegal copies sell, the less incentive there is for the legitimate producer to offer information for sale. A software company may decide to take a program off the market because it is losing too much money as a result of illegal copying. When too many illegal copies circulate, the legal seller loses the incentive to sell because he or she is not making a profit from the sale of that information. In this way, the selling of illegal copies threatens the legal sale of information and discourages legal sellers from offering their goods. As a result, valuable and interesting information may be kept off the market. When that happens, everyone suffers.

Because information is valued so highly, solutions have emerged to reconcile the vulnerability of information to the characteristics of the physical world. In the world of physical economic goods, producers, sellers, and buyers maintain order through contracts. The same can be applied to the intangible world of information. When the writer in the example above sells the manuscript to the publisher, he or she has agreed to a very important limitation. Even though the writer still possesses the information, the publisher controls the distribution of it. In effect, though the writer may still have the text of the manuscript stored in his or her computer, the writer cannot offer it for sale; whereas, the publisher may bring the information in the manuscript to market with the exclusive right to sell it. As a result, the ability to control the availability of goods, which is so critical to physical markets, can be artificially created for information.

The menace to the orderly functioning of information markets is so threatening that governments have also stepped in and legislated protections for the sale and purchase of information. These laws generally fall under the legal class of copyrights and patents. By registering a text such as a song, or a design such as an invention, with the proper government agency, an individual or organization receives an exclusive right to sell and distribute that information for a fixed period of years. Should anyone else attempt to distribute the same information without permission, then the government is obligated to protect the owners by prosecuting those people who are guilty of illegal use. Without legal protections, no commercial producer of information could expect to profit from his or her product because anyone could take it and reproduce it. Fortunately, legal protections against unlawful copying function well enough that information markets thrive.

If the easy duplication of information poses a threat to the orderly functioning of markets, that same attribute offers an advantage to another group of enterprising producers. These individuals write software and then make it available as shareware and freeware. These two unusual kinds of software take advantage of the remarkable ease with which information can be copied and distributed. The author of a shareware program says in effect, "Here is my product. If you like it pay me for it. If you don't want to pay me, then keep it anyway." Surprisingly, software authors who introduce shareware can be quite successful; their product may take off, or they may be hired by a software firm that is impressed with their code-writing abilities. Clearly, the success of shareware depends both on distribution within the market and on distribution outside of the market, because it is both sold and given away. Yet, even in this strange hybrid of selling and giving, the heart of the strategy lies in the essential feature of information, the fact that the producer retains the information after distributing it to others.

Clearly, the way in which individuals think about information influences the way in which they act. People are so comfortable imagining all manner of possibilities for the uses of information that new information applications are invented with ease. However, no two people interpret information in exactly the same way, nor do they place the same value on it. If the first major feature of information is its ease of duplication, then its second major feature is its subjective value. Information conveys a different meaning to each person and, consequently, a different value to each person. Take, for example, a reading of the Iliad. One person might read it to learn about the culture of preclassical Greece. A second person might read it as an allegory of the role of the hero in Western literature. A third person might read it as a mighty adventure story. The text remains identical in every reading, but each reader takes fully different meanings from it. This occurs because the meaning of the information in the Iliad, as with any piece of information, rests not in the text or content but in the mind of the reader. Every person's brain contains a unique configuration of knowledge, and it is within that context that new information receives its special meaning.

Ultimately, the meaning and value of information is subjective. The progression whereby humans convert data into information and then frame it within their previous thoughts and experiences results in knowledge. Information is produced from data, and then knowledge is produced from information. Thus, knowledge is an attribute of an individual. When individuals seek to communicate knowledge, they have to transform it back into information that can be communicated. All knowledge, then, is derived from information and grounded in the ideas that humans have previously communicated to each other; even new ideas derive from the accumulation of previous ideas. Were it not so, humans would find it even more difficult to communicate with each other than is already the case because in that situation the basis for understanding would be harder to achieve. Without information, there could be no individual consciousness; and without communication, there would be no society.

Conclusion

Information possesses an amazing capacity for duplication; with information technology, people

possess an ever-increasing capacity to duplicate and transmit information. Moreover, each individual derives a personal subjective meaning from any piece of information. However, the fundamental condition that characterizes the Information Age is the ease with which people think of information as a physical object. By describing, selling, storing, and transporting information as though it were a physical object, modern individuals achieve the tremendous accomplishment of an information economy. Economic innovations (e.g., new markets for information) and social perspectives that are derived from this attitude (e.g., judging a newspaper by the "amount" of information contained in it) have become so common that they are taken for granted. This idea of information-treating information as though it is a physical thing-stands as the base of the information society, because it directs thinking in such a way as to encourage the information economy, as well as the language with which individuals make sense of the information society.

See also: Computer Software; Copyright; Economics of Information; Ethics and Information; Home as Information Environment; Human Information Processing; Information Industry; Information Society, Description of; Language and Communication; Language Structure; Preservation and Conservation of Information; Reference Services and Information Access; Research Methods in Information Studies; Retrieval of Information; Standards and Information; Symbols; Use of Information; Visualization of Information.

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JORGE REINA SCHEMENT

INFORMATION INDUSTRY

The information industry comprises a group of enterprises and organizations whose purpose is to produce and process information and to develop the infrastructure and delivery mechanisms to distribute information. For the individuals and companies that implement these functions, it is important to understand the nature of the industry and the issues that affect its activities. For the people and organizations that use information, it is helpful to develop an understanding of the larger picture of the industry as a whole so they know where to find the information they need and how it is being made available.

Information as Product

The definition of "information" that will be used in this entry is that of Michael Buckland (1991), which regards information as objects. Information objects include things such as databases, electronic documents, newspapers, books, and calendars. Information is thus something that can be produced, sold, delivered, and used. In order for these activities to happen, however, some aspects of the nature of information objects must be properly understood.

Information as a product must be used in some way (e.g., read, understood, and applied) in order for its value to be realized. Unlike goods such as food, information cannot be consumed; once it is used, it can still be used again. Information also has a lifecycle; it moves from new to old, from specialized to general, and from contested to accepted. All of these aspects of information affect its value as a product, from the perspectives of both the information buyer and seller. The value of information is sensitive to time; new information may cost more to deliver than old. For a buyer, information that is needed by the end of the day may be worth nothing if it is delivered the following day. Value is also affected by the strength of the need for information; finding an emergency room patient's medical history may have a different perceived value to the customer than answering a crossword puzzle clue. The value of information is also related to a number of factors such as its scarcity or proprietary nature, the cost to produce or assemble the information, and the effect it will have when used. All of these factors affect how the information industry creates, prices, and delivers information to consumers. These factors also affect the willingness of the consumer to purchase and use the information. For a clearer understanding, though, it is useful to examine the specific functions that are required for industry to handle information as a product.

Functions of the Information Industry

The functions of the information industry can be separated broadly into four categories: production, processing, distribution, and the building of infrastructure.

Many of the producers of information fall outside the bounds of the information industry proper; these include authors, illustrators, inventors, and so on. However, information is also produced within the industry itself; for example, companies specializing in data mining use large collections of data to create usable information products such as customer profiles or product purchasing trends. Also, some of the products generated in the processing of information are sufficiently novel that processing becomes a form of production.

Information processing comprises a large portion of the activities within the information industry; processing transforms information into products that can be packaged and sold as usable goods. For example, publishing a journal involves processing a number of articles into an edited and integrated package. Creating an electronic database of journal articles involves assembling citations and abstracts for articles from a carefully selected group of journals and integrating them into a large, usable database system.

Distribution of information also comprises a large part of industry activity; distribution includes marketing the information products that were processed and delivering the products to the customers who purchase them. For example, once an electronic database of journal articles has been assembled, proper distribution ensures that potential customers know it exists and that they can access it after purchase. When the product is delivered to the customer, that individual might be a librarian or other information professional. This person, who then distributes information to specific information users, is often called an "intermediary." For nonprofit segments of the information industry, such as libraries, this may be referred to as "access"; rather than delivering information products to customers, they are making them available to people for their use.

Finally, information industry organizations must build a robust infrastructure in order to support their activities. Such an infrastructure may include, for example, computer hardware and software, database systems, telecommunications systems, marketing channels, and other technological and social structures. An important piece of infrastructure that has had a great effect on the information industry is the Internet; this widely available and standardized means of transferring electronic information (including text and graphics) has allowed organizations to move away from proprietary, dedicated delivery systems and toward integrated, multiproduct, multivendor access to electronic information products.

The four activities of the information industry do not operate in a vacuum; rather, they are the means by which information companies provide goods and services that meet customer needs. In doing so, the information industry plays a number of roles. For example, the information industry attempts to reduce information overload; people and companies that use information perceive that they receive too much information. To compensate, the information industry processes large amounts of information, reducing it to smaller, categorized packages that can be distributed to information users. The information industry also helps facilitate access to information; information users often have difficulty in obtaining information, whether they know what information they need or not. To make getting information easier, the information industry processes information into packages that people will understand and want to use, makes users aware of the existence of these efficient packages, and ensures that information products work properly and are timely and accurate.

The variety and complexity of the functions undertaken by the information industry lead one to wonder about who performs such tasks. Successful accomplishment of these activities requires specific kinds of organizations and specialized jobs.



With the growing use of computers in libraries, such as this library in Newport, Washington, librarians have had to adapt to become not only information managers but also technology managers in order to provide the best possible assistance to the library patrons. (Bob Rowan; Progressive Image/Corbis)

Roles within the Information Industry

Individuals and companies that perform production functions work primarily to change large amounts of raw data into information. In data mining, for example, very large stores of data are manipulated and examined in order to generate reports and profiles that identify and explain broad trends. Surveys, censuses, and other types of data collection do similar things on a smaller scale; numerical data are gathered and the results tabulated. In addition, data are changed into information by being arranged into databases. There are other kinds of information production such as authoring and illustrating; these creative processes generate information objects such as books and journal articles.

Those people who are involved in information processing perform tasks that change information objects into organized collections or packages that are suitable for distribution. One important task is publishing, which can mean aggregating articles together to form a coherent journal or editing and assembling a book. Once information has been published, a second level of processing takes place, which places documents or their representations into organized forms. For example, indexers and abstracters generate standardized citations of documents and write summary abstracts of the content. These citations and abstracts can then be assembled in large, searchable document repositories. To help make these repositories easy to use, catalogers or subject analysts use standardized methods of arranging documents by subject and describing their content.

Once information has been packaged for distribution, many different people help transfer information from the producer to the customer. Marketing lets customers know that information resources exist, how they may be useful for the customer, and in what ways one product may be more suitable than another. Suppliers and database resellers act as "wholesalers"; for example, they may repackage a number of databases from different producers into one new product or provide a gateway to electronic journals from a variety of publishers.

The form of distribution in which an information professional acting as an intermediary uses the packaged product to provide information to end users can take several forms. A library is a repository where information is collected, organized, and made accessible to users; the librarian is responsible for selecting items, organizing them within the library's own collection, or helping people with information needs to find answers. Some distributors do not collect items; they pay to access a wide variety of resources and employ people who are expert in using them. For example, information consulting or information-ondemand services are hired by customers who have specific information requests. Such companies fulfill the requests, using perhaps many libraries and database services, and sell the results to the customers. Similarly, document delivery services do not collect materials; they use a number of information resources to provide articles or books on request.

Many different individuals and companies are involved in creating information infrastructures. In building the technical components, telecommunications companies provide the wiring and the communication systems that allow for the transfer of data. Internet service providers (ISPs) provide the means for individuals to access telecommunication systems. Software programmers, software engineers, systems analysts, and database designers build databases and other information systems that provide a framework for information objects and their representations. Finally, interface designers ensure that customers can interact successfully with the electronic information systems.

Equally important is the sociological infrastructure. For the sharing, transferring, and repackaging of information to occur, it must be in standardized electronic forms that move over standard communication channels. Standards must be designed and developed, but they must also be implemented when systems are built. The sociological infrastructure also provides help and support to people who are using information products and may need assistance in operating the system. Usually, telephone technical support workers and technical manual writers provide this assistance.

The information industry also includes people who manage these functions, whether or not the sole product of the organization is information. Knowledge managers, information technology managers, and other types of information managers work in organizations ranging from manufacturing companies to universities to hospitals to banks. These roles combine business knowledge with an understanding of the functional processes of information management to provide an inhouse information industry for the organization.

Given the wide variety of people and organizations that are working in the information industry, along with the profound shift caused by electronic information and telecommunications systems, it is inevitable that the information industry should face many issues. An examination of some of these issues will provide a greater understanding of the state of the industry and its future.

Issues and the Future

As the information economy becomes increasingly global, there are a number of factors that affect the use and transmission of information. The global environment is characterized by extreme fluidity; contexts of information use change continually. The information to be shared is heterogeneous in language and in content; people save, organize, and use information in different language and cultural contexts. Increasing numbers of information sources lead to information overload. In addition, developing global standards for large-scale information sharing is made difficult by the different languages, content, and contexts of global information.

The increase in electronic information gathering, packaging, and selling highlights several kinds of rights management issues. First, personal rights of privacy may be stretched or violated as information-gathering behavior both online and offline is tracked and aggregated. Second, ease of transmission and copying of electronic information makes copyright enforcement difficult. In a global context where copyright laws vary between countries, it is difficult to know what laws should apply. Finally, electronic information objects are subject to different kinds of ownership than are physical objects. While objects can be owned in perpetuity, electronic information is often sold on an access or "right to use" basis, creating difficulty in archiving the information.

Finally, the business models associated with selling information are constantly changing. For example, new payment methods have led to systems where information is paid for not with cash but by the user's willingness to view advertising. The availability of small pieces of electronic information (such as single journal articles or graphics) has led to the development of small transaction aggregation and payment systems. Information companies have been developing joint ventures, strategic alliances, and government partnerships to help adjust to a global information context; often, these alliances are between companies who maintain separate and competing businesses. Finally, as new technologies are developed inside and outside the information industry, those new technologies drive the creation of new information products.

The information industry is in a state of flux in which the only guarantee is constant change. While the functions required to handle information as a product have not changed, the technologies, jobs, and products are quite different than they used to be. Understanding the future of the information industry is to understand the constancy of the functions required, to be aware of the issues that are affecting the progress of the industry, and to realize that the industry flourishes by staying abreast of changes in technology and information use.

See also: Cataloging and Knowledge Organization; Chief Information Officers; Computer Software; Computing; Copyright; Database Design; Databases, Electronic; Economics of Information; Internet and the World Wide Web; Knowledge Management; Knowledge Management, Careers in; Libraries, Digital; Privacy and Encryption; Publishing Industry; Standards and Information; Systems Designers.

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INFORMATION PROCESSING, HUMAN

See: Human Information Processing

INFORMATION SOCIETY, DESCRIPTION OF

"Information society" is a broad term used to describe the social, economic, technological, and cultural changes associated with the rapid development and widespread use of information and communication technologies (ICTs) in modern nations societies, especially since World War II. Information societies are thought to differ from industrial societies because they treat information as a commodity, especially scientific and technical information; because they employ large numbers of "information workers" in their economies; because information and communication technologies and channels are prolific and are widely used; and because using those technologies and channels has given people a sense of "interconnectedness."

The term is somewhat controversial. Some experts believe that new media and computing technologies have produced a fundamentally new kind of society; others think that the technologies may have changed but that the basic social, cultural, and economic arrangements continue to look much as they have since the industrial era. Others criticize the idea on the grounds that "information" is a vague concept, used in different ways by different people (e.g., to mean documents, systems, ideas, data, knowledge, belief, statistical certainty, or any of a dozen other notions). Therefore, as Frank Webster points out in *Theories of the Information Society* (1995), it is difficult to observe or measure what it is that might make an information society different from other types of societies. Is France an information society because it has extensive, advanced telecommunications networks? Is Japan an information society because it produces more documents now than it did in 1950? Is the United States an information society because its companies employ more "information workers" than "industrial workers"?

Despite these difficulties, most observers would agree that many aspects of everyday life, including the workplace, family life, leisure and entertainment, teaching and learning, and earning and spending, have been affected in one way or another by the availability of new technologies and the ways people use them. "Information society" may be an imperfect label, but it is the most widely used one to talk about these complex changes.

Between the 1950s and the 1970s, economists, sociologists, and other researchers began to study the influences of telecommunications and computing technologies in advanced industrial societies. Two concepts from that period, the "information economy" and "postindustrial society," are still important aspects of the information society idea. More recent research has focused on whether the information society is a real departure from industrial society and on the cultural consequences of ICTs.

The Information Economy

Economists typically divide a nation's economy into three parts or "sectors": (1) primary or extractive (e.g., agriculture, mining, fishing, forestry), (2) secondary or manufacturing (e.g., production of goods manufactured from raw materials), and (3) tertiary or services (e.g., education, health care, law and government, banking and finance, sales, maintenance and repair services, entertainment, tourism, and so on). Only the primary and secondary sectors are traditionally considered to be "productive," that is, to contribute to material stocks of resources and goods that can be bought and sold. Service activities in the tertiary sector only "add value" or help produce or distribute the real products, rather than being valuable in and of themselves. Communication and information, from this perspective, do not have monetary value in themselves because they are not material goods-except when they

are transformed into physical products such as movies, books, or computers.

The sheer numbers of television sets, wired and cellular telephones and pagers, radios, computers and modems, print publications, satellite dishes, and so on in homes and workplaces are often cited as evidence of an information society. Certainly, the media, telecommunications, and computing industries all grew dramatically in the twentieth century. However, the sale of telecommunications and computing equipment and supplies such as film, videotape, floppy disks, or paper stock is only part of the picture. "Valueadded" information and communication services (e.g., entertainment cable channels, Internet access, or telephone dial tone) are often more profitable than the manufactured goods that carry them (e.g., compact disc players, videocassette recorders, computers, or telephones).

Such basic measurement problems have encouraged economists to begin thinking differently about both services and information. In the United States, experts noted that employment levels declined in the primary and secondary sectors after World War II. Employment in the tertiary service sector, which had been rising since the 1860s, increased sharply after about 1945. Between the 1950s and the 1970s, the American economy grew at the fastest rate in its history, creating huge increases in income and the growth of a large and affluent middle class. By the 1970s, services comprised about half of the economy and 30 to 40 percent of the workforce in some industrialized nations. This sector seemed to be contributing much more to wealthy economies than analysts had previously thought it could. Compared to manufacturing industries, services employed more white-collar, well-educated, and well-paid workers, whose main tasks involved the creation and management of information and interaction with other people.

In his landmark work, *The Production and Distribution of Knowledge in the United States* (1962), Fritz Machlup of Princeton University was among the first economists to recognize and document the increasing numbers of these "knowledge workers" and their contribution to the American economy in the postwar period. He found that the number of "knowledge-producing" occupations grew faster than any other occupational group between 1900 and 1958 and that they made up about one-third of the workforce in 1958. Peter Drucker (1969) also described what he called the "knowledge economy" and "knowledge industries," "which produce and distribute ideas and information rather than goods and services."

The sociologist Daniel Bell (1973) was so impressed by the growing size and economic power of white-collar professionals, a class "based on knowledge rather than property," that he proposed splitting the service sector into three parts, thus creating five economic sectors that would more accurately reflect the variety and importance of service activities. In place of the traditional tertiary sector, he suggested a different tertiary sector made up of transportation services and utilities, a fourth quaternary sector including trade, finance, insurance, and real estate, and a fifth quinary sector comprised of health, education, research, government, and recreation services.

In 1977, Marc Porat published a nine-volume study for the U.S. Department of Commerce entitled The Information Economy. He and his colrefined Machlup's framework leagues of occupational categories and found that about 40 percent of the American workforce could be defined as information workers. He produced the first input-output table of the U.S. information economy, showing both the employment changes and the amount of the gross national product that was attributable to the "primary and secondary information sectors." Porat's primary information sector included firms whose main business is the production of information and information technology; firms in the secondary information sector use information and information technology to support other types of production.

Using similar definitions of information work and information industries, the Organization for Cooperation and Development Economic (OECD) found that information workers comprised about one-third of the workforce in many of its member countries, mainly in Europe. Other researchers questioned Machlup's and Porat's assumption that only workers who produce informational "goods" could be classified as "information workers." Instead, they said, the definition should be based on the amount of information creation and use required on the job, rather than the products of the job alone.

In Japan, information society is translated as *joho shakai*. According to Youichi Ito (1981),

researchers there took a different approach to documenting the growth of the information economy in the 1960s, focusing on the measurement of information production and consumption. The information ratio used by the Research Institute of Telecommunications and Economics (RITE) in Tokyo measured household spending on information-related activities as a proportion of total household expenditures. That group also developed the johoka index, ten measures that together provided an estimate of a country's degree of "informatization." The RITE researchers defined johoka shakai (informationalized society) in terms of per capita income, the proportion of service workers in the workforce, the proportion of university students in the appropriate age group, and a national information ratio of more than 35 percent.

In light of these and other research findings, economists have reconsidered the value of information and communication and developed theories of the economics of information. They have examined tangible forms of information such as books or tape recordings, as well as intangible intellectual property such as the movie rights to a novel, a patent on an industrial process, or employment contracts that prohibit employees from using for another employer what they learn in one job. Increasingly, knowledge or information itself, apart from its physical form, is considered to have an economic value or price-some argue that it can and should be treated like any other commodity or "raw material." Others point out that information does not behave as other physical commodities do. It is the only commodity, it is said, that one can sell and still have. Nonetheless, most economists and other researchers agree that information- and communication-related activities account for an unprecedented proportion of economic investment and output in wealthy societies.

Postindustrial Society

By the 1960s and 1970s, the spread of media and information technologies, increasing demands for information work, and the expanding information economy led some analysts to wonder whether a large-scale social change was underway that would be as important as the Industrial Revolution had been. Industrial society developed in the eighteenth and nineteenth centuries as agricultural, craft-based, local subsistence economies were supplanted by national economies that were based on factory work and assembly-line methods of mass production of manufactured goods. Similarly, some researchers suggested that industrial society might now be giving way to a whole new form of a postindustrial society based on the production and circulation of knowledge rather than manufactured goods.

The term is usually credited to Bell, who in his influential book, The Coming of Post-Industrial Society (1973), contended that new technologies had produced profound changes in everyday social life and culture. Bell contrasted the dominant economic sectors and occupational groups in preindustrial, industrial, and postindustrial societies, respectively. He also argued that they differ in terms of the kinds of knowledge that they value, their perspectives about time, and what he called their "axial principles." Preindustrial societies, Bell said, have an axial principle of traditionalism, an orientation to the past, and rely on common sense or experience as the best type of knowledge. Industrial societies' axial principle is economic growth; they are oriented to the present and they believe that empiricism-knowledge gained from observation-is most valuable. The new postindustrial societies have an axial principle of centralizing and codifying theoretical knowledge. They are oriented toward the future and forecasting, and they consider abstract theory to be the best type of knowledge. These different orientations, according to Bell, affect social organization and processes differently in each type of society.

Bell was not the only observer to comment on the changes he saw. In the 1960s, Marshall McLuhan used the term "global village" to describe and critique the effects of worldwide electronic communications on culture, and his ideas certainly seem to have influenced the early visions of the information society. Drucker (1969) declared the era to be the "age of discontinuity" and said that changes associated with information technology constituted a major break with the past. Jean-Jacques Servan-Schreiber (1968) warned Europeans of the "American challenge" of technological dominance. Simon Nora and Alain Minc (1980) wrote a report for the president of France in which they described the convergence of telecommunications and comput-tial effects on national sovereignty, social conflict, and human interaction.

In the United States, Alvin Toffler and John Naisbitt wrote popular books that predicted an inevitable tide of technological growth that would sweep away every aspect of traditional life; societies and people that did not adapt would be left behind. By the 1980s, scholars, the media, and laypeople alike took it for granted that they were in the midst of a "technology revolution" that would radically change society and culture forever. The social "impacts" of technology were detected everywhere; the belief that new technology was driving human action was rarely questioned.

An important perspective emerged in the 1980s to challenge the widespread view of a new society driven by the imperatives of technological development, the prospect of ever-growing productivity, and swelling ranks of affluent white-collar knowledge workers. Proponents of this critical view argued that new information and communication technologies tend to reinforce rather than break down established relations of power and wealth. Indeed, the critics said, new technologies were being built and used in ways that extended industrial work organization and processes to industries and workers that had previously seemed immune to assembly-line control, such as health care, education, and the professions. Information technologies gave owners and employers the same kind of control over white-collar professional workers as mass production had given them over blue-collar workers.

Led by notable critics including Herbert Schiller, the advocates of this "continuity" perspective said that industrial capitalism was not dead; it had just taken on a new form. They pointed out that industrial-era ideas about private ownership, market economics, Western-style politics and mass culture were being exported throughout the world via global information and communication networks. The collapse of the Soviet Union in 1989 was widely regarded as a triumph of American-style capitalism and culture. Postindustrial society had preserved industrial institutional structures (e.g., law, education, finance) and organizational arrangements (e.g., private corporations), which critics said would ensure that political and economic power would remain concentrated in the wealthiest nations, firms, and social groups.

In fact, as Porat and others had found, the dramatic rise in white-collar employment in the service sector had flattened out by the 1980s. It appeared that even the most developed economies could use only about 45 to 50 percent "knowledge workers" in their workforces. Of that figure, the greatest demand for information workers was in relatively routine back-office jobs, such as programming, technical support, telephone sales, clerical work, and lower-level management. In the 1980s and early 1990s, despite a strengthening economy, well-educated American white-collar workers were laid off or replaced by temporary workers in record numbers as employers sought to cut costs.

Looking Ahead

In the 1990s, "information society" became a commonplace idea, though major disagreements remain in research and policy circles about its significance. Is it a revolutionary new phase of society driven by unprecedented innovation and the ubiquitous spread of new technologies? Or is it just the latest incarnation of late-stage capitalism, with information instead of raw materials and telecommunications and computing technologies replacing the assembly line? In an attempt to overcome this stalemate, Peter Shields and Rohan Samarajiva (1993) conducted a comprehensive review of information society research. They concluded that four main research perspectives had emerged: postindustrialists, industrialists, longwave theorists, and power theorists.

Other researchers have taken a sociocultural perspective, examining how people use and understand information technologies in the whole fabric of everyday life. Both the continuity and discontinuity views, they say, are technologically deterministic—that is, they assume that technology drives what people do, rather than assuming that people control technologies and decide what to do with them. In contrast, the social shaping of technology view says that technologies are constantly influenced by human actions and social needs, as well as being society-shaping.

Mark Poster (1990) suggests that the "mode of information" has become a defining characteristic of contemporary culture. Social relations and interaction, he says, are being changed by the introduction of electronic communications and information technologies, so to understand the information society, researchers should study people's language and discourse. In a three-volume work entitled *The Information Age: Economy, Society and Culture* (1996–1998), Manuel Castells surveys the economic, social, and cultural changes of the twentieth century. He proposes that advanced societies are shaped by a "space of flows" of information rather than physical space. Nations, organizations, social groups, and individuals can link together, separate, and reorganize themselves into networks as needed according to their interests and the availability of information.

Key Social Issues

Clearly, many different perspectives have developed for understanding the information society. The implications for broad social change are complex and far-reaching. However, research also suggests that everyday life in information societies is changing. Several characteristics that affect interaction and sociality seem to distinguish what is most "social" about the information society: equitable access to information, privacy and surveillance, and new forms of social organization and community fostered by technology networks.

Equitable Access to Information

If information is the principal resource or commodity in an information society, then equitable access to information technologies and services is crucial if that society is to be a fair and just one. Though one might assume that "everyone" uses new technologies and services, such innovations are often too complicated for some people to use, or too expensive for disadvantaged households to afford. Uneven access has led to a growing concern about the rise of a digital divide between information "haves" and "have-nots," based on race, income, family structure, literacy, national or regional origin, or other factors. The introduction of a new communication medium can create an information gap between the best-positioned members of a society and the less fortunate, excluding many people from educational and economic opportunities.

For example, policymakers, regulators, industry, and the public alike have debated for many years whether universal service can or should be extended for other technologies such as the Internet or cable systems. Universal service originated in the 1920s in the United States as a way to ensure that most households would have inexpensive access to telephone service. More recently, the U.S. e-rate policy has required telephone companies to bill their customers a small amount each month that is passed along to pay for computer equipment and Internet access for public schools and libraries. The policy was intended to help promote fair access to online resources, but it has been strongly opposed by the telephone industry because it subsidizes some users and sets prices for services.

Though the number of computer users is growing rapidly in the United States and around the world, a large proportion of the public still does not have Internet access and may not for years to come. Use of online services is particularly low among non-whites, the poor, and single-parent, femaleheaded households. Only 60 percent of American households have cable service, and about 60 percent do not have Internet access. The number of households with basic telephone service declined after the AT&T divestiture in the 1980s, due to increased rates for local telephone service.

Access is not only a matter of technology. Literacy is often assumed to be universal in the industrialized nations. Yet data gathered by the Organization for Economic Cooperation and Development (OECD) show that as recently as 1995, anywhere from one-third to one-half of adults in twelve of its wealthiest member states had literacy skills that were below the level considered necessary to function effectively at home and at work (Healy, 1998). In a policy paper for the 1999 National Literacy Forum, the National Institute for Literacy reported similar figures for the United States. In the developing world, literacy is a serious problem among rural populations and in traditional cultures where educational opportunities for girls and women are limited. Language barriers create a different literacy problem. Non-English speakers and readers throughout the world are at a distinct disadvantage when it comes to online information services because there is relatively little online content in local languages.

Equity problems arise in many other ways. Minority or unpopular views may not find wide audiences if substantially all of the major media and information services are owned by a handful of large international firms. The International Telecommunications Union has long been criticized because it allocates the majority of orbital satellite "slots" to the United States and Western Europe, whose telephone and entertainment companies dominate markets throughout the world. Intellectual property rights such as copyright are being extended, and fair use provisions are being restricted, so that copyright holders can keep works out of the public domain for decades longer than they once could.

Equity is a concern across societies as well as within them. It is often observed that most people in the world have never placed or received a telephone call, much less used online information services or e-mail. Even in affluent areas such as the European Community, subtle regional differences in the distribution of new media and information technologies have been documented. It is doubtful that systems and services will be distributed in poorer parts of the world as evenly as they have been in developed nations.

Privacy and Surveillance

In most developed nations, people enjoy a certain degree of privacy, both the classic "right to be left alone" (in Justice Louis Brandeis's words) and the control of information about their personal affairs and property. However, as more and more information about individuals and their activities has been gathered, stored, analyzed, and traded electronically, people have begun to sense that they are losing control over their personal information and their privacy. New media and information technologies make it much easier for anyone-with or without a legitimate interest or right-to gain and use personal information about others. Some researchers and policy analysts wonder if one of the characteristic features of the information society is a loss of personal privacy resulting from extensive uses of information and communication technologies for record keeping and surveillance.

Concerns about the privacy of electronic networks are not new. Early party-line telephones in rural American communities encouraged eavesdropping among subscribers who shared the same line. In the early 1900s, stockbrokers and bankers adopted telephones quickly when they realized that they could thereby interact without leaving a written record of the conversation or being seen together in meetings or in public. Before the divestiture of AT&T in the 1980s, Americans regarded "Ma Bell" to be almost as powerful as the government. Telephone wiretapping was a staple of detective novels and gangster movies. In the 1960s, the phrase "do not fold, spindle, or mutilate" inscribed across IBM punch cards became a cultural commentary on the inhumanity of new computerized systems for billing and credit, educational, and government records.

Since the 1990s, however, practically every type of information about individuals has been gathered and kept electronically. U.S. data privacy laws are fairly weak compared to those in Europe and other areas of the world. Private firms and law-enforcement agencies in the United States have lobbied hard to retain their right to access and share all types of data about individuals; indeed, differences in data privacy laws have been a major obstacle in U.S.-European trade talks.

It is no wonder, then, that people may be reluctant to send credit card numbers over the Internet or that they wonder who has access to their medical records. Some have started using "privacy technologies" of their own to thwart intruders.

Changing Social Structures and Community

Researchers, beginning in the early 1990s, have examined the ways that information and communication technologies, especially computer-mediated communication such as e-mail and the World Wide Web, may support new kinds of social relationships and communities. People who communicate online share special types of language, take on new social and professional roles, share community "standards," participate in special events or "rituals," and develop rules of "netiquette". Research has shown that people using new technologies develop extensive networks of personal contacts, including a large proportion of indirect relationships to others.

Such findings suggest that in an information society, communities might be based more on shared interests or background than on physical geography or proximity. "Virtual" communities may be more temporary than geographic communities. Data from the U.S. General Social Survey show that, since 1980, a major shift has occurred away from the "nuclear family" that has been typical in modern industrial societies. About onethird of Americans live in households of only one person, and another one-third live in households with two adults and no children. Perhaps the social support that has been traditionally provided by immediate family, neighbors, and local community groups can now be found online, or by using technologies that allow people to stay in touch with loved ones and friends wherever they are.

Summary

By any measure, life in modern nations is inextricably tied up with the use of networked information and communication systems that link places, data, people, organizations, and nations. By using these systems, people can share information and interact more quickly with more people in more places than ever before. However, the question of whether fundamentally new types of social relationships, work organization, or institutional forms have developed is still open. The information society, like industrial society before it, will depend not just on technologies that people use but on the social arrangements and beliefs that make them part of everyday life.

See also: Community Networks; Copyright; Internet and the World Wide Web; McLuhan, Herbert Marshall; Privacy and Communication; Privacy and Encryption.

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INFORMATION STUDIES, RESEARCH METHODS IN

See: Research Methods in Information Studies

INNIS, HAROLD ADAMS (1894-1952)

Harold Adams Innis was a Canadian political economist who turned to the study of communication in the last years of his career and life, publishing two important works on the media, Empire and Communications (1950) and The Bias of Communication (1951). These two difficult and expansive scholarly books have provided a foundation for Canadian political economy of communication studies since their publication, but in the United States and elsewhere, Innis's legacy primarily has been the influence his work had on Marshall McLuhan, who was a controversial colleague at the University of Toronto from the late 1940s until Innis's death and who became a well-known media theorist in the 1960s. Before he died. Innis was a professor and head of the Department of Political Economy and dean of the School of Graduate Studies at the University of Toronto. Innis College is now named after him.

Considered by Canadian cultural theorists to be one of a triumvirate that also includes McLuhan and George Grant, Innis presented in Empire and Communications an encyclopedic interpretation of the influence of communication on Western civilization as he pursued the thesis that communication occupies a crucial position in the political organization of empires, suggestive of the general role of communication in historical change. His studies of each civilization and its dominant media center on concepts of time and space. Durable media such as stone, parchment, and clay emphasize time and favor decentralized and hierarchical institutions. Light media such as papyrus and paper emphasize space and favor centralization and less hierarchy. Empires survive



Harold Adams Innis. (University of Toronto Library)

by managing the bias of dominant media toward either time or space and by balancing media with different biases. Innis also divides history into writing and printing periods, noting the influence of clay, papyrus, parchment, and paper on the writing period, as well as the influence of machinery and wood pulp on the printing period. In a caveat, Innis is careful to guard against suggesting that writing or printing has determined the course of civilization, and also warns against overlooking the importance of the oral period, which has left little record. Reflected in the literature of Greece, in the sagas of northern Europe, as well as in music and poetry, the oral tradition can be too easily forgotten. In many essays included in The Bias of Communication, Innis pleads for a return to the balance of eye and ear and the balance of writing and speech, all of which were hallmarks of Greece at its best and of the oral tradition.

In both of his major works, Innis turned from his economic studies of cod fisheries, the fur trade, and railways in Canada to communication as a central productive force in history. As an economics historian, Innis brought to communication studies a focus on the rise and fall of civilizations and the dialectical relationships between metropolitan centers and peripheral margins. Primarily studying ancient civilizations, but writing with a grand historical sweep that included comments up to the mid-twentieth century as well, Innis developed the idea that the dominant form of communication, whether it was time-biased or space-biased, fostered different types of social power and control in creating a monopoly on the knowledge of a society. As new forms of communication appeared on the horizon and were developed by competing power groups, those emerging monopolies of knowledge, under the right social conditions, could present powerful forces of change leading to the fall of previous civilizations and the rise of new ones. For example, the use of stone and hieroglyphics in Egypt tended toward a time-biased empire of divine kingship that sustained itself over time with the elite's access to a secret script. When papyrus came along, it enabled Egypt to expand its control over space but it also required the priestly class to share power with an emerging administrative bureaucracy.

Often interpreted as a soft technological determinism within a critical framework similar to or a variant of Marxist analysis, Innis's writing on communication exhibited a strongly stated preference for civilization based on oral communication as existed in ancient Greece at the time of the advent of the phonetic alphabet. Innis traced the shift from the time-biased nature of oral culture, which was adept at creating a rich culture over long periods of time but not over wide expanses of space. Oral societies were more democratic because of the dialogic and conversational character of orality. The spread of writing systems and the introduction of the printing press and movable type in Europe in the mid-1400s gave rise to increasingly dominating forms of empire. The social and institutional organization made possible by writing and printing were space-biased, which are good at extending power and control over space, but more vulnerable to disintegrating in a shorter period of time.

Although the monopolies of knowledge fostered by print technology cultures were threatened, or checked, as Innis often wrote, by the emergence of the electronic media of radio and film, Innis argued that these new media intensified rather than challenged the reach of modern empires to a global scale. The inherent attack against the democratic spirit of oral cultures is amplified by electronic media monopolies of knowledge, Innis argued, in contrast to McLuhan's central argument that electronic media were inherently more decentralizing and democratizing because they represented a return to orality.

Innis's death in 1952 prevented his historical analysis of communication from including the effect of the widespread penetration of television throughout the world, not to mention the proliferation of computer and satellite technology that has occurred since his death. However, given the range of his study of communication media (from stone tablets to the printing press to electronic media) and the media's effect on the rise and fall of the empires of Egypt, Rome, Greece, Babylon, Europe, and America, among others, his legacy provides such a pervasive theory of the relationship between communication media and social organizations that his work can be predictive of many future changes in communication. David Godfrey, for example, in his introduction to the 1986 edition of Empire and Communications, ponders Innis's reaction to word processors, which Innis would have regarded as being similar to paper mills, printing presses, and the written alphabet. All are a threat to the oral tradition of human conversation based on speech, hearing, and direct experience in a democratic exchange. Also, as James Carey (1989) predicts, based on Innis's work, the proliferation of new technologies will intensify the speed and spread of empire over both space and time.

Innis's work has appeared in the shadow of McLuhan outside of Canada: however, while Innis has been identified as a member of the Toronto school of communication theorists, the turn of his work toward culture and critical theory makes his scholarship of increasing interest in contemporary American research, which is more open to humanistic and interdisciplinary media studies than in the past ascendancy of media-effects research. Recognized as a founding figure of technology and culture studies, Innis is included, with Lewis Mumford and Jacques Ellul, as one of the key figures in the media ecology approach developed at New York University by Neil Postman and his colleagues. The attention of cultural studies thinker and prominent media researcher Carey also has kept Innis's work from receding. Canadian research continues to be receptive to Innis's work through such contemporary scholars as political scientist Judith Stamps and cultural theorist Jody Berland, as well as through the earlier work of Arthur Kroker.

See also: Cultural Studies; Language and Communication; McLuhan, Herbert Marshall; Models of Communication; Technology, Adoption and Diffusion of; Technology, Philosophy of.

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PAUL GROSSWILER

INNOVATIONS

See: DIFFUSION OF INNOVATIONS AND COM-MUNICATION; TECHNOLOGY, ADOPTION AND DIFFUSION OF

INSTRUCTIONAL COMMUNICATION

The ability to speak clearly, eloquently, and effectively has been recognized as the hallmark of an

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educated person since the beginning of recorded history. Systematic written commentary on how to develop this ability goes back at least as far as The Precepts of Kagemni and Ptah-Hotep (3200-2800 B.C.E.). This document, the oldest remnant of the Egyptian Wisdom Books of the Middle and New Kingdoms (used as a manual of advice to train individuals headed for positions as scribes and officials), contains forty-five maxims, one-third of which are related to effective communication, such as (1) keep silent unless there is something worth saying, (2) wait for the right moment to say it, (3) restrain passionate words when speaking, (4) speak fluently but with great deliberation, and (5) above all, keep the tongue at one with the heart so the truth is always spoken.

Under the label of "rhetoric," the theory and practice of oral discourse was a central concern of Greek, Roman, medieval, Renaissance, and early modern education. In the United States, teachers of communication, from the beginning, devoted considerable intellectual effort to the development of theory and research that was supportive of effective communication instruction—efforts focused on the strategies, techniques, and processes that teachers could use to facilitate the acquisition and refinement of communication competence.

Communication instructors sought to share this knowledge with their colleagues in other classrooms. Donald K. Smith (1954) suggests that speech courses for teachers were offered at Indiana University in 1892; within two decades, the appearance of such courses at other universities was general.

Early efforts applied communication theory and research generated in noninstructional contexts to the tasks of the classroom teacher. What had been learned, for example, about the principles of effective speech making or group discussion was applied to the tasks of preparing a lecture or leading a class discussion. More recently, and largely in conjunction with the development of the International Communication Association's Division 7 (the Instructional and Developmental Communication Division, founded in 1972), communication educators have focused on developing communication theory based on empirical research that is conducted in the instructional context.

This entry explores the subset of communication studies known as communication education. Communication education is the study of communication in instructional (pedagogical) contexts. It is concerned with the study of three categories of phenomena: (1) oral communication skills-instructional strategies that communication instructors use to facilitate the acquisition of communication competence (e.g., What can communication teachers do to help students learn how to be more effective in job interviews?), (2) instructional communication-communication skills and competencies that are used by all instructors in the process of engaging in teaching and learning (e.g., How can all teachers communicate in ways that help their students learn?), and (3) communication development-the normal developmental sequence by which children acquire communication competence (e.g., Are there certain stages that individuals go through as they learn how to detect deception?).

The primary focus here will be on the second component of the phenomena covered by the term "communication education"—that is, on what communication scholars have learned about the process of communication as individuals interact in instructional settings.

The development of instructional communication theory and research in the United States has been guided by two primary forces: the nature of the communication discipline and the broader context of academia's social and behavioral science research traditions.

Robert Craig (1989) suggests that communication is a discipline wherein the essential purpose is to cultivate communication as a practical art through critical study. The defining characteristic of the discipline is, in his view, "the intimate tie that exists between the discipline's work and practical communicative activities" (p. 97). As a result, the discipline seeks to understand the structure, patterns, and effects of human communication and to use this knowledge to facilitate a higher quality of communication for both individuals and for society. For instructional communication scholars, this has produced a primary focus on the communication skills of teachers-that is, on how teachers can be helped to become more effective communicators in instructional contexts. A focus on the communication skills of students-as-learners exists, but this emphasis has been secondary.

In their research, communication scholars have operated within the broader context of teacher effectiveness research. This context was generated
out of the social and behavioral science research traditions of academia. Jonas F. Soltis (1984) suggests that instructional research has emerged from the perspective of roots in three dominant twentieth-century philosophical traditions: logical empiricism (positivism), interpretive theories (analytical, phenomenological, and hermeneutic), and critical theory (neo-Marxist). Soltis argues that "empirical (causal), interpretive (meaningful), and critical (normative) dimensions characterize pedagogy and hence all need to be studied if pedagogical research is to be honest to its subject matter" (p. 5).

One of the first descriptions of instructional communication research was provided by Ann Staton-Spicer and Donald Wulff (1984) who identified, categorized, and synthesized 186 empirical studies of communication and instruction reported in the national and regional communication journals during the years 1974 through 1982. This overview of instructional communication research was updated in 2000 by Jennifer H. Waldeck and her colleagues.

Empirical Inquiry

Since at least 1896, scholars have used empirical research methodology to shed light on what it means to be an effective teacher. As have their colleagues in other social and behavioral sciences, these researchers have operated largely within the language and logic of logical empiricism-a perspective that some have called "the orthodox consensus." Modeled after the approach of the natural sciences, logical empiricism has produced a variety of approaches to instructional communication research ranging, for example, from naturalistic descriptions of teacher classroom behaviors to tightly controlled experiments that manipulate such variables as teacher clarity and teacher humor in order to assess their effect on student learning. Underlying the many varieties of positivist logic are several assumptions:

- 1. Reality exists independent of both the research and the flux of sensory experiences. The knower and the known are separate entities.
- 2. There is a deterministic order to reality-for people as well as for natural objects. Reality is neither random nor chosen.
- 3. The major function of the researcher is to construct general laws or principles that govern

the relationship among classes of observable phenomena.

- 4. The general laws or principles composing scientific knowledge should be consistent with empirical fact. Scientific investigation is properly concerned with establishing an objective grounding for systematic theory.
- 5. Through continued empirical assessment of theoretical propositions and their deductions, scientific understanding can progress. Scientific knowledge is cumulative.

Operating from the assumptions of logical empiricism, instructional communication researchers have, with overlap, worked within five major research traditions: trait-rating, trait-observation, structure, process-product, and mediatingprocess. While each has been a dominant tradition at some point in history, all still contribute to instructional communication research.

Trait-Rating Tradition

The earliest attempts to identify effective communication strategies of teachers used students as observers. H. E. Katz (1896), for example, asked large numbers of students to describe the "best" teachers they ever had and subjected the list to a form of content analysis that yielded lists of the behaviors of "good" teachers (e.g., they care about students; they are clear when they lecture; they are fair in their grading). Beginning in about 1917, researchers began to ask these questions of "experts"-school administrators, professors of education, and others-whose opinions were presumed to have greater validity than those of students. A popular, related approach consisted of examining rating scales in an attempt to locate elements considered important enough to be used to rate teacher performance. Communication scholars have focused their interest largely on asking students for their views of the communication traits of effective instructors.

While early work explored the application of the speaker credibility construct to the role of teacher (e.g., expertise: teachers know what they are talking about; trustworthiness: teachers care about students and want to help them; and dynamism: teachers are good storytellers), more recent work has explored both broad, general categories (e.g., communicator style and sociocommunicative style) and narrower traits (e.g., teacher immediacy, teacher argumentativeness,

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Video can be a valuable source of instruction and is being used here to help students at the Alfred I. duPont Institute learn to read lips. (Richard T. Nowitz/Corbis)

and verbal receptivity). Among the significant programs of research in this domain are ones generated by Robert Norton's conceptualization of communicator style, Janis Andersen's adaptation of teacher immediacy, and Dominic Infante's formulation of argumentativeness.

Trait-Observation Tradition

Dissatisfaction with using someone's opinion (whether a student or an "expert") as a criterion measure of good teaching is not new. The empirical basis for this dissatisfaction was provided by Arvil S. Barr and others as early as 1935, when they demonstrated that correlations between ratings of teachers and mean pupil gains on achievement tests were low (ranging from -0.15 to +0.36, with a mean of +0.16). These findings led researchers to explore the possibilities of systematic observation of teachers, and they turned to the child study movement of the 1920s for their methodology. Because they were studying children who were too young to be tested or interviewed, and because the most convenient place to work with such children was the classroom, child study movement researchers pioneered the use of direct observation of classroom behaviors. The earliest teacher effectiveness study that used this approach (attempting to describe what a teacher does rather than how well he or she does it) was Romiett Stevens's 1912 study of questioning behavior. Based on four years of observation, she discovered, for example, that teachers talk 64 percent of the time; 80 percent of classroom talk is devoted to asking, answering, or reacting to questions; and teachers ask one to four questions per minute, with an average of two. While a number of developments prevented this research tradition from becoming immediately popular, in 1954 Barr was able to devote an entire issue of the Journal of Experimental Education to a review of seventy-five relevant studies done in Wisconsin under his direction. Within the communication discipline, Jon Nussbaum and his students and colleagues have been responsible for focusing attention on the observation of such teacher classroom behaviors as use of humor, self-disclosure, and narratives. Other variables that have received attention include teacher clarity, teacher explanation, teacher affinity-seeking, and teacher fashion.

Structure Tradition

Scholars in the late 1940s began to focus their attention on ways of structuring the classroom environment in such a fashion as to minimize the effect of teacher differences and maximize student learning. The method of classroom discussion, for example, was compared with the method of lecturing, while programmed instruction was compared with stimulation and games. Predictably, in retrospect, because this body of research ignored the complexity and dynamics of the classroom environment, a great deal of research failed to show that one approach was superior to others for any grade level.

A major exception was the use of the personalized system of instruction, as set forth by Fred Keller (1968). In this approach, students are helped to master course content by breaking that content down into smaller units and then helping them master those units with one-on-one tutoring from students that have successfully completed the course. A wide variety of additional instructional strategies have been explored, including use of videotapes, textbooks, interactive distancelearning networks, collaborative learning, and email message strategies.

Process-Product Tradition

Researchers in the 1960s began to isolate and examine elements of teaching behavior that could be used to compare various methodologies (e.g., level of question asking is a variable appropriate to both discussion and programmed instruction). They ultimately isolated more than one thousand such variables. This approach produced an explosion of both descriptive and experimental systematic observation research that centered on identifying links between instructional strategies (processes) and learning outcomes (products).

While early summaries of research within this tradition were largely negative, more recent summaries have been more optimistic. The best-developed program of such research within instructional communication is the "power in the class" series produced by James McCroskey and his colleagues. In the seven essays that compose the original series (and multiple additions), the

authors report studies that explore a wide variety of issues related to teacher use of and student reactions to behavior alteration techniques employed in the classroom. In summarizing this body of research, Virginia Richmond and K. David Roach (1992) conclude that instructor compliance-gaining strategies have a potent influence on learning factors in the classroom, from the elementary school to the university. Power bases and compliance-gaining strategies that emphasize positive relationship and relevant knowledge experience (e.g., "because it's fun," "because it will help you later in life," "because you will feel good about yourself if you do") are far superior in overall effects on student learning than are those that have a coercive and rules-oriented flavor (e.g., "because I will punish you if you don't," "because your parents will feel bad if you don't," "because I had to do this when I was in school").

Mediating-Process Tradition

Adapting to the cognitive emphasis (i.e., a concern for what individuals are thinking rather than what they are doing) that is used in other social and behavioral sciences, instructional communication researchers have studied the cognitive processes that mediate instructional stimuli and learning outcomes. For these researchers, processproduct relationships are of interest primarily as a basis for reasoning about the kinds of mediating responses that make such relationships possible. Thus, learning that certain kinds of teacher questions lead to certain kinds of student behaviors is treated as a stimulus to explore the thought processes of students and teachers that might produce this relationship.

While some of this work has focused on the pedagogical judgments, plans, and decisions of teachers, most has focused on student perceptions and information-processing responses (e.g., student perceptions of differential treatment by teachers, perceptions of abilities of peers, use of an attribution framework for studying achievement, perceptions of the academic climate). In the teacher domain, for example, Staton (1990) and her colleagues have studied a construct labeled "teacher concerns." Within this body of research, teachers become socialized to the role of teacher in a process that can have three stages: concern for self ("Will the students like me?), concern for task ("How many tests should I give this semester?"), and concern for effect ("Will students learn more about this topic if

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I lecture or if I have them work in groups?"). Teachers begin to master the role of teacher with a concern for self and, it is hoped, move quickly through concern for task to concern for effect.

Interpretive Inquiry

Despite the fact that logical empiricism has been (and continues to be) the most widely espoused and employed epistemology and methodology in instructional communication research, a number of criticisms against the position have led researchers to develop alternative methodologies. While the language used to describe these methodologies varies with orientation, interpretive researchers who focus on the classroom share several assumptions:

- 1. Face-to-face interaction is a rule-governed phenomenon (i.e., if a teacher asks a question, it is expected, but not required, that students will provide an answer). Rule-governed means that culturally determined expectations for performance exist and that these expectations guide participation and act to constrain the options for what will or can occur. These expectations do not, of course, predict with certainty the exact form of the participation or even the occurrence of participation.
- 2. The contexts of interaction are constructed by people as they engage in face-to-face interaction. Thus, contexts are not given in the physical setting (e.g., "doing seatwork"); they are constructed by the participants' actions as part of the interaction.
- 3. Meaning is context specific. Closely related to the concept of context as constructed, this assumption suggests that what a behavior "means" is determined by considering how it is used, what precedes it, and what follows. All instances of behavior are not considered functionally equivalent.
- 4. Comprehension is an inferencing process. Meaning is viewed as a process of extracting the verbal and nonverbal information so that a person can "make sense" of the evolving events and gain access to the cognitive, social, procedural, contextual, and communicative knowledge that is provided during face-to-face interaction.
- 5. Classrooms are communicative environments, and the teachers are the only natives.

That is, the teachers know the rules for behaving in this environment because they create the rules; the students do not start with a knowledge of these rules and must learn them. Therefore, emphasis needs to be focused on identifying communication strategies that enable students to adjust to environmental complexity and learn "from" the classroom.

While interpretive inquiry starts with a different view of what it means to be human (active as opposed to reactive-that is, an assumption that individuals make real choices about their behavior as opposed to being shaped by nature and nurture) and while it disagrees with many of the underlying assumptions of logical empiricism, it shares with logical empiricism the view that inquiry should be objective. Individuals who study classrooms from an interpretive perspective are concerned with collecting and analyzing human behavior in natural settings and with exploring what is learned from (and how people learn through) interacting with others. In other words, interpretive research is concerned with how people learn language, learn through language use, and learn about language in educational settings.

Staton (1990) and her students have conducted research that is representative of this work being done in instructional communication. They have undertaken qualitative research in natural settings to explore issues of how students and teachers learn their respective roles. In terms of students, their research examines how people learn the role of "student" across the span of the child and adolescent student career. The central questions addressed are (1) What does it mean to be a new student?, (2) What is the nature of the communication process by which these individuals take on new student roles in new school environments?, and (3) What are the critical dimensions of the particular status passage?

Critical Inquiry

Critical theorists view both empirical inquiry and interpretive inquiry as ideologies (i.e., based on arbitrary belief systems rather than on observable facts) that focus on finding effective means to achieve educational ends that are taken for granted, that preserve the status quo, and that reinforce the power of the dominant class without regard for what kind of social and human life the current forms of schooling produce. They argue, for example, that researchers who use empirical inquiry and interpretive inquiry are studying how teachers can be helped to be more effective in getting students to learn rather than asking whether or not they might better explore how to help students be more effective learners. Critical theorists reject as a myth the idea of value-free research into human social, political, and educational phenomena; they stress instead the need for inquiry that takes into account the historical-ideological moment in which people live and the influence it has on them. Critical scholars, in short, are interested in making people aware of and helping people challenge the values that are inherent in the status quo of the educational enterprise. Research that focuses on creating an awareness of the role of sexism in classroom interaction is an example of this type of inquiry.

Summary

Having explored instructional communication research within empirical, interpretive, and critical perspectives, it is possible to find representative studies for each and every category. Nevertheless, it is striking that the vast majority of the work done by instructional communication scholars involves survey research conducted within the empirical tradition; that is, the majority of instructional communication research explores the dynamics of the college classroom by asking students to report what happens there. In addition to a narrow methodological focus, the focus is narrow in that the emphasis is on the teacher (rather than the student) in the college classroom (rather than in the lower academic levels or in the world of work).

Instructional communication is an exciting and active area within the communication discipline. It has generated a dedicated core group of scholars who are producing quality, programmatic work of methodological sophistication. Much of that work has focused on establishing relationships between paper-and-pencil reports of teacher characteristics and student learning. While successes in these efforts have been and continue to be important, the usefulness of instructional communication research is likely to be enhanced by encouraging a greater diversity of research emphases and traditions—especially within the interpretive and critical frameworks. See also: Academia, Careers in; Communication Study; Language and Communication; Public Speaking; Rhetoric.

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GUSTAV W. FRIEDRICH

INTELLECUTAL FREEDOM AND CENSORSHIP

A climate of intellectual freedom is one where any individual may express any belief or opinion regardless of the viewpoint or belief of any other individual, organization, or governmental entity. These expressions range from private communications to speeches, essays, plays, or websites.

Censorship may broadly be defined as any action that works against a climate of intellectual freedom. Censorship affects both written and oral communication. Its span can encompass not only books but also newspapers, magazines, movies, plays, television, radio, speeches, recorded music, e-mail, government documents, and information communicated electronically. Censorship is both the process and the practice of excluding material that is deemed by someone to be objectionable. In theory, any person or organization may, for what they consider appropriate political, social, economic, social, or sexual reasons, set themselves up in the role of censor. Individuals and organizations ferret out that which they consider immoral, profane, objectionable, or offensive and try to impose their will on society by trying to prevent others from having access to the ideas. Censorship is the most powerful nonmilitary tool that is available to governments.

In every society in every age—from ancient Rome to modern America—the climate of intellectual freedom has been constantly threatened by acts of censorship. Examples of censorship in the United States range from banning the inclusion of certain books in library collections to enacting legislation (such as the Communications Decency Act) that infringes on First Amendment rights. The history of humankind's struggle for intellectual freedom reveals much about the conflict between tolerance and intolerance.

Censorship in History

Censorship has existed almost since the beginning of time, and its history is filled with individual authors and publishers who were intent on expressing ideas that others found to be offensive, indecent, or controversial. As early as the fifth century B.C.E., Greek and Roman orators and writers expressed principles of individual liberties. The playwright Euripides wrote, "This is true liberty when free-born men, having to advise the public, may speak free." The Greeks in ancient times did not, however, allow free expression of ideas that went against state religion, and in 399 B.C.E., Socrates was sentenced to death (to be carried out by his drinking of poison hemlock) after having been found guilty of degrading public morals. Socrates, known for his democratic teachings, argued his own defense, which outlined the importance of freedom of expression and is still extensively quoted in modern court cases.

Rome appointed its first censors in 443 B.C.E. The job of the Roman censor was not only to record demographic information about Rome's citizens but to assess moral behavior. Those who performed noble needs were honored. Those who violated the accepted rules of conduct lost status and privileges, including citizenship.

After the fall of the Roman Empire in the fifth century C.E., the Roman Catholic Church controlled freedom of expression in the Western world for the next one thousand years. In the Middle Ages, religious and political censors protected the Church and state from both written and verbal attacks. The Church suppressed views with which it did not agree, and people were branded as heretics when they expressed ideas or opinions that went against Church doctrine. The Church silenced heretics through exile, torture, or death.

The tradition of individual liberties can be traced by to 1215 and the guarantees included in Britain's *Magna Carta*. In spite of the ideals expressed in that important document, the world's earliest censorship statute came from English Parliament in 1275.

The world changed in 1459 when Johannes Gutenberg began to work with movable type. By 1477, England had its first printing press. For the next two hundred years, from the early 1500s until 1694, licensing played a major role in publishing in England. Each publisher was required to get a formal license from the government before publishing works. If material was objectionable, no license was granted. (This was a most powerful example of what is called a priori censorship.) Unlike political censorship and church censorship, censorship for obscenity is a relatively recent development. Its roots can be traced to the seventeenth century and the advent of literacy among the masses. The term "obscenity" comes from the Latin ob (ideas) and caenum (towards dearth of filth).

Censorship of the press continued during the Reformation, until censorship by licensing ended in 1694. John Milton began arguing for the abolishment of licensing for printing about fifty years before Parliament finally acted. In his *Areopagitica* (1644), Milton argues for abolishment of printing licenses. Freedom of expression was very short lived, however. Shortly after 1694, Parliament enacted sedition laws that made it a crime to publish material that expressed hatred of or contempt for the government or the king. Regardless of the laws and restrictions, people have always found ways to express their ideas and opinions. Since Gutenberg's time, the secret, underground printing of pamphlets has been common throughout Europe.

Censorship in the United States

People think of the United States as the freest country in the world in terms of expression, but during the Colonial period, printing in America was strictly regulated by the government in England. Boston was the site of the first book burning—of Thomas Pynchon's *The Meritorious Price of Our Redemption* (1650)—performed by the public executioner. Newspapers were commonly suppressed in terms of their information content.

When the states voted on the U.S. Constitution in 1789, there was a growing concern being expressed that the Constitution did not guarantee human rights. On December 15, 1791, the states ratified the Bill of Rights (the first ten amendments to the Constitution). The liberties granted with the Bill of Rights make citizens of the United States among the freest in the world. Americans often take those liberties for granted, but they did not happen by accident. The founding fathers carefully planned for the rights of nation's citizens.

Of the ten amendments ratified as part of the Bill of Rights, the most famous has always been the First Amendment: "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or of the right of the people peaceably to assemble, and to petition the Government for redress of grievances."

The First Amendment requires citizens to protect unpopular speech, minority opinion, and the right of a speaker even when they do not agree with the message being conveyed. In spite of the First Amendment, the human inclination to prevent speech has given America a long history of censorship, intolerance, and repression. In 1885, Mark Twain's *Huckleberry Finn* was banned in Concord, Massachusetts. To this day that same novel continues to be one of the most challenged and banned books ever published.

Anthony Comstock, one of America's most famous self-appointed guardians of public morality, had a long and ardent career as a censor. A grocer by trade, Comstock, as a young man, founded

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On November 12, 1936, policemen in New York City participated in a book burning to destroy "obscene" publications. (Bettmann/Corbis)

and was active in the New York Society for the Suppression of Vice. Comstock was instrumental in getting legislation passed to make it illegal to send obscene literature though the mail. The Comstock Law and Comstock's work to outlaw obscene, lewd, lascivious and filthy books and pamphlets set a moral tone in the United States that lasted until the 1950s. Dawn Sova (1998a) has remarked that "Comstock believed that erotic literature was a trap designed by Satan expressly to detour pure and decent young people from the path of righteousness to the road to depravity."

During the twentieth century, particularly during World War I and World War II, censorship was widely practiced and, in fact, accepted by the government and other bodies. In general, during periods of war and unrest, the government and the public are often inclined toward more, not less, control of information and toward suppression of information for security reasons. Following the passage of the Espionage Act of 1917, freedom of speech was more narrowly defined by the courts. In 1947, Senator Joseph R. McCarthy was elected to the U.S. Senate and became a central figure in the Cold War era. In the early 1950s, McCarthy claimed that there were more than two hundred card-carrying communists in the U.S. State Department but refused to produce evidence of his charges or identify his informers. He used the media to make unfounded accusations and was instrumental in a Supreme Court decision that ruled that speakers could be punished for advocating the overthrow of government, even when it was unlikely that such an occurrence would occur.

The debate about obscene material in previous decades resulted in the 1957 *Roth v. United States* decision, in which the Supreme Court changed the definition of the term "obscenity" to mean works that had sexual content but "no redeeming social importance." Samuel Roth had been charged with sending obscene material through the mail. Found guilty at the lower court level, the Supreme Court upheld Roth's conviction. Justice William J. Brennan Jr. stated that obscenity did

not enjoy the protection of the First Amendment because obscenity is "utterly without redeeming social importance."

In 1967, the U.S. Congress created the Commission on Obscenity and Pornography. The report of the commission and its recommendations were rejected by the Senate and by President Richard Nixon. Thus, the 1957 definition of obscenity stood until the Supreme Court's 1973 decision in *Miller v. California*. Marvin Miller, like Roth, had been convicted for sending obscene publications though the mail.

In upholding the decision of the State of California, the Supreme Court's opinion created a new three part test for obscenity: (a) whether the average person, applying contemporary community standards, would find that the work, taken as a whole, appeals to prurient interests, (b) whether the work depicts or describes, in a patently offensive way, sexual conduct specifically defined by the applicable state law, and (c) whether the work, taken as a whole, lacks serious, literary, artistic, political, or scientific value.

Censorship in the United States is not limited to the spoken or written word. Visual arts, including photography, and music lyrics have been the focus of censorship efforts, often by well-organized and well-funded community or national groups. The battles over Robert Mapplethorpe's photographs and the "Sensations" exhibit (which featured works from the Saatchi Collection) at the Brooklyn Museum of Art are but two examples.

Censorship in U.S. schools began after World War II. Textbooks, library books, and material used in classrooms as part of the curriculum have all been the targets of well-meaning parents, community organizations, and even school boards that govern school districts. In 1975, the school board of the Island Trees Union School District ordered nine books removed from the school library. After a 1982 decision by the Supreme Court in Board of Education v. Pico, the books were returned. Justice William Brennan, in his opinion, stated, "local school boards may not remove books from school library shelves simply because they dislike the ideas contained in those books and seek by their removal to prescribe what shall be orthodox in politics, nationalism, religion, or other matters of opinion."

Even the power of the U.S. Supreme Court, though, seems insufficient to quell society's yearn

to censor. The American Library Association's list of the ten most challenged books between 1990 and 1999 (out of the 5,600 challenges that were reported) includes many titles that Brennan's landmark words would seem to protect:

- 1. *Daddy's Roommate*, by Michael Willhoite (96 attempts to ban)
- 2. Scary Stories (series), by Alvin Schwartz (92)
- 3. I Know Why the Caged Bird Sings, by Maya Angelou (60)
- 4. The Adventures of Huckleberry Finn, by Mark Twain (53)
- 5. The Chocolate War, by Robert Cormier (48)
- 6. Bridge to Terabithia, by Katherine Paterson (45)
- 7. Of Mice and Men, by John Steinbeck (45)
- 8. Forever, by Judy Blume (40)
- 9. Heather Has Two Mommies, by Leslea Newman (36)
- 10. The Catcher in the Rye, by J. D. Salinger (32)

Censorship in the 1990s expanded its reach to an ongoing censorship battle over what is acceptable for adults and children to see on the Internet, particularly in public settings. Constitutionally protected sexually explicit material is widely available on every computer hooked to the Internet. Parents, legislators, the government, and industry have rushed to restrict access to what they classify as violence, hate speech, and unacceptably graphic sexual material in cyberspace.

In 1996, the U.S. Congress passed a sweeping telecommunications reform bill-the Telecommunications Act of 1996, which included the Communications Decency Act (CDA). When this bill was passed and thereby made a law, it made it a criminal act to allow minors to see indecent material on the Internet. The CDA was immediately challenged by the American Civil Liberties Union and a coalition of organizations that included the American Library Association. In 1997 the Supreme Court heard oral arguments in Reno v. American Civil Liberties Union, the first case regarding the Internet to be brought before the Court. The Court struck down provisions of the CDA that regulated "indecent and patently offensive speech". While the CDA was intended to protect minors, the Court declared it unconstitutional because it would have reduced "the adult population (on the Internet) to reading only what is fit for children."

The Internet has become a battleground that sets the right to free speech against the interests of protecting minor children. The ongoing struggle to control what both children and adults read, view, and hear on the Internet will not be solved soon.

Censorship in Other Countries

Just as censorship has occurred from early history in the Western world, censorship has been prevalent in the history of many of the world's countries for centuries. Citizens in many countries still live in a culture of fear and secrecy, where information is suppressed and access is restricted. Without a commitment to freedom of expression, governments can and do act as they please in denying access to information. In 1948, the Commission on Human Rights completed its work under the leadership of Eleanor Roosevelt, and the United Nations adopted the Universal Declaration of Human Rights without dissent. This living document has been adopted by nations throughout the world. Article 19, the section that deals with freedom of expression and opinion states: "Everyone has the right to freedom of opinion and expression; this includes freedom to hold opinions without interference and to seek, receive and import information and ideas through any media and regardless of frontiers."

These ideals are difficult to live up to even in countries where there are no formal censorship laws. The culture of many countries does not guarantee that freedom of expression will flourish, even in the emerging democracies. Therefore, censorship persists with both formal and informal mechanisms.

Information Freedom and Censorship (1991) reported on freedom of expression and censorship in seventy-seven of the world's countries at a time shortly after the liberation of Eastern Europe and the end of emergency rule in South Africa. In a majority of the countries covered by the report, individuals remained in jail or detention for expressing their opinions and works continued to be banned. At that time, twenty-seven countries operated under State of Emergency or Prevention of Terrorism legislation that allowed those governments to suspend arbitrarily the right to freedom of expression. In many countries, journalists continued to be tortured or killed, and the government retains control or ownership of the press/and or the Internet.

The international transfer of information via the Internet has made information more accessible to some and less accessible to others. Events such as ethnic and religious conflicts are reported around the globe almost instantaneously, and electronic information is not as easily suppressed. Via e-mail, individuals can report on world events, form their own opinions, and express them to others. Still the Internet is controlled or restricted in many parts of the world. In 1999, Reporters Sans Frontieres (RSF), a French-based organization of international journalists, named twenty countries that were enemies of the Internet and reported that forty-five countries restricted their citizens' access to the Internet. Most of these counties restricted access by forcing citizens to use staterun Internet Service Providers (ISPs). The twenty "enemies" protected the public from "subversive ideas" or used the rationale of national security. In some countries, no citizens were allowed access to the Internet. In other countries, users were forced to register with authorities. Some countries used blocking software, and still others used government-run or approved ISPs. The twenty countries that were selected in 1999 as enemies of the Internet included the Central Asian and Caucasus countries of Azerbaijan, Kazakhstan, Kirghizia, Tajikistan, Turkmenistan and Uzbekistan, as well as the countries of Belarus, Burma, China, Cuba, Iran, Iraq, Libya, North Korea, Saudi Arabia, Sierra Leone, Sudan, Syria, Tunisia, and Vietnam.

RFS (1999) also reported that "the Internet is a two-edged sword for authoritarian regimes. On the one hand, it enables any citizen to enjoy an unprecedented degree of freedom of speech and therefore constitutes a threat to the government. On the other hand, however, the Internet is a major factor in economic growth, due in particular to online trade and exchange of technical and scientific information, which prompts some of these governments to support its spread."

Each month RSF publishes a press freedom barometer. In November 1999, 2 journalists were killed, 19 were arrested, and 85 were in jail. An additional 42 had been threatened. Of the 188 member countries of the United Nations, 93 make it difficult or very difficult to be a journalist. This accounts for almost half of the world.

Modern Censorship

Censorship crosses all political and cultural boundaries but can often be classified into one of five categories: political, religious, economic, social, or sexual censorship. Who chooses to censor, why they do it, and the methods they employ vary depending on the country, the situation, the culture, and its history.

Any person or organization can set oneself up in the position of a censor. Generally, censorship comes from state, local, or federal governments, churches and religious institutions, religious zealots, and well-funded organizations across the political spectrum from right to left. Anyone can become a censor and work to restrict access to speech when they seek to control what materials are available to another person or another person's children.

Censorship can target print, electronic, or visual information. Common targets of censorship include materials with sexually explicit content (called "pornography" by some), violence (particularly in film, television, and video games), hate speech, profanity, information that threatens governments or criticizes government officials, and works that contradict or mock religious beliefs. Racist materials, sexist materials, religious materials, and materials that involve witchcraft and Satanism also make the list of things that some people want banned. In short, any material that someone, somewhere deems to be offensive, indecent, or obscene may be a target of the censor.

There are many forms of censorship. Some are obvious, some are subtle, and some are violent. Censorship methodologies include suppression; prohibition; formal book banning; pressure not to acquire works; proscription; removal; labeling to warn consumers about the content of movies, books, videos, television programs, and music lyrics; suspension of publication; and restriction of access to electronic materials (e.g., by filtering).

The use of legislation, lawsuits, licensing, registration requirements, filtering software, or codes of behavior may all constitute censorship. The same is true of the dismissal of employees who speak out against their employers' policies—particularly in the public arena. In authoritarian regimes that substantially restrict or eliminate most or all civil liberties, terror and violence are common ways of ensuring that access to information is restricted and that people are not free to speak or hold beliefs openly.

In the Western world, other methods of censorship include citizens removing materials from libraries and school curricula, Churches condemning publications, authors voluntarily rewriting their works, and governments requiring a formal license to print in advance of publication. Physical abuse, police interrogation, book burning, and bans on travel are more often employed as means of censorship in other parts of the world (though they have been employed in the United States as well). People, not just materials, can also be the targets of censorship. This could include writers and academics, defenders of human rights, those who work in the media, and political opponents.

Much of the censorship seen outside Europe and North America results from a desire to preserve traditional values and to stop what conservative civil and religious authorities view as the "invasion" of Western culture. Many people first seek to censor things because of what they believe to be a well-intentioned desire to protect children, or because of the desire to maintain political stability and security and to decrease influence from foreign governments. Censorship can also occur in an attempt to maintain moral standards and cultural norms, to maintain respect for religious teachings, to protect government and industry secrets, or to respond to community pressure. This motivation is not dissimilar to that which was present in Europe around the time of Galileo's conviction as a heretic. In fact, throughout history, whenever a society experiences a rapid influx of new ideas and beliefs, those who seek to avert change employ censorship as a primary tool.

Conclusion

The tension between intellectual freedom and censorship is as alive in the modern world as it was more than twenty centuries ago. Many censorship attempts, particularly in the United States, fail because information about the censorship attempt is shared and vigorous debate usually ensues.

While the zeal of the censor often brings fame, this fame is often not long lasting. The battle for public opinion often ends with people recognizing that censorship incidents are about

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control of others. Freedom from censorship is a precious national resource, often taken for granted until challenged. Censorship sometimes brings fortune, particularly when media attention promotes the sale of books that are targeted for removal. Michel Eyquem de Montaigne said it best: "To forbid us anything is to make us have a mind for it."

See also: Communications Decency Act of 1996; First Amendment and the Media; Gutenberg, Johannes; Internet and the World Wide Web; Pornography; Pornography, Legal Aspects of; Printing, History and Methods of; Ratings for Movies; Ratings for Television Programs; Ratings for Video Games, Software, and the Internet; Telecommunications Act of 1996.

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INTELLIGENCE, ARTIFICIAL See: Artificial Intelligence

INTERCULTURAL COMMUNICATION, ADAPTATION AND

Millions of immigrants and refugees change homes each year—driven by natural disaster and economic need; seeking better hopes of freedom, security, economic betterment; or simply looking for a more desirable environment in which to live. Numerous others temporarily relocate in a foreign land in order to serve as diplomats, military personnel, or as employees on overseas assignments for other governmental and intergovernmental agencies. Peace Corps volunteers have worked in more than one hundred nations since the inception of that organization in 1960. Researchers, professors, and students visit and study at foreign academic institutions, and missionaries travel to other countries to carry out their religious endeavors. An increasing number of the employees of multinational corporations work overseas, while individual accountants, teachers, construction workers, athletes, artists, musicians, and writers seek employment in foreign lands on their own.

Individuals such as those mentioned above face drastic, all-encompassing challenges as they attempt to construct a new life in a foreign country. They find themselves straddled between two worlds-the familiar culture from their homeland and the unfamiliar culture of their new host society. Despite having varied circumstances and differing levels of engagement and commitment to the host society, all resettlers begin a new life more or less as strangers. They find that many of their previously held beliefs, taken-for-granted assumptions, and routinized behaviors are no longer relevant or appropriate in the new setting. As a result, they must cope with a high level of uncertainty and anxiety. The recognition of verbal and nonverbal codes and the interpretations of the hidden assumptions underlying these codes are likely to be difficult.

Acculturation, Deculturation, and Stress

Once strangers enter a new culture, their adaptation process is set in full motion. Some of the old cultural habits are to be replaced by new ones. Most strangers desire and seek to achieve necessary adaptation in the new environment, especially those whose daily functions require them to establish what John French, Willard Rodgers, and Sidney Cobb (1974) referred to as a relatively stable person–environment fit. The adaptation process unfolds in two subprocesses, acculturation and deculturation, and involves the accompanying experience of stress. As they gradually establish some kind of working relationship with a new culture, these uprooted people are compelled to learn (acculturation) at least some of the new ways of thinking, feeling, and acting, as well as the linguistic and other elements of the host communication system. As new learning occurs, unlearning (deculturation) of some of the old cultural habits has to occur—at least in the sense that new responses are adopted in situations that previously would have evoked old ones.

The acculturative and deculturative experiences, in turn, produce a substantial amount of internal stress caused by temporary internal disequilibrium. Researchers such as Kalervo Oberg (1960) and Adrian Furnham and Stephan Bochner (1986) have examined the stress phenomenon and employed, in doing so, the term "culture shock" and other similar terms such as "transition shock," "role shock," "language shock," and "cultural fatigue." In varying degrees, the phenomenon of culture shock is a manifestation of dislocation-related stress reactions. The manifestations include irritability, insomnia, and other psychosomatic disorders, as well as an acute sense of loss, insecurity, impotence, loneliness, and marginality. Such a state of flux is also met by defense mechanisms such as selective attention, cynicism, denial, avoidance, and withdrawal. The concept of culture shock is further extended by researchers such as Judith Martin (1984) and Bettina Hansel (1993) to include reentry shock-the difficulties, psychological and otherwise, that an individual may experience upon returning home.

As difficult as they may be in some cases, culture shock experiences serve as the very force that drives strangers to learn and adapt. It is through the presence of stress that strangers are compelled to strive to achieve the level of learning and selfadjustment that is necessary in order to meet the demands of the environment and to work out new ways of handling their daily activities. In a study of Canadian technical advisors (and their spouses) who were on two-year assignments in Kenya, Brent Ruben and Daniel Kealey (1979) found that the intensity and directionality of culture shock was unrelated to patterns of psychological adjustment at the end of the first year in the alien land. Of particular interest is the finding that, in some instances, the magnitude of culture shock was positively related to the individuals' social and professional effectiveness within the new environment (i.e., the greater the culture shock, the greater the effectiveness). Based on this

finding, Ruben (1983) conjectured that culture shock experiences might, in fact, be responsible for (rather than impede) successful adaptation. Peter Adler (1987) echoed this point when he stated that culture shock is a traditional learning experience that facilitates a psychological change from a state of low self-awareness and cultural awareness to a state of high self-awareness and cultural awareness.

Host Communication Competence

At the heart of the experiences of acculturation, deculturation, and adaptive stress is what Young Yun Kim (1988, 1995) identifies as the stranger's host communication competence, or the ability to communicate in accordance with the communication codes, norms, and practices of the host culture. For the natives, such competence has been acquired from so early in life and has been so internalized in their personal communication system that, by and large, it operates automatically and unconsciously. For strangers, however, many elements of the same competence must be newly acquired, often painstakingly, through trial and error. Until they have acquired an adequate level of host communication competence, they are handicapped in their ability to function in the host environment. The degree to which a given stranger acquires the host communication competence, in turn, reflects his or her overall functional fitness, while the lack of such competence manifests itself in various forms of miscommunication, social inadequacies, and, in some cases, marginalization.

In explaining host communication competence, Kim identifies three dimensions of elements-cognitive, affective, and operational. Cognitively, a competent communicator is knowledgeable in the host language and culture, including the history, institutions, laws and regulations, worldviews, beliefs, norms, and rules of social conduct and interpersonal relationships. The knowledge of the host language, in particular, means not just the linguistic knowledge (e.g., phonetics, syntax, and vocabulary) but also the knowledge about the pragmatic uses of the language in everyday life (e.g., the many subtle nuances in the way the language is used and interpreted by the natives in various formal and informal social engagements). The verbal and nonverbal codes and rules of the host culture define the local communication rules about "correct" behavior. These rules enable the natives to make sense of events, activities, and actions that occur within their society. Communication rules function as directives that govern the flow of messages from one person to another and limit the possibilities of actions of the participants. Such rules identify how a given social goal may be achieved and render the behavior of each person more or less predictable and understandable to others. Communication rules apply to all levels of behavior, both verbal and nonverbal, as well as formal and informal. Some rules are explicitly coded within the written or spoken language, as in the case of grammatically correct writing or organizational rules and regulations. Most other rules, however, are implicit, and these deal largely with the nature of interpersonal relationships such as involvement and intimacy, dominance and status, and cooperation and accommodation. In each situation, from asking a friend for help to seeking to resolve a conflict in a relationship, nonverbal behaviors reflect the cultural rules and elicit specific responses that often have measurable social consequences. The affective (i.e., emotion) dimension of host communication competence involves what Maureen Mansell (1981) referred to as the "expressive response" that engages strangers in personally meaningful interactions with the natives. The affective competence allows strangers to co-participate in the emotional and aesthetic experiences of the natives-from the experiences of joy, excitement, humor, triumph, and beauty, to sadness, boredom, sarcasm, and despair. The affective competence thus leads to an empathic capacity and a sense of belonging in the host environment. Conversely, strangers who lack affective competence are likely to feel distant and alienated because they lack the genuine interest in experiencing the local culture and in developing close relationships with the natives. Underpinning this affective competence is an attitudinal readiness toward the host environment that is affirming and respectful. Affective competence further helps strangers to understand the often subtle and hidden meanings embedded in various messages from the host environment, thereby enriching their intercultural experiences.

Closely linked with cognitive and affective competence is operational (or behavioral) competence, or the ability to express one's ideas and thoughts externally in accordance with the host cultural communication system. No matter how competent someone may be cognitively and affectively, his or her interactions with the host environment cannot be successful without a corresponding operational competence. Operational competence thus enables a stranger to choose a right combination of verbal and nonverbal actions to meet the demands of everyday interface-to-face actions-such as managing encounters, initiating and maintaining relationships, seeking appropriate information sources, and solving various problems they may encounter. Ultimately, it is such operational competence, along with cognitive and affective competence, that makes strangers' life activities effective in the host environment.

Host Social Communication

Host communication competence is vitally and reciprocally linked to participation in social communication activities of the host society. On the one hand, strangers' social communication activities are directly constrained by the level of their host communication competence. On the other hand, each intercultural encounter offers the strangers an opportunity to cultivate the ability to communicate with the natives. The primary mode of social communication is face-to-face interpersonal communication, through which strangers obtain information and insight into the mindsets and behaviors of the local people as well as their own taken-for-granted cultural habits. Interpersonal communication activities often provide strangers with needed emotional support and points of reference for checking, validating, or correcting their own thoughts and actions.

In addition to experiencing interpersonal communication processes, strangers participate in the social processes of the host environment via a wide range of communication media, including radio, television, newspapers, magazines, movies, art, music, and drama. By engaging in these forms of communication, strangers interact with their host culture without having direct involvement with specific individuals, and thereby expand the scope of their learning beyond the immediate social context with which they come into contact. In transmitting messages that reflect the aspirations, myths, work and play, and issues and events that are important to the natives, the various public communication media explicitly or implicitly





convey the worldviews, myths, beliefs, values, mores, and norms of the culture. The adaptation function of mass communication is particularly significant during the initial phase of resettlement. During this phase, many strangers have not yet developed a level of host communication competence that is sufficient to forge meaningful interpersonal relationships with local people. The direct communication experiences with the natives can be intensely frustrating or intimidating to many strangers, as they feel awkward and out of place in relating to others and the immediate negative feedback they receive from the natives can be too overwhelming. Under such circumstances, the strangers naturally tend to withdraw from direct contacts and, instead, prefer media as an alternative, pressure-free communication channel through which they can experience the host culture.

Adaptive Change over Time

The cumulative and extensive engagements in the host communication processes bring about a gradual change in strangers over time. The learning and adaptation function of culture shock has been indirectly supported by other studies that have attempted to describe the stages of the adaptation process. Oberg (1979), for example, described four stages: (1) a honeymoon stage characterized by fascination, elation, and optimism, (2) a stage of hostility and emotionally stereotyped attitudes toward the host society and increased association with fellow sojourners, (3) a recovery stage characterized by increased language knowledge and ability to get around in the





new cultural environment, and (4) a final stage in which adjustment is about as complete as possible, anxiety is largely gone, and new customs are accepted and enjoyed. This four-stage model of adaptive change is depicted by researchers such as Adrian Furnham (1988) and Michael Brein and Kenneth David (1971) in the form of the U-curve hypothesis (see Figure 1). Focusing on temporary sojourners' psychological satisfaction in the host culture, this hypothesis predicts that strangers typically begin the adaptation process with optimism and elation, undergo a subsequent dip or trough in satisfaction, and then experience a recovery. Researchers such as John Gullahorn and Jeanne Gullahorn (1963), as well as Brein and David (1971), have extended the U-curve hypothesis into the W-curve hypothesis by adding the reentry (or return-home) phase to illustrate the fact that the sojourners go through a similar process when they return to their original culture.

Research findings on the U-curve process have been mixed. In a study of groups of Swedes who had spent time in foreign countries, Ingemar Torbiorn (1982) reported that the subjects' satisfaction level followed a pattern similar to the U-curve. After about six months in the host country, satisfaction was significantly lower than it had been at arrival. Toward the end of that year, satisfaction slowly started to increase. Other studies have reported, however, that sojourners do not always begin their life in a new cultural environment with elation and optimism as described by the U-curve. Colleen Ward and her colleagues (1998) conducted a longitudinal study of Japanese students in New Zealand and found a more or less linear, progressive process of psychological adaptation; that is, adjustment problems were greatest at entry point and decreased over time.

Building on psychological models such as these, Kim (1988, 1995) has created a model in which the adaptation process is explained in terms of a stress-adaptation-growth dynamic-a push-and-pull of competing psychological forces that leads to a gradual transformation of the individual (see Figure 2). This model highlights the continuous draw-back-to-leap nature of the psychological movement that underlies the adaptation process, which is at once progressive (i.e., an increase in integration of previously distinct subunits) and regressive (i.e., a weakening or even a breakup of a previously integrated entity). To the extent that stress is responsible for frustration, anxiety, and suffering, then, it is also credited as a necessary impetus for new learning and psychic growth. In this process of transformation, large and sudden adaptive changes are more likely to occur during the initial phase of exposure to a new culture. Such drastic changes are themselves indicative of the severity of adaptive difficulties and disruptions, as has been demonstrated in culture shock studies. At the same time, the higher the level of stresses stemming from resistance against change, the more powerful the fluctuations that eventually break through in the unfolding of adaptation and growth. The fluctuations of stress and adaptation diminish over time, and a calming of the overall life experiences takes hold. Accompanying this dynamic process are gradual increases in the stranger's overall functional fitness and in the person's psychological health in relating to the host environment. Also emerging in this process is a gradual shift in the stranger's identity orientation from a largely monocultural identity to an increasingly intercultural identityone with a deepened self-awareness and an expanded capacity to embrace the conflicting demands of differing cultures and form them into a creative and cohesive whole.

Ideology and Adaptation

Traditionally, studies of cross-cultural adaptation in the United States have been largely grounded in the premise that it is a natural phenomenon and that at least some degree of successful adaptation is a goal that most, if not all, individuals who cross cultural boundaries want to achieve. This affirmative view of adaptation, reflected in the theoretical ideas described so far, results from the so-called assimilationist (or melting-pot) ideology, a mainstream American social philosophy that advocates the fusion of diverse cultural elements into a unified system of ideas and practices. In this perspective, adaptation is a matter of practical necessity for people who live and work in a new environment and who are at least minimally dependent on the local culture to achieve some level of psychological and social proficiency in their daily activities.

The assimilationist view and its expectation of cultural convergence, however, have been questioned since the 1970s, when the "new ethnicity" movement began as part of the civil rights movement in the United States. During this time, discussions have increasingly centered on the value of pluralism, leading many scholars to advocate the importance of ethnic and cultural minorities maintaining their cultural and linguistic identities. For example, the conceptualization by John Berry (1980, 1990) suggests the pluralistic nature of adaptation by focusing on the differing "acculturation modes" or identity orientations of individual immigrants rather than on the process in which they strive for a better fit in the host environment. Individuals' acculturation modes are assessed by Berry based on responses to two simple questions: "Are [ethnic] cultural identity and customs of value to be retained?" and "Are positive relations with the larger society of value and to be sought?" As depicted in Figure 3, Berry combines the response types (yes, no) to these two questions, and proposes four identity modes: integration (yes, yes), assimilation (no, yes), separation (yes, no), and marginality (no, no).

A more drastic departure from the traditional assimilationist perspective on adaptation has been taken by a number of "critical" (or "postcolonial") analysts. In sharp contrast to the premise of adaptation as a practical necessity and as a goal for individual strangers, critical analysts tend to view the stressful nature of cross-cultural adaptation as a consequence of power inequality that exists between the dominant group of a society and its ethnic minorities. Likewise, critical analysts such as Radha Hedge (1998) and Robert Young (1996) regard the stressful nature of the adaptation process as a form of oppression. Instead of viewing adaptation as a natural and practical necessity



for non-natives, critical analysts tend to place a spotlight on the politics of identity and the perpetual struggle on the part of nondominant group members, including new arrivals, as victims. Based on interviews, for example, Hedge (1998) characterizes the experiences of a small group of Asian-Indian immigrant women in the United States in terms of their displacement and their struggling to deal with the contradictions between their internal identity and external "world in which hegemonic structures systematically marginalize certain types of difference" (p. 36).

It appears, then, that the pluralistic and critical interpretations of cross-cultural adaptation deviate from the traditional assimilationist perspective by suggesting that adaptation is, or should be, a matter of choice rather than a practical necessity. Pluralistic models accentuate variations in the psychological acceptance or rejection by individuals of the host society. Critical analysts move away further from the assimilationist perspective by advocating that cultural minorities must question the merit of adaptation or even reject the legitimacy of adaptive pressures under which they find themselves. These ongoing ideological disagreements, however, lose their relevance and significance in light of the extensive empirical evidence documenting the fact that most individuals do recognize and accept the reality of having to make adaptive changes in themselves when crossing cultural boundaries. To them, the driving force is not an ideological aim but a practical necessity to meet everyday personal and social needs. Instead of engaging in the abstract question about the nature of their relationship to the host society, their primary concern is to be able to function well in that society.

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It is in this sense that the theories, concepts, and related research evidence highlighted in this entry serve as an intellectual template for individual immigrants and sojourners who strive to help themselves for their own adaptive ends. People learn, for example, that stressful experiences of learning cultural habits (i.e., acculturation) and unlearning cultural habits (i.e., deculturation) are unavoidable if people are to achieve a level of fitness in the new milieu. To accelerate this goal, people need to recognize the host environment as a partner and engage themselves in its interpersonal and mass communication activities. People also must recognize the tremendous adaptive capacity within themselves. This internally driven motivation is essential for anticipating and withstanding the challenge of culture shock, so as to undertake the task of developing a sufficient level of host communication competence. Such has been the case for many people who have ventured through new experimental territories and achieved a new formation of life. Their individual accomplishments bear witness to the remarkable human capacity for adaptation and self-renewal.

See also: INTERCULTURAL COMMUNICATION,

INTERETHNIC RELATIONS AND; INTERPERSONAL COMMUNICATION; NONVERBAL COMMUNICATION.

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YOUNG YUN KIM

INTERCULTURAL COMMUNICATION, INTERETHNIC RELATIONS AND

Polyethnicity, the side-by-side existence of people with varying ethic backgrounds, has become the norm for most of the human community around the world. As a result, concerns about interethnic relations have increased. Even as individuals of differing ethnic backgrounds live and work in closer proximity than ever before, issues of ethnicity and ethnic identity frequently bring about volatile responses in many people. Indeed, hardly a day passes without reports of some new incidents of ethnic conflict in some part of the world. Of course, each society, each locale, and each incident involves a unique set of historical, situational, and psychological twists, making it difficult to generalize about the nature of interethnic relations. In the case of the United States, interethnic relations has been at the forefront of public consciousness and a source of social unease and struggle ever since the Reconstruction era of the late nineteenth century when debates about civil rights began. Today, the traditional American ideology rooted in the primacy of the individual is challenged by the ideology of pluralism, a conflict that has galvanized many Americans into usagainst-them posturing in the form of what is commonly referred to as "identity politics" or "politics of difference."

Social scientists have attempted to find systematic ways to understand the nature of interethnic relations in general, and interethnic communication behavior in particular. The literature created by these individuals presents a wide array of concepts, theories, and research findings that offer insights into how and why different ethnic groups and individuals interact with one another. Psychologists have tried to identify factors within individuals and the immediate social situations that help explain ingroup communication behaviors (i.e., between people of the same background) and outgroup communication behaviors (i.e., between people from different backgrounds). Sociologists have examined interethnic relations mainly from the perspective of society, focusing on macro-structural factors such as social stratification and resource distribution. Anthropologists have provided case studies of interethnic relations in specific societies, while sociolinguists and communication scholars have focused on the processes and outcomes of face-to-face interethnic encounters.

Key Terms and Definitions

The word "ethnicity" is employed in the field of sociology primarily as a label to designate a social group and to distinguish it from other social groups based on common indicators of national origin, religion, language, and race. In this grouplevel definition, ethnicity becomes the objective (i.e., externally recognizable) character, quality, or condition of a social group as well as an individual's membership in an ethnic group. Likewise, anthropological approaches to ethnicity emphasize the group-level collective cultural patterns including language, norms, beliefs, myths, values, and worldviews, as well as symbolic emblems, artifacts, and physical characteristics-from foods, flags, folk songs, folk gestures and movements, and folk dances to skin colors and facial features. Such features associated with an ethnic group are commonly referred to as ethnic markers that connote a common tradition linking its members to a common future. In contrast, psychological studies have defined ethnicity primarily in terms of ethnic identity, that is, an individual's psychological identification with, or attachment to, an ethnic group. Social identity theory, originally proposed by Henri Tajfel (1974), provides a systematic account of the significant role that membership in an ethnic group plays in shaping an individual's self-image and how that person behaves in relation to members of ingroups and outgroups. Other scholars, such as J. Milton Yinger (1986), see ethnic identity as a primordial "basic identity" that is embedded in the deep core of personhood. For others, such as George de Vos (1990), ethnic identity provides "a sense of common origin-as well as common beliefs and values, or common values" and serves as the basis of "self-defining in-groups" (p. 204).

Interethnic communication occurs whenever at least one involved person takes an ingroup–outgroup psychological orientation. As explained by Tajfel (1974), John Turner and Howard Giles (1981), and Marilynn Brewer (1979, 1986), the participants in interethnic communication tend to see themselves and their interaction partners along ethnic categories. The degree to which ethnic categorization influences communication, according to Rupert Brown and John Turner (1981) and Tajfel and Turner (1986), varies on the "intergroup-interpersonal continuum." At one end of this continuum are communication encounters between two or more individuals whose behaviors are fully determined by their respective ethnic group categorization. At the other end are those encounters in which the participants are not at all affected by ethnic categories and, instead, communicate with each other based entirely on the personal relationship that exists between them.

Associative and Dissociative Communication Behaviors

Young Yun Kim (1997) has conceptually integrated various interethnic communication behaviors along a bipolar continuum of association and dissociation. Associative and dissociative behaviors are not two mutually exclusive categories but vary in the degree of associative social meaning that is being communicated. Behaviors that are closer to the associative end of this continuum facilitate the communication process by increasing the likelihood of mutual understanding, cooperation, and convergence or the coming-together of the involved persons. Participants in an interethnic encounter behave associatively when they perceive and respond to others as unique individuals rather than as representatives of an outgroup identified by an us-and-them orientation. Such a cognitive tendency to perceive others as unique individuals is variously labeled in social psychology as "differentiation," "particularization," "decategorization," "personalization," and "mindfulness." The associative orientation is expressed outwardly in what Cynthia Gallois and her colleagues (1995) refer to as "convergent" verbal and nonverbal encoding behaviors. Among such behaviors are attentive and friendly facial expressions and complementary or mirroring body movements, as well as personalized (rather than impersonal) speech patterns that focus on the other person as a unique individual.

Conversely, dissociative behaviors tend to contribute to misunderstanding, competition, and divergence (or the coming-apart) of the relationship between the participants in the communication process. A communication behavior is dissociative when it is based on a categorical, stereotypical, and depersonalized perception that accentuates differences. Dissociative behaviors also include many forms of divergent verbal and nonverbal behaviors that indicate varying degrees of psychological distance and emotional intensity-from the subtle expressions in what Teun van Dijk (1987) has referred to as prejudiced talk (e.g., "you people") to blatantly dehumanizing name-calling, ethnic jokes, and hate speeches. Nonverbally, dissociative communication occurs through covert and subtle facial, vocal, and bodily expressions that convey lack of interest, disrespect, arrogance, and anger. More intense dissociative expressions of hatred and aggression include crossburnings, rioting, and acts of violence.

Dissociative communication behavior is not limited to observable verbal and nonverbal acts. It also includes intrapersonal communication activities. One of the widely investigated intrapersonal communication activities in interethnic encounters is the categorization or stereotyping of information about members of an outgroup based on simplistic preconceptions. Such is the case whenever one characterizes any given ethnic group in a categorical manner, failing to recognize substantial differences among its individual members. This stereotypical perception is accompanied by a tendency to accentuate differences and ignore similarities between oneself and the members of the outgroup and to judge the perceived differences unfavorably. Robert Hopper (1986) explains such an ethnocentric tendency when he focuses on "Shiboleth schema" as the way in which people consider the dialects and accents that are displayed by non-mainstream groups to be defects and therefore objects of discrimination.

The Communicator

Associative and dissociative interethnic communication behaviors are directly linked to the internal characteristics of the communicator. An often-investigated psychological attribute is the communicator's cognitive complexity, or the mental capacity to process incoming information in a differentiated and integrated manner. As explained by George Kelly (1955) and by James Applegate and Howard Sypher (1988), individuals of high cognitive complexity tend to use more refined understanding of incoming messages and to display more personalized messages. Other researchers such as Marilynn Brewer and Norman Miller (1988) have linked low cognitive complexity to ignorance, erroneous generalizations, biased interpretations, and stereotype-based expectations.

Another characteristic that is important for understanding interethnic behaviors is the strength of the communicator's commitment to his or her ethnic identity. Commonly referred to as ingroup loyalty, ethnic commitment often supports dissociative behaviors such as ingroup favoritism and outgroup discrimination. Ingroup loyalty tends to increase when the communicator experiences status anxiety about his or her ethnicity in the face of a perceived threat by a member or members of an outgroup. In contrast, communicators tend to act associatively when their identity orientations reach beyond an ascribed ethnic identity and embrace members of an outgroup as well. Kim (1988, 1995), refers to such an orientation as an intercultural or interethnic identity-a psychological posture of openness and accommodation that reflects a level of intellectual and emotional maturity.

The Situation

In addition to the communicator characteristics, situational factors influence the way communicators behave in interethnic encounters. Each encounter presents a unique set of conditions. One of the key situational factors is the level of homogeneity (i.e., similarity) or heterogeneity (i.e., dissimilarity) that exists between the participants, based on ethnic differences such as distinct speech patterns, skin colors, and physical features. A high level of homogeneity is likely to encourage associative behaviors, whereas a high level of heterogeneity is likely to increase a sense of psychological distance between the participants and block them from noticing any underlying similarities that they might share. Heterogeneous encounters are also likely to increase the perceived incompatibility between the participants and inhibit their ability to form a consensus on topics of communication. However, while certain distinct features of communication behavior are strongly related to dissociative behaviors, not all ethnic differences are incompatible.

Interethnic communication behaviors are further influenced by the structure that organizes the way in which interactions are carried out. The structure of an interaction provides each communicator with guidelines for his or her behavior. One such structural guideline is provided by a shared higher goal that transcends each party's own personal interest. Groups with this type of shared goal would include military combat units, sports teams, and medical teams fighting an epidemic. The presence of the shared goal provides a structure of interdependence and mutuality that is geared toward cooperation, thereby creating a climate that promotes associative behaviors. On the other hand, a competitive, task-oriented structure for interactions tends to accentuate ethnic differences rather than similarities, engender mistrust, and discourage the building of interpersonal relationships across ethnic lines. According to Brewer and Miller (1984), people also tend to exhibit more dissociative behaviors when they find themselves in an organization that is governed by an asymmetric power structure that has been created along ethnic lines. For example, if few ethnic minorities occupy leadership positions in an organization, this power differential is likely to foster separateness and divisiveness between members of differing ethnic groups in that organization.

The Environment

The social environment is the broader background against which a particular interethnic encounter takes place. One environmental factor that is crucial to understanding associative and dissociative communication behaviors is the history between the ethnic groups represented in the communication process. Dissociative communication behaviors, for example, are more likely to occur in an environmental context that has had the history of subjugation of one ethnic group by another. Often, subjugation has taken the form of political, economic, or cultural domination through slavery, colonization, or military conquest. Members of a group that has been subjugated in the past may feel that they have the right to live on or possess territory that the group has traditionally claimed as its own. Many historical accounts have been written on the topic of colonization and the subsequent influences on interethnic discrimination and mistrust. In the case of the West Indian immigrants living in England, for example, the traditional colonial history and the domination tendencies of Whites over

non-White immigrants have been observed to play out in interethnic encounters even today. Similar historical influences on contemporary interethnic power relationships can be found in many other societies, including the situations of Native Americans and African Americans in the United States, Koreans in Japan, Palestinians in Israel, and French-speaking Canadians in Quebec.

This inequality is further reflected in patterns that separate ethnic groups by socioeconomic class. Some investigators such as Harold Wolpe (1986) have argued that capitalistic economic systems exploit ethnic minorities. Michael Hechter (1975) used the term "internal colonialism" to explain a structural (or institutionalized) discrimination in which the imposed division of labor allows the core or dominant group to keep for themselves the major manufacturing, commercial, and banking roles while delegating the least profitable kinds of work to the peripheral groups (such as the ethnic minorities). Under conditions of inequality, the ethnic actions of subordinate groups serve as an outlet for the expression of comparative feelings of dissatisfaction, thereby increasing the likelihood of divergent interethnic behaviors.

By and large, inequities among ethnic groups in a given society are reflected in the laws and rules of the society. In contemporary democratic societies, laws and rules generally mirror the ideological climate and the values and opinions that are held by the majority of the citizens. Over time, changes in institutional inequity in interethnic relations in a given society tend to accompany corresponding changes in judicial actions as well as governmental and other institutional policies. Since the 1950s, countries such as the United States and Canada have undergone a significant transformation toward an increasing equity among their majority and minority ethnic groups. There has been a series of legal actions such as the U.S. Supreme Court's 1954 ruling against racial segregation in public schools. However, some formal barriers persist, as demonstrated by the continuing patterns of intense racial discrimination in housing. Nevertheless, significant progress has been achieved in some institutions, notably in education and employment, to promote equal treatment of individuals of all ethnic categories, thereby fostering a social environment that is more conducive to associative behaviors at the level of the individual.

Interethnic communication behaviors are further influenced by the collective strength of the communicator's ethnic group. As Raymond Breton and his associates (1990) have theorized, a strong ethnic group with a high degree of "institutional completeness" is likely to encourage its members to maintain their ethnicity and discourage them from assimilating into the society at large. Individuals in a well-organized ethnic community, such as the Cuban community in Miami, Florida, are likely to adhere more strongly to their Cuban identity and maintain their ethnic heritage more than their German-American counterparts, whose ethnic community is not cohesively organized. The same Cuban Americans tend to place less emphasis on embracing the mainstream American culture at large. The extent of interethnic contact across different ethnic groups is also an environmental factor that influences individual communication behaviors. Arrangements such as integrated schools and neighborhoods in urban centers allow for maximum contact and interaction, while other arrangements such as segregated ethnic neighborhoods provide the least amount of potential for interethnic interaction, which results in the cementing of any existing hostilities or prejudice. Accordingly, the classical approach to reducing interethnic dissociative behaviors-the contact hypothesis originally articulated by Yehuda Amir (1969)-has been to increase equitable and cooperative interethnic contact so as to increase mutual understanding and cooperation. This approach has not always been successful. Research has shown that, at least in the short run, interethnic contact is just as likely to heighten conflict as it is to reduce it.

Conclusion

The communicator, the situation, and the environment are all important elements to consider when examining the specific contextual factors related to understanding the associative and dissociative behaviors of individual communicators in interethnic encounters.

Associative communication is more likely to occur when the communicator has a high degree of cognitive complexity and an inclusive identity orientation that embraces individuals of differing ethnic backgrounds as members of the ingroup. Communicators are more likely to engage in associative behaviors when there are minimal ethnic differences between them. In addition, associative behaviors are more likely to occur in a situation where there is a shared higher goal, where there is a spirit of mutuality, and where there is a power structure that is minimally differentiated along ethnic lines. Associative behaviors also tend to occur in a social environment where there has not been a strong historical legacy of one group dominating another, where there is minimal socioeconomic stratification along ethnic lines, and where legal and other social institutions are based on the principle of equal rights for all individuals without regard to their ethnic backgrounds.

Dissociative communication is more likely to occur when communicators categorize members of an outgroup based on simplistic and rigid stereotypes and an exclusive ethnic identity that engenders ingroup favoritism and outgroup discrimination. Communicators are more likely to engage in dissociative behaviors when there are salient ethnic differences between them, when there is no common goal that binds them together in a cooperative relationship, and when there is a clear power differential along ethnic lines. Dissociative behaviors are further encouraged in a social environment that is steeped in a history of conflict and subjugation, where there exists systematic ethnic differences in socioeconomic status, and where various institutions favor a certain ethnic group while discriminating against another.

Each interethnic encounter presents a unique circumstance in which some factors may be of greater relevance and play a more prominent role than others. Even a single factor, such as an individual's strong loyalty to the ingroup or a prejudice against an outgroup, may be so powerful as to overshadow all favorable situational factors that are operating in a given encounter. Such would be the case when two individuals respond to an identical set of situational and environmental conditions in vastly different manners. Yet, a serious consideration of the factors related to the communicator, the situation, and the environment can lead to an understanding of the hidden constraints that may potentially lead to dissociation and the conditions that facilitate association between individuals of differing ethnic backgrounds.

Much work is still needed to refine the understanding of how interethnic communication plays out in a specific real-life setting. Detailed questions need to be raised, for example, about how each layer of factors simultaneously influences the way people communicate in an interethnic encounter. There also needs to be a better understanding of the long-term interaction and the significance of associative and dissociative communication behaviors at the grass roots. Clearly, associative communication is vitally important to the cohesion and continued evolution of a society as a single entity. At the same time, it is essential to develop a clearer and more systematic articulation of the role of certain forms of dissociative communication (e.g., nonviolent protests) that can be important forces in the defense of society against stagnation and for the reinforcement of new learning, self-renewal, and growth for all sides involved.

See also: Intercultural Communication, Adaptation and; Interpersonal Communication; Sociolinguistics.

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INTERNET, RATINGS FOR

See: Ratings for Video Games, Software, and the Internet

INTERNET, VIDEO GAMES AND

See: Video and Computer Games and the Internet

INTERNET AND THE WORLD WIDE WEB

In the 1980s, if someone had asked a friend how they kept in touch with a classmate, that friend would have responded "by phone" or "by mail" or perhaps "not often enough." In the 1980s, if someone wanted to find a movie review, they looked in the newspaper; a recipe, they looked in a cookbook; the sports scores, they turned their television to ESPN. Today, the way people do some or all of these things is likely to be drastically different, yet all are variations on a theme: "used e-mail," "looked it up on the Internet," "did a search on Yahoo," or "went to ESPN.com to get the score." The common theme, "the Internet" or "the web," is arguably one of the most potent political, economic, and social forces created in the twentieth century.

Definitions

What is the Internet? Wendy Lehnert (1998, p. 21) calls it "a global assemblage consisting of over 19 million computers in rapid interconnection," while Douglas Comer (1991, p. 493) describes the Internet as "The collection of networks and gate-ways . . . that use the TCP/IP [transmission control protocol/Internet protocol] . . . suite and function as a single, cooperative virtual network." These definitions differ in their specificity, yet both are still correct. While the roots of the Internet can be traced to a research project sponsored by the U.S. government in the late 1960s, the Internet today bears little resemblance to the Internet of the early 1970s or even the early 1980s. Drastic increases in computer power, net-

work capacity, and software capability, accompanied by similar reductions in cost, have put Internet capability into an ever-growing set of hands. Access that was limited to a few research universities in the United States in the early 1980s has now expanded to libraries, schools, businesses, and especially private homes. In 1997, the Computer Industry Almanac estimated that more than 200 million people worldwide would be "Internet connected" by the year 2000. The Internet defies simple definition in part because it changes so rapidly. For example, Lehnert's mention of nineteen million computers was correct in July 1997, but by the same month three years later, according to the Internet Software Consortium (2001), her statement needed to be amended to "ninety-three million computers" in order to be accurate.

The World Wide Web (WWW or web) also defies simple definition. Tim Berners-Lee and his colleagues (1994) defined it generally as "the idea of a boundless information world in which all items have a reference by which they can be retrieved." It is interesting to note that in almost the next sentence they describe it much more narrowly as the body of data accessible using specific addressing mechanisms and access technology. Thus, no less of an authority than one of the founders of the web speaks of it specifically and narrowly, and also very generally as a vision or "idea." Both are reasonable ways to think about the web.

Only one-third the age of the Internet, the web is nonetheless inextricably interwoven with the Internet. For many people there is essentially no difference between the two, because their sole interface to the Internet is through the "web browser," the software that runs on a home computer and is the mechanism through which a person reads e-mail, chats with friends, or surfs the web. While the Internet and the web are technically separate entities, with separate histories and attributes, they also now have an almost symbiotic relationship. The web takes advantage of Internet services, standards, and technology in order to request, find, and deliver content. The governance, engineering, and growth of the Internet are largely enabled through the use of web technologies.

History

As noted by Comer (1997) and Daniel Lynch (1993), the Internet has its roots in a networking research project that was started in the late 1960s



Tim Berners-Lee. (Henry Horenstein/Corbis)

by the U.S. government's Advanced Research Project Agency (ARPA). The original ARPANET comprised only four sites, three academic and one industrial. As work progressed, more sites were added, and by the mid-1970s the ARPANET was operational within the U.S. Department of Defense.

By the late 1970s, it was becoming clear that a major barrier to expanding the ARPANET was the proprietary nature of the communication protocols used by computers that would need to be connected. This observation sparked the creation and deployment of an open set of communication standards that came to be known as the TCP/IP suite. In the mid-1980s, the National Science Foundation (NSF), interested in providing Internet access to a larger number of universities and researchers, built the NSFNET, which augmented the ARPANET and used the same common set of communication standards. By 1990, ARPANET had been officially disbanded, replaced by the NSFNET and a set of other major networks all running TCP/IP. Collectively, this was the Internet. In the mid-1990s, NSF got out of the network management business entirely, leaving the administration of the current set of physical networks that comprise the Internet to a small set of commercial concerns.

Web Beginnings

In 1989, Berners-Lee, a computer scientist at CERN, the European Particle Physics Laboratory

in Switzerland, proposed a project to help that organization manage the vast quantities of information and technical documents that it produced. The fundamental idea was to create an information infrastructure that would allow separate departments within the laboratory to make documentation electronically accessible, to allow decentralized maintenance of the information, and to provide a mechanism for linking between projects and documents. That infrastructure, originally called "Mesh" and later the "World Wide Web," received internal funding in 1990, and Berners-Lee developed a prototype that ran on a computer called the NeXT. In 1991, Berners-Lee demonstrated the prototype at a conference in San Antonio, Texas. As related by Joshua Quittner and Michelle Slatalla (1998), by late 1992 the web had piqued the interest of Marc Andressen and Eric Bina, two programmers at the National Center for Supercomputing Applications (NCSA). In short order they wrote the first widely available, graphics-capable web browser, called Mosaic.

The Web Takes Off

Mosaic was free and available to anyone to download from NCSA. It initially only ran on machines running the Unix operating system, but by late 1993, versions developed by other programmers at NCSA were available for both the Apple MacIntosh and the International Business Machines (IBM) personal computer (PC). In the space of months, the World Wide Web went from essentially having academic interest to having mass-market appeal. By mid-1994, the team of programmers at NCSA had parted en masse for California to help form what soon became Netscape Communications. By the end of that year, they had built the first version of Netscape Navigator, and in 1995, they quickly captured more than 75 percent of the browser market. Both Quittner and Slatalla (1998) and Jim Clark (1999) provide details on this exciting time in Internet history as viewed from the Netscape perspective.

The late 1990s has been characterized by continued explosive growth, the introduction of important technologies such as the Java programming language, live video and audio, the widespread use of secure connections to enable online commerce, and continually more elaborate methods to describe web content. The emergence of Microsoft as a major influence has also had a large effect on the growth of the Internet.

Technical Underpinnings

There is a core set of technical capabilities and standards that allow the Internet to function effectively. It is useful to discuss the technical infrastructure of the "net" by trying to answer the following questions. What does the network actually look like? How does data get transferred from one computer to another? How do computers communicate with each other and "agree" on a communication language?

The Internet Is Packet Switched

When a person calls someone on the telephone, the telephone company sets up a dedicated, person-to-person circuit between the caller and the person being called. The physical infrastructure of the telephone company is set up to provide such a circuit-switched network-it means that before connecting the call, the company must reserve network resources along the entire connection path between the two individuals. On the other hand, as described by Larry Peterson and Bruce Davie (2000), a packetswitched network, of which the Internet is the most well-known example, is composed of links and switches (also called routers). A router can have multiple incoming links and multiple outgoing links. Data is encapsulated as a series of packets, each marked with a source and destination address. Each packet is passed along from link to link through a series of switches, where each switch has a table that indicates, by destination address, which outgoing link a packet should be sent along. Unlike a circuit-switched network, a packet-switched network such as the Internet provides no end-to-end reservation of resources. This means that packets from the same source machine can travel different paths in the network, they can be lost along the way, and they can arrive at the destination in a different order than the order in which they were sent.

The standard for the interchange of packets on the Internet is called the Internet protocol (IP). The standard describes exactly what an IP-compliant packet should look like. For example, each packet must contain control information such as which computer sent the packet, which machine is supposed to receive it, and how long the packet has been "in the network." Of course, the packet also contains data as well. IP also describes how adjacent links on the packet-switched network should communicate, what the error conditions are, and many other details. It is important to note that IP is about packets and not about end-to-end connections.

Reliable Delivery

By definition, a circuit-switched network provides a reliable, end-to-end communication channel between two parties. With the possibility of lost data and out-of-order delivery, a packetswitched network such as the Internet must have some other method of providing a reliable channel that runs "on top of" IP. As noted by Comer (1991), this is the function of the transmission control protocol (TCP). TCP software running at both ends of a communication channel can manage all of the details of chopping a large outgoing message into IP packets and of putting the packets back together at the other side. By using TCP software, higher-level services such as e-mail, file transfer, and web data are shielded from the messiness associated with packet transfer.

Names and Addresses

If an individual writes a letter to a friend, it is easy to remember the name of the recipient, but it is typically harder to remember the full address. That is why address books exist. What is more, the postal service needs the right address to deliver the letter. If an individual puts a friend's name on the letter with nothing else, then the postal service will not know what to do with it, unless the friend's name is Santa Claus or "President of the United States." The situation on the Internet is not much different. The TCP/IP layer of the Internet does not know directly about names; rather, it needs a specific address in order to determine how to route data to its eventual destination.

Every computer that is attached to the Internet must be addressable. That is, it must have a unique identifier so that data destined for that computer can be tagged with the proper address, and routed through the network to the eventual destination. The "Internet address," also called an "IP address" or "IP number," is typically expressed as a sequence of four numbers between zero and 255, for example, <152.2.81.1> or <209.67.96.22>. If a person could examine any set of arbitrary packets being routed on the Internet, then every single one of them would have a destination and source IP number as part of the control information.

In theory, there are more than four billion IP addresses. In reality, there are vastly fewer

addresses than that available because of the way that addresses are distributed. In order for the network to function efficiently, IP addresses are given out in blocks. For example, if a new company needs a bunch of IP numbers, then the company asks for one or more sets of 256 number blocks, and these are assigned to the company, although the company may ultimately use fewer blocks than have been allocated. As noted by Lyman Chapman (1993), distribution of IP addresses was even more inefficient in the past. An organization could ask for a 256-number block (a category "C" number) or a 65,536-number block (a category "B" number) but nothing in between. This led to many organizations owning a category B number but using only a fraction of the available range.

In general, humans do not deal with Internet addresses. For one thing, they are much harder to remember than names such as <www.espn.com> and <www.unc.edu>. However, the IP layer of the network, the place where all the data gets packetized and transported, does deal with IP addresses. Thus, there must be (and is) a translation service available that allows a human-readable name such as <ruby.ils.unc.edu> to be mapped to a particular IP address, such as <152.2.81.1>. This service is called the domain name service (DNS). When a person sends an e-mail message to a friend at <email.cool u.edu>, the mail service must first consult a DNS server in order to get the Internet address of <email.cool u.edu>. Once this is done, the mail software can establish a connection with a mail server at <email.cool u.edu> by using the DNS-supplied address.

As Paul Albitz and Cricket Liu (1997) describe it, the "names" in the DNS server are arranged in an inverted tree structure, starting with a relatively small number of top-level domains, for example, <com>, <edu>, <org>, and <net>. There are considerably more second-level domains within a single top domain. For example, there are thousands of college and university domains that end in .edu, including <unc.edu> (University of North Carolina, Chapel Hill), <evergreen.edu> (Evergreen College), and <vt.edu> (Virginia Tech). The process continues with different departments at a university receiving third-level <ils.unc.edu> domains. such as and <chem.unc.edu>. Machines in those departments then receive names such as <ruby.ils.unc.edu> or <www.chem.unc.edu>.

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FIGURE 1. Typical stacking of service use on the Internet, with services that use other services appearing higher in the stack. Protocols that each service uses are also given.

Composing Mail				
Address Resolution (DNS) Sending Mail (SMTP)				
Reliable End-to-End Data Transfer (TCP)				
Link-to-Link Data Transfer (IP)				
Physical Wires and Cables				

One important feature of the DNS system is that it allows for distributed zones of control. Put simply, this means that if a university wants to connect a new department to the Internet, the new department need only get the university to establish a new administrative zone and assign a subblock of IP addresses to the new zone. The new department would then be free to choose their own computer names and assign particular addresses from their subblock to those machines, all without consulting the university or any higher-level authorities. DNS also has easy mechanisms handling new and changed names.

The importance of having separate names and addresses cannot be overstated. It makes it easier for individuals to remember the name of a website or the e-mail address of a friend. Just as important, it allows flexibility in assigning a name to a computer. For example, an organization can keep its brand name (<www.nike.com>), but as necessity dictates, they can change the machine that hosts and serves web content.

Clients, Servers, and Protocols

A fundamental concept that is important for understanding how the Internet works is that of the client and the server. Client-server computing revolves around the provision of some service. The user of the service is the client, and the provider of the service is the server. Client and server communicate using a prescribed set of interactions that together form a protocol (i.e., the rules for interaction). To illustrate, consider a person who enters a favorite fast-food restaurant to order fries and a hamburger. Typically, the person (the client) waits in line, makes an order to the cashier (the server), pays, waits for the food, and has the food served to him or her on a tray. Optionally, the person may choose to leave before ordering or decide to ask for extra ketchup. This set of required and optional interactions together form the protocol. On the Internet, the client and server are typically computer programs. Accordingly, the protocol itself is very prescriptive because computers are not tolerant of subtle errors that humans can easily accommodate.

One way to think about the Internet is as a set of services provided to both humans and computers. For example, consider a simple interaction such as sending an e-mail. There are several services needed to accomplish this task. First, because the friend has an e-mail address such as <jamie@email.cool_u.edu>, a service is needed to figure out the location of <email.cool_u.edu>. A DNS provides this. Second, once the e-mail software has the location of <email.cool u.edu>, it must send the message to some entity that has access to Jamie's inbox. This entity, a program running on <email.cool u.edu>, is called the mail server. Finally, the message itself is transported using the service that provides reliable in-order delivery of data: TCP software. If one were to build a stack of Internet services that illustrated this example, it would look much like Figure 1, with the basic services at the bottom (wires and cables) and the high-level services (the software used to compose the e-mail message) at the top.

Web browsers such as Netscape's Navigator and Microsoft's Internet Explorer are multipurpose clients. An individual can send e-mail, read news, transfer files, and, of course, view web content all by using a single browser. These programs understand multiple protocols and are thus clients for all of the corresponding services.

Growth

The growth of the Internet and of the World Wide Web has been nothing short of explosive. In fact, the number of host computers on the Internet (essentially, the number of computers that have an Internet address), doubled every fourteen months between 1993 and 1999 (Internet Software Consortium, 2001; Netcraft Ltd., 2001).

Data on the growth of the web is less reliable and involves culling information from multiple sources. One reasonable measure of growth is the number of available web servers. Data through 1996 were obtained from Mathew Grey, a student at the Massachusetts Institute of Technology (MIT), who built software that specifically tried to count the number of servers. Later numbers are available from Netcraft Ltd. (2001) in England. The number of servers rose from thirteen in early 1993 to an estimated seven million in July 1999. Over those six years, the number of servers doubled every three and one-half months.

Governance

The Internet is governed by the Internet Society (ISOC), a nonprofit organization. Members of the society include companies, government agencies, and individuals, all with an interest in the development and viability of the Internet. Within the society, there are subgroups that manage the technical infrastructure and architecture of the Internet, as well as several other areas.

One of these subgroups, the Internet Engineering Task Force (IETF), manages the short- and medium-term evolution of the Internet. Through various working groups within the IETF, new standards are drafted, examined, prototyped, and deployed. The process is geared toward selecting the best technical solutions to problems. The output of these various efforts are technical documents called "Requests for Comments" (RFCs). As noted by Comer (1997), "Request for Comments" is a misnomer, as an approved RFC is much more akin to a standard than to something open for debate. For example, there are RFCs that describe all of the various common protocols used on the Internet, including TCP, IP, Mail, and the web's data transfer protocol, hypertext transfer protocol (HTTP). The IETF does most of its business through e-mail and online publishing. All RFCs are available online at a number of places, including the ITEF website.

Web Basics

The discussion so far in this entry has assumed some basic terminology and concepts. It is now time to be more specific about things such as "hypertext" and "website."

Hypertext and Web-Pages

The notion of hypermedia was first suggested by Vannevar Bush (1945) when he described his idea of a "Memex"—a machine that would allow a person to organize information according to their personal tastes and provide for linkages between pieces of information. In the mid-1960s, Douglas Englebart and Ted Nelson further developed the notion of "hypertext," the idea that pieces of text could be linked to other pieces of text and that one could build these linkages to arrange information in different ways, not in just the traditional left-to-right, top-to-bottom method.

A web-page is a single document that can contain text, images, sound, video, and other media elements, as well as hyperlinks to other pages. A website is a group of pages organized around a particular topic. Typically, all pages connected with a website are kept on the same machine and are maintained by the same individual or organization.

The structure of a typical web-page reflects the influences of all of this earlier work. The hypertext markup language (HTML), the web's content description language, allows content developers to specify links between different pieces of information very easily. The hyperlink can refer to information in the same document or to information that physically resides on another page, on another machine, or on another continent. From the user's perspective, all such links look and function the same. The user clicks on the link and the referred page is displayed, which itself may have links to other pieces of information in other places. This is one of the fundamental ideas behind the web.

Uniform Resource Locators

A uniform resource locator (URL, pronounced either by spelling out the letters U-R-L or by making it a word that rhymes with "pearl") is the closest thing a user has to the address of an information item. When a user clicks on a link in a web-page, the web browser must determine which Internetconnected computer to contact, what resource to ask for, and what language or protocol to speak. All of these pieces are represented in the URL.

Consider the following typical URL: <http://www.ils.unc.edu/viles/home/index.html>. The first part of the URL, <http> in this case, represents the protocol the browser should speak hypertext transfer protocol (HTTP) in this case. HTTP defines the set of interactions that are possible between web servers and web browsers. The next piece of the URL, <www.ils.unc.edu>, is the domain name of the machine that is running the information server that has access to the resource. The last piece, </viles/home/index.html>, is the address of the resource on that machine. In this case, this is the path to a particular file on that machine. Other protocols are possible, including <ftp>, <telnet>, and <mailto>, but the vast majority that an individual encounters during searching or "surfing" the web are ones accessed using the web's native data-transfer protocol, HTTP.

Unfortunately, as anyone who has bookmarked a "stale" page or done a search that yielded "dead" links knows, URLs are not guaranteed to be permanent. They are truly addresses in the sense that the item can move or be destroyed or the server can "die." There is considerable effort in the WWW community to create permanent URLs (PURLs) or uniform resource names (URNs) for those items that are truly supposed to last, but there had been no widespread deployment as of the year 2000.

Search Engines

As the web grew, it quickly became apparent that finding information was becoming increasingly difficult. One early method used to organize information was the web directory, an organized list of new and interesting sites that a person could use as a jumping-off point. The web soon grew too large to keep up with in this fashion. In 1994, the first search engines started to appear. As Lehnert (1999) notes, a search engine is a website that provides searchable access to a large number of web-pages. Search engines work using automated web-page harvesters called robots or spiders. The robot starts with a set of pages and fetches these from their locations. Each fetched page has links to other pages. By successively harvesting pages and following links, a search engine can build a very large set of web-pages. With appropriate database and search capability, these pages form a searchable archive of web-pages.

As anyone who has ever performed the same search on multiple search engines knows, the results can vary tremendously, both in the identity of the documents returned as the "hit list" and in the usefulness of the hits in satisfying the user's information need. There are many reasons for this, all of which can contribute to variability in results. First, search engines use different methods for deciding how to include a web-page in their indexes. For example, Yahoo (<www.yahoo.com>) provides a human-categorized list of websites with both search and directory capability, while AltaVista (<www.altavista.com>) has automated methods for building their searchable database of pages. Second, search engines index vastly different numbers of documents, so documents in some engines are simply not available in others. In data compiled bv Lehnert (1999),Infoseek (<www.infoseek.com>) includes about thirty million pages, while AltaVista includes almost five times that number. Third, each engine uses different information-retrieval techniques to build their searchable databases. Some sites weigh certain parts of the document higher than other sites: for example, one search engine may use descriptive HTML meta tags that have been assigned by the author of the page, while another engine will ignore them. Some search engines give higher weight to a page that has lots of links to it, socalled link popularity, while other engines do not consider this at all. Finally, some search engines will consider the entire text of the document when they build their indexes, while others may only consider the title, headings, and first few paragraphs.

While search engines are extremely important and useful, they do not contain all of the information available on the Internet or even on the World Wide Web. For example, newly created pages do not appear because it can take a long time for search-engine spiders to find the pages, if in fact they are ever found. Information contained in web-accessible databases is not included either. This includes the millions of items available in online stores such as Amazon.com. For businesses trying to get visibility or to make money through online sales, being able to be found by new customers is very important. This means that getting ranked highly in a search engine is very desirable. Knowledgeable businesses create their websites with detailed information on how the main search engines work.

Browser Wars

The success and effect of the Internet and the web initially caught the Microsoft Corporation flat-footed, though as related by Paul Andrews (1999), the company was starting to develop a vision for modifying their software products to embrace the Internet. By late 1995, Microsoft responded and started releasing versions of Internet Explorer that eventually rivaled Netscape's Navigator in ease of use and features. Thus started the famous browser wars. As noted by Ian Graham (1997), one tactic that both companies used was to introduce HTML extensions that only worked in their own browsers. As market share for both browsers approached equality, these tactics left content providers in a quandary, as they needed to describe their content in a way that worked in both browsers. As of late 1999, standards organizations such as the World Wide Web Consortium had remedied some of the incompatibilities, but accommodating differences in browsers continued to occupy a considerable amount of time for content developers.

One feature of the computer landscape at this time was that Microsoft enjoyed huge penetration into the installed base of computers. According to data compiled by Michael Cusumano and David Yoffie (1998), more than 85 percent of all computers in the world ran versions of Microsoft's operating system, the software that controls the computer. One part of the Microsoft strategy was to enter into agreements with computer manufacturers to preload new computers with Internet Explorer. At the same time, Microsoft was developing versions of the browser that were more tightly coupled with the operating system. According to some observers, these tactics went too far in that computer manufacturers were required to preload Internet Explorer or suffer unwanted consequences. Microsoft denied the charges of attempting to exert such leverage, stating in part that the tighter integration of the browser with the operating system was part of their business strategy and to forbid this was to limit their ability to provide innovative products.

On May 18, 1998, the U.S. Department of Justice and the attorneys general from twenty states filed suit against Microsoft, alleging first that Microsoft was a monopoly under the Sherman Antitrust Act of 1890 and second that Microsoft had engaged in unfair business practices (including illegal tying of products, in this case tying the use of Internet Explorer with the use of the computer's operating system). In November 1999, Judge Thomas Penfield Jackson found that the Department of Justice had proved that Microsoft was indeed a monopoly and that it had used that power to the disadvantage of American consumers. Accordingly, on April 28, 2000, the Department of Justice filed a proposal in federal court to split Microsoft into two separate companies, one to make and sell the Windows operating system, the other to handle the company's other software products. Judge Jackson accepted this

decision on June 7, 2000. Microsoft vigorously pursued an overturning decision through the U.S. Court of Appeals. In support of this strategy, on September 26, 2000, the U.S. Supreme Court ruled 8–1 against a Department of Justice request to bypass the appeals court, effectively extending the case for at least a year.

The Future Internet

It is difficult and probably fruitless to speculate on what the Internet will look like in the future. In December 1995, no less an authority than Robert Metcalfe, an Internet pioneer and the inventor of Ethernet, predicted that the Internet would collapse in 1996. At a conference in 1997, Metcalfe literally ate his words, putting his written comments in a blender and drinking them like a milkshake as his audience cheered. It is safe to say that the Internet and World Wide Web will continue to grow, probably at the same breakneck speed. If Charles Goldfarb and Paul Prescod (1998) are to be believed, HTML, the workhorse of content description, will be at least augmented, if not replaced, by the more powerful families of languages defined by the extensible markup language (XML). Advances in wireless technology and portable computing devices mean that web browsing will no longer be relegated to the desktop. Greater network capacity pushed all the way to the home means that more interactive, multimedia capability may realistically be available to the typical consumer. One safe prediction is that the future promises to be exciting.

See also: Community Networks; Computer Liter-ACY; Computer Software; Webmasters.

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CHARLES L. VILES

INTERNET WEBMASTERS

See: Webmasters

INTERPERSONAL COMMUNICATION

Interpersonal communication can be defined broadly as "communicating between persons." As Arthur Bochner (1989, p. 336) points out, though, that definition can be made more specific:

The anchor points [for a narrower and more rigorous conceptualization] are: 1) at least two communicators; intentionally orienting toward each other; 2) as both subject and object; 3) whose actions embody each other's perspectives both toward self and toward other. In an interpersonal episode, then, each communicator is both a knower and an object of knowledge, a tactician and a target of another's tactics, an attributer and an object of attribution, a codifier and a code to be deciphered.

In attempting to apply this narrower definition to research in interpersonal communication published in a leading communication journal (i.e., Human Communication Research), Glenn Stamp (1999) found that very few articles met all of the definition's rigid criteria. The definition embodies particular perspectives regarding the character of interpersonal communication. By including articles that met some of the criteria of the definition and incorporating only those that were readily classifiable as interpersonal communication and not organizational communication, mass media, rhetorical, and so on, Stamp found that, during its first twenty-five years of publication, Human Communication Research published 288 articles on interpersonal communication. This indicates that interpersonal communication is a well-established research tradition in the communication field. Stamp also noted the difficulty of defining interpersonal communication. This difficulty extends to its study-because interpersonal communication is often private, fleeting, and complicated.

History of the Study of Interpersonal Communication

The study of interpersonal communication began during the 1970s, at a time when many

people saw successful interpersonal relationships as being a key to happiness. The (speech) communication field has its origins in the study of rhetoric, or public speaking, especially in political settings. Therefore, in grade schools, high schools, and universities, communication scholars were teaching public speaking. The influence of these origins for the study of interpersonal communication is evident in the emphasis on persuasion in interpersonal contexts. This emphasis characterizes much of the early work in the field and continues to persist. In addition to having roots in the study of rhetoric, the studies related to interpersonal communication-published in most of the mainstream communication journals (e.g., Human Communication Research, Communication Monographs, Communication Quarterly)are characterized by the use of hypothesis testing, which is a traditional feature of social-scientific hypothetico-deductive research methods. This reflects the heavy application of social psychological approaches to the communication field as it struggled to become a recognized social science discipline like experimental psychology. In addition to these influences, in reading interpersonal communication work it becomes evident that the work of Paul Watzlawick, Janet Beavin, and Don Jackson (1967), Gregory Bateson (1972), and Erving Goffman (1967, 1971) also influenced both what scholars of interpersonal communication examined and how they examined it.

Major Approaches to Interpersonal Communication

Four predominant approaches to interpersonal communication are summarized here: the developmental approach, the situational approach, the rules approach, and the covering law approach. It should be noted that each of these approaches has difficulties with regard to how adequately it captures the phenomenon of interpersonal communication. This is informative about the character of interpersonal communication, underlining the fact that it is a complex and multifaceted activity.

Developmental Approach

Some scholars suggest that interpersonal communication should be understood as a developmental phenomenon. That is, interpersonal relationships go through a discernible set of steps or "stages." While many different stage models of relationships exist, particularly in psychology,

Mark Knapp's model offers a clear example of how relationships may develop from a state in which individuals are unacquainted to a state in which they are intimate (at which point the relationships may remain stable or they may disintegrate). Knapp (1978) shows how interpersonal communication is crucial to these stages, suggesting that each stage is characterized by a particular way of speaking. Gerald Miller and Mark Steinberg (1975) suggest that relationships are interpersonal to the extent that they are based on one partner's psychological knowledge of the other partner. They suggest that relationships progress along a continuum from "noninterpersonal" to "interpersonal." Noninterpersonal relationships are those in which communicators base their predictions about another person on sociological or cultural knowledge. That is, these predictions are not based in specific, individualized knowledge of that person but on generalized assumptions about that person's social or cultural group. As the relationship progresses, the ability of communicators to make predictions about the other people comes to be based to a greater extent on psychological or individualized knowledge. In this way, Miller and Steinberg suggest, the relationship becomes more interpersonal. While these models capture the evolving character of relationships and the extent to which this evolution may involve different types of communication, it represents interpersonal communication as somewhat static. Relationships are seen to be locatable at a particular stage of development because of discernible ways of talking. This contrasts with the view that relationships are organic and constantly shifting in character. The developmental approach can be summarized as being concerned with the quality of the communication that goes on between people.

Situational Approach

The situational approach suggests that factors particular to social situations determine the extent to which an encounter involves interpersonal or, alternatively, intrapersonal, small group, organizational, public, or mass communication. This approach suggests that situations may determine the character of the communication that takes place. According to this approach, some relevant features of situations include how many people are involved, whether the situation is formal or informal, private or public, and face-to-face or mediated (see Table 1).

Types of Communication According to Situational Approach				
Type of Communication	Number of Communicators	Formal/Informal	Private/Public	Face-to- Face/Mediated
Intrapersonal	1	Informal	Private	N/A
Interpersonal	2	Informal	Private	Face-to-Face
Group	3–12	Semi-informal	Semi-public	Either
Organizational	12+	Formal	Public	Either
Public	Many	Formal	Public	Either
Mass	Many	Formal	Public	Mediated

TABLE 1.

This approach suggests that interpersonal communication occurs between only two people in informal settings, in private, and face-to-face. Additional dimensions that could be tabulated as factors in the situational approach include the degree of physical proximity between communicators (ranging from close in interpersonal communication to distant or mediated in public or mass communication), the available sensory channels (ranging from many in interpersonal communication to just visual and auditory in mass communication), and the immediacy of feedback (ranging from immediate in interpersonal communication to asynchronous and comparatively rare in mass communication). Both intuition and scholarship suggest that difficulties with this approach stem from the fact that communication often is not constrained by settings. Rather, communication may shape the setting as well as being shaped by it. It is possible to have a party in a classroom or a conversation between friends in a doctor's office. Thus, the situational approach tends to be characterized by issues of quantity.

Rules Approach

The rules approach suggests that interpersonal communication is a rule-governed activity. According to this approach, there are rules for social life that individuals use to structure their communication with others. While much work in interpersonal communication appears to subscribe to this view, it is usually done implicitly rather than explicitly. That is to say, findings about interpersonal communication often assume that there is a "regular" way of doing things that has some normative value attached to it, but findings are rarely, if ever, couched in terms of "rules for doing X." W. Barnett Pearce (1976) describes rules for managing meaning in interpersonal communication. While the rules approach recognizes the orderliness of much of social interaction, beyond appealing to socialization and education, it is often not able to get at the specifics of where rules "are" and how individuals learn them.

Covering Law Approach

Some work in interpersonal communication takes as its goal the formulation of universal rules for interpersonal communication, along the lines of laws that pertain to the natural world. For example, it is taken as axiomatic that water boils at 212°F (100°C). A covering law approach looks for laws of communication that have the same ability to explain, predict, and control behavior. One such proposed "law" is uncertainty reduction theory. Charles Berger and Richard Calabrese (1975) suggest that in situations where individuals meet new people, they may experience high uncertainty. This results in a drive to reduce uncertainty, often accomplished by engaging in self-disclosure (Jourard, 1971; Petronio, 1999). Because self-disclosure is subject to a norm of reciprocity, the self-disclosure of one party encourages self-disclosure from the other. Finding out more about another person enables an individual to predict more accurately their communication behavior, thereby reducing the uncertainty. Research has explored this concept in various settings, including interculturally. However, the complexity of factors involved in understanding what is happening in a communication situation often results in doubts regarding the status of the concept as a covering law.

Much of the research published in the mainstream journals of the communication field proceeds according to traditional hypotheticodeductive social scientific strictures. This often involves experimental or survey research aimed at testing a hypothesis. Robert Craig (1995) offers a

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threefold explanation for this. First, at the time when interpersonal communication emerged as an area of study, communication departments were divided between "humanists" and "scientists." Rhetoricians typically took a humanistic position, regarding the study of communication as a liberal art that could not become a science. Scholars studying interpersonal communication took the position that in order for it to be rigorous, experimental research was necessary. Craig suggests that a second explanation for the turn to scientific methods by scholars of interpersonal communication was an effort to offset the "academically disreputable, anti-intellectual, 'touchy-feelie' image" (p. vi) that was associated with it as a legacy of the human potential movement in the 1960s. A third explanation was the field's initial reliance on theories from such cognate fields as experimental social psychology. Borrowing theories from related fields that used these methods may have resulted in appropriating their methods also.

Social scientific work of this kind has sometimes been criticized for overusing as subjects the convenience sample of college sophomores. While college sophomores may be better educated and more "elite" than much of the population, nonetheless a large percentage of the population in the United States attends college. Furthermore, between the ages of eighteen and twenty-two, individuals may be looking more actively for companions and/or mates than at other times in their lives and thinking seriously about their interpersonal communication. These could be considered advantages of studying this population. Clearly, using this approach, it is difficult to get a sense of how relationships develop over time and just what moment-by-moment communication looks like. This issue has been addressed in a line of work that is gaining increasing prominence in the field-work that comes from the perspective of social constructionism (Gergen, 1985). This approach sees selves and relationships as having a dynamic, interactive character, in which they are constructed moment-by-moment through communication. Working from this perspective, researchers have taken a more descriptive approach to their object of study, often enabling them to describe specific methods through which relationships are constructed. Work using social approaches contrasts in various ways with traditional approaches to interpersonal communication. Wendy Leeds-Hurwitz (1995, p. 5) summarizes the differences as follows. Social approaches emphasize the social, organic, ritual, and interpretive aspects of interpersonal communication, while traditional approaches emphasize its psychological, mechanistic, transmission, and scientific aspects. Although not all scholars of interpersonal communication would agree with these contrasts, they summarize some of the key dimensions along which more traditional approaches and social approaches to interpersonal communication differ.

Some Important Interpersonal Communication Concepts

The influence of the traditional approach to interpersonal communication can be seen in some of the key concepts and findings that have been developed since the early 1970s. These include stage theories of relationships, factors that move couples through relationships (uncertainty reduction, self-disclosure, social exchange theory), persuasion strategies, the role of nonverbal communication, and communication-related personality constructs (e.g., cognitive complexity, self-monitoring, Machiavellianism, communication apprehension).

Stage Theories of Relationships

Relationships are typically seen to develop through a series of stages. According to these theories, each stage in a relationship is characterized by distinctive forms of communication. Mark Knapp and Anita Vangelisti (2000) lay out ten stages from "greeting to goodbye," as follows:

- 1. Initiating: The stage that involves all of the processes that occur when people first come together.
- 2. Experimenting: The "small talk" stage, which further uncovers common topics.
- 3. Intensifying: Partners come to perceive themselves as a unit.
- 4. Integrating: Relaters are treated as a unit by outsiders.
- 5. Bonding: The relationship is formalized by some kind of institutionalization.
- 6. Differentiating: Disengaging or uncoupling emphasizes individual differences.
- 7. Circumscribing: Communication is constricted or circumscribed.

- 8. Stagnating: Many areas of discussion between the members of the couple are cut off and efforts to communicate effectively are at a standstill.
- 9. Avoiding: Communication is specifically designed to avoid the possibility of communicating face-to-face or voice-to-voice.
- 10. Terminating: The relationship ceases, which can happen immediately after initiating or after many years.

Stage theories represent an inventory of the progress of relationships from inception to stabilization and sometimes to termination. Each stage is characterized by particular ways of talking. While these stages are logically and intuitively acceptable, there are two difficulties with stage theories. First, they might seem to suggest that relationships are easily characterized as falling into a given stage. Yet it is known that even in the course of a brief conversation, several stages may be represented. This suggests that stage theories may present a rather static view of relationships, which does not take full account of their dynamic, interactively constructed character. Second, many of the stages do not differentiate the development of romantic relationships from the development of friendships. It is likely that in many cases there is a substantive difference between how the two are initiated, developed, maintained, and terminated.

Factors that Move Couples through Relationship Stages

The drive to reduce uncertainty so as to make the other person, and ultimately the relationship, more predictable may result in communicators engaging in self-disclosure that may be reciprocated, resulting in the interactants coming to know one another better. These communication activities may move interactants through stages of relationships. Another motivational force may be social exchange. According to this theory, based on assumptions drawn from economics, relationships can be described in terms of the rewards, costs, and profits that partners offer each other. For example, Uriel Foa and Edna Foa (1974) describe a model whereby couples negotiate for resources such as love, status, information, money, goods, or services. These are located along continua of concreteness and particularism. The theory suggests that a relationship will develop or

fail to develop according to the costs or rewards that intimates are able to provide each other.

Persuasion Strategies

Communication scholars have given extensive attention to strategies for persuading, or "interpersonal influence." Perhaps reflecting the field's roots in the study of rhetoric, communicators are taken to be strategic players. For example, Robert Clark and Jesse Delia (1979) suggest that communicators are engaged with three simultaneous concerns: instrumental (trying to achieve specific goals), relational (the effect on the relationship in which the communication occurs), and identity (how an individual is being perceived by others). Researchers have described many different strategies communicators use in the process of persuasion. These are commonly referred to under the umbrella of compliance-gaining strategies. This line of research originates in the work of George Marwell and David Schmitt (1967). More recent works describe the range of strategies communicators may use in trying to get others to do things (cf. Dillard, 1989; Siebold, Cantrill, and Meyers, 1994).

Role of Nonverbal Communication

Nonverbal communication is often studied in isolation from verbal communication. However, it is widely accepted that the two are intimately connected. It has been suggested that nonverbal communication may regulate verbal communication (providing one of the indications that a turn may be complete and that speaker transition could occur, for example), complement it (as when someone says they are sorry and flushes red), accent it (as when the hand is brought down hard on the table when someone is saying "Come here NOW"), repeat it (as when a person says "North" and then points in that direction), substitute for it (nodding instead of saying "Yes"), or contradict it (as when someone says "I love you too" in a sarcastic or nasty voice). Scholars of nonverbal communication often divide it into a number of distinct areas. These include proxemics (the study of the communicative use of space), kinesics (the study of the use of the body), haptics (the study of the use of touch), chronemics (the study of the use of time), and vocalics (the study of the use of the voice). Studies of nonverbal communication have emphasized the importance of understanding nonverbal communication in understanding how communication works.
Communication-Related Personality Constructs

Personality constructs are generally derived from psychology, focusing on measurable aspects of individuals that can be used to characterize and understand them, and possibly to explain and predict their conduct in certain situations. In this way, they tend to be cognitive in nature. However, some communication-related personality characteristics have been described. A person's cognitive complexity is determined by the number, abstraction, differentiation, and integration of constructs that they have about the social world and others in it (Delia, 1977). Those who are high in each of these constructs are said to be more cognitively complex than those who are lower in them. There is some controversy regarding how cognitive complexity is to be measured. Frequently, it is measured by seeing how many constructs can be coded in a subject's response to a particular question, raising the concern that cognitive complexity and loquaciousness might be conflated. Self-monitoring is the process through which a person adapts to a particular social situation. A "high" self-monitor is someone who assesses the social situation and adjusts conduct to meet the needs of that situation. A "low" self-monitor is someone who does not adapt to the social situation, but rather tends to present a consistent self (Snyder, 1974). Machiavellianism is a person's propensity to manipulate others. This concept, like communicator characteristics in general, raises the question of whether someone who measures "high" in a characteristic will demonstrate it on all occasions, or whether it may vary from communication situation to communication situation. Studies of communication apprehension have shown that feelings of anxiety about communication situations may be traits, (actual persistent characteristics of a communicator) or states (which arise only in certain conditions, such as public speaking).

Conclusion

An understanding of interpersonal communication processes offers both researchers and lay practitioners insight into the complexity of coming together in everyday interpersonal communication situations. Interpersonal communication is complex, private, and ephemeral. Yet, because it is so important in people's everyday lives, many native theories exist about its character. Despite the difficulty of studying it, significant progress has been made in the attempt to describe how interpersonal communication works in a variety of settings. The findings described above suggest that a scholarly understanding of how communication works for individuals, couples, groups, organizations, and families contrasts with native theories about it, and can be very important. For example, if it is understood that while individuals have discernible characteristics, a person's identity or "self" can be seen to emerge in and through interpersonal communication-constructing what Kenneth Gergen, (1991) calls a "relational self"-then individuals can have a sense of participation in the creation (through interpersonal communication) of who they are. This allows individuals to develop the sense that if they are not content with "who they are," this conception of self could be changed in and through communication. Similarly, understanding that relationships are constructed, maintained, and dismantled through particular ways of talking makes clear to communicators that relationships can be seen as "works in progress." This can help couples to overcome problems in all phases of relationships.

Understanding the processes of interpersonal communication in groups enables group members to see that group roles, relationships, and decisionmaking processes are not fixed. Because they are constructed through various ways of communicating, there can be some flexibility. Here again, scholarly theories may contradict native theories about interpersonal communication and may provide ways of solving problems that may have seemed insoluble. In organizations, understanding the processes of interpersonal communication is crucial. The recognition that, even in formal organizations, task-related relationships are managed through interpersonal communication can have important consequences for how successfully these relationships are managed. Interpersonal communication in families brings together the complexities of managing selves, relationships, and tasks through communication. A scholarly understanding of the nature of communication in families can help family members avoid such communication problems as role assignment, stereotyping, repeated blame, and others that may result in family difficulties. If families realize that difficulties of this kind are often constructed through communication, possible ways of remediating them become clearer.

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See also: Apprehension and Communication; Group Communication; Interpersonal Communication, Conversation and; Interpersonal Communication, Ethics and; Interpersonal Communication, Listening and; Intrapersonal Communication; Nonverbal Communication; Organizational Communication; Public Speaking; Relationships, Stages of; Relationships, Types of; Rhetoric.

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INTERPERSONAL COMMUNICATION, CONVERSATION AND

Linguists have long studied the properties of language as an organized system, focusing especially on syntax (i.e., grammatical organization) and semantics (i.e., how meaning works). J. L. Austin (1962) noticed that linguists tend to assume that language is used "constatively" (i.e., to describe the world). Austin contested this, suggesting that language is used to accomplish actions. That is, in his words, "Speech Acts." Coming together with Ludwig Wittgenstein's (1953) notion of "language games," the notion of language use as a way through which humans enact their everyday business with one another has been very influential. The interest of communication scholars in language is then a pragmatic one. That is, such scholars are interested in language-in-use. While in the communication field language and nonverbal communication are frequently treated as separable, the argument that they are in fact part of the organic whole of everyday conversation is a strong one. The to and fro of language that orchestrates nonverbal behavior through which everyday actions get done is what constitutes conversation. It has been suggested that conversation can be regarded as the "primordial site of sociality" (Schegloff, 1987). That is, it is in and through conversation that humans come together to construct and coordinate their daily lives. Thus, a detailed knowledge of how conversation works is central to understanding how interpersonal communication works.

Within the communication discipline, the study of conversation has developed out of the study of language. Language studies have focused on the attitudes of communicators toward language, on language and culture, and on psycholinguistic and sociolinguistic questions such as how language use is related to aspects of character and how it is related to aspects of social class, race, gender, and so on. Since the early 1980s, increasing attention has been paid to the organization of naturally occurring conversation and its role in interpersonal communication.

Much work in discourse analysis, sequential analysis, and conversation analysis has attended to the role of ordinary conversation in interpersonal communication. Conversation analytic work focuses on the workings of naturally occurring conversations in everyday life and therefore provides a useful resource for inspecting how everyday conversation affects, and may even be taken to constitute much of, interpersonal communication.

Conversation analytic study of interaction began in the early 1960s when Harry Sacks began to notice that systematic description of conversations was possible. Specifically, he described a systematic method by which a caller to a suicide hotline could avoid giving a name. His work with Emanuel Schegloff, Gail Jefferson, Anita Pomerantz, David Sudnow, and others started with the observation that "The talk itself was the action. and previously unsuspected details were critical resources in what was getting done in and by the talk" (Schegloff, 1992, p. xviii). Sacks (1984) indicates that the initial interest was not in conversation itself, but rather in social order. Starting from the ethnomethodological premise that everyday life is constructed in an orderly fashion and treated by interactants as being orderly, Sacks and his colleagues took the position that anywhere they looked in naturally occurring social life they could find that orderliness. Taped conversations had the advantage that they were preserved and could be played repeatedly and transcribed. However, as study of conversation proceeded, it became clear that it played a crucial role in everyday social life. Subsequently, the field has laid out features of the organization of naturally occurring interaction, as well as descriptions of the methodical ways in which a wide range of interpersonal actions are conducted.

Content

Regular methods for taking turns at talk, for constructing sequences, for repairing difficulties in talk are described by conversation analysts. Drawing on these resources, the overall structure of conversation is laid out. Each aspect of the structure of conversation is important because variations in the regularities have implications for the relationships that exist between people. This is further evidenced in a range of interpersonal conversational activities, including joke-telling, complimenting, blaming, inviting and turning down invitations, accounting, and complaining. Patterns of conversation in professional settings (e.g., medical and legal) reveal that the setting and the talk that goes on within it have a reciprocal influence. A brief description of how these activities are accomplished in talk shows how their enactment has implications for interpersonal communication.

Joke-Telling

Sacks (1974, 1978) has described the orderliness of joke-telling and the interpersonal activities that it may be designed to accomplish. He suggests that joke-telling is tightly and economically structured and that it may function as a kind of "newsletter" for the audience of early teenage girls for whom it appears to be designed. Sacks further suggests that because the joke that he describes is about oral sex, its tellability was limited to its intended audience-early teenage girls. The joke that he examines concerns three sisters who marry three brothers. The mother of the three girls "leads" the joke recipients through the joke, listening through the doors of her daughters' rooms on their wedding night and then asking them about the strange sounds she heard. In the punchline of the joke, the youngest daughter gets the better of the mother, disobeying one maternal rule in the observance of another. Sacks suggests that the joke serves as a newsletter for its early teenage audience in the following ways. First, by featuring three sisters marrying three brothers it may address the target group's concern about being separated from their friends when they get married. He notes that young adolescent girls tend to "travel in packs." Second, listening at the door and hearing inexplicable sounds may be something young teenagers have experienced and wondered about. Raising it in this joke format may be a way of addressing this concern sub rosa. Third, trumping the mother by flouting one rule while observing another may appeal to adolescent girls who struggle with their mothers and with the often conflicting and confusing parent-imposed rules of childhood. In these ways, then, Sacks sees the joke as serving an interpersonal function. Observing joke-telling in a variety of settings indicates that jokes are often tailored to serve interpersonal functions of this type.

Complimenting

According to Pomerantz (1978a), compliments have two simultaneous functions. First, they are positive assessments—offering a positive evaluation of some aspect of another person. Second, they are supportive actions—something nice someone may do for another. In general, there is an empirical skewing in conversation in favor of agreeing with positive assessments and accepting supportive actions (Pomerantz, 1984). Pomerantz (1978a) observes that despite this, compliments frequently are turned down in ordinary conversation. She points out that there is a widespread preference in conversation for avoiding engaging in self-praise and that a conflict with this preference would be encountered by individuals who agree with the positive assessment and accept the supportive action embodied in a compliment. Thus, compliments may be turned down or deflected in order to avoid violating the norm of not engaging in self-praise. In this way, Pomerantz shows how offering and responding to compliments are activities that are discernibly influenced by interpersonal communication considerations. While psychological reasons, such as low selfesteem, are often offered to explain turning down compliments, as this conversation structural explanation shows, close examination of details of conversation can offer an alternative explanation based in the structure of conversation.

Blaming

Pomerantz (1978b) notes that blaming can be accomplished interactively. A speaker may take the first step in indicating that something blameworthy has happened, without officially laying blame. A speaker reports an "agentless, unhappy event"—some "negative" circumstance for which the agent is not officially designated. This puts the recipient in the position of inferring from the reported circumstance that someone is to blame. In the next turn, the speaker can assign responsibility or report some other circumstance that shows he or she is not to blame. Pomerantz (p. 118, instance 4) provides the following example:

- R: Liddle has been eating pudding.
- C: You've been feeding it to him.

R reports an agentless unhappy event (i.e., the baby eating pudding). In the recipient's turn, C transforms the unhappy event into a consequent event by describing an another event (i.e., R feeding pudding to the baby) that is chronologically prior to the unhappy event. If an unhappy event can be turned into a consequent event, then an agent for it (i.e., a person to blame) can be specified. In this example, C, the recipient of the report of the agentless unhappy event thus attributes blame for the event by describing the preceding event. In this way, reporting provides a method for a speaker to make attributing responsibility relevant, without actively engaging in blaming. This puts the recipient in the position of claiming or attributing responsibility. Thus, blaming becomes voluntary and collaborative. In blaming, the technique of presenting a neutral brief story or report, which puts the recipient in the position of inferring the "upshot" or consequences, provides a method for undertaking a delicate activity. A similar mechanism operates in the organization of conversational complaints.

Inviting

Reportings may be used in a bipartite technique for managing invitations (Drew, 1984). By reporting a possible upcoming social event, such as, "Uh, next Saturday night's surprise party here for Kevin," the speaker can put the recipient in the position of inferring that this social event could be available for them to participate. The recipient could then treat the report simply as news. If this occurs, the potential inviter could take it as an indication that the recipient is not interested in attending the party. Alternatively, the recipient can respond by self-inviting, or at least indicating some interest in attending the party. Similarly, the invitee may turn down the invitation by reporting circumstances that the inviter could hear as precluding the invitee from taking up the invitation. This can put the inviter in the position of either modifying the invitation in an attempt to achieve acceptance of it or abandoning the invitation without the invitee having to give, and the inviter having to receive, an outright "no." Thus, reporting provides a collaborative method for managing invitations without explicitly engaging in an activity that could result in the inviter getting turned down. Like blaming, then, inviting can be managed interactively by making information available that puts the recipient in the position to advance the action or not take it up. In this way, both inviting and blaming, activities that both have some interpersonal delicacy associated with them, can be managed in a collaborative fashion.

Accounting

Managing issues of responsibility is often dealt with under the rubric of "accounts." While the term "accounts" is used to characterize a variety of actions, in its strongest sense it refers to stories with which communicators attempt to remediate some wrong. Marvin Scott and Sanford Lyman (1968, p. 46) examined "talk that shore[s] up the timbers of fractured sociation." Often, they found, this shoring up involves telling about some specific aspect of an event in order to provide an explanation or justification for its having happened. A great deal of work in a number of fields has examined this phenomenon.

Richard Buttny (1993) has identified four different ways in which the concept of accounts has been taken up. First, the telling of accounts in conversation can be seen as being strongly related to remediating social wrongs, especially as this activity relates to matters of face-preservation. Work in the communication field has focused in this domain. Second, accounts focus on explanation of everyday activities, with less of a focus on remediating social wrongs. Third, accounts form part of the attribution theory literature. In this line of work, accounts as explanations of actions (whether the actions are problematic or not) are not limited to verbal accounts; they may form part of private cognitions. Fourth, for ethnomethodologists, social actors treat their everyday activities as "accountable" (i.e., sensible, normal, and proper). Accounting processes offer one method by which everyday people treat and come to see their actions as being ordinary. Rather than being a feature only of remediation, for ethnomethodologists, accounts are part of the everyday work of constructing the social fabric of everyday life, even though they are often "seen but unnoticed."

For practical reasons, much work on accounts relies on reconstructed or remembered accounts, or accounts that are produced in response to hypothetical situations. As they occur in interaction, though, accounts are often found in narrative structures. They may be found in the psychotherapeutic setting as part of justifications for actions. Kenneth Gergen and Mary Gergen (1983) found them being used to explain failed relationships. Buttny (1993, p. 18) points out, "Narratives as a discourse genre work as accounts when tellers re-present past events in such a way to defend their conduct. Narratives allow the teller to offer explanations at a greater length."

Complaining

A story may be told in such a way as to provide for the delicate management of a complaint. Here, a structure is used that is similar to the structure used in constructing blame, where the story is told neutrally, leaving the recipient to infer what is being done. However, in complaints, tellers may first set up a frame that allows the recipient to infer the negative or problematic character of the neutrally recounted events. The frame puts the recipient in the position of collaborating with the teller to discern, and show the appropriate reaction to, the complainable events the teller recounts. Jenny Mandelbaum (1991) describes how one teller set up a frame for the events she was about to tell: "He really doesn't know where he is. He always gets mixed up." This puts the recipient in the position of listening to and understanding the events of the story with this frame in mind. Whether or not such a story is treated as a complaint or simply as an account of an activity may be shaped by considerations related to the relational delicacy of becoming involved with the complaint or not.

Context

Studies of conversation have shown that it is both a context-shaped and a context-renewing phenomenon (Drew and Heritage, 1992). That is to say, talk in social and professional settings is constructed by the interactants, rather than by the setting, but conversation may also show the sensitivity of interactants to the fact that the talk is taking place in a given setting. Schegloff (1987) suggests that one aspect of what makes talk into institutional talk is how turn-taking is organized. In institutions, there is often a variation on the system for exchanging turns that exists in ordinary talk. Studies of talk in the medical and legal contexts show that other features of language may also be involved in how professionals and lay people work together through conversation.

Medical Setting

Studies of conversation in the medical setting show that although it is a professional setting, how talk unfolds has important implications for interpersonal communication. For example, John Heritage and Sue Sefi (1992) have studied health visitors with new parents in Great Britain. They contrast the responses that each parent makes when a health visitor comments that the baby is enjoying a bottle:

- 1. Health Visitor: He's enjoying that, isn't he.
- 2. Father: Yes, he certainly is.
- 3. Mother: He's not hungry because he just had his bottle.

The father agrees with the health visitor's remark, indicating that he understands it as an

assessment of how the baby is taking the bottle. The mother's response indicates defensiveness regarding whether or not the baby is hungry, which could implicate a failure on her part. In this way, she shows that she takes the health visitor's comment to have institutional relevance regarding her competence as a mother. It is thus seen that the same remark can be understood to have interpersonal relevance or to have institutional relevance and that the recipient of the remark plays a part in constituting its possible institutional character.

Legal Setting

Paul Drew (1985) has studied how talk in a court of law can be constructed to display institutional concerns. Specifically, this talk is designed in such a way as to be partly for the benefit of nonparticipating overhearers (i.e., the jury and judge). Also, this talk is designed to be responsive to the context of both prior and anticipated testimony. Participants' awareness that talk is overheard by the jury and judge is demonstrated in a particular vigilance with regard to word selection. For example, a prosecuting attorney in a rape trial asks a witness (the victim) if she went to a "bar." In responding, the witness responds that she went to a "club." The shift from "bar" to "club" can be attributed to the witness's understanding that "bar" may sound more disreputable than "club," which may influence how she is perceived by the jury and judge. With regard to talk being designed with prior and anticipated testimony in mind, Drew has shown how, in responding to an attorney's question, a witness may proceed from descriptive to explanatory accounts that show that he or she anticipates the negative case that the attorney is trying to build. Thus, particular aspects of language have significant interpersonal and institutional consequences in the legal setting.

Conclusion

Recognizing the centrality of conversation in interpersonal communication can have important consequences for communicators. Language (and the associated nonverbal conduct that is part of its production) may be a medium through which relationships are created, maintained, and dismantled. A detailed understanding of how language works in interpersonal communication shows that it is orderly, not random. Once communicators understand the structure, they can know what to expect in communication. This can lead them to become more effective communicators. Furthermore, as is shown by the example of complimenting described above, a structural explanation of conduct may emphasize the communicative character of an action and may differ markedly from the native theory explanation, which may emphasize individual psychology. As the discussion of blaming shows, understanding some of the different interactional methods that are available to interactants can give them a choice between pursuing blame in a collaborative or a confrontative manner. Similarly, awareness of different methods for inviting makes interactants aware of the possibility of providing for voluntary coparticipation in shared activities. In the professional setting, the effect of different ways of talking on how institutions and institutional roles are produced can also have an important effect on interpersonal communication in the workplace.

Understanding the role of conversation in how relationships are enacted and managed can empower communicators to go beyond the stereotypes that they may hold with regard to themselves, others, relationships, and institutions by re-creating them anew in and through different ways of communicating.

See also: Interpersonal Communication; Interpersonal Communication, Ethics and; Interpersonal Communication, Listening and; Intrapersonal Communication; Language and Communication; Language Structure; Nonverbal Communication; Relationships, Types of; Sociolinguistics; Wittgenstein, Ludwig.

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JENNY MANDELBAUM

INTERPERSONAL COMMUNICATION, ETHICS AND

In 1984, on behalf of more than 130 petitioners, James Jaksa from Western Michigan University submitted a request to the administrative committee of the Speech Communication Association now known as the National Communication Association (NCA)—to establish a Communication Ethics Commission. In the petition, Jaksa noted that "ethics is central to [the communication] field and has been an indispensable part of our tradition since our beginnings." Jaksa went on to add the following:

[The] search for truth, truthfulness in communication, and the moral obligations of speakers, listeners, third persons, and society as a whole are concerns of scholars in communication. However, events in contemporary society have presented a real threat to confidence in "the word." . . . The tendency to accept lies and deception as the norm in parts of our society is increasing. Yet truthfulness must be the norm for communication to exist and for society to survive. This includes private and public settings across the entire spectrum of our discipline: interpersonal, business and professional, organizational, mediated and mass communication, political and intercultural communication, and other specialized areas.

In 1985, the Communication Ethics Commission was officially established.

The NCA Communication Ethics Commission

The NCA Communication Ethics Commission continues to be an active hub for scholarly activity in the field of ethics and interpersonal communication as well as in other areas of interest to its members (e.g., ethics in contexts such as the media, the classroom, and in organizations). The commission distributes the quarterly newsletter *ethica* and cosponsors (with the Western Michigan University Department of Communication, Western Michigan University Center for the Study of Ethics in Society, and Duquesne University) a biannual National Summer Conference on Communication Ethics. This conference, held in Gull Lake, Michigan, draws together scholars from around the country to discuss issues of scholarly and pedagogical importance in communication ethics.

In 1999, after a year-long process of extensive examination, comment, and discussion (with numerous contributions from members of the Communication Ethics Commission), the NCA adopted the following "Credo for Ethical Communication":

Questions of right and wrong arise whenever people communicate. Ethical communication is fundamental to responsible thinking, decision making, and the development of relationships and communities within and across contexts, cultures, channels and media. Moreover, ethical communication enhances human worth and dignity by fostering truthfulness, fairness, responsibility, personal integrity, and respect for self and others. We believe that unethical communication threatens the quality of all communication and consequently the well-being of individuals and the society in which we live. Therefore we, the members of the National Communication Association, endorse and are committed to practicing the following principles of ethical communication:

- We advocate truthfulness, accuracy, honesty, and reason as essential to the integrity of communication.
- We endorse freedom of expression, diversity of perspective, and tolerance of dissent to achieve the informed and responsible decision making fundamental to a civil society.
- We strive to understand and respect other communicators before evaluating and responding to their messages.
- We promote access to communication resources and opportunities as necessary to fulfill human potential and contribute to the well-being of families, communities and society.

- We promote communication climates of caring and mutual understanding that respect the unique needs and character-istics of individual communicators.
- We condemn communication that degrades individuals and humanity through distortion, intimidation, coercion, and violence, and through the expression of intolerance and hatred.
- We are committed to the courageous expression of personal convictions in pursuit of fairness and justice.
- We advocate sharing information, opinions, and feelings when facing significant choices while also respecting privacy and confidentiality.
- We accept responsibility for the shortand long-term consequences for our own communication and expect the same of others.

Additional Rules, Guidelines, and Perspectives

In his book *Ethics in Human Communication* (1996), Richard Johannesen built on the work of John Condon and set out the following guidelines for interpersonal communication:

- 1. Personal beliefs and feelings should be shared in a candid and frank manner.
- 2. Keeping social relationships harmonious may be more ethical than speaking one's mind in groups or cultures where interdependence is valued over individualism.
- 3. Communicate information accurately, with minimal loss or distortion of the intended meaning.
- 4. It is generally unethical to deceive someone intentionally.
- 5. There should be a consistency in the meanings that verbal and nonverbal cues, words, and actions communicate.
- 6. It is usually unethical to block the communication process intentionally with behaviors such as cutting off people before their point has been made, changing the subject when another person obviously has more to say, or using nonverbal behaviors to distract people from the intended subject.

Lana Rakow (1994) proposes an interpersonal communication ethic that emphasizes norms of trust, mutuality, justice, and reciprocity. She suggests three ethical rules for achieving healthy relationships: (1) inclusiveness or being open to multiple perspectives on truth, an encouragement of them and a willingness to listen, (2) participation or ensuring that all people must have the means and ability to participate, to be heard, to speak, to have voice, to have opinions count in public decision making, and (3) reciprocity so participants are considered to be equal partners in a communication transaction and there is a reciprocity of speaking and listening.

Many scholars of ethics and interpersonal communication offer a dialogic perspective in which sustaining and nurturing dialogic interaction is one of the most important values in a communication encounter. In a dialogic perspective, both participants in an interaction are considered to be worthy of respect and should be allowed to express their own points of view. Theorists such as Ronald C. Arnett (1992) explore the value of dialogue in maintaining interpersonal communication encounters. Extending philosopher Martin Buber's analysis of the need for dialogue, Arnett does not call for a "perfect dialogue"; instead, he discusses the importance of a position of humility in which the interactants argue for their own ideas while respecting the rights of others to do the same. Johannesen (1996) lists the following six characteristics of a dialogue: authenticity, inclusion, confirmation, presentness, a spirit of mutual equality, and a supportive climate. Authenticity refers to being direct, honest, and straightforward but not necessarily saying everything that comes to mind. Inclusion refers to trying to see other people's viewpoint without sacrificing one's own convictions. Confirmation occurs when people express positive warmth for each other. Presentness occurs when people concentrate completely on the encounter and demonstrate that they are willing to be completely involved in the interaction. A spirit of mutual equality exists when the participants view each other as people and not as objects to be manipulated or exploited. A supportive climate exists when the participants avoid value judgments that stifle understanding and instead encourage each other to communicate freely.

Feminist and Interethnic Scholarship

Feminist scholarship has had a great influence on the theorizing about ethics and interpersonal communication. One of the major contributions of these scholars has been to highlight and explicate the concept of care. Carol Gilligan, in In a Different Voice (1982), proposes that women are more likely to base their decisions on an "ethic of care" in which relationships with others and responsibility for them is paramount and that men are more likely to use an "ethic of justice" that emphasizes hierarchical principles and issues of right versus wrong. Julia Wood (1994) has criticized this perspective for promoting the stereotype of women as nurturers, and Nel Noddings (1984) contends that any person (female or male) is capable of being either the caring one or the cared for. Rita C. Manning (1992) maintains that a reciprocal web of caring is created in day-to-day interactions with others and that although one may be free to choose who to care for at what point in time, roles and responsibilities (such as parenthood) set up an obligation to respond in a caring manner. Nevertheless, Gilligan made a major contribution to theory in the field of interpersonal communication ethics by (1) emphasizing that neither the care perspective nor the justice perspective is a more morally developed perspective and (2) including the voices of women in an area in which they were not well represented previous to her theorizing.

In extending the consideration of ethics in interpersonal communication beyond the bounds of Anglo-American culture, Anthony Cortese argues in *Ethnic Ethics: The Restructuring of Moral Theory* (1992) that morality based on justice cannot be purely subjective (derived from the principles of individuals alone) nor purely objective (based, for example, on universal rules). Instead, he calls for "communication without domination":

[R]elationships, not reason nor justice, are the essence of life and morality. . . . Relationships provide the context and the basis for any type of justice, any code of moral principles for which we live. Relationships provide the context for all of our sets of belief, value systems, and behavioral norms. Justice must always refer to some type of relationship; justice is meaningless without its application to relationships. If we do not comprehend the social fabric of our relationships with others, then justice is merely a set of empty mathematical, reified formuli. Justice then hangs dangerously devoid of meaning, like a trapeze artist without a safety net. That is, without relationships justice contains no system of checks and balances. It becomes primary and an end itself without regard to the purpose of morality [pp. 157–158].

Questions for Further Study

In a 1997 presentation to the NCA, Johannesen raised several questions that are faced by scholars who study ethics. First, can communication ethics survive the devastating critique posed by postmodernism (i.e., the contemporary idea that life is fragmented in many ways and there is no ultimate moral authority guiding ethical action in all contexts)? Can interpersonal communication ethics survive if there is no individual moral agent, there is no autonomous self that can decide ethical questions objectively, there are no absolute moral values, and there is only fragmentation and alienation? After reviewing several approaches to the notion of self, Johannesen concluded that even in a postmodern context it is possible to have a self that is unique and individual, capable of acting responsibly. Second, do transcultural ethical values block the search for minimum ethical standards for communication? Johanessen points to Ethics in Intercultural and International Communication (1997) by Fred Casmir and Communication Ethics and Universal Values (1997) by Clifford Christians and Michael Traber as examples of works that successfully identify universal ethical principles. Third, can people recognize the roles that diversity and marginalization (i.e., people who do not have equal access to political and other types of power in a society) play in developing communication ethics? Johanessen responded that, as other scholars have noted, honoring diversity must also include respect for common values and respect for all human beings.

See also: FEMINIST SCHOLARSHIP AND COMMUNICA-TION; INTERPERSONAL COMMUNICATION.

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INTERPERSONAL COMMUNICATION, LISTENING AND

Listening is a fundamental part of the process of communication. Adults spend about 42 percent of their time in listening activities, and children spend about 58 percent of the time in the same activity (Lederman, 1977). Listening is a complex facet of the communication process, and it is considered by some communication researchers to be a more difficult activity than speaking. While the word "listening" is used interchangeably with some other words, such as "hearing," it is a unique process, unlike any other.

Definition

To define "listening" entails comparing and contrasting it with some other similar activities: "perception," "attention," and "hearing."

"Perception" has been defined as a process of extracting information from the world outside oneself, as well as from within. When perceiving something, a person is able to note certain stimuli and draw some kind of information from them. One type of perception is listening, the process by which one selectively attends to certain auditory stimuli. Listening is selective perception and attention to auditory stimuli.

In the selective process of listening, stimuli are filtered. Hearing is related to listening. Hearing is a nonselective process. If one has hearing that is not impaired, he or she hears every audible sound that occurs in his or her presence. Thus, hearing is a prerequisite for listening. While words such as "listening" and "hearing" are often used interchangeably in everyday speech, listening is a process that includes selective attention and the assignment of meaning. Physiologically, listening involves the use of hearing organs to receive those acoustic vibrations that are converted into signals that can be understood by the brain. It is the brain that gives meaning to those vibrations. The brain decodes these vibration patterns that are known as "words." Physiologically, listening occurs in waves. There are natural peaks and valleys in the listener's processing of auditory stimuli, and listeners can only comprehend some of the stimuli that they are able to hear.

Just as listening has a physiological basis, it also has a psychological basis. The psychological aspects have to do with interest and attention. A person listens to what interests him or her and does not listen to what is found to be boring or dull or irrelevant. Listening is an activity that involves the skills of paying attention, making sense of what is being said (interpretation), and providing feedback or response to the speaker. These skills are learned, and they can be improved. Improvement of listening involves correcting the five most frequently found psychological interferences to effective listening: habitual inattention, selective perception, selective inattention, inaccurate inference making, and the inability to frame concepts. Habitual inattention occurs when listeners regularly and consistently find their attention wandering. Selective perception occurs when listeners only perceive some of the things that are being said to them. Selective inattention occurs when listeners listen only to those things to which they want to pay attention. Inaccurate inference making occurs when listeners draw conclusions incorrectly about the meanings of what they have heard. The inability to frame concepts happens when listeners are unable to comprehend or understand what has been said.

Reasons for Listening

People listen for a variety of reasons. The most fundamental reasons for listening are to learn something, to be informed, to be entertained, or to form relationships. When people listen to learn, be informed, be entertained, or to form relationships, they are motivated by the prospect of gaining something for themselves. As a result of listening, they know more, are more informed, or are more entertained.

When it comes to forming relationships, people listen for some other reasons. In many ways, communicators act as sounding boards for others when they function as listeners. People continually address verbal messages to each other. People listen if there is some reason to do so; if not, while they may look as if they are paying attention, they simply do not really do the work that it takes to listen to the person who is speaking.

There are several reasons to listen to someone who is speaking. One reason one person listens to another is because he or she knows that at times he or she needs the other person to listen to him or her. Everyone is at one time or another in need of good listeners. A second reason that anyone listens to anyone else is because he or she cares about that other person or about what that other person has to say. A third reason for listening is because one feels he or she must listen. There are many other reasons for listening, including to pass time, to enjoy a joke, to get directions, to add to one's knowledge, and to share another's experience.

The Role of the Listener

Just as there are many reasons to listen, the role of the listener is more than just passively taking in sounds and making sense of them. In interpersonal communication, listening includes providing reactions and responses for the person who is speaking. These reactions and responses are called feedback. It is feedback to the speaker that makes listening a more active process. Feedback is any form of response to the speaker's message. It is verbal and/or nonverbal and/or silent. Any response or lack of response is the listener's message to the original speaker. Thus, verbal (words) and/or nonverbal (sounds, gestures, facial expressions) communications are the ways in which feedback is provided. The skillful listener is continuously paying attention, evaluating what is being said and what it means, and deciding on what are the best choices to make about selecting the most appropriate feedback or response.

Feedback serves two functions. First, it indicates the listener's understanding or misunderstanding of the speaker's intended meaning. Second, it shows the listener's willingness or resistance to proceed as requested and/or directed by the speaker. Viewed as feedback, responses or lack of responses are the listener's tools for indicating to the speaker how effectively he or she has expressed himself or herself. Feedback that is other than what is desired, either in form or content, would be an indication that the speaker has not been effective.

Active Listening

Because of the importance of the feedback from listeners, and because that feedback takes the form of some active response, listening is at times referred to as "active listening." "Active listening" is a term that is used to refer to listening activity that includes providing the speaker with feedback. The speaker talks. The listener listens. The listener reacts: nods, says something, utters subvocalizations (e.g., "ohh," "uh huh"). Active listening, therefore, goes beyond the attention and interpretation of stimuli. Active listening involves verbal and nonverbal response. Active listeners work at letting the people who talk to them know that they are listening. Active listeners work at letting those people know that they are being attended to—that the listener is working at understanding what the speaker is trying to say.

As an active participant in interpersonal communication, the listener attempts to see, hear, and understand all that is said or done by the speaker who is attempting to communicate. One of the hallmarks of the good listener is that he or she is empathetic and supportive. In other words, the listener tries to understand what is being said both emotionally and intellectually. The listener works to try to understand what is meant, or the meaning of what is being said, by the speaker. In trying to understand, the listener may even be helping the speaker to understand better the message that is being sent. In this sense, the listener is an active responder. While listening is being discussed separately from speaking, in conversations or interpersonal communication, speaking and listening are roles that are exchanged almost imperceptibly.

It is often said that a good listener is a good conversationalist. What this means is that the person who is quiet and listens thus allows the other person to speak. However, beyond allowing another to speak, a good listener really is a good conversationalist, because the listener provides feedback that is needed by the speaker, and the listener actively takes a turn in engaging in conversation. In essence, feedback is a message that the listener directs toward the original speaker in response to the original speaker's message. It occurs in response to the original message maker rather than as the initial message in a given conversation or verbal interaction. Thus, feedback is both a response and the listener's message.

As a responder, the listener has choices to make about the ways in which to frame the message and how to convey it. First, the listener must decide the timing: when will he or she respond. Second, the listener must decide how to respond. The listener can respond either verbally by saying something or nonverbally by gestures, facial expressions, or vocalizations. In fact, listeners usually provide a combination of these responses. The verbal response is what is left until the speaker has completed his or her thoughts. The nonverbals—facial expressions, nods of the head, gestures, vocalizations—may take place while the speaker is talking.

Being More than an Active Responder

Feedback can be more than just a response to a speaker or a speaker's message. Feedback can be seen as the listener's exertion of control over the communication. In this instance, feedback is not a measure of ineffectiveness on the speaker's part. It is the listener's way of expressing how the conversation must proceed if the listener is going to continue to participate in the conversation. The listener responds to the speaker by indicating either verbally or nonverbally that the conversation needs to take a turn in order to keep the listener involved. A deep yawn while a speaker goes on at length would be an example of a nonverbal expression that the conversation needs to be changed.

To view feedback only as the response to the speaker violates the activeness principle of listening. It makes the listener a less-than-equal partner, one who passively functions only to assist the speaker in accomplishing his or her ends. In any interpersonal exchange, however, all participants must be accomplishing some sort of personal ends, or they may have no reasons to participate, actively or passively.

Feedback is more effective when it is descriptive, specific, timely, and about behaviors that can be changed. In offering feedback, the listener is attempting to let the speaker know how he or she responds to the speaker and the speaker's message. For example, feedback that is descriptive is report-like rather than judgmental and includes details that explain what the listener needs for the speaker to be understood clearly. Its timeliness is significant. If it is offered as an interruption or before the speaker has completed his or her thought, it is either not of value to him or her or it may be perceived as being an attempt to redirect the conversation. Feedback, to be effective, must also be reflective of something about which the listener thinks the speaker can take some action.

See also: Interpersonal Communication; Interpersonal Communication, Conversation and; Interpersonal Communication, Ethics and; Nonverbal Communication; Relationships, Stages of; Relationships, Types of.

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Linda Costigan Lederman

INTERVENTION

See: Antiviolence Interventions; Parental Mediation of Media Effects

INTRAPERSONAL COMMUNICATION

Intrapersonal communication, or communication within the individual, is an area of study that is fundamental to the study of all communication. Communication can be thought of as beginning with the self. When a person talks of communication with others, he or she speaks of interpersonal communication, or communication between one individual (the self) and another. Intrapersonal communication limits itself to communication within the individual. It is communication that takes place within the individual when he or she is communicating with others, or simply, when he or she is alone and thinking to himself or herself. When a person says to himself or herself, "way to go," he or she is engaging in intrapersonal communication. Intrapersonal communication, however, has been less studied than many other areas of communication.

Studying Intrapersonal Communication

While the literature on communication has included the area of intrapersonal communication since the 1980s, it has been a problematic area of study for researchers. One of the most often discussed problems among communication researchers in the last part of the twentieth century was how to study intrapersonal communication—and how to understand it.

The "self" has long been acknowledged as an integral part of any communication interaction between people. It is defined in a variety of ways, all of which try to establish the self as something that is unique and separate from any other individual or entity. From a systems perspective, the self is viewed as an entity that interacts with and processes information or data from its environment. The self (individual) affects the environment and is affected by it in a dialectic relationship in which the self is a socially constructing and constructed reality. Explanations of the derivation of the sense of self tend to emphasize social interaction as a profound influence. Symbolic interactionists argue that it is in social interaction that the self is created, with individuals taking roles in response to the feedback that they receive from others. Charles Cooley (1902) identified the "looking-glass self" as the view of self that arises in response to the opinion of others. George Herbert Mead (1934) extended the looking-glass self, proposing that the structure of the self is a reflection of the entire social process—the self as a complex and multiple structure that arises from all social experience.

As early as the work of William James (1890), the notion of multiple selves has been part of the literature on communication between people. Eric Berne (1964) depicted three ego states of the self, and Mead (1934) differentiated between the "I," the impulsive, unorganized, unpredictable self, and the "me," the generalized other who provides direction and guidance. The construct of self as being a composite of multiple selves derives from psychoanalytic theory, based on the concept of internalization, or the incorporation into the self of that which was before external to the self.

The self, similar to any other multifaceted system, is made up not only of parts but also of relationships between those parts, referred to hereafter as "intrapersonal relationships." An enhanced understanding of the dialectic between intrapersonal and interpersonal communication is made possible by examining the intrapersonal relationships that exist between the multiple selves that constitute each participant in a dyad.

Defining "Intrapersonal Relationships"

"Intrapersonal relationships" were first defined in the literature on communication by Linda Lederman (1996). She based her conceptualization of intrapersonal relationships on the literature on interpersonal relationships. A review of the literature on interpersonal relationships suggested to Lederman that whatever is known of relations between people that is useful in understanding their communication can be applied and examined as it sheds light on the concept of intrapersonal relationships and communication.

In interpersonal communication, defining what is meant by "relationship" is difficult. The difficulty lies in identifying what a relationship is and when one exists. The same holds true for intrapersonal relationships. Generally, it is agreed that two or more people are in a relationship if they have an effect on each another-if they are "interdependent" in the sense that a change in one person causes a change in the other person and vice versa. Harold Kelley and his colleagues (1983, p. 135) define relationships as two chains of events, one for P (person) and one for O (other) that are on the same time dimension and that are causally interconnected. For two people to be in a relationship with each other then, some of the events in P's chain of events must be causally connected to some of the events in O's chain. This definition of "relationship" applies to the interface of chains of events in multiple selves as readily as in two-person systems. Given the physical reality that the self shares with itself, it is self-evident that the chains of events that are experienced by any one of an individual's multiple selves is on the same time dimension and is causally interconnected with the experiences of the other selves. In fact, the psychopathological state of multiple personalities exists when the selves become so detached from each other that they have "separate lives." This does not mean that the multiple selves all experience any given event in the same way, but it does indicate that there are connections between the chains of events and causal connections.

Interpersonal relationships are not observable; instead, what can be observed are cues that can be interpreted to determine the nature of the relationships between two people. Erving Goffman (1959) notes that the tie signs between people, such as hand holding, provide clues as to the nature of the connection (relationship). Jerome Manis and Bernard Meltzer (1967) explore how people attempt to determine when other people are "with" each other (i.e., connected, related) based on their behaviors, verbal as well as nonverbal. These interpretations are based on culturally determined cues, such as bonding signals, in the form of nonverbal behaviors and/or explicit descriptive labels that are produced by the two people or are applied by other to them. The labels and behaviors can be either mismatched or correctly matched. The relationships themselves between the communicators are never visible; they are the products of inference and interpretation.

Intrapersonal relationships, too, are invisible. The connections between multiple selves are not visible to outsiders. Instead, inferences are drawn based on the interpretations of verbal and nonverbal behaviors. For example, when observing the way a person is dressed, it is possible to draw inferences, such as "She takes good care of herself" or "He neglects himself," which makes a statement about the interpretation of the self in relation to itself, or about an intrapersonal relationship. This is not unlike statements of the self in relation to another (e.g., "John and Mary are going together," "She's so involved with him"). When someone responds to a compliment about his or her attire by saying, "Oh, it was on sale, I got it for almost nothing," inferences can be drawn about the way in which the individual engages verbally with others in relating to himself or herself. Inference making is necessary in understanding any relationship; the invisibility of a relationship does not preclude one's ability to infer a relationship intrapersonally any more than interpersonally.

Because relationships cannot themselves be made visible in either interpersonal or intrapersonal communication, the nature of those relationships must be derived by examining evidence of them in terms of what goes on between the participants: the manifestations of their interdependence. Thus, when, for example, Ralph and Vinnie wear the same tee-shirts, the shirts become the manifestation of some relationship that exists

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between them. They may be friends or family members or members of the same team. The shirts provide evidence of some connection. In intrapersonal relationships, it is the manifestations of the interrelationships between multiple selves that indicate a relationship. A person gives self-congratulations for getting a good grade or provides self-criticism for making a wrong turn.

Intrapersonal relationships, then, can be defined as those connections between multiple selves, albeit invisible, that determine the interdependence of those selves and the effect of that interdependence as it affects and is affected by any part of the self that makes up one's being. By using the same kinds of considerations to examine intrapersonal relationships that are used to explore interpersonal relationships, intrapersonal communication can be seen to encompass more than simply one's self-concept or its derivation more even than one's talk with oneself. Intrapersonal relationships are a rich field for examination as they potentially affect communication, be it intrapersonal or interpersonal.

The Importance of Intrapersonal Relationships

One's relationship with oneself interacts with one's relationships with others, just as an individual's relationship with a spouse affects that individual's romantic relationships with others, or as an individual's relationship with his or her child affects his or her relationships with others. One's relationship with oneself affects and is affected by one's relationships with others. One's attitudes, feelings, and thoughts about self can intervene in communication just as possibly as one's attitudes, feelings, and thoughts about the other. Thus, for example, when one is very critical of oneself, it is harder to accept compliments from others than when one feels pride in oneself. Or, what one thinks someone else means by a compliment may be related to how one thinks about oneself. If, for example, Jack is self-conscious about his looks, and Bob tells him he likes Jack's haircut, Jack may take Bob's comments as sarcasm. To the extent that the purpose of communicating is to be understood, it is important to examine the role of intrapersonal communication in the understanding of interpersonal interactions.

Intrapersonal communication is a complex and complicated system of symbols and meanings. It is

part of everyday life. By including communication with the self in the study of communication, the understanding of the complex set of symbolic interactions that take place in communication is increased. It also has very practical applications. Just as one can learn to communicate better with a coworker or family member, one can learn to communicate more effectively with oneself. One can learn to listen to oneself, to note the ways in which one talks to oneself, and to change that self-talk in order to improve one's relationship with the self.

See also: Interpersonal Communication; Mead, George Herbert; Nonverbal Communication; Relationships, Types of.

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J

JOURNALISM, HISTORY OF

Some form of "news packaging," defined as tailoring news for sale, has likely existed since the first newspapers were published. This entry, however, examines the history of journalism in terms of four basic American eras: the 1830s, the Civil War era, the Watergate era, and the 1980s and beyond. News packaging (not to be confused with distribution techniques of print media) has three crucial definitional elements:

- arrangement of news in formats to make it more appealing, accessible, and readily available while facilitating the ability of consumers to "make sense of" it—that is, making news easier to grasp, absorb, digest, understand, and use,
- 2. efforts to market news as a product, and
- 3. the notion of news as a commodity.

When the term "packaging" was first used in this sense is not clear, but a 1971 book by James Aronson may have been the first with the concept in the title: *Packaging the News: A Critical Survey of Press, Radio and Television.* Since the late 1980s, the term has been widely used, but it must be distinguished from "framing"—also used increasingly interchangeably with "packaging." Framing, however, instead of referring to overt efforts to sell news, concerns how the "packaging" or "framing" of subjects in news accounts shapes the way in which people think about events and issues. Generally not considered a conscious effort, framing is assumed to result from the beliefs and values of content producers as absorbed via cultural heritages.

Over time, the emphasis in news packaging has evolved from helping readers find news quickly to presenting news in ways that help consumers make sense of it. Important impetuses to developments include: (1) the drive to gain readers or viewers—to profit; (2) new technologies; and (3) new media, new ways of conveying news, or reinvented media forms.

The 1830s and the Penny Press

Beginning in the 1830s, a shift occurred away from a partisan press and toward the penny press, which brought profitability to the field and laid the foundation for later news packaging developments. As part of this shift, the interest in news events overtook interest in political essays. Pre-1830s newspapers served political parties and seem to have been aimed at an educated eliteespecially political leadership. Dominated by political content, they had small circulations (averaging approximately 1,000), were expensive, and, with estimated life spans averaging three years, were rarely profitable. Advertising was sold by the square, newspapers were delivered by mail, and unpaid subscriptions caused serious financial problems.

Seeking profits, the first successful penny newspaper editor, Benjamin Day, beginning in 1833, introduced structural changes and news packaging techniques. On the structural level, he established new advertising sales and circulation systems, thereby assuring profits through both. He sold advertising by the line and created street sales of newspapers, charging carriers less when they paid in advance. Solving the deadbeat subscriber problem and establishing a new advertising sales system put newspapers on a solid financial foundation. The first penny newspapers were small enough to be easily carried around, so they could be read as opportunities arose during the day; thus, Day made news more accessible to readers through newspaper price, size, and content.

Day's approach to content especially fits the definition of news packaging. The items were concise and easy to read, and thus they were more accessible to the less educated than were the publications that featured political essays. Day is credited with establishing core news values that have endured, including prominence, proximity, and human interest. Among wittily written and deliberately amusing items, some "stories," such as the great moon hoax, were fabricated for sheer entertainment.

The Civil War and News Innovations

The Civil War era marks a significant turning point in news packaging history. The format became crystallized (in a version that is very similar to the modern newspaper), and several wartime changes consolidated the commercial value of newspapers. Organized business techniques for handling demand, supply, and costs of producing war news increasingly shaped the press, leading to a well-defined business model. People's need to know what might be happening to loved ones away at war and whether the nation might endure created an insatiable demand for news. This unprecedented value attached to newspapers meant news was treated distinctly as a product, as, in the effort to meet demand, more newspaper space was given to war news than had been given to any subject previously.

A style that has come to be called the inverted pyramid was created to standardize the presentation of information. By beginning with summary leads (that explained who, what, when, where, why, and how), an item could quickly provide the readers with the most important elements of news accounts. Some, including J. Cutler Andrews (1970), say the summary lead developed from the use of the telegraph by Civil War correspondents, who had to transmit essential details quickly before sending fuller reports. However, at least one scholar, David Mindich (1998), has attributed the summary lead to a model found in U.S. Secretary of War Edwin Stanton's writing.

Related to the summary lead, multideck headlines (i.e., headlines with multiple divisions, creating subheadlines under the main headline) were used during the war. Prewar headlines were one column wide, and many were "standing heads" (e.g., "By Telegraph") that revealed little if any information about the content to follow. However, headlines became increasingly tailored to stories during the war, and multideck headlines-used on occasion in the New York Herald before 1860became common packaging techniques. The decks gave readers the gist of elements about events being reported, thus making news readily accessible and digestible. As with the summary lead, some have credited these developments to the use of the telegraph by correspondents. Because telegraph lines were unreliable during the war, due to underdevelopment, vulnerability to weather conditions, and to being cut by enemy troops, reporters developed the practice of transmitting the most important details first, followed by full accounts as access to the telegraph permitted. Editors built multideck headlines of those details, packaging the information for readers to absorb quickly.

Other news packaging advances that occurred during the Civil War period include interviews, direct quoting of sources, descriptive techniques adapted from fiction and poetry, use of multiple sources, expansion of evewitness accounts, and illustration. While these were used before the war. none was common, but illustration and interviews became irreversibly integral to news packaging. Before 1860, newspapers had little display material and virtually no cartoons or illustrations, except small woodcuts that were commonly restricted to advertisements. However, to help package war news, magazine publishers hired artists to draw pictures of battles. (Soon after the war, the first illustrated newspaper, the New York Daily Graphic, began, and, in 1880, the first photograph appeared in a newspaper.) Also, interviews, rare before the war, became a fad soon after.

News packaging advanced also as journalists focused on the commodity qualities of news. That is, marketing involves emphasizing the most salable qualities, and the most salable quality of Civil War news was timeliness. Prewar accounts com-



A group of Civil War correspondents gather at the mobile headquarters of James Gordon Bennett's New York Herald. (Corbis)

monly reported events in chronological order, and some were two to three years old, especially those from abroad. One had to read to the end of a story to learn the latest developments of the events that were being reported. During the war, however, demand for the most recent accounts entrenched timeliness as a permanent value, along with factual accuracy. One of the first editors to create a set of written rules to govern the work of journalists was George C. Childs. After purchasing the *Public Ledger* (in Philadelphia) in 1864, Childs listed twenty-four rules to govern the conduct of the journalists who were working for that newspaper.

Following the Civil War, news packaging escalated, especially in an environment influenced by Joseph Pulitzer's successes in the 1880s. Among the many news-selling techniques associated with him are the staging of events to report, undercover reporting, and visuals. The physical appearance of newspapers was changing as well. Departmentalizing content into labeled sections made it easier for the readers to find the subjects that were of the most interest to them, and this approach advanced significantly by the 1890s. Indeed, the notion of news as a commodity was so common that discussions through the last thirty years of the nineteenth century focused on newspapers as businesses. An 1897 article by Lincoln Steffens likened a newspaper to a factory or department store-alluding to the many departments that were by then established in newspapers to separate various kinds of content. Excesses in using gimmicks to sell news turned more attention to the qualities of the product being sold, which in turn provoked efforts to create and maintain "quality control." Such efforts encompassed development of professional organizations, codes of ethics, and journalism education. The latter was especially assisted by Pulitzer's 1904 article that suggested a journalism curriculum and his 1911 endowment of the Columbia University School of Journalism, which opened in 1912. While that packaging stage in newspapers seemingly peaked by 1900, a new media genre two decades later epitomized news packaging. Time magazine was first published in 1923 with a purpose to present weekly digests of the most important news from the nation and the world. Other news magazines soon followed the success of this packaged news medium.

Watergate and the Mass Media

Several factors in the second half of the twentieth century culminated in the late 1970s and early 1980s in an environment that propelled news packaging to an unprecedented degree. One very important factor was the development of image manufacturing to sell political candidates to voters. This practice, which began at least as early as the 1952 presidential campaign, was, by the mid-1980s, entwined with news packaging to a degree that blurred lines between image and news in such events as presidential press conferences, political campaigns, and interviews. Television has so pervasively influenced news packaging as to be perhaps still undistillable. However, one must note at least (1) the power of the television ratings system to compel ever-more enterprising efforts to package news to sell and (2) the creation and perpetuation of the "sound bite" as a packaging technique. These bites, which are snippets of interviews with "experts," are used to distill reports into the most compact form possible and "enhance" the quality of opposing sides. Other factors that propelled news packaging in these years included new media, the spread of communication technologies, and efforts of traditional media to remain competitive in a changing popular culture environment.

A catalyst for consolidating these as an impetus to modern news packaging was a "let-down" in the mid-1970s as the Watergate scandal subsided. The drama of this episode, which led to the first resignation of a U.S. president (in this case, to avoid impeachment over abuse of power), so riveted attention to news reports that its end brought a clear public sense of a news vacuum (ironically, in an era of information overload). Media personnel sought ways to sustain (or recapture) what some have called an almost addictive attention of consumers to the media throughout the Watergate episode. For newspaper journalists, an added perceived need to continue trying to compete with television intensified the search for ways to sell news, and by the spring of 1983, scholar Ben H. Bagdikian referred to a "passion for an unholy trinity sweeping all American media-packaging, marketing, and graphics."

The 1980s and Beyond

A newspaper intended to present news as a package appeared in 1981. USA Today, called a "new medium" and "experimental little newspaper," came with a promise that it "would be easy and fun to read." Advance research, called the most thorough ever on behalf of a newspaper, had sought how, where, and what length to publish stories for optimum sales. The resulting news package included short items; no jumps; lots of charts, graphs, and color; and information presented so it could "be absorbed quickly." A departmental managing editor described the aim as simple presentations that communicate a sense of urgency; clear, straightforward writing; photographs of "what has happened today or what's coming"; "fact-filled" and "vibrant" graphics; and "urgency" in headlines (Seelye, 1983). By the late 1990s, these packaging elements were commonplace in newspapers across the nation.

Criticism has probably always accompanied news packaging. James Parton wrote in 1866 of watching a "respectable New Yorker" observe a penny newspaper for the first time: "[H]e gazed at it . . . with . . . mingled curiosity and contempt." However, modern trends may have produced more criticism than did past developments. By 1990, news packaging, which has always seductively flavored information with ingredients to amuse, aroused strong criticism for mixing information and entertainment in televised magazines. These shows came to be derisively called "infotainment," as current-affairs programmers, in an attempt to compete with "melodramatic pseudo-documentary and talk shows," borrowed the theme music of television programs and used simulations and reenactments-too often without identifying the latter as such. Furthermore, as Rae Corelli (1989) has pointed out, the appearance of television magazine journalists in situation comedies and dramatic series (to enhance the salability of both genres) blurred even further the lines between informational and noninformational programs. A statement by Bagdikian (1983) distilled enduring concerns as he spoke (referring to USA Today) of "the primacy of packagers and market analysts in a realm where the news judgment of reporters and editors has traditionally prevailed." And Lynn Staley, in 1998, complaining about an increasingly blurred line between hard and soft news, said "packaging the news is getting trickier as words and pictures have to be balanced carefully to reflect what is substantial [versus what is] sensational."

With the expansion of the Internet, online publishing capabilities are still being defined and assessed, but John Pavlik (1997) has already referred to the work as involving "repackaging" information. Doug Underwood (1992), who said that modern news packaging trends made "news into just another commodity," predicted that, as newspapers joined "electronic competition," reporters would be "ever more subject to the forces of technological change, the demands of perpetually updating the news for electronic services, and the pressure to think of their work in marketing terms." Thus, news packaging appears certain to reach new levels in cyberspace.

See also: Bly, Nellie; Hearst, William Randolph; Internet and the World Wide Web; Journalism, Professionalization of; Magazine Industry; Magazine Industry, History of; Murrow, Edward R.; News Effects; Newspaper Industry; Newspaper Industry, History of; News Production Theories; Pulitzer, Joseph.

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JOURNALISM, PROFESSIONALIZATION OF

Contemporary mass communication scholars, as well as some journalists themselves, still debate whether journalism is, or even whether it should be, a profession. But certainly, during the past 250 years, journalism in America has evolved toward professional values, from the one-person printing operations of the Colonial period to the division of labor of the antebellum newsroom and the emergence of reporters in the mid-1860s to the more sophisticated understanding of the social role and responsibility of mass media of the early twentieth century.

To qualify as a profession, an occupation should be founded on a body of specialized knowledge over which the professional gains authority through specialized education and training; furthermore, a professional has a large degree of autonomy from outside censure and is regulated by an internal code of ethics and by the sanction of fellow professionals through professional associations. On a moral level, a profession provides society with a service that no others can. These defining characteristics are based on those of classic professions such as medicine and law. Many critics claim that journalism hardly fits them, because of the lack of educational requirements and licensing, among others. These critics also point out that unionization of such journalists as daily newspaper reporters, which is commonplace, limits autonomy in the sense that unionized employees are not free as individuals to set their own workplace rules. Other critics respond that journalists possess the most important professional feature-a higher calling to work fundamentally not for personal pecuniary gain but for public service.

By the 1830s, journalism in the United States had become a full-time occupation and the "professional communicator" developed-someone whose thoughts have no necessary relation to the message. The professionalization of journalism emerged visibly after the U.S. Civil War, with the establishment of professional associations, standards and codes of ethics, and education programs. For example, Cornell University was offering a "certificate of journalism" in 1873, and Joseph Pulitzer, founder of the New York World, endowed Columbia University in 1903 to found a journalism school. The Missouri Press Association was formed in 1876, and it established its own ethical code. Edwin Shuman published perhaps the first comprehensive journalism textbook, Steps into Journalism, in 1894.

Unquestionably, the most evident sign of change toward more professional journalism was

the parallel emergence in the late nineteenth century of the ultimate journalistic value: objectivity. Partly in reaction to the sensationalistic excesses and the blunt commercialism of yellow journalism in the 1890s, journalists sought professionalization, and its norm of objectivity, as a way to make their occupation more respectable and socially responsible. The reforming impetus of progressivism also spurred journalists to detach themselves from crass circulation battles and fight for social enlightenment. Michael Schudson, in Discovering the News (1978), argues that professionalism was a way to strive for more objective reporting. According to Dan Schiller (1979), objectivity also helped commercial newspapers legitimate their function as watchdogs of the public good. While allowing journalists to be independent from the self-interests of business and politicians, objectivity has also come under attack for thwarting the autonomy of journalism-a critique attached to professionalism itself. While some envision professionalism as the opposite of bias, others charge professionalism with serving as a method of control by management over reporters and editors (a co-opting of labor unrest) that ultimately standardizes news content and protects the status quo. In this view, Douglas Birkhead (1984) argues that the professionalization of journalism is so opposed to independence in favor of business interests as to be "a perversion of the ideal."

Somewhat paradoxically, other critics of professionalism and objectivity who also follow the "power approach" charge that the autonomy of journalists functions as a profit- and prestigeseeking device, which makes journalists detached from the public and socially irresponsible. They accuse objectivity of downgrading the journalist from critic to mere reporter of facts, a "communication technician." This criticism found voice in the social responsibility theory of the press early in the twentieth century; the theory, best expressed by the Hutchins Commission Report in 1947, holds that there is no freedom apart from responsibility, so a free press should perform a certain service for society and some institution (the government) must make it do so. Attacking objectivity, this theory holds that the public is served not only by facts but by context that can point to conclusions (i.e., interpretation). While journalists had been instrumental in developing a socially responsible press to give credibility to their occupation, most balked at the Hutchins Report because of its hint at governmental censorship and disregard for the prevailing libertarian view of press freedom. (Some consider it a sign of professionalism that journalists have been active in "political agitation" over a free press.) The contemporary product of this theory-public journalism-can also be seen as both a development and a threat to professionalism. If professionals have as their ultimate goal serving and improving society, then public journalism follows quite naturally. But some see it as the opposite of professionalism and objectivity, which they criticize for shielding journalists from true public service. Other critics of professionalism argue that it stifles diversity and even that the "institutionalized mentality" it breeds restricts press freedom.

Finally, the question remains whether journalists see themselves as professionals; several scholars tend to agree that journalists do indeed. Penn Kimball, in the defining article "Journalism: Art, Craft, or Profession?" (1965), claimed journalists are "pros" because of their higher calling, their special role in society, and the need they have for both schools and associations to develop a professional ethic outside of a formal code. While journalism might not be a classic profession in the organizational sense, journalists are found to espouse professional values such as commitment to public service, autonomy, and a sense of "calling." In their germinal study, "Professionalization Among Newsmen" (1964), Jack McLeod and Searle Hawley Jr. concluded that professional journalists gave much importance to objectivity and responsibility in newspapers. Slavko Splichal and Colin Sparks (1994) noted a shared positive attitude toward professionalization (especially as occupational autonomy) in aspiring journalists across twenty-two countries worldwide. Whether this global trend will create a corps of independent-minded, socially responsible, and useful professional journalists, or whether it is an indication of cultural imperialism in the interests of big business, remains open to debate.

See also: Cultural Studies; Culture Industries, Media AS; Democracy and the Media; First Amendment and the Media; Functions of the Media; Globalization of Media Industries; Journalism, History of; News Production Theories; Pulitzer, Joseph; Social Change and the Media; Society and the Media.

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KNOWLEDGE MANAGEMENT

The basic challenge in knowledge management is learning how to design an organization's strategy, structure, and systems so that the organization can use what it knows to innovate and adapt. Although the field of knowledge management is still evolving, its terrain may be surveyed by focusing on two themes: the structure of organizational knowledge (i.e., the nature of knowledge in organizations and what makes it distinct from other forms of knowledge) and the processes by which organizations turn knowledge into action and results (i.e., how organizations create, share, and use knowledge).

Data, Information, Knowledge

Information and knowledge are the outcomes of human action and cognition that engage signs, signals, and artifacts in social and physical settings. Knowledge builds on an accumulation of experience. Information depends on an aggregation of data. Consider a document that contains a table of numbers that indicate product sales for the quarter. As they stand, these numbers are data. An employee reads these numbers, recognizes the name and nature of the product, and notices that the numbers are below last year's figures, indicating a downward trend. The data has become information. The employee considers possible explanations for the product decline (perhaps using additional information and personal judgment) and comes to the conclusion that the product is no longer attractive to its customers. This new belief, derived from reasoning and reflection,

is knowledge. Thus, information is data that is given context and vested with meaning and significance. Knowledge is information that is transformed through reasoning and reflection into beliefs, concepts, and mental models.

Types of Organizational Knowledge

Knowledge in organizations is not monolithic, nor is it homogenous; knowledge evolves from different origins and is engaged in different ways. Research suggests that organizational knowledge may be divided into tacit knowledge, explicit knowledge, and cultural knowledge.

Tacit Knowledge

In organizations, tacit knowledge is the personal knowledge used by members to perform their work and to make sense of their worlds. It is learned through extended periods of experiencing and doing a task, during which time the individual develops a feel for and a capacity to make intuitive judgments about the successful execution of the activity. Examples of tacit knowledge at work would be the technician who can tell the health of a machine from the hum it generates, or the bank manager who develops a gut feeling that a client would be a bad credit risk after a short conversation with the customer. Because tacit knowledge is experiential and contextualized, it cannot be easily codified, written down, or reduced to rules and recipes.

Despite its being difficult to articulate, tacit knowledge can be and is regularly transferred and shared. Tacit knowledge can be learned through observation and imitation. Thus, apprentices learn their craft by following and copying their masters, professionals acquire expertise and norms through periods of internship, and new employees are immersed in on-the-job training. According to Donald Schⁿ (1983), professionals reflect on what they know during the practice itself (e.g., when they encounter an unusual case) as well as afterward (e.g., in a postmortem) and, in doing so, test and refine their own tacit knowledge. Tacit knowledge can also be shared. Although not completely expressible in words or symbols, tacit knowledge may be alluded to or revealed through rich modes of discourse that include the use of analogies, metaphors, or models and through the communal sharing of stories. Storytelling provides channels for tacit learning because narratives dramatize and contextualize knowledge-rich episodes, allowing the listener to replay and relive as much of the original experience as possible.

Ikujiro Nonaka and Hirotaka Takeuchi (1995) emphasize that tacit knowledge is vital to organizations because it is an important source of new knowledge. New knowledge in the form of discoveries and innovations is often the outcome of creative individuals applying their tacit insights and intuitions to confront novel or difficult problems. Because tacit knowledge resides in people's minds, it is lost when employees leave the organization.

Explicit Knowledge

Explicit knowledge is knowledge that is expressed formally using a system of symbols and can therefore be easily communicated or diffused. Explicit knowledge may be object based or rule based. Object-based knowledge may be found in artifacts such as products, patents, software code, computer databases, technical drawings, tools, prototypes, photographs, voice recordings, films, and so on. Knowledge is object based when it is represented using strings of symbols (e.g., words, numbers, formulas) or is embodied in physical entities (e.g., equipment, models, substances). In the first case, the symbols directly represent or codify the explicit knowledge. In the second case, explicit knowledge may be extracted from the physical object by, for example, disassembling equipment, inspecting software code, or analyzing the composition of a substance. Explicit knowledge is rule based when the knowledge is codified into rules, routines, or operating procedures. A substantial part of an organization's operational

knowledge about how to do things is contained in its rules, routines, and procedures. Although all organizations operate with standard procedures, each organization will develop its own repertoire of routines, based on its experience and the specific environment in which it functions.

Patrick Sullivan (1998, p. 23) discusses an organization's explicit knowledge that takes the form of "intellectual assets," which he defines as "the codified, tangible, or physical descriptions of specific knowledge to which the company can assert ownership rights." Examples of intellectual assets may include plans, procedures, drawings, blueprints, and computer programs. Intellectual assets that receive legal protection are intellectual property. Five forms of intellectual property are entitled to legal protection in the United States: patents, copyrights, trade secrets, trademarks, and semiconductor masks.

Explicit knowledge codified as intellectual assets is valuable to the organization because it adds to the organization's observable and tradable stocks of knowledge. Moreover, because they have been committed to media, ideas may be communicated more easily. Explicit knowledge serves a number of important purposes in an organization. It encodes past learning in rules, coordinates disparate organizational functions, and signifies competence and rationality. Because explicit knowledge has been codified, it remains with the organization even after its inventors or authors leave the organization.

Cultural Knowledge

An organization's cultural knowledge consists of the beliefs it holds to be true based on experience, observation, and reflection about itself and its environment. Over time, an organization develops shared beliefs about the nature of its main business, core capabilities, markets, competitors, and so on. These beliefs then form the criteria for judging and selecting alternatives and new ideas, and for evaluating projects and proposals. In this way, an organization uses its cultural knowledge to answer questions such as "What kind of an organization are we?" "What knowledge would be valuable to the organization?" and "What knowledge would be worth pursuing?"

Cultural knowledge includes the assumptions and beliefs that are used to describe and explain reality, as well as the criteria and expectations that are used to assign value and significance to new information. These shared beliefs, norms, and values form the sense-making framework in which organizational members recognize the saliency of new information. Although cultural knowledge is not written down (but is conveyed in stories, histories, and reward or evaluation systems), it remains with the organization even after employee changes and staff turnover.

There are well-known accounts of organizations in which cultural knowledge is misaligned with its efforts to exploit tacit and explicit knowledge. For example, Xerox PARC (Palo Alto Research Center) in the 1970s pioneered many innovations that later defined the personal computer industry but which Xerox itself did not commercialize. PARC had invented or developed the bit-mapped display technology that was required for rendering graphical user interfaces, software for on-screen windows and windows management, the mouse as a pointing device, the first personal computer (Alto), and an early wordprocessing software (Bravo) for the Alto. Xerox was not willing to realize the application potential of these inventions because its identity and business strategy was still focused on the photocopier market. Many of the researchers working on these projects subsequently left PARC, taking their knowledge with them.

Knowledge Creation

Nonaka and Takeuchi (1995, p. 59) suggest that the production of new knowledge involves "a process that 'organizationally' amplifies the knowledge created by individuals and crystallizes it as a part of the knowledge network of the organization." Two sets of activities drive the process of knowledge amplification: (1) converting tacit knowledge into explicit knowledge and (2) moving knowledge from the individual level to the group, organizational, and interorganizational levels. An organization creates knowledge through four modes: socialization, externalization, combination, and internalization.

Socialization is a process of acquiring tacit knowledge through sharing experiences. As apprentices learn the craft of their masters through observation and imitation, so do employees of a firm learn new skills through shared activities such as on-the-job training. Externalization is a process of converting tacit knowledge into explicit concepts through the use of abstractions, metaphors, analogies, or models. Combination is a process of creating explicit knowledge by bringing together explicit knowledge from a number of sources. For example, individuals exchange and combine their explicit knowledge through conversations, meetings, and memos. Computerized databases may be "mined" to uncover new explicit knowledge. Finally, internalization is a process of embodying explicit knowledge into tacit knowledge, internalizing the experiences that are gained through the other modes of knowledge creation in the form of shared mental models or work practices.

Knowledge Sharing

Promoting the effective sharing and transfer of knowledge is often the centerpiece of knowledge management initiatives. Unfortunately, there are significant cognitive, affective, and organizational barriers to knowledge sharing. Cognitively, the individual who is transferring knowledge must put in mental effort to explain new concepts, demonstrate techniques, answer questions, and so on. Affectively, the individual may experience regret or reluctance about losing ownership of hard-earned expertise. Organizationally, individuals are not rewarded for solving another person's problems, nor are they usually given the time or support needed to share information. There are also cultural factors in most organizations that inhibit knowledge sharing. Thomas Davenport and Laurence Prusak (1998) consider the most common inhibitors to be lack of trust, different frames of reference, lack of time and opportunity, rewards going to those who own knowledge, lack of capacity in recipients to absorb new knowledge, the not-invented-here syndrome, and intolerance for mistakes.

Max Boisot (1998) points out that diffusion of organizational knowledge is increased and accelerated by the codification and abstraction of personal knowledge. Codification is the process that creates perceptual and conceptual categories that facilitate the classification of phenomena. Whereas codification groups the data of experience into categories, abstraction is accomplished by revealing the structure and cause-and-effect relationships that underlie phenomena. It leads to knowledge that is based on abstract thought and is mainly conceptual and broadly applicable. The more codified and abstract an item of knowledge becomes, the larger the percentage of a given population it will be able to reach in a given period of time.

Knowledge Use

The use of knowledge is a social activity. Whenever organizational knowledge is put in use, its tacit, explicit, and cultural facets bind together in a flow of practice and social interaction. Work groups form around these practices, creating communities of practice. Communities of practice emerge of their own accord and tend to self-organize; people join and stay because they have something to learn and to contribute. By sharing and jointly developing practice, communities of practice evolve patterns of relating and interacting with one another. Over time, they develop a common understanding of the meaning and value of their work, as well as a shared repertory of resources that include both the tacit (e.g., "war stories," workarounds, heuristics) and the explicit (e.g., notebooks, tools, communication devices). Communities of practice therefore constitute historical and social settings that embrace all three categories of organizational knowledge.

Knowledge Management in Practice

A thorough understanding of knowledge management can best be obtained by examining specific examples of the process being put into practice. Two good examples are the Xerox Eureka project and the consulting firm of PricewaterhouseCoopers.

Xerox Eureka

The Eureka project at Xerox is an example of how an organization can tap into the tacit knowledge of its employees, codify that knowledge, and facilitate its diffusion and use. Eureka is also an illustration of how an organization can balance the need for looseness and improvisation with the need for structure and control when managing its knowledge.

In the early 1990s, Xerox was employing approximately twenty-three thousand technicians around the world to repair copiers at client sites. Some of the repair solutions existed only in the heads of the experienced technicians, who had found ways of dealing with tough machine-repair problems. Xerox developed Eureka as a system of practices, procedures, and tools that would allow the personal knowledge of technicians to be validated and shared. Eureka was initially developed by Xerox PARC and deployed in 1992 for service representatives in Xerox France. By the end of 1999, more than five thousand tips had been entered, and they were available to Xerox service representatives worldwide via their laptop computers.

The following is how Eureka works. Customer service representatives who are on site visits discover solutions to difficult repair problems. They submit these tentative solutions into a "pending tips" database. Pending tips are voted and commented on by other technicians when they try these tips to solve customer problems. Tips that are validated by product leaders or specialists are then edited and entered into the "validated tips knowledge base." Service representatives are motivated to use Eureka because of its problem-solving benefits. They are motivated to contribute to it by personal recognition (e.g., their names are attached to the tips they submit) and by prizes for frequently used tips.

Priscilla Douglas (1999, pp. 217–218) of Xerox described the effect of Eureka as follows:

Technically, Eureka is a relational database of hypertext documents available online via the Intranet. It can also be viewed as the distributed publishing of local community know-how. In practice, Eureka is an electronic version of war stories told around the water cooler—with the added benefits of a user-friendly search engine, institutional memory, expert validation, and corporate-wide availability. It is a way to simultaneously grow both intellectual capital and social capital.

Eureka saves Xerox about 5 percent on labor and another 5 percent in parts costs in field customer service. It is being used by 15,000 Xerox technicians worldwide. Tom Ruddy, Xerox's director of knowledge management for worldwide customer services, estimates that Xerox will eliminate approximately 150,000 calls per year with Eureka—worth \$6 million to \$8 million. Savings should actually be higher, since Xerox has implemented the system in its call centers, increasing the expected number of users to more than 25,000.

PricewaterhouseCoopers

Consulting firms recognize that their products and services are based almost exclusively on knowledge, and many are active in implementing strategies that leverage their internal knowledge. Organizationally, the approach of PricewaterhouseCoopers (PwC) is based on a four-level structure for managing knowledge:

- 1. The Global KM Management Team coordinates the overall PwC approach to knowledge management and implements specific, key enterprise-wide initiatives.
- 2. The KM Council (composed of the Global KM Core Team, lines of service chief knowledge officers, and representatives from stakeholders throughout the firm) coordinates global efforts with those of lines of business and industry clusters.
- 3. The KM Action Committees are responsible for areas such as content architecture, best practices, knowledge management technologies, professionalism, and people information.
- 4. The KM Communities of Interest (which comprise approximately one thousand professionals, knowledge managers, researchers/ analysts, information specialists, and extranet owners) share innovative thinking in the knowledge management area.

To promote knowledge management as a professional career, the firm has developed a competencies framework and a set of professional principles. Thus, the primary mission of a knowledge management professional is to harvest, share, and build PwC's intellectual capital. Bonuses, promotions, and partner admissions are linked to knowledge sharing. For example, partners are formally assessed on their ability to foster knowledge sharing, and everyone from new hires to partners are encouraged and recognized for their knowledge creation and sharing activities. The firm encourages knowledge sharing by including the names of contributors on documents in knowledge stores, by providing publicity on individuals who make the extra effort to share knowledge, by sending thank-you notes from partners and peers to personnel files, and by awarding "Knowledge Bucks" prizes and spot bonuses (Hackett, 2000).

PwC sees its investment in knowledge management as highly strategic; knowledge sharing increases customer satisfaction and revenues while providing the firm with a competitive advantage. Brian Hackett (2000, p. 66) relates the following example: In one instance, PwC was providing auditing work to a global client. PwC became aware that the client was dissatisfied with an electronic commerce project that was being conducted by another consulting company. Asked to develop a proposal in one week, this auditing team had to quickly locate PwC's expertise in another area, find expertise pertinent to the client's industry, and develop a responsive proposal. Using PwC's vast network of internal databases, KnowledgeCurve, and other sources, the team located a partner who specialized in e-commerce, another partner with the appropriate industry expertise, database experts, and a change management expert. In less than a week, PwC effectively maximized its internal talent and produced a winning proposal.

Both Xerox and PwC are finding ways to use tacit, explicit, and cultural knowledge to improve corporate performance. In each case, knowledge management is a formal activity.

See also: Chief Information Officers; Knowledge Management, Careers in; Management Information Systems.

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KNOWLEDGE MANAGEMENT, CAREERS IN

Once upon a time an article about careers might well have described a "career ladder." The concept was a useful one when organizations were hierarchical in nature and one might progress step by step ever higher in the management hierarchy. Many research studies of such diverse careers as college presidents, career army officers, directors of academic libraries, and chief executive officers concluded that successive positions followed a predictable upward pattern (i.e., a career ladder).

At the beginning of the twenty-first century, however, the comfortable clarity and stability that the hierarchy offered is gone. David Skyrme (1999), a frequent writer on knowledge management (KM) topics, summarizes the transformation in business and society that has taken place in the "networked knowledge environment." The defining characteristics of networked organizations, according to Skyrme, are not so much particular organizational structures as they are informal human networking processes with the information technology that "underpins and enhances human networking" (p. 15). New ways of working in these environments include self-managed teams, virtual teams, flexible offices, and teleworking. The transition from a hierarchical organization to a postmodern environment can be characterized as "a series of interwoven projects defined by the sense-making and learning of its participants" (Addleson, 2000, p. 151).

The learning organization places less emphasis on rules, detailed specification of tasks, and error avoidance than on creative chaos, risk-taking, and error detection and correction. Organizations that tend to have knowledge management initiatives also usually have (1) senior management who believe that organizational learning and knowledge management are critical success factors, (2) an organizational culture focused on rapid growth, often driven by outside competitors, (3) internal trust, leading to a willingness to share knowledge, and (4) a strong customer orientation.

An IBM-supported study of twenty chief knowledge officers (CKOs) in North America and Europe sought to determine commonalities in the roles and to explore current and evolving knowledge management practices. The model CKO in this study is both a technologist and an environmentalist. He or she (many are female) has a responsibility "to encourage and initiate investment in information technology (IT) and also in the social environment" (Earl and Scott, 1999, p. 6). Most of the CKOs interviewed lacked formal IT training but had past involvement with IT projects. The first initiative for a CKO is often technological-building knowledge-sharing tools such as groupware projects, knowledge directories, and intranets. In the organizational domain, the CKOs create social environments and initiate events and processes to encourage knowledge creation and exchange-for example, through the design of space and by sponsoring events that bring people together to create communities with common interests. Part of the CKO's job as environmentalist involves a radical redesign of performance measurement systems in order to encourage collective, rather than individual, performance. The CKO also works with any educational or organizational development opportunities as a means of encouraging knowledge creation.

CKOs are change agents and entrepreneurs. They have a broad view of the organization and the ability to think strategically. Most CKOs have held a variety of jobs; no one professional background is dominant. They usually have had a number of years of experience in the organization (typically about ten years) and have established a reputation for credibility. Knowledge of the organization and its culture "yield advantages in the consulting and influencing aspects of the job" (Earl and Scott, 1999, p. 8).

CKO positions are new. All those who held the title in the IBM study were the first incumbents in the role. They operate with small budgets and staff. Most view their roles as temporary because once the goal of "embedded knowledge capacity" has been achieved, a knowledge management office and implementation team may not be needed. It is not clear, however, what would mark the attainment of the goal as objective measures of performance are often lacking, despite the demand for measures of knowledge and intellectual capital.

Another study, commissioned by the Library and Information Commission of the United Kingdom and undertaken by TFPL (1999), sought to determine the routes available to people wishing to develop knowledge management skills. Rather than studying the CKO, the emphasis in this study was on knowledge management facilitation roles. As is true of the appointment of a CKO, the first members of the knowledge management team are usually internal, perhaps for two reasons: (1) those who are already members of the firm are more apt to have important tacit knowledge about the organization and how it works and (2) personnel needs in this area are difficult to define and classify. As the concept of knowledge management has become more accepted and pervasive, external recruitment procedures have been established.

One search company, KnowledgeJobs (2001), specializes in knowledge jobs and provides a classification of them. In a similar manner, Nigel Oxbrow (2000) identifies a number of special roles such as knowledge management consultant, intranet manager, content manager, extranet manager, communities coordinator (to identify and stimulate communities of interest and communities of practice), and knowledge architect (to design structures for information resources, taxonomies for more accurate retrieval of information, and expertise databases).

These categories appear to be influenced by past experience, education, and job titles, rather than by identifying new knowledge, skills, and attitudes. The TFPL study identified a knowledge management skill set to include the following: business process identification and analysis; knowledge asset identification, creation, maintenance, and exploration; knowledge mapping and flows; the ability to leverage information and communication technology to create knowledge management enablers; project management; an understanding of information management (IM) and awareness of technology opportunities. To this list, Skyrme (1999) would add financial management skills, knowledge of how people learn, and how knowledge is developed, shared, and reviewed.

Information management skills are important, but people who demonstrate these skills do not necessarily come from the information profession. No one profession or function comprehends the whole picture of corporate information flows. Historically, different types of information have been treated as discrete entities, with the library/information profession focusing largely on external information and records management focusing on internal information. Other functions with information management capability include market research, strategic planning and competitive intelligence, customer relations, sales, technical support, research and development, and information technology.

For people to take advantage of knowledge management opportunities means they must develop a wide horizon and focus on the business objectives of the organizations that employ them. Jo Cates (2000), a knowledge manager for the Ernst and Young Center for Business Knowledge, offers tips for those people who are seeking career positions in the knowledge management field. She points out that most positions require industry experience, but she also notes that no field has a lock on these positions. She encourages attention to the presentation of skill sets on resumes; for example, she suggests adding "synthesis" to research skills and "taxonomy management" to cataloging skills.

Certainly, visibility and operational (or organizational) knowledge are important. Temperament probably plays a role in most successful careers as well. The need for a "match" between the person and the job is commonly discussed. The typical

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profile of a knowledge manager seems to include an outgoing personality, strong interpersonal skills, a high level of energy, a pragmatic and flexible cast of mind, high tolerance of ambiguity, and a sense of, and commitment to, business imperatives. Given the apparent growth of the knowledge management function within organizations, the number and kinds of positions below the CKO is expanding, although probably not indefinitely. For those people who are willing to take the leap, opportunity awaits.

See also: Chief Information Officers; Knowledge Management; Organizational Communication.

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KNOWLEDGE ORGANIZATION

See: Cataloging and Knowledge Organization

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LANGUAGE ACQUISITION

Human language is a remarkable symbolic means of communication that makes it possible for individuals to convey their thoughts and feelings to others. Although babies are born completely without language, by the time they are three or four years old, children have acquired thousands of vocabulary words, complex grammatical and sound systems, and the ability to speak appropriately in many different social situations. Although societies around the world differ in many ways, language is a universal phenomenon, and children around the world acquire their native language in very similar ways.

The Structure of Language

All human languages include a number of systematic features that the young learner must master. Languages are organized hierarchically and include a number of subsystems. The systems of language include phonology, morphology, the lexicon and semantics, syntax, pragmatics, and discourse. Children begin to acquire some aspects of their language during their first few months of life.

The phonology of a language is its sound system. This system includes all of the significant sounds that are used in the language, as well as the ways in which they can be combined to make acceptable-sounding new words. For example, a new cereal in English might be called "Crunchix," but not "Kshicrun," because acceptable English words cannot begin with "kshi." Across the world, languages use many hundreds of different sounds, from trills on the tongue to scrapes in the throat, but each language employs only a small subset of these possible sounds. The sounds that the speakers of a language regard as different from one another are its phonemes. In English, for example, people make slightly different "p" sounds in words such as pool, where the "p" is followed by a puff of air (aspiration), or in words such as spool, where there is no puff of air following the "p." English speakers perceive these as just one sound, the phoneme "p." In the Hindi language spoken in India, however, the "p" without the puff of air and the "p" with the puff of air are different phonemes. The Hindi language has words such as phal ("fruit") and pal ("moment") that differing only in that puff of air. Some languages have many more phonemes than others, but it is typical for a language to have about twenty-six consonant and nine vowel phonemes. In written English, the alphabet does not always represent the sounds of the language clearly or consistently, but in Spanish or Russian, the sounds of the language and the letters used to represent them correspond quite well.

The morphology of a language is a set of rules for word formation and variation. (The term "rules" is used to refer to the way things are regularly done in a language by speakers of that language, not to a set of formal regulations that are taught in school.) Morphemes are the smallest units in a language that carry definable meaning or grammatical function (the word "hat," or the plural ending "-s," for example.) Addition of a morpheme can change a word from singular to plural or indicate the tense of a verb. Other morphological rules allow one word to be changed into another word (e.g., "fit" into "unfit") or into another part of speech (e.g., "fit" into "fitness").

The lexicon and semantics of a language are its vocabulary words and the meanings that go with them. Speakers of a language have a remarkably large and complicated mental lexicon or dictionary. English-speaking adults can recognize more than 50,000 different words, and in common speech, they can come up with or produce anywhere from 20,000 to 50,000 of those words.

The syntax of a language includes the ways that words can be combined or rearranged in order to produce different kinds of utterances (e.g., questions, negatives, imperatives, and passives). Children soon learn to understand syntax—such as the difference between "The tiger chases the girl" and "The girl chases the tiger." In English syntax, meaning depends on word order. Typically, the first noun in a sentence is the subject, and the next is the object. Subjects are often followed by verbs. All sentences do not follow this pattern in English, however, and children must learn to interpret passives and other complex constructions. Complex syntax is not mastered until well into the school years.

Pragmatics is the appropriate use of language in various social situations. People all know how to talk in different ways, depending on the situation they are in, or the person they are addressing. People speak differently to babies, to informal acquaintances, and to people in authority, for example. If people are called into court, they do not say "Hi, sweetie" to the judge, although they might say this to their neighbor's little girl; people's knowledge of pragmatics leads to their choice of words and their interpretation of the language that they hear in social situations. Depending on their own roles, the person they are addressing, and the situation they are in, speakers vary their language according to a complex set of pragmatic conventions. Parents stress the importance of pragmatics when they teach very young children social routines, such as when to say "hello," "thank you," and "bye-bye."

Children must gain an understanding of how connected sentences are related to each other. In English, people must use a noun before a pronoun referring to the same thing can be used. Thus, "My dog ate it" is not a good way to begin a conversation with one's teacher, but saying "it" makes sense if the teacher has just asked where the student's homework is, since, in this case, the "it" refers to the homework. How to make a conversation or engage in other spoken or written activities that last longer than a single sentence requires knowledge of the discourse conventions of a language. After children enter school and begin to gain literacy skills, learning to use all of the discourse rules that are involved in expository writing is a particularly difficult task.

Stages of Language Acquisition

Understanding how children acquire language makes it possible to identify instances where they may not be developing language in an age-appropriate way, and may need intervention or remediation. It also allows people to know when immaturesounding language is part of normal language acquisition (such as when a two-year-old says "top" instead of "stop," since it is normal for a child of this age to simplify the pronunciation of consonant clusters). Knowing what stage of language development a child has reached also makes it possible for people to interpret what the child says and to tailor their own language so that communication is effective.

At birth, infants are prepared to learn any language. For example, an American baby adopted by an Inuit-speaking Eskimo family would grow up speaking fluent Inuktitut and have no trouble saying words such as *qikturiaqtauniq* ("mosquito bite"). However, even before their first birthdays, babies begin to lose the ability to hear the distinctions among phonemes in languages other than their own. By around the age of six months, babies have already begun to hear the sounds of their own language in the same way that adult speakers do, as Patricia Kuhl and her associates (1992) have shown in their research.

Human infants are intensely social; even in the first few days of life, they look into the eyes of their mothers and are sensitive to the emotional tone of the human voice. Long before they say their first words, babies begin to acquire the communicative skills that underlie language. As they get a little older they begin to take their turn in little "conversations" with their caregivers. The adult speaks, and the baby's turn can be something as simple as a sneeze or a burp. As they near their first birthday, many babies understand fifty or more words and can point out the right person when asked "Where's mommy?" They show that they are intentional communicators even before they begin to talk, by using gestures, by using con-



A sixteen-month-old child learns body part terms by touching the part of a stuffed lion that corresponds to the mother's "Where is ...?" questions. (Laura Dwight/Corbis)

sistent word-like sounds, and by becoming insistent when they are not understood.

As their communicative skills grow, the ability of infants to produce speech sounds also develops. They begin to babble, or play with sounds, midway through the first year. At first, babbling may consist of just a few sounds. Soon, the infant begins to babble repeated syllables, such as "dada" and "baba." A little later, many babies babble long sequences of syllables that resemble the sentences of their language. Communicative development in the first year has universal features and occurs in this way in all parts of the world, regardless of the degree of sophistication of the culture or complexity of the language being learned. First words emerge during the babbling stage and are produced by many infants at about the same age when they take their first steps, around their first birthday or a little later.

Once babies have begun to produce a few words, they begin to use them for a number of purposes. The earliest words children acquire refer to things in their immediate world that are important to them. They learn the names of their relatives (e.g., their mommy or daddy) and words referring to food, to games, toys, animals, body parts, and simple actions (e.g., eat, sit, up, down). Babies tend to learn the names of things that move or that they can act on (e.g., a mitten or ball) rather than something that is not related to their everyday activities (e.g., the sky or a floor). Early words represent different parts of speech, such as nouns, verbs, and adjectives, although nouns tend to make up the largest category. These words are also simple in terms of their pronunciation and generally not more than two syllables long. Infants use their single words in fairly complex ways. They may say "cookie," meaning "I want a cookie" or "that is a cookie" or "another cookie." In this one-word stage of language acquisition, children are restricted to the here-and-now. They do not talk about the future or the past.

Late in the second year, after they have acquired about fifty words, children begin to put

the words together into little two-word sentences. Children's early two-word utterances also have universal characteristics. Children around the world are trying to get across very much the same kinds of ideas. They want to ask for more of something ("more cookie"), to reject something ("no sock"), to notice something ("hi, doggie!"), or point out that something has disappeared ("allgone milk"). These early word combinations are called telegraphic utterances, because the child makes them without articles, prepositions, inflections, or other little grammatical words, and they sound like telegrams. The child can now say such things as "That kitty," meaning "That is a kitty," and "Mommy sock," meaning "Mommy's sock" or "Mommy, give me my sock" or "Mommy is putting on her sock." The telegraphic utterances become longer as the child gains language ability and becomes able to say even more things. Although the language of toddlers is similar across all languages during the telegraphic stage, what is acquired next depends on the structure of the language that the child is learning.

As the child's utterances grow longer, grammatical forms begin to appear. In English, children begin to add articles, prepositions, and inflections to their language. English-speaking children learn the articles "a" and "the," but in languages such as Chinese or Russian, which do not have articles, they learn other things. One remarkable discovery has been that children acquiring a given language follow essentially the same order of acquisition. As the vocabulary of young children continues to grow they gain a knowledge of morphology even before they enter kindergarten that allows them to make plurals or past tenses of words they have never before heard. In fact, when a young child says "mouses" instead of "mice," this is good evidence that the child is learning the regular forms of the language and knows how to make plurals, even if he or she has not yet learned the irregular forms. Almost all preschool children produce regularized plurals and past tenses such as "gooses" and "ringed" as they acquire the systematic aspects of their language. By the time they enter school, children also know how to make all of the basic sentence types of their language, and they can use them in connected discourse.

Although the basics of the language are acquired in the first few years of life, there is much

to be accomplished during the school years as well. By the age of six, children have acquired approximately fourteen thousand words, as the linguist Eve Clark (1993) points out in her book *The Lexicon in Acquisition*. As children grow older, the words that are related to each other become associated in the mental lexicon, so that a word such as "doctor" becomes linked to words such as "nurse," "hospital," and "stethoscope." This growing vocabulary is necessary for success in school.

School-age children begin to use language in a variety of new ways. Children develop pragmatic skills as they interact with others, and they learn how to use language appropriately in many different situations. Their language becomes decontextualized, in the sense that they can now talk about things that are not in their immediate environment (e.g., ancient history, events in other countries). Another new development is the ability to think about language itself, to know what a word is and even what their favorite words are. This new skill, called metalinguistic awareness (awareness of language), contributes to their ability to make jokes and riddles and to engage in other kinds of wordplay with their peers. It also helps them to acquire literacy skills. Learning to read and write are, of course, essential developments in the school years.

Although it is evident that the major aspects of language acquisition are complete by the time an individual has finished formal schooling, language skills continue to develop throughout the life span. Individuals are continually adding new vocabulary and learning new pragmatic and discourse skills.

Theories of Language Acquisition

Although many researchers have described what happens during the course of language development, there is much debate over just how children are able to acquire such a complex system in such a short time. Several major theories have attempted to explain the mechanisms of language acquisition:

Learning theory explanations of language development are based on the work of B. F. Skinner and other behaviorists, who view language as just one kind of human behavior that is learned. According to this theory, children learn to imitate adults, who also actively teach the children the language. For example, when babies begin to babble, adults reinforce or reward the babbling. A little later, the adults are thought to reward systematically the utterances that become closer and closer approximations of the target language until, eventually, children are speaking like the adults around them.

Many linguists, including Noam Chomsky and Steven Pinker, believe that the basic principles of language are innate, or present at birth, and that only human beings are capable of language. According to this view, adults' role in children's language development is minimal; all that is necessary is for the infant to be exposed to language. A built-in mechanism in the brain—referred to as a "language acquisition device" (LAD)—allows the child to develop language skills in a very short time without explicit teaching. These theorists believe that language is a unique and separate ability and that acquisition is possible only during a brief critical period during early childhood.

Jean Piaget was a major proponent of cognitive developmental theory. According to this theory, language is not a separate capacity; rather, it is just one facet of children's general intellectual ability. Cognitive theorists believe that infants use their senses and motor skills to begin to learn about the world—for example, that cats are furry and say "meow"—and that once they have gained such knowledge, they map words such as "kitty" onto the concepts that they have already attained.

Social interactionists, including Jerome Bruner and Catherine Snow, view language as a facet of communicative behavior that develops through interaction with other human beings. They agree that humans have special linguistic abilities that are not shared by other animals, but they hold that children acquire language in part through the help of others, rather than purely through their own mental activity. Thus, interaction, rather than exposure, is seen as necessary. These researchers have found that there are special ways of talking to young language learners the world over that are tailored or fine-tuned to children's cognitive and communicative needs. They believe that the clear and simple child-directed language that adults use helps children to figure out how language works.

Understanding Language Acquisition

All of the components of language are important for communication, and disruption at any level can lead to miscommunication or even failure to communicate. For example, an individual who has not correctly acquired the sound system will not be able to make important distinctions between similar-sounding words (e.g., the difference between "ship" and "sheep"). Morphology and syntax are needed to convey meaning. A rich, shared lexicon, or vocabulary, is needed in a complex society in order to make reference to people, places, and concepts. The pragmatic system is particularly important in communication because even slight misuses or inappropriate uses of pragmatics can have quite disastrous interpersonal results, particularly if pragmatic conventions that govern politeness are violated. Finally, everyone must learn how discourse works in order to communicate about any connected set of ideas or events. If people understand how language is structured, they gain insight into what the basic building blocks of messages are and into what may have gone awry when communication fails.

See also: Alphabets and Writing; Interpersonal Communication; Language and Communication; Language Structure; Sociolinguistics; Symbols.

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For the communication field, language can be understood as an organized system of symbols used for creating and transmitting meaning. Language involves the meaningful arrangement of sounds into words according to rules for their combination and appropriate usage. James Bradac (1999, p. 12) captured the multiplicity of conceptions of language when he noted three ways of defining it:

- Language₁: "[The] communicative agency [... that] allows speakers to accomplish routinized purposes (e.g., exchange greetings) and other purposes that are completely novel.... It is highly flexible and adaptable."
- Language₂: "[The] biologically based, hierarchical system studied by linguists. It has multiple levels, each complexly structured and interrelated with the others. The structures at each level can be represented by construction rules [... and] constitute part of the tacit knowledge of speakers."
- Language₃: "[A] collection of verbal features that are often influenced or even determined by environmental, physical, or psychological variables that are not under the conscious control of speakers.

A variety of aspects of language are studied in the communication field. These include consideration of the origins of language, language acquisition, phonetics, phonology, syntax, semantics, pragmatics, language and culture, language and diversity, and language and relationships.

Approaches to Language Study in the Communication Field

A variety of different methodological perspectives have been brought to bear on the study of language. Psycholinguists study the psychological principles that are involved in how language is processed and represented. Noam Chomsky's theory of transformational generative grammar emphasized cognitive aspects of language use, theorizing that linguistic competence (i.e., the ability to produce proper sentences in any language) is innate in all humans. This led linguists to study linguistic performance (i.e., actual sentences) in order to infer what may be going on in the brain. That is, the study of surface structure provides information about the deep structure of language.

Some scholars in the communication field take a cognitive approach to language, examining perceptions of and attitudes toward a speaker based on the language they use.

Sociolinguists in the communication field couple the social characteristics of communicators with features of how they communicate. One example of this is the search for a gender-linked language effect. That is, scholars have examined language to see if particular features of it can be tied to the gender of the speaker.

Other researchers employ a descriptive approach (i.e., ethnography of speaking) to examine how culture may influence different aspects of language use. "Discourse analysis" can be thought of as an umbrella term that refers to a range of different approaches, including speech act theory, interaction analysis, and critical approaches. Stephen Levinson (1983, p. 286) describes discourse analysis as "a series of attempts to extend the techniques so successful in linguistics beyond the unit of the sentence."

Harvey Sacks (1984) recognizes that the study of the language used in poetry, literature, and rhetoric often seems to be given priority over the study of the language used by individuals in their everyday talk. However, he makes the case that the language of everyday talk is in fact an immensely important field of study because it is the fundamental medium through which social life is enacted. It is for this reason that conversation analysts focus on the seemingly mundane talk that is used in everyday and institutional settings. Using videotapes and audiotapes (of conversations that would have happened whether or not they were taped) as data, conversation analysts describe in detail the practices that communicators use for enacting a wide range of activities in a variety of settings.

The Origins of Language

There is much speculation about the origins of language. Two theories exist regarding the evolution of language in humans. First, it is claimed by some that language was the result of a pivotal development in the human brain, at which point humans gained the capacity for language. Chomsky (1957) is an important proponent of this theory. Others suggest that language developed gradually as humans developed. It is thought by some, such as Philip Lieberman (1998), to be a result of the evolution of the brain, nervous system, and vocal cords. Regarding the character of language itself, some propose that language "expresses" the character of nature itself, in the manner that an onomatopoeic word such as "whoosh" captures the character of the sound it is designed to name. Others suggest that languages are largely conventionalized, with the relationship between the object and the word that names it being arbitrary. Animals also use symbolic forms of communication to signal one another. For example, bees may dance in a particular pattern to signal to other bees the location of a food source. The different songs of birds may have different meanings. The major difference between animal language and human language is that humans can create new messages for new situations, while animals cannot.

Language Acquisition

Most children have acquired spoken language by the time they are five years of age. This suggests that children are born with the neural prerequisites for language. On the basis of the fact that feral children (i.e., children who have grown up separated from any human contact) do not speak any sort of language when they are found, it has been suggested that social stimulation of language is essential. Victoria Fromkin and Robert Rodman (1993) have identified the following stages in language acquisition:

- 1. Babbling Stage. At around six months of age, infants begin to babble. Many of the sounds they make resemble the sounds of human language. This babbling occurs in deaf children and in the hearing children of deaf parents who do not speak, so it is thought not to depend on auditory input. However, for language to develop, children appear to need either auditory input or sign language.
- 2. Holophrastic Stage. At approximately one year of age, children begin to produce apparently meaningful words that often stand as "sentences." At first, these words may be used simply to label ("cheerio"), but as the children develop, these words may provide such communicative functions as asking for



Symbolic language in the animal world is illustrated by the bee dance, where a bee (number 37) "dances" to communicate a feeder location to other members of the swarm during an experiment at Michigan State University. (James L. Amos/Corbis)

things (e.g., indicating "I want a cheerio"). At this stage, words may also be used to convey emotion.

- 3. Two-word Stage. At about twenty-four months of age, children may begin to produce two-word combinations. At first, these appear to be two holophrastic utterances two isolated words produced together. Soon though, children begin to produce the appropriate intonation contours for the two words to be heard as a grammatically and semantically connected "sentence."
- 4. Telegraphic Speech. As children continue to mature, they begin to build strings of words that may be longer than three words. The name for this type of speech comes from the fact that the strings are often missing such "function" words as "to," "the," "is," and "can."

There are various theories about how children acquire language. Some suggest that it is acquired through imitation. Others suggest that it is acquired through positive reinforcement (i.e., acceptance of "correct" sentences and "correction" of incorrect ones). Children appear to acquire the rules of grammar in stages that become increasingly complex. The mechanism that enables this process is thought to be a process of generalizing or overgeneralizing grammatical rules ranging from simple to complex.

Language is made up of various components. These have been studied under the rubrics of phonetics, phonemics, syntax, semantics, and pragmatics.

Phonetics

Phonetics is the study of the sounds of language. This involves determining the discrete sounds that can be made in a language and assigning a symbol to each sound. The International Phonetic Alphabet is a compilation of symbols that represent the sounds that are made in all languages. For each language, the collection of sounds that are unique to that language can be represented by symbols from the International Phonetic Alphabet. Sounds may be distinguished according to how they are made-which airstream mechanisms are used and whether the sounds are voiced, voiceless, nasal, oral, labial, alveolar, palatal, velar, uvular, glottal, and so on. Pitch, tone, intonation, and stress are also important features of phonetics.

Phonology

Phonology is the study of the sound patterns that are found in language. It may also be used to refer to a speaker's knowledge of the sound patterns in their specific language. While humans can make an almost infinitely wide variety of spoken sounds, the regularity of the sounds that are made in a given language represent some agreement as to which sounds are meaningful in a consistent way. Fromkin and Rodman (1993, p. 35) point out that "[phonetics] provides the means for describing speech sounds; phonology studies the ways in which speech sounds form systems and patterns in human language." It is on the basis of phonological knowledge that individuals are able to produce sounds that form meaningful utterances, recognize foreign accents, make up new words, and so on. Individuals recognize different sounds on the basis of their difference from other sounds. For example, the words "pill" and "bill" are distinguished by the difference between "p" and "b," making them "distinctive" sounds in English. Distinctive sounds are phonemes, and pairs of words of this sort are minimal pairs. Studying phonology involves laying out the sets of minimal pairs that make up a language, or the phonological rules that make different sounds meaningfully discriminated.

Syntax

The basic unit of grammar is the morpheme. A morpheme is a minimal linguistic sign: "a phonological form which is arbitrarily united with a particular meaning and which cannot be analyzed into simpler elements" (Fromkin and Rodman, 1993, p. 114). Thus, the word "lady" consists of one morpheme, while the word "ladylike" consists of two—"lady" and "-like". In order for language to be used for communication, though, morphemes must be organized in a particular order. Strings of morphemes are organized according to the rules of grammar (i.e., syntactic rules). The grammar of English, for example, results in "The car drove on the street" having a different meaning from "The street drove on the car." The placement of a word in a sentence influences whether it is understood as the subject or object of the sentence. The study of syntax involves laying out the grammatical structures that are meaningful and permissible in a given language (i.e., the phrasestructure rules).

Semantics

While the phrase "Colorless green ideas sleep furiously" is grammatical, it is conventionally contradictory and meaningless. This suggests that knowing the syntactic rules of a language is not sufficient. It is also necessary to know how meaning works. The study of meaning is complex. On the one hand, a "dictionary" approach to meaning suggests that all words have objective definitions. This approach, structural semantics, is based in formal logic. In contrast, lexical semantics is concerned with explaining "how people understand words and what cognitive processes interact with this understanding to produce meaningful communication" (Ellis, 1999, p. 60).

Pragmatics

Even with an understanding of syntax and semantics, the crucial feature of language is its appropriate use. The distinction between the abstract knowledge of language and its actual use is captured in the distinction that Ferdinand de Saussure (1960) drew between *langue* (i.e., the formal language) and *parole* (i.e., the actual use of language to communicate). In order to be able to use language competently, communicators must have knowledge of the norms for appropriate usage.

As Levinson (1983) points out, delineating the parameters of the field of pragmatics is complex. The term is used in many different ways. Examining notions of language structure without considering the context in which it is used may result in a compelling formal study with little practical application. Pragmatics attempts to explain language in use. This involves coming to an understanding of the complex concept of context. Teun Van Dijk (1997, p. 11) suggests that context is what "we need to know about in order to properly understand the event, action or discourse." Karen Tracy (1996) shows that context is a complicated, illusive phenomenon. Paul Drew and John Heritage (1992) point out that people tend to think of context as a "bucket" in which things take place. Those things are often taken to be shaped by the bucket. Heritage (1984) has also demonstrated that while context may shape communication, communication often shapes context, providing for a reciprocal relationship in which talk is both context shaped and context renewing.

Other aspects of pragmatics that have received extensive scholarly attention include speech acts. This theory, described by J. L. Austin (1962), asserts that language is performative rather than being merely constative or descriptive. That is, when individuals use language, they do so in order to perform an action, not merely to describe some state of affairs. Thus, when the Queen says "I name this ship . . . ," she is actually performing the action of naming the ship. John Searle (1969, 1975) elaborated on Austin's Speech Act Theory, explaining some of the felicity conditions that must pertain for an utterance to have illocutionary force, or social and communicative purpose. Furthermore, utterances may have perlocutionary force if the attempted action of the speech act is accomplished. Saying "Pass the salt" has the illocutionary force of a directive. If interactants are in a situation where this can actually be done, and the salt is passed, the utterance has perlocutionary force. Indirect speech acts involve saying, for example, "It's cold in here" as a way of requesting that the door or window be closed. Conversation analysts have discussed utterances of this kind as the first turn in a presequence-an exchange that

is designed to precede some other action. This view that language is active in the social world comes together with Ludwig Wittgenstein's (1953) theories about language consisting of language games (i.e., the regular ways in which individuals use language to perform activities in everyday life). This active view of language feeds into social constructionist theory, which suggests that much of the social life of individuals—their selves, relationships, and even cultures—are constructed through language and communication.

Another aspect of pragmatics addresses the question of how people are able to understand what a person may be doing with specific utterances. H. Paul Grice proposed the following cooperative principle: "Make your contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (Grice, 1976, p. 45). This involves four aspects that Grice formulated as "maxims":

- 1. Quantity: A contribution should be just enough, not too much and not too little.
- 2. Quality: A contribution should be true.
- 3. Relation: A contribution should be relevant.
- 4. Manner: A contribution should be brief, orderly, and not ambiguous, overly verbose, or obscure.

Grice suggested that individuals attempt to understand talk according to this principle and these maxims. Even if an utterance appears to be elliptical or obscure, an individual will try to understand it, but with the assumption that something "special" is going on. That is, an individual will make assumptions beyond the semantic content of the utterance. These assumptions are referred to as "conversational implicature," which Donald Ellis (1999, p. 78) defines as "an interpretive procedure that operates to figure out what is going on." Levinson (1983, p. 102) gives the following example:

- A: Where's Bill?
- B: There's a yellow VW outside Sue's house.

The semantic content of B's utterance would suggest a failure in cooperation. Yet interpreting the utterance at a deeper level, assuming that it is in fact cooperative, an individual might come to the conclusion that there is a connection between

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where Bill is and where the yellow VW is. Therefore, the answer to A's question, if Bill has a yellow VW, is that he is likely to be found at Sue's house. Thus, inference is used to preserve the assumption of cooperation. This is the process referred to as "conversational implicature."

Discussion of pragmatics indicates that its concern with competent use of language as a means of doing action in the social world makes it a central concern for communication.

Language and Culture

Culture and language are thought to be intimately connected. As with theories of context, there is debate regarding whether culture shapes language or language shapes culture. Language use is widely thought to be strongly related to culture. Sociolinguists and ethnographers of language and communication have devoted significant attention to the interplay between language and communication. The Sapir-Whorf hypothesis suggests that language shapes the thinking of individuals to the extent that it constrains the kinds of thoughts and ideas people can have (linguistic determinism). Furthermore, a strong version of the Sapir-Whorf hypothesis takes the position that because different cultures have different grammatical and lexical structures (i.e., use different languages), it is virtually impossible for members of different cultures to understand one another fully (linguistic relativity). Other researchers have shown that culture may play an important role in shaping norms of conduct. For example, Gerry Philipsen (1975) showed that, in certain social circles in a working class neighborhood in a large industrial town, speaking instead of using one's fists was considered a sign of weakness. Thus, it seems that language and culture are mutually elaborating. A study of one may increase the understanding of the other.

Language and Diversity

Communication scholars have given extensive attention to linguistic markers and their effect on how people are perceived. Linguistic markers are those features of speech that are taken as an indicator of a person's social identity. For example, Robin Lakoff (1975) suggested a number of features that some take to characterize women's speech. This includes markers of uncertainty, such as tag questions (ending an utterance with "isn't it?," "don't you think?," and so on), qualifiers (such as "maybe," "perhaps"), disclaimers (such as "I may be wrong but"), hypercorrection (using "correct" features of speech rather than colloquial usages), and use of a wide range of color words (such as "chartreuse," "aqua"), instead of standard primary color words (such as "red," "green"). Lakoff suggested that these usages may result in women being perceived as powerless speakers in contrast to men. Here, Lakoff connected specifics of language use with social power. Subsequent research has struggled to document the claim that men and women speak differently, but the researchers have had very varied degrees of success. Some suggest that it is stereotypes and prejudice that cause men and women to be seen differently. It has been proposed that use of sexist language may reinforce negative stereotypes of women. For example, certain usages may have the effect of making women invisible. When a woman marries and takes her husband's name, the change from "Miss Jane Smith" to "Mrs. Michael Jones" may have the effect of making her invisible. Use of generic terms such as "man" and "he" (which has declined significantly since the 1970s) may also have the effect of making women invisible.

Other research has asked similar questions with respect to whether certain cultures are marked by particular ways of talking and whether certain social groups are perceived more positively than others.

Language and Relationships

It has been suggested that different stages in the development of relationships are marked by distinct ways of talking. However, there is debate regarding whether being at a particular stage of a relationship produces a particular way of talking or whether talk constructs relationships. Work on linguistic idioms suggests that couples may use "private language" in public and in private as a way of both displaying and creating special integration or "togetherness."

Conclusion

Clearly, language is a highly complex and multifaceted phenomenon. Understanding its various aspects may enable communicators to go beyond stereotypes that are often unwittingly based in unspoken attitudes that individuals may hold about language. Recognizing the various components of language (i.e., phonetics, phonology, syntax, semantics, pragmatics) may help communicators to understand not just the complexity of language, but also its orderliness. Understanding semantics helps communicators see that there is a shared responsibility between interlocutors for meaning making; it is not simply a matter of one participant speaking clearly. Pragmatics elucidates the fact that appropriate use of language can be thought of as a rule-bound activity, where rules may apply differently in different situations. Its rule-bound character means that rules can be learned and applied in new settings. Finally, understanding that using language is a way of doing actions, rather than merely describing the world, demonstrates that language can be a form of political action. For example, using sexist and racist language may do more than reflect a person's views; it may actively engage in creating or perpetuating sexism and racism. The study of language brings to light features of a system that is a key part of the basic currency of human collective life but that is often overlooked precisely because it is so basic.

See also: Animal Communication; Gender and the Media; Intercultural Communication, Adaptation and; Intercultural Communication, Interethnic Relations and; Interpersonal Communication; Interpersonal Communication, Conversation and; Language Acquisition; Language Structure; Nonverbal Communication; Sociolinguistics; Symbols; Wittgenstein, Ludwig.

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JENNY MANDELBAUM

LANGUAGE STRUCTURE

Both scholars and communicators operate on the premise that language is structured in an orderly fashion. An alternative view is that language is organized in a random fashion. Clearly, however, communicators treat language as tightly structured. A source of debate centers around whether the structure of language is innate in humans or is learned through socialization processes.

Research History

Noam Chomsky (1957, 1965) suggests that children are born with knowledge of a universal grammar (i.e., a set of principles that are common to all languages) that can be applied to any language. This fundamental knowledge of languages is an individual's linguistic competence. The ability to use a given language in a particular situation is an individual's linguistic performance. Scholars can use linguistic performance as a resource for inferring the character of linguistic competence.

Chomsky observed that while there are a fixed number of phonemes (i.e., meaningfully discriminated smallest units of sound) and morphemes (i.e., meaningfully discriminated blocks of phonemes), humans can construct an infinite number of sentences. This suggests that in learning a language, individuals are learning rules for producing sentences, rather than learning sentences themselves. Actual sentences are referred to as "surface structures." From them, linguists can infer deep structures (i.e., the basic rules of grammar that are part of a speaker's innate knowledge and are the same across languages). Chomsky, therefore, was concerned with inferring a theory of abstract sentence structure that could account for and generate grammatically correct sentences. In this sense, the grammar that Chomsky was seeking to describe was a generative one. Chomsky's grammar is also referred to as "transformational" because the few rules that operate to create an infinite number of sentences perform transformations on deep structure.

Some linguists and communication scholars examine the structure of suprasentential units. Their interest is to see how it is that a larger unit of discourse may be coherent and "hang together," or have cohesion. Karen Tracy (1985, p. 30) defines conversational coherence as "the fact that comments produced in conversation seem connected to each other in meaningful orderly ways." In this sense, conversational coherence is strongly related to topic organization. A "text" that is "coherent" is one in which topic is successfully managed. Different schools of thought take different positions with regard to how coherence works. For example, John Searle (1969, 1975) takes a speech act theory perspective. He sees conversation as being made up of series of speech acts that have rules for when and how a particular utterance is to be understood to perform a particular action. These rules provide for the recognizability of a particular turn as doing a particular action, and the have been called "felicity conditions." Michael Halliday and Ruqaiya Hasan (1976) describe different linguistic devices that provide for connection within discourse. Their focus is on written texts, but their work has been applied to oral communication as well. The cohesive devices they describe include, for example, references, conjunctions, ellipsis, substitution, and pronomial reference. Each of these requires connecting with something earlier in the text to be understandable and thus provides for the text to be seen as a coherent whole.

Conversation analysts have described many aspects of the structure of language as it is used to conduct the mundane business of everyday communication. Harvey Sacks (1984) observes that the structured character of everyday social life is a dominant feature. He suggests that one could examine almost any aspect of society to find its locally structured character. Conversation analysts examine tapes of naturally occurring conversations. At first, taped conversation was examined simply because it was easy to obtain. Subsequently, it was realized that because taped conversations can be replayed, they can be transcribed and examined in great detail. Thus, by examining audio and video recordings of naturally occurring interaction, conversation analysts have been able to discover a range of structural features of conversation that are part of the infrastructure through which a wide range of activities are conducted in and through conversation.

Basic Structures

Some of the most important conversational structures are turn-taking, sequence organization, and repair.

Sacks, Emanuel Schegloff, and Gail Jefferson (1974) describe how turn-taking in conversation can be seen as a locally managed system. They point out that many different systematic processes for taking turns could be envisioned; for example, Starkey Duncan and Donald Fiske (1977) propose that turn-taking is based on the exchange of cues in talk. Sacks, Schegloff, and Jefferson describe the organization of turn-taking as communicators' organized solutions to the practical problem of who should talk when and for how long, and how speaker change should be arranged. They show how conversation proceeds in minimal units that could consist of a word, a clause, a phrase, or a sentence. These minimal units of talk (i.e., turn constructional units) are produced in such a way that it is hearable whether or not they are complete. One speaker produces such a unit. At its point of possible completion, a next speaker may take the conversational floor. If this does not happen, the current speaker could continue until the possible end of the next turn constructional unit, when there is another opportunity for speaker change to occur. These speaker change opportunities are called "transition relevance places." A speaker may bid for a longer turn at talk (i.e., one consisting of multiple turn constructional units) by starting his or her turn as a list (e.g., "First.... "). In this way, the interlocutor can project that the upcoming turn will consist of multiple items that are contained in multiple turn constructional units. This may also be done by projecting that there is a story to tell. Thus, turn-taking is locally managed, and it proceeds on a turn constructional unit by turn constructional unit basis.

A fundamental observation regarding turntaking is that, ordinarily, one speaker speaks at a time, and speaker change recurs. While this is the canonical organization for turn-taking, variation can occur. For example, it is possible for overlap to occur if a speaker begins to take a turn when another person is at or near a point of possible turn completion. As Jefferson (1986) has shown, overlaps are often precisely placed, and they display one speaker's close monitoring of another's talk. It is also possible for a speaker to talk interruptively, coming in at a point that is not at or near a point of possible turn completion. Don Zimmerman and Candace West (1975) have suggested that interruption is practiced disproportionately by men interrupting women and therefore may be a way of enacting power. Schegloff (1987) calls this into question, pointing out that taking the floor via an interruption is tantamount to winning a battle but that the war is won only if the interruptive turn is actually taken up in subsequent talk. Nonetheless, other more subtle

interpersonal activities—such as monopolizing the conversational floor or preventing the other speaker from taking an extended turn—can be accomplished by overlap and interruption.

Often, subsequent turns at talk are related to prior ones by a relationship that is stronger than just a serial relationship. That is, a next turn may be specifically "implicated" by a prior one, such that it can be heard to be officially "missing" if it does not occur. This strong relationship may be apparent in the way in which turns are structured. A strong relationship between turns is often referred to as "sequence organization." Schegloff and Sacks (1973) refer to pairs of turns of this kind as "adjacency pairs." Examples of adjacency pairs include summons/answer, question/answer, greeting/greeting, and compliment/response. According to Schegloff and Sacks (pp. 295–296), adjacency pairs have the following features:

- 1. They are two utterances in length (i.e., a first "pair part" is followed by a second "pair part").
- 2. The two utterances are adjacently placed (i.e., the second pair part must come right after the first pair part).
- 3. Different speakers produce each utterance.
- 4. First pair parts precede second pair parts.
- 5. The pair type of which the first pair is a member is relevant to the kind of second pair part that is selected (e.g., if the first part is a question, the second pair part must be an answer and not a greeting).

If a second pair part is not produced after a first pair part is uttered, it will be heard as officially "missing." Delaying a second pair part, or postponing it through such items as "um" or "well," may be heard to foreshadow upcoming disagreement (Sacks, 1987). Thus, sequence organization is another environment in which subtle interpersonal dramas can be enacted.

Problems in talking together are generally resolved very soon after they happen. Schegloff, Jefferson, and Sacks (1977) describe how repairs can be made when problems occur. The first opportunity for a problem to be resolved is through "self-initiated" repair, where a speaker offers a correction or substitution to something that has been said (e.g., "She was giving me all the people that were gone this year, I mean this quarter, you know."). If the speaker does not correct the problem in or just after the turn in which the problem occurred, another speaker can initiate repair with a next turn repair initiator (i.e., a turn that can be heard to indicate a problem of some sort in the prior turn), thus putting the speaker of the problem in the position to remediate it. Schegloff, Jefferson, and Sacks (p. 368) provide the following example:

- B: Well I'm working through the Amfat Corporation.
- A: The who?
- B: Amfat Corporation. It's a holding company.

Here, A produces a turn that calls into question, or initiates repair on, an item mentioned in B's first turn. Next B offers a redoing and explanation of the problematic item. If this type of repair does not occur, the second speaker can complete the repair, as the following example from Schegloff, Jefferson, and Sacks (p. 378) illustrates:

A: Listen to the pigeons.

B: Quail, I think.

Thus, the possibilities for repair include selfinitiated self-repair, other-initiated self-repair, and other-initiated other-repair. The organization of repair is also a rich site for interpersonal activities, since it is a method through which intersubjectivity is negotiated. Repeated use of repairs may constitute an inability to understand one another, for instance (Ragan and Hopper, 1984).

Overall Structural Organization

Two general features of the overall structure of a conversation are how it is begun and how it is ended. Schegloff (1968, 1986) describes how conversations on the telephone are opened. He shows that although there is a canonical order of adjacency pairs enacted by interactants (e.g., summons/answer, identification/recognition, greeting/greeting, "how are you"/"how are you," reason for the call), these should not be thought of as the enactment of a script. The series of sequences can be deviated from at any point in the conversation. For example, the answer to the summons may be a "Hello" instead of an expected corporate identification. A caller may take this up. Problems in recognizing one another may occur. The response to "How are you?" may be "Oh, okay, I guess" and

thus may indicate that there might be some trouble that could become elaborated. Both following and deviating from the canonical format may have implications for the relationship between the interactants.

Schegloff and Sacks (1973) describe a canonical way that telephone calls may be brought to a close. They show how the orderliness of methods for closing telephone calls (and, by implication, the orderliness of other features of conversation) represents the interactants' solutions to the technical problem of how to suspend the relevance of speaker exchange. That is, once a conversation has begun, speaker exchange recurs. Speakers are thus faced with the problem of working together to agree to suspend the relevance of exchanging turns. This is accomplished by producing a preterminal sequence in which it is possible for interlocutors to recognize that the conversation is possibly complete, but that previously unmentioned mentionables could be inserted. Thus, for example, after the apparent completion of some previous spate of talk, an "Okay" shows that the current speaker is not advancing the talk at this point and yields the floor to the other speaker. If the other speaker passes up this opportunity by producing a reciprocal "Okay," then the conversation may be treated as closed. This will be indicated by an exchange of "Goodbye." Thus, sequence organization can provide a structure for the closing of a conversation.

Because talk is organized on the basis of speakers taking minimal turn constructional units, with the potential for speaker exchange recurring after each next turn constructional unit, special work must be done if, for example, a speaker is to take the floor for an extended turn at talk to tell a story. In this case, the prospective storyteller produces a story preface in which he or she indicates that he or she may have something to tell. These turns vary with regard to how strongly they project an upcoming story. First pair part turns such as "You wanna hear a story my sister told me last night" (Sacks, 1974) or "You'll never guess what happened to me today" strongly project a story. They also make a forwarding response strongly relevant, putting the prospective recipient(s) in the position of aligning as recipients of an extended turn by saying "Okay" or "What?" Alternatively, a turn may simply announce some news, such as "Shawn ate lobster this afternoon." Recipients could treat this as the news and offer some assessment such as "Wow," or they could treat it as projecting a story, in which case they could solicit further talk about it with a turn such as "He did?" Thus, the temporary suspension of turn-by-turn talk for the taking of an extended turn to tell a story is interactively worked out at the possible beginning by interactants.

In the body of the story, recipients can become passive recipients, producing continuers such as "mm hm" or "uh huh" (which show them to be attending but do not shape the story by showing what they make of it). Alternatively, recipients may produce assessments, such as "Wow" or "How terrible" that show what they are making of the story-so-far. Turns of this kind are considered to be more "active" recipiency because they may influence the course of the storytelling, particularly if they display an understanding of the storytelling that is not in line with that of the teller. The most active kind of recipiency (i.e., the kind of turns that may have the most effect on how the telling unfolds) are first pair part turns that actively require the teller to take a particular kind of turn next. According to Jenny Mandelbaum (1989), a first pair part recipient turn, placed just at the point where the teller is apparently about to make fun of one of the recipients, can (by actively influencing what the teller says next) divert the storytelling from making fun of a recipient and convert it into a storytelling in which something good happened. Recipients of storytellings can show different kinds of understanding of the point that the storyteller is trying to make. When a recipient goes along with the point the teller appears to be making, he or she is aligning with the teller. The recipient is affiliating when he or she shows support for the action or perspective apparently espoused by the teller. While alignment and affiliation are not limited to storytelling, storytelling is an environment in which alignment and affiliation often become observable issues for interactants. The recipients' alignment and/or affiliation, or lack of them, are primary ways in which interpersonal work can be undertaken in the storytelling environment.

Collaboration between teller and recipients is also necessary at the possible end of the storytelling. When the teller produces turns that suggest that the storytelling is possibly complete, the recipient must show a realization of the possible completion in order for turn-by-turn talk to resume. Thus, conversational storytelling is interactively constructed throughout its course. This demonstrates that the normative structures for conversation that have been described above are just that—normative structures that are constructed and enacted by interactants. That is to say, they are not fixed rules, but rather, they are the communicators' organized solutions to the structural problems that are embodied in the activity of interacting.

See also: Group Communication; Interpersonal Communication; Interpersonal Communication, Conversation and; Language and Communication; Storytelling.

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Jenny Mandelbaum

LAZARSFELD, PAUL F. (1901-1976)

During the 1940s and 1950s, the Department of Sociology at Columbia University was dominant such department in the United States. It owed this distinction mainly to Paul F. Lazarsfeld, an investigator of mass communication effects and a research methodologist, who collaborated with his colleague Robert K. Merton, a sociological theorist. Lazarsfeld pioneered the university-based research institute, first in Europe at the University of Vienna and later in the United States at the University of Newark, Princeton University, and Columbia University. His Bureau of Applied Social Research at Columbia was famous in the 1940s and 1950s for conducting the most important investigations of mass communication effects.

Lazarsfeld was born in Vienna and grew up there, highly involved in socialist politics. He organized and led the Red Falcon youth organization of the Socialist party. He earned his Ph.D. in applied mathematics at the University of Vienna, and taught research methodology in the Department of Psychology there. In 1925, Lazarsfeld founded the Research Center for Economic Psychology (Wirtschafts-psychologische Forschungsstelle), which engaged in market research, to provide jobs for his unemployed Socialist party friends. The most noted study by Lazarsfeld's research institute was an investigation of Marienthal, a small community near Vienna in which everyone was unemployed during the Great Depression. His opportunities for advancing his career at the University of Vienna were blocked by anti-Semitism.

From 1933 to 1935, Lazarsfeld traveled among several American research universities on a Rockefeller Foundation fellowship and decided to migrate, given Adolf Hitler's increasing dominance of Austria. In 1937, Lazarsfeld founded and became the director of the Research Center of the University of Newark, which mainly conducted research on the unemployment of youth. The Rockefeller Foundation funded the Radio Research Project on the effects of radio through Princeton University, with Lazarsfeld as director of the project from his base at the University of Newark.

In 1939, Lazarsfeld moved with the Radio Research Project to Columbia University, where he became a faculty member in the Department of Sociology. There he joined forces with Merton and began the next thirty-five years of their academic collaboration, in which they formed a fruitful merger of theory and empirical research. The Rockefeller Foundation project on radio effects became the Bureau of Applied Social Research in 1944. This research institute was regarded as the most important center for the empirical study of mass communication problems for the next several decades. Funded by government, foundations, and private companies, the bureau provided research training opportunities for doctoral students at Columbia University and an outlet for Lazarsfeld's numerous research ideas. He presided over the bureau with a rather chaotic management style, stealing funds from one project in order to conduct other research, in a process that one bureau researcher called "Robin Hooding."

Among the most noted of the studies conducted by the bureau was the Erie County (Ohio) investigation of the role of the mass media and of opinion leaders in the two-step flow of communication. The 1944 book that resulted from this study, The People's Choice (written by Lazarsfeld, Bernard Berelson, and Hazel Gaudet), helped establish the specialty of political communication and ushered in a scholarly era of the minimal effects of mass communication. Contrary to their expectations, Lazarsfeld and his colleagues found that the mass media of radio and print had relatively minor direct effects on how people voted in the 1940 presidential election in the United States. Mainly, people decided for whom to vote on the basis of interpersonal communication with peers.

Another famed bureau study followed, the Decatur (Illinois) research in which Lazarsfeld sought further understanding of the two-step flow of communication—in which ideas move from the media to opinion leaders and then to their followers through interpersonal networks. The results of the Decatur study appeared as a 1955 book, *Personal Influence* (written by Lazarsfeld with Elihu Katz), and illustrated the importance of mediastimulated interpersonal communication between opinion leaders and their followers as they made consumer decisions about movies, fashions, and so on.

Lazarsfeld's methodological contributions were many and varied: the focus-group interview, which he pioneered with Merton in 1941; panel surveys, a research design that he used in the Erie County study; and important qualitative dataanalysis techniques. In fact, Lazarsfeld saw himself mainly as a methodologist or toolmaker, one who could study mass communication, unemployment, or any other social science topic. Nevertheless, Lazarsfeld was one of the four main forefathers of communication study, along with the political scientist Harold Lasswell, and the social psychologists Kurt Lewin and Carl Hovland. Lazarsfeld's research dealt centrally with individual actions, such as voting, consumer purchases, and so on, taking place in a social context. He sometimes described himself as a mathematical sociologist and was quite proud of being named the Quetelet Professor of Social Science at Columbia University in 1962. (Adolphe Quetelet was a nineteenth-century Belgian statistician.)

Lazarsfeld was ideally located for his research since New York City was the hub for the rising industries of radio and television broadcasting, advertising, and public relations during the 1930s and thereafter. Media-related companies needed to know the size of their audiences and their sociodemographic composition, a type of market research that Lazarsfeld helped create at the Bureau of Applied Social Research. In fact, Lazarsfeld is acknowledged to be one of the forefathers of market research. His investigations of the effects of mass communication also fit with the needs of media industries.

When Lazarsfeld was once asked about the seeming paradox between his leftist beginnings in Vienna and his capitalistic actions in America, he remarked that he was just "a socialist on leave" in the United States.

See also: Election Campaigns and Media Effects; Models of Communication; Schramm, Wilbur.

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EVERETT M. ROGERS

LESBIANS IN THE MEDIA

See: Gays and Lesbians in the Media; Sex and the Media

LIBRARIANS

Librarians connect people with information and ideas by organizing and facilitating the retrieval of information in all formats. Dictionaries have long



Although librarians are becoming increasingly responsible for technology in the library, they are still responsible for the accumulation and distribution of the cultural heritage, including items such as this scroll, which is being handled by a librarian in San Francisco. (Phil Schermeister/Corbis)

tended to define the word "librarian" as the person in charge of a library. Library users tend to associate the word with anyone who works in a library. Professional associations and those people who work in libraries tend to reserve the appellation for one who holds a master's degree in library and information studies.

The work librarians perform, how and where they do it, and how they are perceived have all evolved in a manner that parallels changes in the way information is produced and stored. Technology fueled this evolution in the twentieth century. Three different library educators, each writing about thirty years apart, defined "librarianship" as follows. In 1933, Pierce Butler wrote that "the fundamental phenomenon of librarianship . . . is the transmission of the accumulated experience of society to its individual members through the instrumentality of the book" (p. 84). In 1964, another acclaimed library educator, Carl White, wrote that librarianship was concerned with the retention, organization, and use of the accumulated heritage in all its forms, with books and journals being just a part of that heritage (see pp. 10-11). Thirty-four years later, a third library educator, Richard Rubin (1998, p. 379), wrote that "librarians support fundamental democratic values by emphasizing equality of access to knowledge. . . . Underlying the special character of librarianship is not its techniques, but its underlying values. The significance of librarianship lies not in its mastery of sources, organizational skills, or technological competence, but in why librarians perform the functions they do. The fact that librarianship tends to encompass the vast body of print, audiovisual, and electronic information increases the importance of these underlying values further and differentiates it from other, even kindred, professions such as museum curators or historical society professionals."

Librarians today use an astonishing array of resources as they connect people with information and ideas. In a single working day, a librarian is likely to help a user select a novel for pleasure reading, use the Internet to answer reference questions, help someone learn to retrieve information from CD-ROM databases, and teach a small class how to use World Wide Web search engines. The twenty-first century also finds librarians performing a wide range of work in a variety of exciting settings. The majority of librarians work in traditional school, public, academic, and special libraries (such as corporate, law, or medical libraries). Other librarians bring their specialized knowledge and skills to bear in ventures such as serving as information architects who design intranets, information brokers who retrieve and analyze information on a freelance basis out of their homes or offices, and researchers who work for international consulting firms.

Never before has the librarians' ability to understand and use a wide variety of methods to organize and retrieve information been so much in demand. As more and more information is produced daily, and as instant access to that information becomes vital, the need for technologically savvy librarians will continue to grow. Information literacy (teaching people how to access and interpret information in all formats) is an increasingly significant part of thelibrarians' charge. For the first time ever, the librarians' ability to analyze users' needs to determine what information is appropriate and then to select, acquire, organize, and retrieve information that meets those needs is considered *chic* in many circles.

Like all professions, librarianship offers specialties and subspecialties. The primary demarcations in the field are set by the type of library one works in (i.e., public, academic, school, or special). Other specialties are formed by the type of work, such as catalogers, systems librarians, children's librarians, or collection development librarians. According to the Occupational Outlook Handbook (2000) of the U.S. Department of Labor, librarians held about 152,000 jobs in 1998. Most were in school and academic libraries, while others were in public and special libraries. A small number of librarians worked for hospitals and religious organizations, while others worked for governments at all levels. About one-third of all librarians held part-time positions in 1996.

In order to become a librarian, one needs a master's degree in library and information studies. Most professional positions in public and academic libraries require that the degree be from a program accredited by the American Library Association. School library media specialists must be certified by the state in which they are employed. Certification requirements vary, but most states require a master's degree. Special librarian positions also usually require a master's degree with additional education or significant experience in the subject area. For example, most law librarians hold a law degree as well as a master's in library and information studies (MLIS) and engineering librarians might hold a bachelor's degree in a scientific area as well as an MLIS degree.

Career paths vary widely. Since many libraries are small, they might only employ one professional librarian. Other libraries are huge, employing thousands of people, and thus offer considerable opportunity for administrative advancement. According to the U.S. Department of Labor Statistics (2000), the median annual salary of all professional librarians was \$38,470. Librarians employed by the federal government received an average annual salary of \$56,400 in 1999.

Librarianship is primarily a service profession, but one that requires an increasingly broad technological base. Because of this, librarianship is one of the more unusual professions in the twenty-first century. Librarians can be found connecting people with information in settings such as branch libraries serving large urban housing projects, bookmobiles equipped with Internet workstations connected by satellite or cellular modems, and ultramodern health sciences libraries on university research campuses. While the setting and the clientele vary, the mission of each librarian is the same today as it was at the dawn of the printed word: to connect people with the information and ideas they need and want.

See also: Libraries, Functions and Types of; Libraries, History of; Library Automation; Reference Services and Information Access.

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CHARLES HARMON ANN K. SYMONS

📕 LIBRARIES, DIGITAL

A library must have a collection of materials that carry information. In addition to its collection, a library must have some kind of organizational rules and some kind of finding mechanisms, collectively known as its "technologies" (e.g., catalogs, search engines). Finally, every library serves one or more identifiable communities of users. A library becomes digital as the collection, the technologies, and the relation to the users are converted from printed formats (i.e., books and paper) to electronic formats. First, the collection itself must be made machine readable. Next, the technologies must be converted to computer-based forms. Finally, an interface to members of the user community must be provided in computer formats. A digital library may be as small as the set of files on one person's computer, organized into a hierarchical directory structure and supplemented by the owner's personal scheme for naming files and directories. In such a system, the meaning of the path name "c:/documents/personal/smith.david/to/2000April2 4" is clear to the owner of the system. However, if the owner wished to locate the letter in which "I wrote to David Smith about Aunt Martha," this naming scheme might not be adequate. If the system were used by many people, the problem would be complicated further by the possibility of there being more than one David Smith. The problem of indexing or organizing by content exists for every digital library, from the smallest to the largest. The key technology for solving this problem is called "information retrieval."

The purpose of a library, viewed in the broadest sense, is to facilitate communication across space and time by selecting, preserving, organizing, and making accessible documents of all kinds. Digital libraries provide many opportunities to improve upon paper libraries. For example, methods of information retrieval make it possible to index books at the level of chapters, or even at the level of sections and paragraphs. However, just as a paper library can provide too many books, digital libraries can provide an even greater overabundance of documents, chapters, and passages. This calls for improvements at the micro level (e.g., better identification of relevant passages) and at the macro level (e.g., effective organization of vast networks into useful and usable logical collections). In addition, the old problem of preserving fragile paper materials is replaced by the problem of maintaining usability, given the potential transience of particular modes of storage (e.g., magnetic tape, diskette, CD-ROM, DVD). Libraries must plan for unending migration of their collections to new modes of storage.

Digital Library Collections

The materials in a collection may be found in a single group, or they may be contained in multiple, nonoverlapping subcollections, which may be housed at physically and logically distinct locations. This raises the problem, which is new to digital libraries, of combining documents found in several distinct collections into a set that will be most useful to the user of the library. This problem is commonly known as "collection fusion." In the world's libraries, most volumes are text, in some human language. These form a major part of digital libraries as well. Along with texts, libraries contain other texts about those texts. Data added to a collection, or to an object in the collection, for the purpose of identification is called "metadata" (i.e., "data about data"). An early example of metadata is the catalog card in a mid-twentieth-century library. In a digital library, some metadata are prepared by hand (i.e., "cataloging"). Metadata may also be generated automatically from machine-readable text that has been analyzed to support indexing and retrieval of passages and documents by subject.

Some digital library collections contain images or graphics that have been created by human effort (e.g., sketches, oil paintings, hand-designed maps). The object in the collection may, alternatively, be a mechanically produced (i.e. photographic) representation of a human product or artifact. Other images may be photographic or tomographic representations of naturally occurring scenes or objects. Each kind of image poses specific problems for the digital library. For a humanly produced artifact, information about the author and the date and place of production are both useful and (in principle) knowable-although there can be identification and attribution problems with older artifacts. Newly produced artifacts can be labeled or "tagged" with this information. Typically, the added information is permanently linked to the information object (e.g., by placing both in a single machinereadable file).

Metadata about images may also include more technical descriptions of the imaged object and of the imaging process itself—for example, "church in northern New Brunswick, imaged at 4:30 P.M. on April 13, 1999, in infrared light of wavelength 25 microns." Part of this information (that the object is an image of a church) must be provided by a human analyst. On the other hand, the wavelength of the infrared light, the time at which the image was made, and the precise geographic location of the imaged object (which may be determined by a global positioning system device built into the digital camera) can all be automatically included in the machine-readable record.

Is the World Wide Web a digital library? Strictly speaking, it is not; it is better regarded as an interconnected set of different libraries that contain different kinds of collections and serve



An international initiative was started on February 24, 2000, when King Juan Carlos of Spain and James Billington of the U.S. Library of Congress "clicked" to launch a collaborative digital project between the Library of Congress and the National Library of Spain. (Reuters NewMedia Inc./Corbis)

different communities of users. In fact, a given person may belong to several communities of users (e.g., a dentist may, on the one hand, may search the web for information about dental procedures and, on the other hand, for information about a gift for his or her son). Most digital libraries are best regarded as being made up of several related collections or subcollections. Users access these collections through two kinds of technologies: engines and interfaces. The engine is the collection of computer programs that locate documents for indexing and the programs that build indexes. The interface is the collection of computer programs that lets a user "see" the organization, the contents of the index, and often the documents themselves.

Digital Library Technologies

Indexing of texts by the words that they contain is an example of generating metadata from features. In this approach, the features of the document are simply the words that it contains. Indexing is based on things such as the frequency of words, which is taken to be an indication of what the document is about. In a sense, there becomes a "library catalog card" for every occurrence of a meaningful word and every book in which it occurs. Of course, the technology is more efficient, but the access provided has the same power that a huge card catalog would.

Machine-readable records of sounds are difficult to index automatically. If the sound is a human voice speaking some natural language, voice recognition tools may be used to create an approximate transcription of the speech, which becomes a powerful basis for the creation of metadata for retrieval purposes. For naturally occurring sounds, such as birdcalls, the first line of classification is based on an analysis (using waves and wavelets) of the physical properties of the sound.

For texts themselves, the distribution of words in the text forms the basis for defining many kinds of features. These include the frequency with which a given term occurs in the document, the presence or absence of terms, the location of terms within the document, the occurrence of two- and three-word phrases, and other statistically defined properties of the text.

National Initiatives

As a shared national priority, the development of digital libraries is addressed both by existing libraries and by programs created by the national government and by philanthropic organizations. The National Science Foundation, the National Institutes of Health, and the U.S. Department of Defense, among others, joined temporarily in the early 1990s to solicit and fund projects to develop key technologies for digital libraries. This program was later subsumed into the broader Information Technology Research initiative, which addresses both key technologies and the building of collections.

In addition, organizations such as the private Getty Foundation and the Andrew W. Mellon Foundation encourage, with their funding, efforts aimed at building specific collections of images or texts in digital form. These projects often have a major research component, such as the Columbia University Digital Library initiative. In general the goal of these initiatives is to "manage the revolution" by ensuring that each major experiment in digital libraries is conducted and documented in a way that will ease the path for those who come later.

Management and Policy Issues

Digital libraries pose new problems related to management and policy. For example, rapid advances in technology make most forms of digital storage either obsolete or difficult to support after a period of about ten years. Therefore, digital libraries must provide for a continual process of "preservation" or "conservation" of the content of its collections by moving them from soon-to-be obsolete media to more contemporary media. Since the price of media is generally highest when they are new and falls sharply as they reach the end of their periods of market dominance, this poses difficult economic policy issues for digital libraries. This "migration" problem stands in sharp contrast to the ease with which one can still read a paper book printed more than two hundred years ago.

Policy issues also arise in the protection of authors, publishers, and readers from various kinds of exploitation. The methods (i.e., webbased browsers) that are used to deliver the contents of digital libraries require that a separate physical copy of the document reside on the computer (either in the volatile random access memory or on the more permanent hard drive storage). This copy might then be appropriated, adopted, modified, and used in other documents, thereby depriving the author and the publisher of revenue, credit, or both. For materials that are essentially images, there are methods, called "digital watermarking," for embedding a unique identifier in the image. While this does not prevent misappropriation of the material, it does support post facto discovery of that activity and the search for legal remedies. However, standard text processing tools can convert some kinds of page descriptions-for example, those made available in the Adobe postscript format or the portable data format(pdf)into pure text, which carries no watermark.

Protection of readers is also an issue because, even in an open political system, some materials are deemed inappropriate and potentially harmful to some groups of readers, particularly the young. There are both technical and policy problems related to identifying and tagging such materials automatically, as well as to knowing which readers should be permitted access to materials of each identified class. Efforts to resolve this problem legislatively are ongoing in the United States.

Costs and Benefits of Digital Libraries

While digital libraries represent an exciting new technology, they carry costs as well as benefits. As both technological and social entities, digital libraries compete for scarce resources, so they must be evaluated. The evaluation process must serve a diverse group of stakeholders, including individuals (e.g., readers, authors, librarians), corporate entities (e.g., libraries, host institutions, publishers), and national entities with shared interests (e.g., health, science, education).

The economics of digital libraries is still in its infancy, but it seems to be characterized by several key features: (1) observation of the library system in use, as opposed to a simple assessment of its size or collections, is essential to evaluation, (2) observations must be reduced both to numerical measures of some kind (e.g., statistics) and to comprehensible narrative explanations, and (3) the resulting measures and narratives must make sense to various groups of stakeholders in order to support decisions.

While much library material is ephemeral (e.g., newspapers), much of the value of libraries lies in the works of art and of scholarship that they contain. With regard to scholarship, colleges and universities are still developing the policies that will encourage (or discourage) the publication of digital works by their faculties. Unless such work is recognized, scholars will not produce in the new formats. There are challenging issues related to ownership of digital collections. The effort expended in digitizing collections must be paid for either by concurrent funding (e.g., government-sponsored programs) or with borrowed funds that must be repaid by sale of access to the materials. In a nation committed to equal access to information, many of whose leaders in science and industry obtained much of their basic knowledge in the public libraries of the twentieth century, issues of ownership and access will be among the pressing national policy problems of the twenty-first century.

Prospect

Overall, it seems likely that libraries in digital form will become the norm. Systems for duplication and migration will be needed to ensure the permanence of the cultural heritage in this form. Sound economic frameworks will be needed to ensure that access is provided in ways that benefit the society as a whole rather than only those who can afford to pay for the newest technology. All in all, an ever-accelerating technology will make the digital library an increasingly effective servant and collaborator for the society that develops and maintains it.

See also: Cataloging and Knowledge Organization; Communications Decency Act of 1996; Databases, Electronic; Internet and the World Wide Web; Libraries, Functions and Types of; Libraries, National; Library Automation; Preservation and Conservation of Information; Retrieval of Information.

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LIBRARIES, FUNCTIONS AND TYPES OF

The word "library" was originally drawn from the Latin term *liber*, which means book. Historically, the libraries of the world have been closely identified with the books that came to fill their respective shelves. As recent as the 1980s, it would have been possible to define the nature and future of libraries in terms quite similar to those used in the description of libraries in the fifteenth, the eighteenth, and the mid-twentieth centuries. For it is apparent to even the most casual of students that the character of libraries has remained remarkably stable throughout some four millennia. Across those four thousand years, librarians constructed libraries large and small that were designed to effectively collect, organize, preserve, and make

accessible the graphic records of society. In practical terms, this meant that librarians, the managers of these ever-growing libraries, collected large numbers of books and periodicals, arranged them for relatively easy use, and made these collections accessible to at least part of the community (if not the whole community). This broad definition of the nature and function of libraries served quite nicely until recently.

What shattered this timeless consistency, of course, was the emergence of information technology (IT) and the onset of the "information era." The emergence of the e-book, the e-journal, and hypertext writing systems appears to be rapidly undermining previous commitments to the printon-paper communication system that played such a fundamental part in constituting the libraries of the world. Authors and publishers are increasingly recognizing IT as the new "core" or "defining" technology of the information era. It is apparent that knowledge production is being rapidly shifted to this new medium in an attempt by authors and publishers to amplify intellectual capacity through the enlightened adoption of a new medium that promises to enhance productivity, while concomitantly lowering the costs of knowledge production. It is also clear that librarians are being asked to devote ever-larger proportions of their limited resources to the provision of digital information services, and are being required to devote eversmaller proportions of their budgets to the traditional print-on-paper materials.

The dramatic and accelerating development of the digital communication system and its rapid adoption by large segments of society has forced a wide-ranging revision of the notion of "library" and a reconsideration of the role of the librarian within the context of the now-dominant information economy. Initially, this development was viewed by library interests in much the same contradictory fashion as it was by society at large. For some, the idea of using IT to eliminate the printon-paper system was a positive and exciting new development, while for others it promised an intensely unappealing future. Many librarians viewed the emergence of the information revolution as the long-sought opportunity to transcend the limitations imposed on libraries by the printon-paper system, while to others the much celebrated "death of the book" heralded little more than cultural decline. As a result, the last decade of the twentieth century was marked by heated and highly polemical arguments about the nature and extent of the information revolution and its implications for the future of libraries.

Types

While the digital revolution has forced an intensifying debate about the future of libraries, much, nevertheless, remains the same. For example, for several centuries the principal types of libraries have remained unchanged. What differentiates these library types is the nature of their clienteles; and thus governmental, public, academic, school, and special libraries are found, serving information-seeking patrons throughout the world.

The first of these types to emerge in time was the library serving government. From the beginnings of centralized civilizations some five thousand years ago, it was necessary for governments to collect and organize for efficient use, large (and eventually huge) amounts of information. Then as now, some of the largest libraries in any country are government libraries serving special clienteles of civil servants, legislators, or members of the judicial and executive branches of the government, and are supported with public resources. For example, in Washington, D.C., there are literally hundreds of governmental libraries ranging in size from the mammoth Library of Congress, generally considered the largest library in the world, to small libraries containing only a few thousand volumes and serving only a few individuals. The same could be said for each of the most sophisticated world capitals such as Moscow, Paris, London, and Berlin. The government library category would also include thousands of libraries serving state, provincial, and municipal governments.

Another large and extremely diverse group of libraries can be categorized as special libraries that serve a wide variety of business enterprises. In any developed nation, thousands of special libraries serving companies large and small offer sophisticated information services to the employees of their respective companies. These libraries are funded with corporate resources and thus consider their collections and services to be proprietary and accessible only to those who work for the company. Special libraries offer a wide range of services to company employees but focus on two: preserving and organizing vital records relating to the opera-



Special academic libraries are often designed to meet collection and facility needs, which is the case with this fifteen-thousand-volume academic library on the Universe Explorer, a floating campus for college students who are participating in a "Semester at Sea Voyage" on the Atlantic Ocean. (Dave G. Houser/Corbis)

tion of the company, and providing a resource from which the research staff of the company can mine ideas for new products and services.

Equally significant are the public libraries of the world; that is, those libraries established as public trusts, administered with public funds, and open to every element of the citizenry, from children to adults. Free and readily accessible to local inhabitants, these libraries constitute the very cornerstone of information access for citizens, and virtually every community in the developed countries, from Great Britain to Sweden to the United States, proudly boasts the existence of significant numbers of public libraries that are open to all of their citizens. While these libraries offer many services, the emphasis on recreational or leisure reading is a unique characteristic of public library service.

Academic libraries are those libraries that serve the students and faculty of the colleges and universities of the world. The collections of these academic libraries can range from a few thousand well-chosen volumes in the library of a small community college to the approximate ten million volumes found in the complex system of libraries serving Harvard University in Cambridge, Massachusetts. Unlike their public library counterparts, the academic library is little concerned with recreational or leisure reading and is devoted almost exclusively to the collection, preservation, and preparation for use of scholarly research materials that may never be widely used but are viewed as having research significance.

School libraries complete our categorization of library types. The school library is devoted to the support of the educational programs of elementary and secondary schools in countries throughout the world. Heavily oriented toward didactic material viewed as useful by schoolteachers, and smaller than academic libraries, the school library is an integral part of the education of children.

Perhaps it would be appropriate to end this section on contemporary libraries by noting the

great variations in the number and nature of libraries that exist from country to country and continent to continent. The most extensive system is that found in the United States, which boasts some 8,500 public libraries, over 3,500 academic libraries, and literally tens of thousands of government, school, and special libraries. This massive library system is managed by some 250,000 professional librarians. Most of the Western European countries also have large and well-supported systems, but Eastern Europe, Africa, and most of Asia lag far behind. Thus, it should be no surprise to find that American and Western European libraries have also taken the lead in deploying information technologies in the service of their diverse clienteles.

Functions

While the information revolution has placed enormous pressure on libraries as they try to find their way across this dramatic technological divide, librarians continue to carry out a series of basic functions in the service of their overarching goal of making information readily available to their clienteles.

Perhaps first and foremost in the functions carried out by libraries is the never-ending collection of recorded information deemed of value to the users of libraries. Hundreds of thousands of librarians have devoted millions of hours to the assembly of the tens of thousands of library collections found throughout the world. Such collection development requires special awareness of the nature of knowledge production and the nature and extent of user needs, and remains one of the most important functions of the librarian. The glorious fruits of the labors of those responsible for the collection development function over the years can be seen in the magnificent book collections to be found in the great national libraries of the world, such as the Library of Congress, with nearly twenty million volumes, and the national libraries of England, France, Germany, and Russia, with nearly as many volumes. Such collections, painstakingly assembled, represent a virtually complete memory of the cultural history of their respective nations, and as such remain invaluable. These print-on-paper resources are, of course, now being joined by massive amounts of digital information stored in the computers of the libraries.

Once such large and valuable collections were assembled in countless libraries across the world, it next fell to the library profession to preserve those collections across time. Thus, librarians have pioneered techniques for restoring old books to usable states, and are leaders in the project to ensure that all future books will be printed on materials designed to last for hundreds of years. Librarians have also been in the forefront of the discussion of the most effective ways to collect, organize, store, and preserve digital communications.

Another enormously costly aspect of the effort to preserve library collections has been the construction of library buildings specially designed to conserve the priceless contents of the libraries of the world. These libraries have become ever more expensive, and, depending on the size of the collection, can run to hundreds of millions of dollars to build. Many people hope this huge cost can be eliminated in the future as digital communication comes to replace traditional books and periodicals in the knowledge production system. Then, a computer might well become the library, but it must be noted that it would be many years before the accumulated knowledge of the world, stored in millions of books, periodicals, and manuscripts, could be translated onto the new digital medium. Thus, it appears that librarians will be faced with the daunting task of managing yet one more medium in the future.

Large collections of books are virtually unusable without careful attention to organization for ready access. As a result, the cataloging and classification of library materials remains a central function of the libraries of the world. Using various classification schemes such as the Library of Congress Classification scheme or the Dewey Decimal Classification scheme, librarians have prepared detailed catalogs that act as efficient guides to the contents of their ever-larger collections. Providing author, title, and subject access to library collections, these catalogs remain essential to the proper utilization of any library. Librarians have also been working to develop search engines that will facilitate searching the multitude of databases available to library patrons via the Internet.

Finally, libraries must be interpreted for effective use. This library function is implemented by librarians who are prepared to answer user requests for specific information related to research projects and classwork. Librarians also prepare a wide variety of reference and bibliographic tools designed to provide library patrons with guidance in the use of specific elements of the collections of a library, such as periodical holdings, book reviews, or biographies of prominent individuals. Librarians are particularly committed to providing extensive formal and informal instruction to users who are seeking guidance in navigating their way through complex library collections and gaining what librarians refer to as "information literacy."

Information Technology and Libraries

Thus, while the types and the functions of libraries have remained much the same as they have been for several millennia, it is essential to note that the revolutionary spread of integrated digital communication systems has dramatically complicated and influenced the way in which libraries function in modern society. Perhaps an initial glance at several of the largest national libraries of the world-the Library of Congress and the Bibliotheque de France-will make this point clear. The Library of Congress, located in Washington, D.C., is housed in two expansive and expensive buildings and contains more than twenty million volumes in its collections. It is charged with a multitude of roles, including providing extensive reference and research services to the U.S. Congress, serving as the largest scholarly research library in the world, and offering a widely praised books-for-the-blind program. Even at the beginning of the twenty-first century, the Library of Congress receives a book every five seconds and has a massive number of unprocessed items waiting to be cataloged. At the same time, the Library of Congress has taken a leadership role in the deployment of IT in libraries. Perhaps the most dramatic venture is the American Memory Project, which is designed ultimately to translate a vast amount of the collection of the library into a digital format that will be accessible via the Internet from all over the world. In attempting to transfer such huge amounts of printed material to digital formats, the Library of Congress has been forced to deploy the most sophisticated and expensive IT available today, and most experts estimate that it will still cost millions of dollars and take decades for the American Memory Project to encompass any significant portion of the vast holdings of the Library of Congress.

The tremendous controversy surrounding the architectural design of the Bibliotheque de France illustrates the problems associated with the construction of library buildings in the information era. When the plans were first presented to the French public in 1991, there was a huge public outcry because it appeared that the Bibliotheque de France had been designed by architects who seemed to think that the book was "dead" in the digital era. Thus, very little provision was made for the preservation and use of books and periodicals in the new French national library. Many critics railed against the design, suggesting that it threatened the "collective memory" of the French people as represented by the millions of books in the library. The architects were urged to plan for the deployment of the latest technology for reproducing and storing information without gambling on the survival of the traditional book collection that represents the "collective memory" of the nation. The outcry in the early 1990s was so great that the French architects were forced to return to the drawing board and develop a design for a building that would be more friendly to the printon-paper materials in the collection.

College and university libraries throughout the world should face a quite similar if less extensive set of problems as they enter the information era. Ever-larger amounts of the material they acquire is being produced in digital formats, and college and university students are especially sophisticated users of the new IT and are increasingly insistent that coursework and course readings be accessible via the Internet. Such demands have forced university administrators, faculty, and academic librarians to invest substantial amounts of money in IT and e-books and e-journals. At the same time, librarians must constantly attempt to stay abreast of the rapidly changing information environment so that they can adequately interpret the emerging "electronic library" for students and faculty.

Indeed, it appears that students and their parents are pushing the IT revolution at all levels of education as they demand ever-wider access to a growing array of IT. Students throughout the world are increasingly aware of the burgeoning information economy and the kinds of job opportunities available in that sector. Thus, their demands for ready access to e-mail, Internet services, online coursework, and digital reading materials and research resources are at least in part intensely pragmatic as they rush to qualify for the new employment opportunities in the information economy.

Virtually all libraries have been significantly influenced by the emergence of the new IT and the widespread development of the Internet. For instance, a vast majority of the libraries in the United States, and many more libraries throughout the world, have eliminated the old library card catalog and replaced it with an Online Public Access Catalog (OPAC). Almost as many libraries now provide Internet access to library patrons via dozens of computer terminals available to the general public.

Far fewer libraries have been able to completely replace their print-on-paper collections with e-journals and e-books, but nevertheless, there are many libraries worldwide, especially in the special library sector, which have gone virtually digital where in a very real sense the whole library is contained in a computer. An example of a totally digital and commercial library would be Microsoft's Corbis.com. This huge database comprises the largest collection of digital art and photography in the world, and half a million individuals visit this digital art library each day via the Internet. Those who discover art or photography that they want to own on the site can purchase these materials from Corbis.com.

Thus, by the beginning of the twenty-first century, every aspect of human existence has been influenced by the new IT. However, two particularly pressing information-era issues emerged to trouble all of those who were charged with planning library development.

Commodification of Information

In 1973, Daniel Bell, the distinguished Harvard University sociologist, published his now-famous book titled *The Coming of Post-Industrial Society*, in which he forecast, with amazing accuracy, the coming of the information revolution, an era he predicted would mark a complete break with our industrial past. Central to his work was the notion that the information society would be characterized by a changeover from a goods-producing to an information-producing society. He went further to insist that, in time, information would come to represent the most important commodity sold in the new electronically linked world marketplace. Two decades later, Bell's prediction was confirmed when Bill Gates, the president of Microsoft (and by then the wealthiest man in the world), noted in his 1995 book titled *The Road Ahead* that digital information had indeed become a central commodity in a massive global information marketplace, and that brash and uncivilized market forces were definitely at play in the public sector of the economy as well. Virtually everyone now concurs with this conclusion, but many remain troubled by the implications of the dramatic and relentless commodification of information.

One concern is essentially political. That is, many students of the notion of "democracy" in the Western world have pointed out that a key characteristic of the democratic model is the insistence that the success of democratic systems depends on the extensive and enlightened participation of citizens in the political process. An important corollary, and a central justification for the public library systems of the world, is the belief that enlightened participation by the citizenry is dependent on widespread and easy access to "free" information defined as a public good and provided with public tax funds.

Librarians and others remain skeptical of the idea that the commodification of information and the privatization of information delivery systems is conducive to the democratic process. They fear that such a process, if left unchecked, would actually lead to the restriction of access to information for those citizens who lack the financial resources necessary to buy significant amounts of digital information in the information marketplace. That is, many fear that the commodification of information, and the abandonment of the idea of information as a public good, would lead to an ever-larger gap between the "information rich" and the "information poor" in society and have the ultimate effect of undermining the democratic process. Thus, it should come as no surprise to find that the librarians of the world are at the forefront of the effort to provide widespread access to information to all of the citizens of a nation via a system of public, school, government, and academic libraries defined as public goods and supported by the state.

Many other critics, many of them librarians, see grave cultural implications in the insistence that all information of value will come to be defined as a commodity and that all information sales and services should be privatized. These critics are also troubled by the suggestion that all valuable information will come to be seen as practical or instrumental. And they insist that this notion would undermine the cultural value of books and reading, where great books are viewed as "priceless," and are often quite "unpopular" with the mass reading audience. The aggressive and instrumental commodification of information is seen as a recipe for cultural decline and the destruction of not just the book, but more importantly, the "great books." Librarians insist that the provision of public tax support for libraries has guaranteed the existence of a culture of great writing, because librarians have always attempted to purchase and preserve only the best that had been thought and written in their respective societies. In a real sense, librarians argue, they have acted as subsidies for the highculture industry, and thus they fear that the commodification of information and the privatization of information delivery systems could ultimately undermine the cultural life of the nation.

It must be noted that advocates of the e-book and the commodification of cultural production insist that the information revolution does not threaten literacy, but rather simply promises to undermine the old print literacy. What will emerge, they insist, is a new hypertext writing system that will significantly alter the way people write and read as individuals create "texts" that are no longer linear and that tend to empower readers, who will be able to manipulate books in ways rarely imagined before the information era.

The Library as Place

Michael Levy, writing for the January 1, 2000, issue of *Newsweek*, concluded that by the year 2020 some 90 percent of books sold would be published as e-books. It is assessments such as these, widely endorsed by many experts, that lead librarians to wonder what "place" they will occupy in the new millenium. Richard Lanham sums up this dilemma in his book *The Electronic Word* (1993) when he notes that "the library world feels *dépaysé* today. . . . Both of its physical entities, the buildings and the books they contain, can no longer form the basis for planning" (p. 134).

Library buildings are hugely expensive to build and operate, and at present virtually all of the libraries in the developed West, at least, are filled to capacity. In the minds of many this situation will slowly, and happily, disappear as more and more of the books that currently stand in ordered rows on library shelves are digitized and transferred to a computer system located "somewhere" on the Internet. And as virtually everyone agrees that more and more new books will be published as e-books, it follows that society is rapidly approaching the time when it will no longer be necessary to build any new libraries, and some would go so far as to insist that society may well be able to close those buildings still operating by the beginning of the twenty-second century. These concerns and developments are forcing librarians to carefully analyze the role of the library in the information era and explicitly attempt to imagine a completely new library landscape where large traditional library buildings are slowly replaced by computers holding massive numbers of e-books and e-journals. Where will librarians work, what will they do, and how should they be trained when the library is no longer a "place"?

In the past, librarians could focus on the collection and preservation of books, and because access to books and periodicals depended on ownership, libraries could offer a valuable service to a select group of users by simply buying and housing as many books as possible. The new IT promises to break the linkage between ownership and access, and information seekers can now "access" information in a wide range of information markets. These users are extremely sophisticated consumers of information services and demand ever-more effective delivery systems. Librarians are struggling to define new programs that will effectively compete with the vast array of information services available through the Internet. The ability of the library profession to successfully fit into the new information environment will dictate the future of the library.

While it seems certain that libraries of the twenty-first century will appear quite different than those of the twentieth century, the precise direction and speed of the change remain murky. What seems likely is that answers to such questions will emerge over the course of the new century as librarians and communication specialists experiment, investigate, and analyze developments in countless libraries throughout the world. It also seems obvious that the pace of change will vary widely from country to country, and even from region to region within individual countries.

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Perhaps the most responsible way to conclude would be to say that most interested parties seem to agree that society cannot simply walk away from the collective fruits of the intellect as represented in the untold millions of words-on-paper so thoughtfully housed and made accessible in the libraries of the world. And at the same time, almost everyone is equally certain that IT and the e-book must be effectively deployed by a profession that boasts three thousand years of sustained commitment to the responsible collection, preservation, and effective organization for use of the recorded knowledge of civilization—no matter in what format that knowledge may come.

See also: Archives, Public Records, and Records Management; Archivists; Community Networks; Internet and the World Wide Web; Librarians; Libraries, Digital; Libraries, History of; Libraries, National; Library Automation; Preservation and Conservation of Information; Reference Services and Information Access.

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LIBRARIES, HISTORY OF

As places that preserve written evidence, libraries existed as early as the third millennium B.C.E. Those from Mesopotamia featured baked clay tablets with cuneiform writing, and those from Egypt featured papyrus rolls. Great collections from this time are still being uncovered, such as the one at Ebla in modern Syria. They tell mostly of record-keeping agencies. In the centuries just before the birth of Christ, their records also came to be viewed as religious, political, and literary texts, and as this happened, the modern library emerged. It was a place, but it was also a center of the society's thought.

The most impressive library of antiquity was in Egypt at Alexandria, the city named for Aristotle's most famous pupil, Alexander the Great. The Pinakes ("tablets") of Callimachus listed its holdings, and probably also the titles that needed to be found and added to the library, since the collection was meant to grow. This work cites texts (not mere factual information but writings that were seen as permanent, and thus stable in meaning so they could be cited, criticized, and revised) and thus it also records a literary "canon" of the important writings of civilization. The destruction of the Alexandrian library is one of the great tragedies of human history, and the suggested assailants have included Marc Antony, the early Christians, and the early Muslims. It is likely that what precisely happened to that library will never be known because there is no existing evidence. This is ironic considering that evidence is exactly what libraries seek to preserve.

Libraries were sustained through the Middle Ages as writings were preserved by monastic copyists. The original Benedictine scriptorum at Monte Cassino in southern Italy was recreated in Ireland, and eventually throughout much of Europe. A heritage of antiquity thus survived alongside biblical and early Christian writings, as humanist poets and scholars sought out the evidence of a lost antiquity preserved in surviving manuscripts. If the loss of the Alexandrian library symbolically represents the decline of classical civilization, Boccaccio's visit to Monte Cassino symbolically represents the Renaissance of modern Western history.

Rediscovery of the past inspired the passions of many book collectors, including the Medicis, many

the Popes, the Duke of Urbino, King Mathias Corvinus of Hungary, and Humphrey, Duke of Gloucester. Prominent book collectors of more recent times include John Rylands in England and J. Pierpont Morgan, Henry Clay Folger, and Henry L. Huntington in the United States. Less famous, but just as important, were the countless book owners who, as readers, collectors, and patrons, maintained personal libraries. The instinct to build and use collections thus reflects and fosters the personal and social responsibilities of inquiring minds.

Johannes Gutenberg's printing press (ca. 1450) obviously fostered the growth of libraries. The Renaissance may have cherished its books, but it was the later age of reason, enriched by the blessings of the printing press, that cherished its libraries. Francis Bacon's vision of the advancement of learning proposed three mental faculties: reason (naturally the foremost), memory, and imagination—a conception that still underlines most modern library classification schemes. The faculty of reason, celebrated by RenÈ Descartes, also inspired the first great treatise on library method, Gabriel Naudé's *Advis pour dresser une bibliothèque* (1623).

Of the institutional libraries that still survive, few date from before 1600. Among the oldest is the Bodleian Library in Oxford, which was opened in 1602. The library was founded when Sir Thomas Bodley, on learning that Duke Humphrey's private collection had been ignored, boldly vowed to provide funds, along with rules and purposes. As other institutional collections emerged, libraries slowly became a public good. Tall single-room libraries emerged during the seventeenth century and were lavishly decorated in the eighteenth century. However, their aim slowly changed, from places of beauty and personal enrichment to ones that also addressed a social mission. In 1650, John Dury's The Reformed Librarie Keeper introduced the idea of a "publick stock of Learning." A half-century later, Jonathan Swift, in his satire "Battle of the Books" staged a mock battle between the Ancient Books and the Modern Books in the Library of St. James in London. Swift's satirical conflict, which presented scholarly skirmishes over several decades, had profound implications for the search for the best evidence. In simple terms, humanists were seen as readers who used libraries for both primary and secondary sources, while scientists used empirical laboratory work for their primary

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This 1813 print depicts the interior of the Bodleian Library in Oxford, England. (Historical Picture Archive/Corbis)

sources and libraries mostly for secondary sources. The "Battle of the Books" also foreshadowed the decline of the aristocracies, both intellectual and political. Libraries were an homage to tradition, but in the new modern political states that arose out of the democratic revolutions, libraries also reflected the rights and responsibilities of the newly enfranchised citizens. National literatures were canonized through source materials acquired by and maintained in libraries, and national bibliographies were established to record the output of the national press. In democratic societies, libraries were a civic necessity.

Public libraries date from the late sixteenth century, but only in the nineteenth century were they first widely supported by tax funds. The models were the many "social" libraries, joint-stock or subscription institutions that allowed members loan privileges or access to noncirculating ("reference") collections. In his *Autobiography* (1784), Benjamin Franklin discussed the tribulations and successes of his small reading group that attempted to formalize its activity under the name of the "Junto." Other social libraries were designated to reflect special readerships (e.g., mercantile, apprentices, mechanics), conditions of access (e.g., free, subscription, joint-stock), or ideals (e.g., lyceum, Athenaeum).

Tax support for school libraries began in 1835 in the state of New York; municipal support for public libraries soon followed and led to the landmark founding of the Boston Public Library in the 1850s. In England, the work of Edward Edwards had promoted the Library Act of 1850. Tax-supported public libraries soon began to multiply in the industrial Midlands of England and in the New England region of the United States. Emerging urban centers were prime locations for the new public libraries.

Public libraries thus came to reflect the same democratic instincts that led to a free press. They would serve enlightened citizens who would produce even more enlightened citizens. As printing technology improved during the industrial revolution, more reading matter was available. Thus emerged the classic ideology of libraries: a commitment to public literacy, intellectual freedom, and the dialectic processes that define and enhance the common good of the societies that support the libraries and which they served. It was assumed during the early days that libraries in a liberal society must provide freedom of access to the totality of civilization, in reliable forms. The classic adage about "the right book for the right reader at the right time" incorporates the vision of personal betterment that commits librarians to public service and to the never-ending battle against censorship. Out of the ambiguities arose other bold adage: "Librarians have opinions, libraries do not." Values, contexts, and commitments, such as result from the interaction between the text and the mind of the reader, remain the primary objective of libraries.

The public library movement in the United States faltered before the Civil War but quickly resumed afterward and encouraged the founding of the American Library Association in 1876. National practices for cataloging and classification were high on the agenda of the new profession. Public libraries comfortably shared their concerns with other libraries. Academic libraries, then still mostly symbols of learning and repositories for alumni bequests, slowly grew in support of the new German-style seminars that would in time lead to the modern research university. Scientific libraries soon found their focus in their own organization, the Special Libraries Association (founded in 1901). The public library, however, has remained an ideal, benefiting from the vast patronage of Andrew Carnegie in the early years of the twentieth century. During the years of the Great Depression in the 1930s, Carnegie's support of public libraries offered hope and enlightenment to a discouraged populace. In the 1950s, federal support for libraries of all kinds began to grow.

Originally, the title of "librarian" had been given out to caretakers of no or dubious distinction. Librarianship began developing into a recognized profession when formal educational programs became available and were required for employment. One of the earliest such programs was founded in 1884 by the brilliant, outrageous, and legendary Melvil Dewey in New York. Dewey's quirky egalitarianism, mixed with the widespread vision of library service, led to the strongly feminine character of libraries that emerged around 1900.

Sanctioned by the values of their mission, libraries continued to grow. Much as manufacturing and sales were separated in the flourishing American corporation, however, so in libraries was work with readers (public service) separated from processing activities (technical service). Concerns for efficiency often confronted concerns for the professional agenda and standards, so when computers and telecommunications systems arrived, libraries were understandably quick to take full advantage of them. Early work in systems design may have been frustrated by the vast holdings and intellectual complexity of libraries, which were always expanding, and by the unpredictable needs of readers, which were always being redefined. Viewed as engines of a sort, however, librarians are clearly exhilarated by the prospects of improving their mechanisms for making their resources available to readers.

See also: Carnegie, Andrew; Cataloging and Knowledge Organization; Dewey, Melvil; Franklin, Benjamin; Gutenberg, Johannes; Librarians; Libraries, Digital; Libraries, Functions and Types of; Libraries, National; Library Associations and Consortia; Library Automation; Printing, History and Methods of.

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D. W. KRUMMEL

LIBRARIES, NATIONAL

National libraries collect, preserve, and organize materials that document the intellectual capital of their respective countries. Because the political histories, intellectual and cultural traditions, and attitudes toward libraries vary considerably from country to country, there is much variety among such institutions and only the most general of definitions applies to them all. According to the International Federation of Library Associations and Institutions (IFLA), there are almost 175 institutions serving the functions of national libraries, including those not officially so designated.

Functions of National Libraries

In the context of the history of library and information science, national libraries are a relatively recent phenomenon. There have been collections of books and archives associated with nations for thousands of years, and large-scale libraries in the modern sense have been associated with imperial or other royal courts since the sixteenth century. It is generally agreed that the first national library took form when, in 1795, the French National Convention decreed that the royal collections would become national property and form the basis of a depository of all printed publications in France. During the nineteenth century, more than twenty such national collections were formed worldwide, with that of the British Museum Library serving as the most prominent model. Under Anthony Panizzi, that library aimed to become the most comprehensive collection of English literature in the world and the most comprehensive collection of international literatures outside of their respective countries.

From the earliest years to the present, national libraries have served as research institutions rather than lending institutions, and their users have traditionally been advanced researchers rather than the general public. As the nineteenth century progressed, national libraries because resource centers for the deposit of periodicals, official government publications, works published in the respective countries, works published abroad by nationals of the respective countries, and works about the respective countries regardless of where they were published. A major function of national libraries toward the end of the century and the beginning of the twentieth century became that of bibliographic control and bibliographic cooperation, which necessitated the establishment of standards of bibliographic records. Perhaps more easily visible in national libraries than anywhere was the gradual shift in the nineteenth and early twentieth centuries from collecting literature to establishing comprehensive records of literature in the sciences, technology, and business. Because of the growing importance of such literatures to wide audiences, national libraries served as coordinating institutions for resource sharing and the cooperative use of bibliographic records.

National libraries have been criticized at various times as being stagnant, unwieldy general collections and excessively specialized collections serving relatively elite populations. Proponents of such collections have argued that the institutions have large and complex roles. Their attempt to preserve their respective cultural traditions, to be exhaustive in several collecting areas, and to be comprehensive in as many others areas as possible constitutes the very nature of modern national libraries.

The various purposes of modern national libraries include the following (with considerable variation from country to country):

- 1. collect (acquire, organize, preserve, and provide access to) national literature on all subjects exhaustively,
- 2. collect literature on all subjects comprehensively, regardless of national origin,
- 3. coordinate bibliographic activities of a country,
- 4. provide bibliographic access to the nation's literature in the form of a national bibliography,
- 5. coordinate national bibliographic services, including resource sharing and the sharing of bibliographic data,
- 6. provide technical and training expertise for libraries and other information agencies nationwide,
- 7. lead in international bibliographic cooperation efforts,
- 8. educate the general public about a nation's historical, literary, and scientific traditions,
- 9. coordinate national policies of intellectual property, especially copyright,
- 10. establish a system of legal deposit of published material,
- 11. provide research assistance to government entities, and
- 12. provide access by means of in-house consultation or lending to researchers as well as the general public.

Being icons of information policy for their respective countries, national libraries are perhaps the most visible manifestations of information dis-



The facilities that accommodate national libraries vary greatly; the Austrian National Library, for example, is housed in the Hofburg Palace in Vienna. (Bob Krist/Corbis)

tribution that can be observed by the outside world. While national information policies are not promulgated in such institutions, but rather in the countries' legislative bodies, the libraries do play symbolic roles beyond the practical ones of organizing and providing access to information. They demonstrate that the country in question is cognizant of the need to preserve a past, to document the country's intellectual capital, and to provide its citizens with access to information. Some national libraries do indeed house specialized departments that are enabled by legislation to protect intellectual property; the Library of Congress is one prominent example of this. Such departments can be charged with the task of writing the specific details required by broad legislation, and they can play central parts in the development of laws that together constitute a country's information policy.

Library Growth and the Related Problems

Because of the comprehensive nature of many national libraries, they have faced growth problems

on a larger scale than have any other library types. The growth of institutions such as the French National library, the British Museum Library, and the Library of Congress was due to the rapid expansion of scientific and other research literature after the eighteenth century and because of the effects of changing printing technologies in the nineteenth and twentieth centuries. By the end of the nineteenth century, most of the countries of Europe, North America, and South America had established national libraries, and the major countries of Asia and Africa were to follow in the twentieth century. There are fewer than two hundred national libraries, but it is remarkable that most of them were established in the last 150 years and that they grew so rapidly that they assumed the roles of major cultural institutions throughout the world.

There is no question that printed resources grew at faster than expected rates in the nineteenth and early twentieth centuries. The largest and most comprehensive national libraries have also been leaders in the acquisition and storage of materials in other formats, most notably including microforms from the 1930s onward and digital information from the 1950s onward (but especially since the mid-1980s). The major national libraries of European countries, including especially those of Austria, Romania, Hungary, France, and Great Britain, established centers of documentary reproduction to preserve microformats of materials that faced threats of war and natural disaster. The National Archives of the United States was one of the world's leaders in microphotography for the purpose of preserving the intellectual content of records. The Library of Congress and other major national institutions have alternately struggled to keep up with advances in such information technologies and provided leadership to their respective countries in areas such as documentation (especially large-scale microform projects) and electronic information storage and retrieval. These institutions have become leading storehouses of data in all formats, and they have provided leadership to other libraries for their own microform and electronic preservation efforts and as consultants for digitization programs.

Because national boundaries are impermanent, national libraries attempt to adjust to boundary shifts when they occur. With such circumstances as the reunification of Germany and the breakup of the Soviet Union, Yugoslavia, and Czechoslovakia, issues beyond those of general collecting strengths and chronology come into sharper focus. Countries with very definite cultural identities desire that their characteristics be reflected in the living cultural monuments called national libraries; however, changes in such large-scale institutions take much time and can be complicated by competing ideologies. The Slovak National Library in Matica slovensk has very old roots in the nationalist movement in the area and is now the major library of the Slovak Republic, as well as its bibliographic center. The National Library of the Czech Republic in Prague has a centuries-old history that closely reflects the history of the Czech people. An economic factor provides yet another disincentive for the formation of comprehensive national collections. New countries, especially those created by wars, are in no financial position to create large retrospective collections, especially when they have many higher priorities. In some cases, as with the National and University Library Ljubljana, the library reassumed the function of a national library (when Slovenia became an independent country in 1991) to complement its role as the leading academic library. This particular institution has added and dropped functions to coincide with the political changes that occur in Slovenia.

U.S. Institutions

Because national libraries vary considerably in purpose, it is difficult to find one that can represent them all. However, the Library of Congress illustrates many of the collections and services that are found in the national libraries of other countries. Complemented by prominent specialized national institutions, including the National Archives, the National Library of Medicine, and the National Agricultural Library, the Library of Congress is the de facto national library of the United States. It is the largest library in the world and preserves 115 million items on all subjects, in all existing formats, and in several hundred languages. It has offices throughout the world to acquire, process, and organize materials, and it has more than fifteen thousand formal agreements with other libraries and foreign governments to address material purchases, gifts, deposits, and other issues. Its primary stated purpose is to serve the legislature of the United States, but for more than 150 years, it has also served the international research community and the general public.

The Library of Congress maintains some of the world's most prominent materials within some of the most comprehensive subject collections anywhere. These subjects include maps, artwork, music, literature, and scientific materials. While the Library of Congress occupies several large historic buildings, it has evolved to become more than just a physical collection of materials; it provides nationwide services for researchers, publishers, teachers, the blind, and the physically handicapped. It works with other federal libraries and information centers and provides technical consulting. The Library of Congress is well known for its digitization projects, which provide access to library materials of high interest on a variety of topics to readers worldwide via its extensive Internet website. The Library of Congress is home to the Copyright Office of the United States, and like other national libraries, it is the most important national resource center for issues of intellectual

property. It has developed an informational and educational presence on the Internet that has been emulated by other national libraries. This relatively recent development has changed the direction of public awareness of the institution and has provided a new means of access to its collections and services for the library world and the general public. The Library of Congress website is a source for information about the library's holdings, its programs, its services, and its history. The website has also become an educational resource for American history and culture because of the American Memory project. A related website, "Thomas" is a comprehensive portal to information about federal legislation. Both sites are sufficiently sophisticated for use by advanced researchers, yet they are appropriate for schoolage researchers who are seeking authoritative information. The Library of Congress is not typical of the world's national libraries, but it does exemplify their major functions.

Conclusion

As conservative institutions that are concerned primarily with preserving their nations' intellectual culture, national libraries have reacted to technological developments in the printing and publishing world. As leaders in the library community, they have led the field in programs for preservation of library materials and the adoption of information technologies.

See also: Archives, Public Records, and Records Management; Bibliography; Libraries, Digital; Libraries, Functions and Types of; Libraries, History of; Library Automation; Museums.

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THOMAS D. WALKER

LIBRARIES, REFERENCE SERVICES OF

LIBRARY ASSOCIATIONS AND CONSORTIA

Library associations and library consortia in the field of library and information science are two related, but very different, membership organizations. It may be possible for an association to be a member of a consortium, but that is not common. It is much more likely that a consortium may become a member of one or more professional library associations. The distinction between associations and consortia is often found in their missions and membership criteria.

Associations usually have much broader missions, such as the promotion of the welfare of librarians and the institutions in which they work. Associations usually accept membership from individuals as well as organizations, with individual membership making up the bulk of their membership support. Consortia, on the other hand, often have narrower missions, usually very specific in scope, such as the sharing of books, journals, and other materials (resource sharing). Consortia nearly always restrict membership and participation to institutions and organizations. Given the interrelationship of library associations and consortia, and the potential for confusion between the two, it is worth spending some time looking at detailed definitions.

Definition and Typology of Associations

A common dictionary definition of an association is "an organization of persons having a common interest." Most dictionaries link the term "association" to the term "society," which is sometimes defined as "an organized group working together or periodically meeting because of common interests, beliefs, or profession." For library associations, the definition of a society fits well. Most library associations can be characterized as

See: Reference Services and Information Access

organized groups (often under charters approved by state or national governments) consisting of individuals and institutions that share interests in libraries and librarianship. Usually, library associations are concerned with principles and standards for services and sometimes for certification of professional personnel or accreditation of programs that provide education for library professionals. They are also concerned with support of professional principles and ethics that are related to access to information and intellectual freedom, especially in countries where there is a tradition of open access to information. In some cases, the organization may function more as an extension of government policy, especially in the countries that are formally associated with the former Soviet Union. However, as time goes on, library associations even in those countries are focusing more on professional principles and less on being an extension of government agencies.

In the United States, there are national library associations that represent the interests of medical, law, music, and art libraries, to name a few. There are also local, state, or regional chapters of these national associations. These chapters meet separately from the national association meetings, and they have as their mission the provision of services and communications at the local or regional level. Thus, the law, special, and medical library associations, for example, may have regional or state chapters that serve the state of Illinois or the city of Chicago or the Midwest region. In the United States, states have their own state library associations that represent libraries of all types. In some states, there are separate associations for elementary and secondary school librarians, often indicated by having "school library media specialist" or similar terminology in the name of such associations to contrast their mission and membership from the more general state library associations that include academic, public, and special librarians within their membership.

Definition and Typology of Consortia

The dictionary definition of a consortium often includes references to an association or society, noting that the word comes from Latin for "fellowship or company." However, in library and information science, the term "consortium" refers more specifically to a group of institutions, rather than persons, that join together for the mutual benefit of all the members of the group. Often, there is a formal legal compact among the institutions that agree to join the consortium. Thus, in the professional terminology of librarianship, consortia are usually groups of institutions joined together, while associations are more likely to represent individuals and institutions or just individuals who form a society based on mutual interest. There are exceptions to this generalized definition, of course. One of the most notable is the Association of Research Libraries, a group that has membership open only to institutions (libraries) that meet the specified criteria for membership. Even here, however, the Association of Research Libraries exists to assist the member institutions in communicating and sharing research reports and so on, as opposed to the generally more specific compacts of consortia, which focus on sharing resources, joint acquisitions, or coordinated cooperative projects.

Consortia follow categories similar to those of associations. There are international and national consortia, as well as regional, state, and local consortia. The term "network" is often used as a synonym for "consortium." Some people have noted that academic, special, and research libraries seem to favor the more Latin-based word "consortium," while public, school, and library groups that consist of many different types of libraries tend to favor the word "network." When the term "consortia" is used, the group often has a more focused or single-purpose mission, such as sharing periodical resources or seeking joint bids on expensive digital databases, while groups of libraries using the term "network" to describe themselves are more likely to have a mission that includes broader, more encompassing, multiple cooperative activities and to include public as well as academic, research, and special libraries.

Library Associations in the United States

The largest and the oldest of the library associations in the United States is the American Library Association (ALA). The ALA includes Divisions, Sections, and Roundtables that cover all types of libraries, including public, academic, research, school, and institutional libraries. Nearly every function and type of material that libraries are involved with are also covered, ranging from information services to technical and computer services and from multimedia to government information sources. The ALA, which was founded in 1876 by Melvil Dewey (the developer of the Dewey Decimal Classification) and others, has grown to have more than fifty-five thousand members in the United States and nearly two thousand international members. Both individuals and institutions may be members of the ALA. In 1999, there were nearly four thousand organizations and institutions that held memberships in ALA. Many of the units within the ALA hold separate conferences at sequenced intervals to supplement the ALA's annual summer and midwinter meetings.

There are a number of specialized associations that do not focus on the institution of librarianship exclusively. One is the American Society for Information Science (ASIS), which is the national society for those people who are involved in information science. It grew out of the American Documentation Institute, which was established in 1937 to promote interest in scientific and technical information transfer. In 1999, ASIS had more than three thousand personal members and more than two hundred institutional members.

The Association for Library and Information Science Education (ALISE) is an organization directed at educators in graduate schools of library and information science in North America. As such, it might be considered to be an example of a specialized educational association because of its focus on specific issues that are related to the education of librarians and information scientists.

Most states have state associations that represent libraries of all types within the state. While these individual associations are separate from the ALA, they generally maintain a liaison by having representatives within the ALA governing structure.

There are a number of national umbrella associations that encompass diverse interests in subjects and in types of libraries. The Special Libraries Association includes a wide variety of interests in specialized libraries, ranging from libraries that serve science and technology research organizations to those that serve business and commercial organizations.

Library Associations Outside of the United States

Numerous associations exist at the multinational, national, regional, state, and local levels worldwide. While the ALA was the first national library association to be established, library associations were established in other countries in the latter part of the nineteenth century and in the early twentieth century. The Library Association, which is the British association of librarians and is comparable to the ALA, was established a year in 1877. In the period between 1892 and 1922, Japan and most of the major European countries established national library associations with missions that were similar to those of the American and British associations. While Canada did not establish a separate library association until 1946, Canadian librarians were and continue to be active participants in the ALA from its inception.

International Library Associations

The International Federation of Library Associations and Institutions (IFLA) is the umbrella association that provides a venue for librarians to meet and communicate internationally. As its name implies, IFLA is an organization of library associations (international, national, and multinational), but it also accepts membership applications from libraries, library schools, research organizations, and other institutions. There is also a personal membership category for individuals. In 2000, there were 17 international association members, 137 national association members, and more than 1.000 institutional members worldwide. Personal affiliates accounted for 300 memberships. Thus, IFLA serves as both an umbrella organization for national and international library associations throughout the world and a place for institutions and individuals to come together over shared interests in international issues that are related to librarianship.

There are many international associations that are related to special library interests. The International Association of School Librarianship (IASL), the International Association of Law Libraries (IALL), the International Association of Agricultural Information Specialists (IAALD), and the International Association of Technological University Libraries (IATUL) are four such examples. These, and similar groups, are international association members of IFLA.

Library Consortia in the United States

Consortia are usually formed when two or more institutions realize that they can more effectively solve a problem or meet a need by working together with other institutions but still maintaining their own autonomy and most of their independence. While there may be informal cooperative efforts among libraries and related information institutions, they are unlikely to take the name "consortium" without some sort of formal charter or agreement in writing. The formal groups are the focus of this discussion.

Examples of library consortia in the United States range from regional consortia in one state, such as the Triangle Research Libraries Network in North Carolina, to regional consortia covering several states, such as the Committee on Institutional Cooperation (which represents the states of the Big Ten University System) and the Big 12 Plus Libraries Consortium (which covers university libraries in the Midwest and in southwestern states).

The Triangle Research Libraries Network in North Carolina was created in 1933 by the University of North Carolina, Chapel Hill, and Duke University. North Carolina State University and North Carolina Central University have since joined the cooperative program of coordinated collection development and resource sharing. The Chicago Public Library, the Newberry Library, and John Crerar Library also formed a consortium in the 1930s in Chicago to cooperate on acquisitions and purchasing materials.

Many consortia in the 1930s and 1940s were established to develop regional union catalogs of holdings. The Bibliographic Center for Research (established in Denver in 1934) and the Pacific Northwest Bibliographic Center (established in Seattle in 1948) are two such examples. Both have since been integrated into or replaced by the national electronic databases that list the catalog holdings of individual libraries in one database, but resource-sharing consortia still are built on the concepts of these early union catalogs. One such database is the VEL (Virtual Electronic Library), established in the 1990s by the Committee on Institutional Cooperation (CIC), which maintains a library consortium within the "Big Ten" university libraries plus the University of Chicago. The VEL catalog, which can be accessed through the World Wide Web, lists the holdings of all of the university libraries that participate in the consortium and permits borrowing by the faculty and students of those institutions.

International Consortia

Most consortia are regional or national in scope. Some are multinational and include membership in a number of organizations. However, there are comparatively few consortia that are truly international in scope and membership.

For example, the International Coalition of Library Consortia (ICOLC) was formed in 1997 from an informal group known as the Consortium of Consortia (COC). ICOLC had become an international group by 1998, with seventy-nine North American library consortia joining consortia from around the world. The mission of the coalition is to inform participants "about new electronic information resources, pricing practices of electronic providers and vendors, and other issues of importance to directors and governing boards of consortia." A review of the membership of this coalition reveals a wide variety of cooperative organizations that range from state or university agencies to state and national libraries. The most common function of these international consortia involves electronic content licensing. Resource sharing is a close second.

As noted above, the major benefits of a consortia agreement is that resources may be shared through interlibrary loan or digital transmission and that more cost-effective contracts for acquisition of print and digital resources can be negotiated as a result of the bargaining power of a critical mass of libraries joining together in negotiation. This latter advantage seems to be contributing to the interest in consortia worldwide. In addition, consortia often provide both training for the staffs of member organizations and discounts on continuing education opportunities. As the trend of concentrating the business of distribution of information resources into fewer and fewer separate publishers and distributors continues, consortia are developing as a viable option for libraries to counter the increases in costs of information. They provide libraries with a mechanism for negotiating with an ever-increasing concentration of information providers. Therefore, as long as the trend toward consolidation of publishing and distribution sources continues, the formation of consortia by libraries in order to gain better negotiation positions will continue as well.

Nearly all library associations and consortia are actively involved in planning for the future. Some have special committees and projects that have been established specifically to project future trends and events and to determine the appropriate responses for the members of the associations and consortia. Both library associations and library consortia must be oriented toward the future as libraries respond to the changing technological and social environment of the twenty-first century.

See also: Dewey, Melvil; Librarians; Libraries, Digital; Libraries, Functions and Types of; Libraries, History of; Libraries, National.

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Terry L. Weech

LIBRARY AUTOMATION

Modern libraries are complex systems that consist of many procedures and functions. Traditionally, these functions (subsystems) have included acquisition of materials, cataloging and classification, circulation and interlibrary loan, serials management, and reference services. The most important function, however, has been the provision of service to the users. For centuries, librarians have managed warehouses of documents by acquiring, cataloging, and classifying books, journals, and other materials, and circulating them to their clients. Computer and telecommunication technologies have empowered the new breed of information professionals to select, organize, retrieve, and transfer (SORT) the actual information effectively and efficiently to the users.

In the Beginning

Historically, the most labor-intensive operation of a library has been circulation, the main goal of which is to retain a record for each item that is borrowed from the library. This transaction record usually contains information about the material (e.g., call number, title, and author), as well as information about the borrower (e.g., name, address, telephone numbers). The record also includes two other important items: the borrowing date and the due date. Up until the mid-1970s, the library staff, or in some cases the user, would enter the circulation transaction information on a special card for each borrowed item and then file the card in a prespecified sequence (e.g., by call number, title, or date due back to the library). When the book was returned, the appropriate circulation card would be pulled from the file, and the book would be returned to the shelves. Maintaining the circulation file, however, was a timeconsuming task. Every day, the file would have to be updated, which involved merging and sorting the new transaction cards with the master file. locating overdue books, and identifying items that were requested by other users. In addition, individual overdue notices had to be written and sent, fines had to be calculated, and library users who had outstanding fines had to be identified.

To reduce the cost and increase the efficiency of the subsystem, library managers sought new approaches. While a few libraries used microfilm technology to record transactions and thereby reduce labor expenses, most libraries directed their attention to computers to automate their circulation operations. Using the batch-processing technology of the mid-1960s, the staff would record the transactions on punch cards, which would then be processed overnight, resulting in a printed master list of all the items borrowed from the library. Although the automated circulation systems were primitive by modern standards, they were a cost-effective solution that allowed a library to provide a better service to its clients.

Meanwhile, librarians were embarking upon another venture, which proved to be a pivotal point in the history of library automation. One of the most important functions in a library is cataloging and classifying individual items. Creating such a bibliographic record is time consuming because it requires professional librarians to apply the Anglo-American Cataloging Rules to each item. To curtail the costs and raise the productivity of the system, librarians and library technicians have copied the cataloging information for individual documents from the Library of Congress and other institutions. In the early 1960s, a few libraries formed informal networks to exchange their printed book catalogs to decrease the amount of original cataloging that their staffs had to perform. Toward the end of the 1960s, the Library of Congress took a leading role in using computer technology to establish a project for
exchanging cataloging information. Under the leadership of Henriette Avram, MARC (Machine-Readable Cataloging) was developed as a protocol for storing bibliographic information in a standard format to facilitate exchange of cataloging records. In the ensuing decade, MARC computer tapes allowed many libraries in the United States and Canada to exchange cataloging information. It also facilitated the production of other products such as catalog cards and microfiche. The Library of Congress experiment was so successful that many other countries embraced the MARC record structure (with minor local variations), and eventually it was adopted by the International Organization for Standardization (ISO).

In the early 1970s, another important development shaped the future of library automation. Lockheed Missiles and Space Company introduced Dialog, an online information service that provided access to a variety of bibliographic databases. Many large academic libraries began to offer specialized services for scientists who required literature searches for their projects. As the demand for online access to information grew, so did the number and the size of databases. Between 1975 and 1999, the number of databases grew from 301 to 11,681, and the number of records in these databases increased from 52 million to 12.86 billion.

Progress

The technological progress occurring in the last half of the 1960s and in the early 1970s led to the introduction of turnkey systems in libraries. Computer hardware and software were combined to provide libraries with an exclusive and dedicated system to automate circulation operations. Turnkey systems usually consisted of a minicomputer, dumb terminals (i.e., stations without a central processing unit), and software to manage check-in and check-out of documents and to issue overdue lists.

By the end of the 1970s, many libraries had automated some of their functions, mainly circulation, cataloging, and, to a lesser extent, reference services. This was also the era of the development of the Ohio College Library Center (OCLC), known as a "bibliographic utility." OCLC was one of the first computer-assisted library cooperatives, in which fifty-four college libraries joined to share their cataloging records. OCLC, which was later renamed the Online Computer Library Center, Inc., provided online access for more than thirty thousand libraries in sixty-five countries to its vast MARC database and produced millions of catalog cards for libraries around the world. Shared cataloging, though relatively expensive, enabled many large libraries to begin transferring cataloging and classification duties from professional librarians to library technicians.

Libraries also began to convert their old card catalogs into machine-readable records. Many large-scale retrospective conversion (RECON) projects, while costly, were underway or had been completed by the mid-1980s. Academic institutions were in the forefront of RECON projects, creating millions of MARC records based on their holdings in their main and branch libraries.

These first automated library systems required a different type of bibliographic record for each function (e.g., cataloging, circulation, and acquisitions), which resulted in inefficiencies and delays in entering data and in a lack of quality-control standards. Technological advances and market demands required the vendors of library automation systems to develop a new generation of powerful integrated systems. These systems were designed to use a single bibliographic record for all the library functions. A unique MARC record allows every book (or any item) to be tracked from the moment that it is chosen for acquisition by a library to the time that it is available on the shelf for the user. At each subsystem, the MARC record is enhanced and augmented with the additional information that becomes available about the book (e.g., when the order is placed). Libraries, which have completed their RECON projects, can transfer their large bibliographic databases to the new integrated systems and automate all their operations.

Acquisitions and serials management were the last modules to be incorporated into the integrated systems. Procurement of library materials involves complex functions such as online ordering, invoicing, accounting, and claims for unfulfilled orders. When a book is considered for selection, the automated system allows library staff to enter minimal bibliographic information about it. The incomplete record is then augmented with new information to form a MARC format record as soon as the item is acquired and received by the library. Some bibliographic utilities offer libraries time-sharing access to their large databases for acquisition purposes. Among these is the Research Libraries Information Network (RLIN), which supports a number of functions such as preordering, standing orders, and in-process information. Serials management is one of the most complex operations in an online environment. Tracking publication patterns of individual journals, automatic claiming of late arrivals or missing issues, and maintaining binding information are a few examples of the activities performed by the automated serials management subsystem.

Perhaps the greatest effect that automation had in the 1980s (certainly the most visible) was the introduction of online public-access catalogs (OPACs). The new online catalogs quickly gained wide acceptance among the public, who preferred them to traditional card catalogs. The first generation online catalog was simply an extension of the card catalog and had limited capabilities. These OPACs provided users with a few access points (i.e., ways to find library materials), generally the traditional author/title/subject headings, using character-by-character matching to retrieve bibliographic records. Despite the limitations of the early OPACSs, library patrons preferred them to the card catalog, since these online systems provided patrons with information about circulation status (e.g., whether books were checked out or in the library).

Another significant technological development was the introduction of CD-ROM technology. Although the first bibliographic database on CD-ROM only appeared in the mid-1980s, by the end of the decade, hundreds of titles on CD-ROM were available in the marketplace. Libraries were among the first organizations to adopt the new technology, since librarians and information professionals realized the potential of the CD-ROM as a storage medium for vast amounts of information. This technology was used to provide access to a variety of bibliographical records, including MARC cataloging information. Many libraries used CD-ROMs to supplement or even replace the online utilities as a cost-saving measure.

Standards

As library functions became increasingly automated, libraries encountered problems in linking different computer systems, interoperability of systems, and implementing the client/server computer architecture. To alleviate these problems, ISO developed the Open Systems Interconnection Reference Model (OSI) in the early 1980s. This model consists of protocols for a layered communication system, which simplifies the movement of data between various computers. ISO also developed another set of protocols, referred to as Search and Retrieve Service Definition and Protocol Specification, to facilitate search and retrieval of information.

At the same time in the United States, the American National Standards Institute (ANSI) and the National Information Standards Organization (NISO) proposed the Information Retrieval Protocol for managing bibliographical records. This protocol was later modified and became known as the Z39.50 standards.

Z39.50 uses the client/server model to send messages or protocol data units (PDUs). The Information Retrieval Protocol has eleven "facilities": Initialization, Search, Retrieval, Result-Set-Delete, Browse, Sort, Access Control, Accounting/Resource Control, Explain, Extended Services, and Termination. This elaborate scheme, in conjunction with an abstract database model, has been developed to accommodate the differences among server databases. The client may specify the record structure and data elements to be retrieved, preferred syntax (e.g., different MARC formats), naming of the result set, and subsequent deletion of the set. The server should be able to provide access and resource control for the client. The standard also has provisions for security passwords, charging and billing, scanning terms in lists and indexes within the browsing facility, and sorting.

Several other standards that facilitated the management and communication of the digital information were proposed and drafted by the end of the 1980s. Along with information retrieval standards, new MARC communication standards were introduced (i.e., MARC 21) to include not only traditional bibliographic fields but also information about computer files, music, maps, and multimedia materials. In addition, the Unicode project, which began in 1988, responded to the lack of a consistent international character set and led to a set of standards for encoding multilingual text. Unicode is modeled on ASCII coding but uses a 16-bit schema rather than an 8-bit encoding system.

Standard Generalized Markup Language (SGML), initiated by ANSI in 1978, was designed as a way to separate content from style and as a

means of marking up any type of text so it can be effectively handled and managed by any type of computer. SGML identifies and names digital information to be used in a variety of products and services, such as indexing, typesetting, hypertext manipulation, and CD-ROM distribution. SGML, which was approved and ratified in 1986 by ISO as an international standard, formed the basis for other markup languages such as Hypertext Markup Language (HTML) and Extensible Markup Language (XML).

The Internet

Although computer networks were first developed in the 1960s and the first e-mail was sent in the early 1970s, it was not until the late 1980s that computer communication systems were widely used in libraries. File Transfer Protocol (FTP) was used for transfer of large data files, and e-mail service was used for fast and efficient interlibrary loans. Telnet, however, had the greatest effect on information services by allowing users to have remote access to libraries. Researchers no longer had to rely on librarians to find information in distant libraries or even travel to many locations to search library catalogs.

As telecommunication technology progressed at a rapid rate, so did computer hardware and software technologies. The introduction of graphical user interfaces (GUIs), particularly the Windows operating system, had a profound effect on library automation. Vendors promptly converted their character-based systems designed for the older generation mainframe computers to Windows-based GUI systems that used client/server architecture. Librarians began hastily to write request for proposals (RFPs) and seek funding to upgrade their outdated automated systems. The users were the real benefactors of the new systems, since they would no longer need to learn and memorize long commands to search, retrieve, and display the desired bibliographic records.

Throughout the 1990s, the pace of development in libraries matched the changes fueled by the introduction of the World Wide Web. Many library automation vendors adopted the Z39.50 standards and created web-based catalogs. New products included features of the previous generations of online catalogs, such as author/title/subject or keyword searching, Boolean operators, and truncation capabilities, but they also provided users with new ways to search for and display the requested information. The implementation of Z39.50 standards ensured uniformity among web interfaces in incorporating these features.

While web-based systems were being developed, the Library of Congress, OCLC, and other organizations sought new methods for enhancing the contents of millions of cataloging records in their databases. MARC format was augmented by adding a new field in its record structure to reflect the availability of information resources on the web. The Electronic Location and Access field was added to contain the Uniform Resource Locator (URL) of the item, linking the record to any type of digital unit. The unit may be a full-text document, still image, audio and video segment, or a software program.

The instability of URLs, however, poses a serious problem for maintaining large bibliographic databases while assuring high-quality control standards. Through the establishment of new systems, protocols, and standards, such as Persistent Uniform Resource Locator (PURL), Uniform Resource Name (URN), Uniform Resources Identifier (URI), OpenURL, and Digital Object Identifier (DOI), many of these obstacles may be overcome. Another approach to providing access to the varied items on the web is the development of metadata standards, introduced in the mid-1990s as a way to describe the attributes and contents of digital items. Metadata describe the content of a document in a formalized way and have been used in different contexts. The Dublin Core Metadata Element Set, for example, outlines fifteen elements to identify a web-based document. The Resource Description Framework (RDF) is another example of metadata used to describe web resources to accommodate interoperability between various applications.

The Digital Library

The terms "electronic library," "e-library," "virtual library," and "digital library" have been used interchangeably to describe a new phenomenon the development of digital information warehouses. The digital library, encompassing many concepts, was best defined by Christine Borgman (1999, p. 233) as "(1) a service; (2) an architecture; (3) a set of information resources, databases consisting of text, numbers, graphics, sound, video, etc., and (4) a set of tools and capabilities to locate, retrieve and [use] the information resources available."

In 1993, a consortium of several institutions, including the National Science Foundation and the National Aeronautics and Space Administration, funded the first Digital Library Initiative. The consortium sponsored a few large-scale projects to investigate the technological feasibility of developing digital libraries to contain information sources that can be accessed through the Internet. Digital Library Initiative-2 (DLI-2), which involved ten sponsoring organizations and more than twenty projects, was launched in 1998. The focus of DLI-2 was on the social, behavioral, and economic aspects of digital libraries.

Libraries have automated their subsystems to provide better service to their users. At the same time, advances in computer and telecommunication technologies, new standards for storage and retrieval of documents, and the World Wide Web have dramatically changed the functions performed by librarians. Automating libraries now signifies the transfer of digital information, regardless of the medium, shape, size, or form, from the producer to the consumer. Library automation has been transformed to information automation.

See also: Community Networks; Databases, Electronic; Internet and the World Wide Web; Librarians; Libraries, Digital; Libraries, Functions and Types of; Libraries, History of; Library Associations and Consortia; Preservation and Conservation of Information; Retrieval of Information.

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Jamshid Beheshti

LICKLIDER, JOSEPH CARL ROBNETT (1915-1990)

J. C. R. Licklider, born on March 11, 1915, was first and foremost a psychologist. He received his B.A. and M.A. degrees from Washington University in 1937 and 1938, respectively, and his Ph.D. in psychology from the University of Rochester in 1942. In 1941, he joined the faculty at Harvard University, where he was a researcher in the Psycho-Acoustics Laboratory until 1946 and then a lecturer at the Psychology Laboratories until 1949. At that point, he joined the faculty at the Massachusetts Institute of Technology (MIT).

At MIT in the 1950s, Licklider was first exposed to computers while working in human factors engineering. He immediately realized their potential for transforming society, but he also realized that this transformation could only be achieved by improving the usability of computers. It was during this period that he did some of his most seminal and influential work.

"Man-Computer Symbiosis"

Published in 1960, "Man-Computer Symbiosis" was one of Licklider's most influential and widely read papers. Although more inclusive language is now used, this idea struck Licklider as having great potential for profoundly transforming the way people do their work. Based, by his own admission, on a completely unscientific evaluation of his own technical thinking, Licklider discovered that he spent most of his time on clerical or mechanical tasks that only served as preparation for thinking. Tasks such as searching, calculating, plotting, and determining the logical consequences of hypotheses or assumptions obstructed the flow of thoughts and insights that ideally should be the sole occupation of a scientist. Moreover, Licklider found to his own embarrassment that his selection of a scientific problem was often based on the feasibility of the necessary clerical work rather than his capacity to do the intellectual work involved. This indicated that further progress in science would be impeded without some way to reduce the clerical load inherent in scientific research.

The answer, Licklider knew, was to have computers do the clerical and mechanical tasks, thereby freeing researchers to concentrate on the intellectual aspects of their work and to perform the decisions that required human judgment rather than accurate calculation. However, it was imperative that the use of computers was a seamless part of research rather than a process that halted when software had to be written to handle particular problems. In this sense, computers had to be interactive, with sophisticated, flexible software that could be used in a large number of situations.

Licklider referred to this complementary division of work between humans and computers as "symbiosis," where the close union and cooperation of two dissimilar organisms benefits both. While in fact humans benefit from this arrangement far more than computers, the analogy nonetheless helps to illustrate Licklider's vision.

Libraries of the Future

Perhaps Licklider's grandest vision was the "Library of the Future," which consisted of large, interconnected, distributed knowledge bases organized and subdivided by fields of knowledge. As conceived, it was far more organized than the World Wide Web that developed in the 1990s and would have offered its users advanced analysis that went far beyond mere text indexing and retrieval.

Although Licklider found the conventional library to have shortcomings, most of which had to do with the physical nature of the printed book and the arrangement of books on library shelves, he still favored the printed page for display. More significant, he favored retaining most "component-level schemata" of current bibliographic practice, including concepts such as titles, authors, abstracts, body text, footnotes, lists of references, catalogs, indexes, and thesauri. These, when combined with the speed of access provided by networked computers and with interactive computing, would have provided some of the components of the online library he envisioned.

While not planned as a centralized, monolithic system, the "Library of the Future" still would have required widespread cooperation to make its various services work in a unified way. Licklider described it as a "procognitive system" that would offer its users access to the actual knowledge contained in the library rather than merely its collection of publications. This proved to be an elusive goal, as it involved somehow extracting and encoding the essence of meaning contained within the literature it encompassed and then allowing the user to have the system execute chains of logical reasoning to test hypotheses. While some expert systems have demonstrated such functionality within limited domains of knowledge, no one as of the year 2000 has succeeded in demonstrating a system that does this in a generalized way.

Other Influential Ideas

In 1962, Licklider joined the Advanced Research Projects Agency (ARPA) of the U.S. Department of Defense. While there, he served as director of information processing techniques and behavioral sciences, and he played a significant role in the development of the ARPANET, which demonstrated the usefulness and reliability of high-speed packet-switched networks over large geographical areas and laid the foundation for the Internet. Licklider is also credited with establishing concepts such as time sharing and resource sharing, making it possible for multiple users to access a single large computer.

In 1968, Licklider, along with Robert W. Taylor, published a paper titled "The Computer as a Communication Device," which outlined how networked computers could improve the quality and effectiveness of long-distance communication and support online interactive communities. They described in detail what is essentially the infrastructure of the Internet, with computers interconnected by "message processors" that pass messages between computers and handle such tasks as packet routing and error detection and correction. They also described a number of networked devices that would act as user liaisons in the demanding online world, addressing such issues as e-mail filtering, network security, and even electronic commerce, years before their time.

From 1968 to 1970, Licklider directed project MAC at MIT, the first university-based, large-scale experimental computer science project, which later became the MIT Laboratory for Computer Science. His work at ARPA also set the precedent for the establishment of the first graduate programs in computer science, located at the University of California at Berkeley, Carnegie Mellon University, MIT, and Stanford. These programs, which remain among the best graduate computer science programs available, have served as role models for other programs that have since been developed.

Licklider retired from the faculty at MIT in 1985, but he remained a professor emeritus until his death on June 26, 1990.

See also: Computer Software; Computing; Electronic Commerce; Internet and the World Wide Web; Library Automation.

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Eric Johnson

LISTENING

See: Interpersonal Communication, Listening and

LITERACY

The word "literacy," which was first used in the nineteenth century to mean the opposite of the more easily defined term "illiteracy," has come to be a widely accepted term. In most cases, literacy means the ability to read and write, to understand what is written, and to be able to communicate in the written form. Within this framework, however, there are many aspects to its meaning. Scholars and researchers debate the context and intent of the uses of literacy in many disciplines, ranging from psychology to sociology to linguistics. It is the purpose of this entry to consider the history and development of reading and writing, to consider the need for a literate society, and to examine briefly some programs and activities that have been undertaken in an attempt to provide a reasonable literacy standard for all people.

Early History

Human beings first began to record activities in a recognizable way as early as 10,000 B.C.E. Cave paintings were used in many different parts of the world (especially in France and Spain) to record herds of animals that the artists had seen. These rough drawings were probably meant to indicate that a band of animals had passed that way or to record some other event or activity, although there is no actual account to indicate very specific meanings. It is thought that communication between people increased as the level of social development increased. As a community grew, it was necessary to keep a record of transactions between members—who traded so many animals to someone else or how much grain was produced in one harvest. Some of the earliest forms of recordkeeping involved the use of stones or pebbles, notched sticks, or knotted cords to represent a transaction.

From these early efforts, attempts at writing tried to be more systematic by using small separate pictures to tell connected stories. The hieroglyphics of ancient Egyptians, cuneiform, and scripts from Mayan and Aztec cultures are examples of this type of picture-writing. Most historians agree that there was probably one alphabet from which all others followed, but many details about these developments are still a mystery. This early writing was used to record the sophisticated dialogues of Plato and the logic of Aristotle, for example, but the system of writing was primarily used to record oral speech. There was little use of vowels, and letters, words, and sentences were not separated. Most scholars agree that this form of writing and reading was only marginally related to literacy, which required the development of language with rules of grammar and punctuation to make it intelligible in silent or private reading.

Toward the end of the seventh century, monks in Ireland and England introduced word separation and punctuation into Greek and Latin texts in order to isolate units of meaning. This made it possible for a reader to consider a text silently, an innovation that was exclusive to the British Isles until the tenth century. Writing in the vernacular-Middle English, French, Italian, and German, for example-was still largely used for oral reading. Although the clergy in the early Roman Church conducted schools for clerics and some sons of noblemen, the use of books was limited, and those books were primarily copied by hand. Even in university towns, reading was limited, and much of the learning that occurred was the result of "learned discourse." The scholarly reading of Greek and Latin was limited to only certain segments of the population.

In other parts of the world, the use of language was not associated with writing; the oral tradition was the most common method of instruction. In the early Middle Ages (through the twelfth and thirteenth centuries), monastic orders spread throughout Europe and Great Britain, and the production of manuscript books became the occupation of many monks. Texts were produced by hand with elaborate decoration of everyday things as well as fantastic and imaginary beasts-often depicted with gold leaf and in rare colors. These books were highly valued and were kept chained to cabinets and lecterns in monastic libraries because they were so rare. Even with these manuscripts available, oral reading was still a major source for learning, praying, and governing.

Outside of books of prayers and texts for learning, writing continued to be primarily a matter of importance in the legal field-keeping track of births and deaths, property ownership, deeds, agreements, and the like. In reality, literacy was initially important only to the governing class, the Church, and the legal community. In fact, it was of great concern that reading and writing be limited to these groups for fear that the "lower classes" would use such abilities to assert themselves and destabilize the community as a whole. Although the Church hierarchy was opposed to popular literacy as a possible challenge to authority, some clergy, as early as the twelfth century, favored the use of the vernacular for reading the Bible. Guglielmo Cavallo and Roger Chartier (1999, p. 34) point to the change in reading patterns from monastic, "which assigned to writing a task of preservation and memory that was in great part disassociated with reading," to "the scholastic model of reading, which made the book both the object and the instrument of intellectual labor" as a major revolution in reading.

In the late Middle Ages, with the rise of universities, libraries became a part of the scholarly process. By the end of the thirteenth century, library architecture and furnishings changed dramatically. Reference libraries were opened at Merton College, Oxford, in 1289, and a similar one was established at the Sorbonne in Paris in 1290. The library of the university was seen as a common good and that the books were there for scholarly use by professor and student alike. The restraints that were placed on the use of these books, however, restricted scholars and set the

stage for the remarkable change that was brought about by the invention of printing.

The Printing Press and Its Importance

The invention of moveable type in the sixteenth century coincided with the Reformation that was started by Martin Luther and the posting of his theses. Luther and those who followed him stressed the necessity of reading the Bible to find true salvation. With the printing press, the potential for making such material available to a wide audience could be realized. At first, many of the printed works were more related to manuscripts than to books, but as the craftsmen became more familiar with the new invention, the printed book gained a distinct personality. The role of the individual author became more significant, a title page was included, and print characters were more standardized. One of the more important innovations was the distribution of these works through networks that were developed by the printers themselves and later by independent entrepreneurs in publishing houses.

The rise of the middle class and the spread of the use of vernacular language (instead of the Latin of the Church) increased a need for "common people" to read. As the Reformation swept over Europe, translating the Bible into the language of the people became a priority. Even with this proliferation of material, however, oral language was still at the center of most communication. Scholars have debated the degree of literacy that existed in Western Europe throughout the sixteenth and seventeenth century, and the estimates of the number of readers range from the low 1 percent for women to the high 30 percent for some regions of Germany. It was not until the later half of the eighteenth century, however, that what some have called a "reading revolution" occurred. Conservative bookseller Johann Georg Heinzmann expressed a sentiment shared by many of his contemporaries in 1795: "[It] was not the Jacobins who dealt the fatal blow to the ancien regime in Germany, it was readers" (Wittmann, 1999, p. 285). Although historians debate the extent to which reading had spread in the latter half of the eighteenth century, there is no doubt that factors such as the growth in book production, proliferation of newspapers, and lower book prices among others encouraged a growth in the general interest in reading.

The Spread of Literacy

By the beginning of the nineteenth century, conditions in Western Europe were conducive to the spread of literacy. Public education was available in both the United States and Europe, although it was not until the middle of the century that most industrialized countries had legislation that provided for the firm establishment of formal schooling. In France, the Guizot Law of 1833 suggested the need for education, but basic education was not mandated until reform laws were passed in the 1880s. The literacy rate in Great Britain in 1850 was approximately 70 percent for men and 55 percent for women, but it was only with the enactment of the Education Act of 1870 that the basis for mandatory education was created in the British Isles. Although the Massachusetts Bay Colony passed a law in 1647 to "establish and maintain schools," attendance was not mandatory. It was not until 1852 that Massachusetts established a compulsory attendance law. Within the following fifty years, many states established universal public education as a standard. Public education in the United States was originally based on three assumptions: that all citizens could be taxed to support education, that parents must provide opportunities for basic education, and that free public education must be secular. In some places, factory schools allowed children and workers to attend classes for part or all of a day. Parents could choose to send their children to a school other than one supported by public monies, but that did not relieve them of their responsibility to provide support for the public schools. This general establishment of a basic, compulsory education system set up the possibility for educating a literate public. There was still a great discrepancy in readers between rural and urban communities, but with the rise of the Industrial Revolution, the shorter workday provided more opportunities for reading.

This shift in literacy led to many changes. One of the first was a withdrawal of both teachers and children from the work force. Learning took place away from the family; it was given over to an established system for both socialization and education. This profound revolutionary development is still prevalent in modern educational systems. Another development was that the availability of and market for reading materials (including newspapers and "cheap" fiction) blossomed. Publishers became established as distributors of the printers'



Andrew Carnegie, shown here in a 1902 political cartoon, was one of the early supporters of creating public libraries to increase the literacy of the general population. (Bettmann/Corbis)

work. Books that had originally been printed in quantities of 1,500 to 2,000 copies in a first run were being issued in editions of 30,000 by 1850. The novel, which was not highly regarded as an art form, came into its own by the middle of the nineteenth century. Publishers began to expand the market for these new favorites by issuing chapters for newspapers and magazines to print in installments. In fact, there are accounts of American readers crowding the docksides to obtain the latest installment of the trials and tribulations of Charles Dickens's Little Nell in *The Old Curiosity Shop*. This is similar to the modern phenomenon of lines of readers waiting to buy the latest book of the Harry Potter series.

Although public education initially catered primarily to young boys, girls were still part of the public education system, and they were a major part of the reading population by the 1890s. Novels were in great demand and magazines flourished. For women, *Godey's Lady's Book* was eagerly awaited for its tips on housekeeping and current fashion. Children read *St. Nicholas Magazine*, which was published between 1873 and 1939 and featured young writers and illustrators such as Louisa May Alcott and Winslow Homer.

In the transition from a largely non-reading population to one in which primary education provided a rather large mass of literate individuals, oral tradition still persisted. Street cries of peddlers hawking wares, song-sellers chanting ballads, and the reading of the Bible to families or workers was still very much a part of the everyday life of an ordinary citizen. In schools, children's recitations of Bible passages, poetry, or other forms of oratory often gathered large groups of adults to listen and applaud. Families shared the serialized adventures (such as those written by Dickens or Jules Verne) in a group as avid listeners—even though each member of the group might well have been able to read on his or her own.

Libraries also were important in the spread of reading in the nineteenth century. With Boston leading the way in 1852, tax-supported public libraries were organized in cities in the northeastern and midwestern parts of the United States. Public libraries were seen by community leaders as educational agencies, supporting and supplementing the newly formed public primary schools (although some public libraries posted "No children or dogs allowed" signs). Libraries were considered a public good, a necessity to support an expanding market and worthy of public support. State laws enabled public libraries to exist, rather than mandating them, and left ambiguities in the concept of just who was to be served. Well into the twentieth century, certain groups of people (e.g., African Americans and young people who were under fourteen or sixteen years of age) were excluded from being able to use some public libraries.

Although the idea that most communities should have a tax-supported public library was widely recognized, it was primarily the largess of Andrew Carnegie that spread the public library from major urban cities to smaller cities and towns across the United States and throughout the world. Carnegie's libraries represented a partnership with government—with Carnegie funding the buildings and the community providing the land and the upkeep of the facilities and collections. In England, public lending libraries were also widely distributed, helped by an 1850 law that allowed local authorities the right to levy support for a public library. As Martyn Lyons (1999, p. 332) points out, libraries in Great Britain and Europe were seen as "instruments of social control, designed to incorporate a sober working class elite into the value system of the ruling classes." Public taste did not necessarily conform to this concept, but the possibilities for self-education and life-long learning were goals that existed early in the public library movement.

Literacy in the Twentieth Century

In the early part of the twentieth century, some educators believed that the problem of literacy was settled, especially with the establishment of compulsory education in many parts of the United States and Western Europe. Many countries that were less developed were also still under colonial rule. As part of that social structure, literacy was considered to be a skill of the occupying powers and therefore available to only a small segment of the population. In the United States, however, it was quickly discovered that some groups of people had decidedly lower or relatively nonexistent literacy levels. African Americans and large groups of immigrants both had problems in literacy and learning. African Americans had consistently been denied access to materials and sometimes even instruction; immigrant groups had problems because of language differences. So although the basic pattern of public education was fairly well set at the beginning of the twentieth century and it was assumed that each child had an equal opportunity to learn to read and write, the actual implementation of public education programs varied greatly. Brave new experiments in learning (exemplified by the teachings of John Dewey, which, for example, held sway for some thirty years) did not touch the learning lives of children in rural and urban poverty. Beset by two world wars and a worldwide economic depression, the first fifty years of the twentieth century saw some major increases in literacy rates, with equally dismal rates for other segments of the population.

The actual definition of "literacy" has been the subject of some intense discussion. On an operational level, definitions have ranged from the ability to sign one's name, to pronouncing words, to comprehending paragraphs. In 1994, the Organization for Economic Co-operation and Development (OCED) conducted the International Adult Literacy Survey. The second in a series of related reports (Darcovich et al., 1997) identified three "domains" of literacy, defining literacy along a continuum of skills rather than limiting the definition to a distinction of those who were literate and those who were not. The domains include "prose literacy," "document literacy," and "quantitative literacy." Prose literacy was used to describe the knowledge and skills that are needed to understand and use information from texts such as news stories, brochures, and instruction manuals. Document literacy identified the knowledge and the skills that are necessary to use information in a variety of formats, from job applications to bus schedules, from payroll information to charts, tables, or maps. Quantitative literacy was used to refer to such operations as balancing a checkbook or completing an order form or understanding other types of numerative material that is embedded in text. This categorization of adult literacy skills along a continuum has provided a more realistic way of assessing literacy for both adults and children as learners.

The way in which reading has been taught has also been the subject of heated debates in both the popular press and academia. The early studies of reading instruction concentrated on what was wrong with instruction. Since then, researchers have tried to identify those factors that were predictive of success in reading. David Wray (1997) has offered a clear overview of the many differences of opinion about the teaching of reading. He has identified two streams of thought: one that focused on a code-based approach to reading and another that emphasized the place of meaning. Wray contends that, although some aspects of the argument have shifted from whether teaching should focus on whole language or phonics to whether written language should be acquired naturally or through more formal means, most researchers and practitioners rely on a balanced approach to reading instruction. Research by Shirley Brice Heath (1983), for example, concentrated on the social context of literacy in her widely cited study of three communities in the Carolina Piedmont region. Brian Street (1999) notes that debates about literacy have shifted from teaching methods (i.e., phonics versus whole language) to literacy practice in a social context,

which clearly sets an agenda for research, policy, and curriculum. Street further contends that this shift in direction extends "the clarification of the key concepts in the field, the analysis of the underlying assumptions and theories, and development of practical applications" (p. 39).

Preschool children and their families have also been the subjects of interest to those who are concerned about relatively low levels of literacy, especially among poorer families with less education. Some researchers have concentrated on literacy for younger children, not teaching reading but creating a "climate for reading." Terms such as "family literacy" or "emergent literacy" are generally associated with efforts to link early literacy efforts to success in school for poor children, while at the same time offering some sort of adult education program to parents, grandparents, or caregivers of these poor families. Family literacy programs may share a common goal, but the programs vary greatly from country to country, depending on funding, family culture within the country, and the political priority for literacy. While these programs have various goals, many other researchers have suggested that planning is a significant factor in the success of these programs. Short-term goals with very specific outcomes must be matched with long-term planning that takes into account the needs and successes of both child and family. Factors that are of major importance in determining the strength and direction of family literacy programs and plans include (1) a conceptual framework that identifies the cultural and social structures of families and (2) careful consideration of the measures used to assess the program.

Another area of controversy has been ways in which literacy programs for both children and adults are evaluated. Methods of assessing programs have altered as critics argue that traditional assessments are based on outdated and inappropriate models. The debates regarding children of school age have taken place within a larger discussion of the quality of education in the United States. Studies and publications-including A Nation at Risk, by the National Commission on Excellence in Education (1983)-have pointed to continuing arguments about literacy and its measures in society. Both the popular press and academia seem to disagree about the meaning and usefulness of some approaches to literacy. While some studies point to the fact that literacy rates have risen steadily since the end of the nineteenth century, others argue that simply reading and writing is not enough. Reading and writing well enough to function in an increasingly complex environment is the challenge.

By the end of the twentieth century, academics, employers, policymakers, and parents had begun to realize that the ability to organize, understand, and use language is essential to a creative, productive life. Many scholars who work with literacy programs, plans, and policy have come to agree that there can be no single, uniform approach to literacy. Rather, programs on a local or regional level are often the result of a national or international attempt to solve the problem. Several agencies are key players in this arena internationally and can serve as examples of how such agencies often directly affect lives on levels beyond that of acquiring skills in reading and writing.

The United Nations has a network of agencies, functioning on a practical level to address global concerns, guided by principals of peace, progress, and the setting of standards. In 1945, the United Nations charged one agency in particular with the responsibility of literacy provision: the United Nations Educational, Scientific, and Cultural Organization (UNESCO). By the end of the 1990s, several other agencies of the United Nations that had mandates for assistance to poorer countries saw education as a target for development. Chief among these agencies are the World Bank, the United Nations Development Program (UNDP), and the United Nations Children's Fund (UNICEF).

From the beginning, UNESCO's task was to persuade governments that universal literacy should be a priority. By identifying literacy as a basic human right, UNESCO set about analyzing needs, demonstrating the best practices, setting up pilot or experimental projects, and fostering cooperation between governments, the academic community, and practitioners. For nearly four decades (from its founding in 1945 through the mid-1980s), for example, UNESCO had a strategy of funding that emphasized basic education in African countries, which was shaped largely by British Colonial Office philosophy from the 1920s and 1930s. However, politics within the United Nations itself often stymied implementation of policies, including those related to literacy. When the Soviet Bloc in the 1960s proposed a World Campaign for Universal Literacy as part of the Development Decade, the proposal was opposed by the United States. The United States was much more interested in education as a part of economic growth, especially when connected with worker productivity, an approach that led to a rapid expansion of formal schooling in most newly independent nations. By the mid-1970s, however, UNESCO had begun to recognize that universal application of policy was not effective and instead adopted a more flexible and diversified approach to literacy policy, with an emphasis on culture as an organizing principal. UNESCO's policy stressed the social and economic consequences of literacy instead of the political and consciousness-raising implications. At the national government level, UNESCO argued for a balance between formal schooling and out-of-school strategies for literacy acquisition.

The World Bank is an agency that is concerned with lending, and projects are often developed to create systemwide change, along with reforms, training programs, policy advice, or other such arrangements. The World Bank, which is one of the major sources of funding (in the form of loans) for educational programs around the world, accounts for nearly 25 percent of educational assistance. One policy approach is to support universal primary education. The World Bank rejects adult literacy education, however, insisting that there is little evidence to support the link between adult programs and worker productivity, therefore economic growth.

UNDP is the largest provider of grant aid (as opposed to loans). Its programs attempt to foster partnerships between public and private agencies in order to enhance living standards and economic growth. In the literacy field, the UNDP's lack of commitment to adult literacy programs in the mid-1960s kept such efforts at a minimum. In 1990, however, UNDP was a co-convener of the World Conference on Education for All. This conference, held in Jomtien, Thailand, featured considerable rhetoric about the need for literacy programs for adults and young people. In addition, the participants in the conference pledged that the world illiteracy rate would be cut in half by the year 2000. Funding realities suggest, however, that UNDP remains more in line with the World Bank policy of favoring formal education programs rather than the balanced approach of UNESCO.

UNICEF is primarily concerned with the welfare of children, and it has always considered this commitment to include the mothers of these children. At first, UNICEF was careful to avoid conflict with UNESCO and declined any involvement with formal school programs. As UNESCO's influence shifted and waned, UNICEF incorporated both formal education as well as out-of-school programs for mothers and young women, hoping to elevate the level of the care being provided to children. UNICEF accomplishes much of its work through country-based programs for literacy.

In spite of the funding provided by these intergovernmental agencies, the promise made at Jomtien to cut the world illiteracy rate in half by the year 2000 was not realized. Oxfam International, a long-time leader in international development aid, refused to participate in the planning for the year 2000 follow-up to the Jomtien conference because of lack of progress, leadership, and commitment to literacy from the more developed countries. Mohamed Maamouri (2000) has identified several reasons for the failure to meet the goals of the Jomtien conference. He asserts that "basic education" is too often restricted to primary, formal schooling and that, in spite of a major emphasis in funding, the results of work concentrated in that area are not satisfactory. Economic restructuring, wars, falling amounts spent on basic education per capita, and high demographic growth rates have contributed to an increase in illiteracy and the continuation of low literacy rates among out-of-school youths and young adults. Maamouri points to three problems (in addition to monetary concerns) that have created such declines. First, mass literacy programs are often political in nature, making claims that cannot be fulfilled. Second, both teachers and students lose motivation when learning is not associated with positive, identifiable results. Third, he suggests that while adult literacy classes are often taught in local languages, formal primary schooling uses an official language (often that of the former colonial power). This barrier between formal and nonformal educational efforts can sow confusion and create problems for learners.

The number of illiterate people in most developing countries represents more than half of their total populations of youths and adults—with girls and women accounting for nearly two-thirds of the illiterate population. This gender imbalance reflects the growing "feminization of poverty." A number of programs attempt to offer practical solutions to the low literacy rate by suggesting activities that produce income and employment and foster good parenting skills. Other programs suggest a link between adult learning and the education of children and youths, encouraging the use of materials related to nutrition, primary health, and HIV-AIDS education as learning tools.

Conclusion

The problems for those who struggle with the basic skills of reading and writing and meaning are exacerbated by intensive technological expansion. The Internet and the World Wide Web have created even more demands on learners at every level, and the term "computer literacy" now vies with other forms of literacy for programs of education. Those who work with the poorest nations find themselves debating issues about which language or dialect to teach. Libraries, which were a force in the spread of literacy and life-long learning in the nineteenth century, struggle with problems of identity and survival in the twenty-first century. Those who set policy and create priorities find themselves faced with choices much like the clerics of the fifteenth and sixteenth centuries, who were afraid of the results of offering the "lower classes" access to reading the word on their own.

See also: Alphabets and Writing; Carnegie, Andrew; Computer Literacy; Libraries, Functions and Types of; Libraries, History of; Printing, History and Methods of.

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LITERACY, COMPUTER

See: Computer Literacy

LUMIÈRE, AUGUSTE (1862–1954)

LUMIÈRE, LOUIS (1864–1948)

The Lumière brothers, Auguste and Louis, were French inventors and artists who were involved in the early development of the film industry. They are usually mentioned together rather than individually because they always worked together. However, some people suggest that it was Louis who possessed the real talent that led to their tremendous successes.

Antoine Lumière, the father of Auguste and Louis, was a successful photographer. He and Louis invented a photographic plate that became a commercial success. The family employed more than three hundred workers in their factory to create these photographic products. With the invention of Thomas Edison's Kinetoscope (which used George Eastman's new flexible film), however, Antoine was concerned that the family's invention was going to become obsolete.

After viewing a Kinetoscope, which displayed the image inside the machine and allowed for only one viewer at a time, Antoine returned home to instruct his sons that they should develop a device that would get the picture outside of the machine. While Edison had worked on such an invention at one point, he had shelved the project to work on other things.

The brothers worked on the invention for several months, but Auguste said that Louis invented the final device during a single night when he was suffering from feverish dreams and a migraine. The Cinématographe, as they called it, served as both camera and projector, and the brothers patented it in February 1895. The machine also featured a significant improvement in the claw device that regulated the movement of the film.

The Lumières began demonstrating their device to private groups, such as the societies for national industry and for photography, as early as March 1895. However, it was on December 28, 1895, that they first presented (in Paris) a motion picture for the general public. One possible reason for the long delay in making their first public presentation could be that they were preparing for the onslaught that would follow. It is certainly true that they had several Cinématographe machines created and photographers and projectionists trained and ready to go by early 1896. This proved essential since their invention quickly attracted worldwide attention. Film parlors opened in London, Geneva, Vienna, Brussels, Berlin, Bordeaux, Madrid, Belgrade, and New York within six months. Demand was so great in New York that twenty-one operators were not enough to keep pace. The Lumières' army of photographers had soon shot 1,200 short films on a wide range of subjects.

The effect that the Lumières' invention had on history is not insignificant. Barriers related to language and national custom were overcome by this means of communication. The world began to seem smaller as viewers saw films of people from many other nations. It was an intentional decision on the part of the Lumières to let people see sights from around the world as their crews filmed almost every continent and major culture. Fashions and fads began to spread with the films, contributing to a reduction in the cultural uniqueness of different nations. In addition to the Cinématographe, the Lumières worked to develop wide-gauged film, 360-degree projection that encircled the audience, and three-dimensional effects. They also made contributions to the development of color-plate photography.

Beyond their mechanical inventions, the Lumières contributed in new ways to the art of the motion picture. Their first film, *Workers Leaving the Lumière Factory* (1895), featured just what the title suggests, along with a dog, a bicycle, and a horse exiting the building. Capturing real-life events was central to most of the films that were made by the Lumières and their hired crews. These films have since become increasingly valued for their documentation of life at the end of the nineteenth century.

The Cinématographe was much more portable than the Kinetoscope, which allowed the Lumières to make most of their films outside while Edison had to bring acts into his studio to film. This gave much more variety to the Lumière films, which included subjects such as children at different stages of development, family members engaged in various activities (the first "home movies"), working-class people, military regiments from many nations, and fire and police personnel.

Some of the Lumière films are important for reasons other than the reality that they showed. For example, *The Arrival of a Train at the Station* (1895) impressed audiences because the locomotive was



Louis Lumière (left) and Auguste Lumière work together in their laboratory in Lyon, France. (Bettmann/Corbis)

filmed as it moved toward the camera-giving audience members (who were obviously new to the cinema experience) the impression that the train was going to crash through the screen and into the audience. This film, one of the most remembered of the brothers' films, also shows wonderful photographic skill in the lighting and composition of the piece. The Lumières developed ways to display more depth of field and sharpness in their photography than any other early filmmaker. Another film, Tables Turned on the Gardner (1895), was the first farcical film, as well as the first film to tell a story. In it, a gardener is watering a flowerbed with a very large hose when a boy comes up behind and steps on the hose, stopping the flow of water. As the gardener looks into the dried-up hose, the boy steps off of the hose, causing water to spray into the gardener's face. While this narrative type of film was more the exception than the rule, it was followed by at least a few other attempts at telling short stories.

The Lumière brothers and their photographers were involved in many important innovations during the early years, including product placement, tracking shots, and trick photography. The most basic form of product placement was when some of their films showed the cinemas where the public could see the films. Other films featured specific products, such as beer produced by a brewer who was a family friend. Tracking shots are those films that are created while the camera is moving. The first use of a moving camera for a Lumière film occurred when one of their photographers in Venice shot footage while riding through the waterways by boat. Upon seeing the film, the brothers asked that more such tracking films be made. Trick photography, close-up shots, and editing were novel devices that the Lumières employed on occasion in their early films, but the techniques never became regular features. As a result, other people (such as Georges Méliès, who is known for his early use of trick photography) are usually credited with their development.

Overall, the mechanical devices that were created by the Lumière brothers turned motion pictures into an entertainment medium for the masses. The brothers also helped to define cinematography by introducing the elements of artistic photography to the composition of their films. Through these technical and artistic accomplishments, the Lumières were able to bring together both people and images from around the world.

See also: Edison, Thomas Alva; Film Industry, History of; Film Industry, Technology of; Méliès, Georges.

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STEPHEN D. PERRY

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MACHLUP, FRITZ (1902–1983)

Fritz Machlup was born in Vienna, Austria, and began his career there as an entrepreneur and businessman. He did not pursue a scholarly career until after he moved to the United States in 1933. In the United States, Machlup's career encompassed work in many fields, including capital, monetary, and business-cycle theory, along with work on knowledge creation and dissemination.

Career Highlights

During his career, Machlup was a visiting professor at more than fourteen American universities, including Harvard University, Cornell University, the University of California at Berkeley, and Stanford University. He was the Abram G. Hutzler Professor of Political Economy at Johns Hopkins University in Baltimore, Maryland, from 1947 to 1960 and the Walker Professor of Economics and International Finance and Director of the International Finance Section at Princeton University in New Jersey between 1960 and 1971. He was on the faculty of the School of Economics at New York University from 1971 until his death in 1983. In addition, Machlup was a Visiting Professor at Osaka University in Japan (1970), at the University of Melbourne (1970) and at the University of Vienna (1972-1973).

Among his non-academic accomplishments, Machlup was a council member of the Austrian Cardboard Cartel in Vienna, Austria (1929–1931), a Special Consultant to the Post War Labor Problems Division, Bureau of Labor Statistics, U.S. Department of Labor (1942–1943), Chief of the Division of Research and Statistics, Office of Alien Property Custodian, Washington, D.C. (1943–1946), and a consultant to the U.S. Department of Treasury (1965–1977).

Areas of Study

In 1950, Machlup began his groundbreaking work on the role of knowledge and its economic influence and continued to research and publish on the topic for more than thirty years. Through his work, Machlup was instrumental in developing the scholarly subfield of knowledge creation, diffusion, and utilization. In 1980, in the first volume of Knowledge (his series on knowledge creation, distribution, and economic significance), Machlup provided a classification of five major types of knowledge: (1) practical knowledge, (2) intellectual knowledge, (3) small talk or pastime knowledge, (4) spiritual knowledge, and (4) unwanted knowledge. Practical knowledge is the knowledge that is instrumental or central to one's work or profession. Intellectual knowledge satisfies one's "intellectual curiosity." Small talk knowledge satisfies one's "nonintellectual curiosity and one's desire for light entertainment and emotional stimulation." Spiritual knowledge is related to one's religious beliefs. Unwanted knowledge is outside of one's interests-"usually accidentally acquired, aimlessly retained" knowledge.

Before he arrived at this scheme, Machlup had reviewed and considered several distinctions such as basic and applied knowledge, theoretical and historical knowledge, general/abstract and particular/concrete knowledge, nomothetic and ideographic knowledge, analytical and empirical knowledge, enduring and ephemeral knowledge, knowledge for many and for only a few, as well as social and private knowledge. Machlup reserved his most critical discussion for the most widely used classification: mundane knowledge, scientific knowledge, humanistic knowledge, social science knowledge, and artistic knowledge.

It should be remembered that each type of knowledge has a "claim" on how one establishes what is "known" as "true knowledge." Each offers a set of rules or understandings for the inquiry to establish acceptable evidence. Scientific knowledge, in the sense of controlled experiments in the natural sciences, has come to be viewed, by many, to be a unique and superior form of knowledge because it offers a set of rules for inquiry that promises precision and the hope for overcoming systematic bias and human error.

Machlup went beyond some rather traditional distinctions between data, information, and knowledge. Data is meant to be the most rudimentary unit of analysis (i.e., raw material). Information goes beyond data. Information is thought of as refined data, which provides some added value to the user. Knowledge, which goes beyond information and provides added value, must be able to withstand being subjected to some validation or "truth test."

The type of knowledge may well have an effect on how one views utilization and how one thinks about relevant and appropriate outcomes. Not only have some types of knowledge assumed more importance than others in potential users' perceptions, but past studies also often refer to use as if there are no significant differences among various types of knowledge that might be used.

Publications

Over the years, Machlup authored more than twenty-two books, including *The Political Economy* of Monopoly (1952), An Economic Review of the Patent System (1958), The Production and Distribution of Knowledge in the United States (1962), and Education and Economic Growth (1970). His later works on information and knowledge include Information Through the Printed Word (1978) and the Knowledge series (of which he completed three volumes: Knowledge and Knowledge Production, 1980; The Branches of Learning, 1982; The Economics of Information and Human Capital, 1983). His numerous contributions to international economic theory include International Trade and the National Income Multiplier (1943), International Payments, Debts, and Gold (1964), Remaking the International Monetary System: The Rio Agreement and Beyond (1968), and The Alignment of Foreign Exchange Rates (1972). He was also a major contributor to the literature on the methodology of economic research, which work appeared in two volumes, Essays on Economic Semantics (1963) and Methodology of Economics and other Social Sciences (1978).

Machlup's papers—"Register of the Fritz Machlup Papers, 1911–1983"—are available through the Hoover Institution on War, Revolution, and Peace Archives at Stanford University. These papers contain correspondence, writings, reports, memoranda, notes, questionnaires, data, financial records, grant proposals, instructional materials, and other printed matter related to economic theory and to information systems and the creation and dissemination of knowledge.

See also: Economics of Information; Knowledge Management.

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ROBERT F. RICH

MAGAZINE INDUSTRY

To understand the scope of the magazine industry, it is necessary to define the term "magazine." And while the translation of the word "magazine" may simply be "a storehouse," technological advances constantly challenge how people define the word in their own minds. In the modern world, online websites and television broadcasts are considered to be magazines, but in the traditional sense, a magazine is printed on paper. At the most basic level, a magazine provides information that may be more in depth but less timely than that of, for example, a newspaper. A magazine can typically focus on trends or issues, and it can provide background information for news events.

Magazines have the luxury of focusing on a smaller target audience, which means they do not have to try to please all of the people all of the time. Instead, they can narrow their audience to a very specific population—such as the sports enthusiasts or amateur gourmet chefs. By focusing on a specific target audience or niche, magazines know what their readers want to see in the magazine, and advertisers know more about the target audience for their advertisements.

Types of Magazines

In general, there are three categories of magazines: consumer, trade, and organization. A consumer magazine is what comes to mind most readily for most people when the term "magazine" is mentioned. Consumer magazines are on newsstands and in grocery store aisles everywhere. They can be bought as single issues or by subscription, and they are marketed like any other product (using advertisements and special promotions). There are actually fewer consumer magazines than any other type, but the consumer magazines generally have the largest audiences. Consumer magazines can be broken down into a large variety of specialized categories, such as men's, women's, entertainment, regional, political, general interest, and so on.

A trade magazine specializes in a particular business, so its content is focused on job-related subjects and its readers have specific occupations. Many of these magazines are provided at no cost to a controlled audience. Because trade magazines are able to deliver a highly desirable audience to advertisers, they are able to charge higher advertising rates.

Organization magazines can be divided into three categories: association and society, public relations, and custom. The association and society magazines are often provided as part of the membership in the organization. The purpose of these magazines is mainly to enhance the organization. They can provide unity and a forum to discuss issues and to draw members closer to one another. Association and society magazines may carry advertisements, and they may be sold through reader subscriptions (which may be incorporated into membership dues). Regardless, the basic purpose of these publications is still to enhance their organization rather than make a profit. Organizations and companies publish public relations magazines for self-promotion, and they may each have more than one such magazine to do this. For example, an internal publication may target the employees of a company (to keep them abreast of the progress of the company and help them to feel a part of it), while an external publication may target the same company's clients (to explain how the company works and to provide a better understanding of the company's philosophy or mission). Traditionally these magazines do not have advertisements and are provided at no cost to the readers.

The third type of organization magazine is the custom or sponsored magazine. A client may receive a magazine of this type as a result of purchasing a particular product or using a particular service. Typically, custom magazines are provided free of charge, but they may be also be sold on newsstands or through subscriptions. The purpose of a custom magazine is to promote or enhance the use of a company's products. For example, the in-flight magazines that are provided by airlines are designed to keep the passengers occupied and to make the flight more pleasant. It may be obvious who the sponsor is, or a company may team up with a consumer magazine to create a more subtle approach. Advertisements are usually part of these magazines, and advertisements from other companies may be included as well.

Basic Staff Structures

With such a wide variety of magazines, it is almost impossible to estimate the number of magazines that are published each year. The counts completed by various agencies vary so significantly that it becomes difficult even to put together rough numbers. In addition, most counts do not include the organization magazines. So, while it is difficult to estimate the actual numbers of magazines, it is certain that the magazine industry holds a prominent place in the economy. It provides an important outlet for advertisers to reach a very specific target audience, which helps their companies to continue to grow and succeed.

In the United States, many of the consumer magazines are published in New York City, but Illinois, California, and Pennsylvania are also responsible for a large number of titles. It is common for one company to own many magazines. This allows them to shift money around and take chances on launching new titles. The largest magazine producers include Conde Nast, Hearst, Meredith, Hachette Fillipachi, and Time Warner. A small number of consumer magazines make up most of the industry's total revenues, but there are many small magazines and small businesses in the industry, too.

Whether a magazine is published by a small company or by a huge conglomerate, it is still possible to discuss a "typical" structure of a magazine. This is because, regardless of the scale, there are basic principles that lead to the success of a magazine. In most cases, a magazine is divided into two parts, the creative side (i.e., the editorial and art departments) and the business side (i.e., the advertising, circulation, and general management departments). All of these divisions must work very closely to ensure the stability of the magazine and to deliver the publication on schedule.

Often overseeing the entire process is the president or chief executive officer. This person may have an extensive background in the publishing industry, but in the case of large media companies, it is possible that the president may not have any experience in the industry. Typically, this person reports to the board of directors of a company and is held responsible for the profits and losses, direction, and reputation of the magazine. At smaller companies, this person may also be responsible for the development of new products, the management of personnel, and other financial aspects of the magazine. The duties of this position may even be combined with those of the publisher.

The publisher traditionally has an advertising background, although this is not always the case. For example, magazines that depend heavily on circulation as a source for revenue may be more likely to have a publisher who has experience in the circulation department. For the majority of magazines, however, the main source of revenue is advertising. A publisher typically ensures the visibility of the magazine in the marketplace and helps define the audience of the magazine for advertisers.

The publisher and the advertising director often work closely. It is the advertising director's job to convince companies to advertise with the magazine. Often, magazines will advertise to potential advertisers by placing advertisements in trade publications that reach the media buyers or those people who are in charge of advertising for their companies. Advertising directors may also create printed brochures and media kits about the magazine and send them to the advertising departments of companies. An advertising director may also work with the publisher to ensure that they reach potential readers. For those magazines that rely on subscriptions and sales rather than advertisements, guaranteeing that the publication reaches the potential readers would be the main focus of the advertising director's job. Instead of advertising to companies, the advertisements would be directed at target readers.

The circulation director keeps a close eye on just who is reading the magazine. When a magazine's revenue depends heavily on advertising, it is important to be able to identify the type of audience an advertiser can reach by placing and advertisement in the magazine. Most important, the circulation director maintains the rate base, or the number of readers the magazine is guaranteed to reach. This is the number that the advertising rates for the magazine are based on. When a magazine's revenue is based on sales of the magazine alone, the circulation director provides the crucial measurement of the magazine's performance. This person can help to identify trends, such as what type of magazine covers sell more on the newsstand; for example, a food magazine may or may not sell more magazines when a dessert is featured on the cover. The information provided by the circulation department guides the publisher and advertising director as well as the editor.

The editor is responsible for the content of the magazine, which includes the visual elements as well as the written elements. Thus, this position requires a strong sense of the overall editorial message of the magazine. A good editor is both creative and a good manager. He or she must work closely with the magazine designers and department editors or writers to ensure continuity. The editor focuses on delivering the kind of magazine that the core readers and subscribers want to see. If a magazine fluctuates too much from this core design, readers will be lost, which results in a loss of revenue from advertising and magazine sales

Bringing the advertisements and the editorial content together in one finished, printed piece is the job of a production director. The production director ensures that the magazine is in the proper format for the printer, and he or she then oversees the printing. This can include finding the most feasible paper stock and negotiating prices, as well as monitoring the quality of the printing job. The production director may also be responsible for the distribution of the printed magazine. Otherwise, the circulation department is responsible for the distribution.

Many magazines use outside companies to handle the mailings to subscribers, and the circulation director oversees this process to ensure that it is being correctly executed. For newsstand sales, publishers may work with a distributor to determine the number of magazines that should be sold on the newsstand. The distributor also finds wholesalers who will receive magazine shipments and deliver them to retailers. Distributors keep track of the number of magazines that are sold, and they collect the unsold magazines.

While the specific roles performed by the people who hold the above positions vary according to the size of the magazine staff and the type of magazine that is being produced, the basic structure and functions are all necessary for the efficient production of a magazine. These positions have evolved with the development of the magazine. Education, technology, and distribution are important factors that have shaped the growth of the magazine industry.

Historical Changes in the Industry

When the first magazines were published in the United States in the eighteenth century, the majority of the population could not read. The magazines targeted the elite and were quite expensive. They were packed full of information, often gathered from British magazines, with little or no artistic embellishment. The publications were printed by hand-set type on hand-operated presses, which was time consuming and labor-intensive. Often, the only illustration for a magazine was the cover art. These were usually made from crude woodcuts, although a few magazines used the more expensive copperplate engravings. Later in the eighteenth century, magazines were used for distributing political essays and ideas. Typically, the publisher was also the editor, printer, and main writer. In many cases, the articles were all unsigned.

The distribution of the early magazines was difficult. Either by hand, horse, or carriage, they were delivered to subscribers. Since postmasters decided whether or not magazines could be mailed through the formal postal system, many magazines employed their own carriers. It was not until improved roads and railway systems were in place in the nineteenth century that the distribution of magazines became easier.

In the nineteenth century, the number of magazines increased, as did the rate of literacy. Women became targeted audiences for the first time, and they devoured magazines that discussed leisure activities and homemaking. Magazines began to have paid editors, and writers signed their articles and essays. Content expanded to include literary essays, short stories, and poetry. By the middle of the century, the types of magazines had expanded to include trade, professional, and corporate magazines. The look of the magazine also improved tremendously during the nineteenth century. Copperplate and steel engravings became more feasible, and some magazines even hired watercolorists to hand-tint the engravings. Woodcuts were much less expensive and had improved from the crude eighteenth-century prints. As a result of their increased quality, magazine illustrations began to be used to decorate homes. By the end of the century, printing presses were able to print both sides of a continuous roll of paper, which made the process of creating a magazine more cost efficient.

Magazines, at the beginning of the twentieth century, began to appear in households that did not even contain books. Content became more concise. The essays became shorter to accommodate the increasingly fast-paced society. While photography had been invented in the nineteenth century, it was not until halftone printing was invented in the twentieth century that magazines were able to reproduce photographs easily and inexpensively. Artists and engravers found themselves no longer in demand, and art directors became part of magazine staffs that had previously consisted of only writers and editors. Since the early 1980s, computers have significantly changed the production process for magazines. When Scientific American published its January 1995 issue, which highlighted "The Computer in the 21st Century," it became the first magazine to publish without the use of film. While these technological advancements could reduce the time and cost of producing a magazine, the postal costs did not follow suit. In fact, postal rates increased dramatically during the twentieth century, making it difficult for many magazines to survive.



The growing relationship between the magazine industry, other media industries, and the Internet is typified by the February 2001 announcement by the Disney Company chairman, Michael D. Eisner (right), and the chairman and owner of US magazine, Jann S. Wenner, that Disney had acquired a 50 percent interest in US magazine and that the magazine will have several tie-ins to broadcast and Internet activities owned by the Disney Company. (AFP/Corbis)

Technology and Trends

Magazines are everywhere. They are easily accessible and geared toward all facets of the population. Clearly, the magazine industry has gone through many changes that reflect the evolutions in society and in the technology that is used to produce magazines. Technology, such as television was first thought to be a great competitor for the magazine, but many magazines now have television shows as counterparts, and vice versa. In addition, specialized cable channels resemble magazines in many ways, including the fact that both formats attempt to serve specific targeted niches. As with television, the Internet was initially considered to be a major foe for the magazine. However, many magazines have already developed a "new media" staff to produce an online version of the magazine. The people in charge of these magazines realized that the Internet provides a viable way to maintain a close relationship with readers and offers another forum in which to sell advertising. Also, because there are no real production costs, the Internet is a very practical way for magazines to reach potential new subscribers.

A stronger emphasis on visual design is a continuing trend in the magazine industry. Television and computers have strongly influenced this trend. Journalists need to be able to think in terms of visual communication as well as written communication. Magazine art departments are growing larger in order to encompass online design as well as print design. They understand that a strong, effective design is increasingly crucial if they are to continue attracting readers.

With increased outlets to promote magazines and their advertisers, strong branding of a magazine is becoming increasingly important. Audiences need to recognize instantly a magazine's masthead on various products, television shows, and the Internet, and they need to associate it with quality and integrity. All of this means that editors need to continue working closely with publishers and advertising departments to develop a strong marketing strategy.

See also: Magazine Industry, Careers IN; Magazine Industry, History of; Magazine Industry, Production Process of; Newspaper Industry; Printing, History and Methods of.

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STACEY BENEDICT

MAGAZINE INDUSTRY, CAREERS IN

A variety of careers are available in the magazine industry, from the obvious jobs in editorial and advertising to work in supporting areas such as circulation and marketing. The majority of consumer magazines are published in New York City; however, many career opportunities exist elsewhere, particularly at magazines published for city, state, or regional audiences and at magazines that serve trades and associations.

While staff positions vary from one magazine to the next, most have the same basic staff roles. Editorial functions are carried out by people who work with words and images to create the editorial product. The editor or editor-in-chief is the top editorial position at a magazine and is responsible for directing all content and implementing the mission of the magazine. The editor's righthand person, the managing editor, is responsible for following the day-to-day operations of a magazine, and the duties of that position include enforcing deadlines, overseeing the quality of the work, managing the editorial staff, and serving as the liaison between writers, artists, and production personnel. The production manager, along with production assistants, work closely with the managing editor to track the progress of each issue, helping the staff meet printing deadlines and making sure that each page is formatted correctly for the printer.

Some magazines also have an executive editor who may fulfill some of the managing editor's duties but who is usually more focused on content issues than on production. The editor and executive editor work with a staff of senior editors and/or section editors as they oversee particular areas of a magazine by planning content, assigning articles, and writing stories. Associate and assistant editors may have similar duties with smaller magazine departments or may assist the senior editor on a magazine's larger sections. Staff writers handle specific story assignments without managerial and planning functions. Entry-level positions in the writing area of the editorial department usually fall under the title of editorial assistant. The duties for a person in this position can be wide ranging and often include basic administrative functions, but they may, in some cases, include short writing assignments.

Once articles are written, copy editors read them to correct errors in fact, grammar, spelling, and punctuation; to eliminate problems in organization, clarity, and style; and to ensure that the piece reflects the content and tone of the mission of a magazine. The copyediting staff, often referred to by the traditional newspaper term "the copy desk," is managed by the copy chief. Entrylevel positions on the copyediting staff include proofreaders and fact checkers.

The visual side of the editorial department is supervised by the art director, who works closely with the editors to carry out the unique look of a magazine. The art director makes all assignments to photographers, photo stylists, and illustrators and manages the designers who lay out editorial pages. The more experienced staffers in the art department may carry titles such as senior designer; while the entry-level positions may include staff artist, junior designer, or art assistant.

Many careers are available on the business side of magazines. The top position is generally the publisher, who has usually worked up through the ranks of advertising sales. An advertising sales director manages a team of advertising sales representatives who are responsible for selling space in the magazine to advertisers. These "ad reps" or "sales reps" not only maintain long-standing relationships with current advertisers but must generate business by securing new accounts. Entry-level positions that assist the advertising sales team include advertising sales coordinators, advertising production assistants, and sales assistants.

The advertising sales staff is also supported by people who provide expertise in both business and creativity. The marketing director designs a sales strategy to attract advertisers. The research director gathers information about a magazine's readership to help advertisers better understand and appreciate the audience they will be reaching. The public relations director works to promote a magazine's image among its various constituents-readers, advertisers, and others in the magazine industry. The promotion director prepares sales materials such as board presentations, brochures, and videos that sales representatives use to help sell advertising. The merchandising director develops and implements "value-added" programs to enhance the marketing programs of advertisers. All of these sales support directors employ assistants to help carry out their jobs; the promotion and merchandising directors also manage artists and copywriters to prepare materials related to their work.

Other careers at magazines can be found in the circulation, distribution, technical support, and finance and accounting departments. A new position that is rapidly being included on many staffs is an online editor who oversees the content and design of the website of a magazine.

Many people who supply creative talent for magazines do so as self-employed freelancers, working from their home or private studios. These writers, photographers, photo stylists, artists, and designers may work predominantly for one magazine, which may earn them the title of "contributor" on the masthead, or they may work for a variety of magazines, sometimes specializing in one content area such as food or travel.

People seeking positions in writing and editing for magazines must possess a firm command of the language, which can be developed through college programs in the liberal arts, journalism, and other communication fields. Many section editors and staff writers have education and/or experience working in a secondary area that is related to the editorial content of a magazine (e.g., in politics, fashion, or horticulture). Potential magazine artists should have experience not only in graphic design but in the latest design software and in the prepress and printing processes. College students who are planning on having writing or art careers at magazines are encouraged to seek experience in the media industry, preferably at publications; internships offer valuable training and often provide opportunities for permanent employment after graduation.

Those individuals who plan to pursue a career on the sales side of magazines must be able to persuade effectively. A college degree in business, marketing, advertising, or another communication field is helpful, but many advertising sales representatives begin in an entry-level position and gain the experience they need as they work their way up the ladder. People who are interested in sales and promotion must be able to persevere, accept rejection, and thrive on competition. Strong negotiation and presentation skills are helpful. College students are wise to seek experience in business situations that will help them learn about advertising sales, such as preparing research and presentations and otherwise assisting sales representatives.

Anyone pursuing a career at a magazine, regardless of the position, should be dependable, efficient, and organized in order to meet deadlines. Computer literacy is also a must, as is the ability to communicate effectively, both through writing and speaking. Creativity, the ability to juggle multiple tasks, and a passion for magazines will help ensure a fulfilling career.

See also: Editors; Magazine Industry; Magazine Industry, History of; Magazine Industry, Production Process of; Public Relations, Careers in; Writers.

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TRACY LAUDER

MAGAZINE INDUSTRY, HISTORY OF

The first two publications to be categorized as magazines were created in England by Richard Steele and Joseph Addison. Steele began publishing the *Tatler* in 1709 and then joined with Addison (who had written for the *Tatler*) to begin publishing the *Spectator* in 1711. These publications differed from newspapers because they carried more of an emphasis on entertainment and enlightenment than on pure information and news. Magazines in America began with a similar concept.

The Eighteenth Century

American magazines were chiefly born out of the need to voice political opinions and ideals as the Colonies evolved into a democratic nation. The first magazines in America debuted in 1741: Benjamin Franklin's *The General Magazine, and Historical Chronicle, For all the British Plantations in America,* which published six issues; and Andrew Bradford's *American Magazine, or a Monthly View of the Political State of the British Colonies,* which ran for three issues. Both folded quickly, some say, because America was not yet ready for this new type of publication, showing a general lack of interest.

Another reason there were few magazines in America is because there were few who could read them or afford them. Most literate people were wealthy males, and because it was expensive to produce and distribute a magazine, they were the primary readership. Few women of that time were educated; therefore, magazines carried what was then thought to be male-oriented content such as politics, business, and science.

America's early magazines were filled with reprints of essays and information that was originally published in British magazines, books, and pamphlets. Very little of the work was attributed



The General Magazine, and Historical Chronicle, For all the British Plantations in America, which was printed and sold by Benjamin Franklin in 1741, was the first magazine to be published in the British Colonies, and it carried the crest of the Prince of Wales. (Bettmann/Corbis)

due to the lack of copyright laws. As the Revolutionary War approached, magazine content became more persuasive and political, and the words of some of the great statesmen of the time were frequently published. Magazine writers, however, did not work for money or fame; no payments were made and bylines were rarely given. In many cases, the publisher of a magazine also edited materials, wrote content, *and* ran the press.

Much time and labor were needed to produce a magazine before the 1800s. Printing presses had not evolved much past the movable type created by Johannes Gutenberg in 1448. Type was set by hand—letter by letter, page by page—and printed by hand using wooden presses. The stiff rag paper and oil-based ink were also made by hand, unless the printer was fortunate enough to afford imported printing supplies from England. The design of early magazines was bland, and the small type was difficult to read. Illustrations, which typically were found only on the cover or title page, were generated from rough woodcuts, although some publishers could afford the more detailed images of engraved copperplate.

Because magazines were larger and heavier than newspapers, postal stagecoaches often would refuse to deliver magazines because they took up precious space. If the postmaster accepted magazines on board, they were charged a much higher rate than that of other mail. The Postal Act of 1792 provided even lower rates for newspapers and subjected magazines to the higher rates assessed on letters. Two successful magazines of the day, The Columbian Magazine and The American Museum, soon died under the high postal rates. Two years later, the U.S. Congress saw the need to support magazine publishing and lowered postal rates for them, resulting in more new startups—a trend that continued into the 1900s. Rates were still high enough, however, to be a burden on the reader, because at that time delivery charges were paid in addition to the subscription price.

The Nineteenth Century

In the 1800s, literacy increased, and by the end of the U.S. Civil War, the majority of Americans could read. Magazines began to seek larger readerships-including the growing middle class that had more disposable income. From 1825 to 1850, approximately 5,000 magazines were launched (although not all of them succeeded), most from the Northeast, with New York replacing Philadelphia and Boston as the magazine-publishing capital. After the Civil War, the magazine industry boomed, increasing from 700 titles in 1865 to 3,330 in 1885. Circulation had grown also, but readerships of 100,000 were still considered huge. By the 1830s and 1840s, paid editors and bylined writers were common, and a new writing professional, the "magazinist," was born.

Magazines published in the nineteenth century sought to broaden their appeal. Meanwhile, magazines that targeted large groups such as religious denominations and trades began to take off during the latter part of the century. Notable mass-market magazines of the 1800s include Atlantic Monthly, Century Magazine, and Scribner's Magazine. Two of the greatest mass-circulation successes that appealed to the growing middle class were Ladies Home Journal and Saturday Evening Post. Cyrus H. K. Curtis developed the former in 1879, and when circulation reached the 500,000 mark in 1889, Edward Bok took over the editorship and was the first to cover many new areas of interest for women. In 1904, Ladies Home Journal was the first magazine to reach a circulation of more than one million. Curtis achieved additional success when he acquired Saturday Evening Post, which was struggling, in 1897. Under the editorship of Horace Lorimar, the magazine eventually grew to be regarded as the most successful magazine of the first half of the twentieth century. Curtis is known for recognizing the importance of readership to advertisers and for capitalizing on the increasing demand to place national brand-based advertising.

By the end of the century, magazines owners began to discover that advertising revenue could pay for the actual production, thereby making magazines more affordable for the reader. Frank A. Munsey was one of the first to experiment with this new idea. In 1893, he reduced the annual subscription rate of *Munsey's Magazine* from \$3 to \$1 and circulation grew from 40,000 to 500,000 by 1895. As a result, the magazine attracted more advertisers who were developing national advertising campaigns based on brand recognition.

One of the most successful startups of the era was Harper's Magazine, created by Harper & Brothers in 1850. These book publishers used their magazine as a way to make money with their book press during down time and as a vehicle in which to promote their book titles. The elegant publication featured biographies, essays, and articles on travel, leisure, and science. Throughout its successful history, Harper's Magazine attracted a wealthy, educated, upper-class audience. Other magazines that spun off from book businesses include Collier's Weekly, Atlantic Monthly, and Putnam's New Monthly Magazine. In a similar way, the highly successful women's magazine McCall's originated in 1873 when pattern maker James McCall saw it as a viable way to sell his dressmaking designs.

The best known of the early magazines targeting women was *Godey's Lady's Book* (1830–1898), which emphasized fashion and manners. Sara Josepha Hale, who served as the editor of the magazine for more than forty years, was known for shaping women's magazines of the day. She encouraged publisher Louis Godey, who hired her in 1837, to help educate women by providing articles about subjects other than fashion, such as history, art, music, travel, childcare, and important women. *Godey's Lady's Book* eventually grew to a circulation of 150,000.

New technology changed the look of magazines through the 1800s. In the early part of the century, magazines began to enhance text with illustrations and engravings. Copperplate engravings were often individually painted by hand with watercolors, such as those found in *Godey's Lady's Book*, but these engravings were obviously laborintensive and costly to produce. Woodcuts were a less expensive option than steel or copper plates and were gradually improved to provide durability and detail. Illustrations became more popular as the century progressed, but by the late 1800s, with new engraving technology, photographs began to be more common.

New printing techniques made publishing magazines quicker and easier. The old flatbed press could only print one sheet at a time; in 1822, the steam-powered press accelerated the process, and in 1847, the rotary press made printing even faster. The greatest press advancements appeared in 1871, with the advent of the web perfecting press, which could simultaneously print both sides of a single roll of paper, and in 1886, when the invention of the Linotype machine by Ottmar Mergenthaler virtually dispensed of hand-set type, thereby speeding up the typesetting process nearly eightfold. Meanwhile, handmade linen papers were replaced with wood pulp papers, lowering the cost of the product. All of these new developments saved time and money, which resulted in lower magazine prices for the consumer.

Postal rates, however, continued to be a major monetary concern for magazines. In 1825, Congress enacted rates based on distance traveled, which resulted in magazine circulation being concentrated in the northeastern United States. In 1845, Congress eliminated the distance factor and set rates based on weight alone. Magazine publishers continued to push for better rates, and in 1852, postal rates for magazines dropped again. At this time another significant change was made when publishers were allowed to pay postage on magazines at the mailing office—absorbing costs themselves and eliminating the need for subscribers to prepay postage on magazines at their own post offices. Finally, in 1879, Congress passed the Postal Act, which allowed magazines a lower second-class rate.

The Twentieth Century

Magazine readership flourished in the 1900s. More people were able to read, more people found leisure time in which to read, and more people had discretionary income to spend on magazines. Early in the century, magazines carried over the content focus from the nineteenth century, providing general interest articles and advice; however, this editorial style soon gave way to specialized content that met the needs of specialized audiences. Magazines began to move toward shorter articles, more concise writing, and more service-oriented journalism. Although mass circulation leaders such as Saturday Evening Post and Life remained popular through the early part of the twentieth century, they eventually folded when magazines with uniquely focused editorial concepts began to dominate the industry.

Reader's Digest, created by DeWitt Wallace and his wife Lila Acheson Wallace in 1922, was one of the first notable successes of the twentieth century. The couple tried to meet the needs of busy readers by condensing and reprinting a variety of articles published in other magazines and by printing them in a small magazine format that was easily transported. Henry Luce and Briton Hadden founded *Time* in 1923 with similar goals of educating busy readers, and their publication broke ground as a weekly news magazine. Meanwhile Harold Ross's *New Yorker* provided another unique editorial product with its individualistic criticism, sarcastic wit, and slanted profiles.

Other special-interest magazines, such as *Sports Illustrated* and *Modern Maturity*, became so popular that they eventually gained large circulations. *Sports Illustrated* was founded by Time, Inc., in 1954. Although it was hugely popular from the start, it took ten years to turn a profit. *Modern Maturity*, founded in the 1980s by the American Association of Retired People (AARP), became one of the nation's top-circulating magazines due to the organization's growing membership. A wide variety of special-interest magazines created in the twentieth century were so popular that they eventually gained mass appeal, including such titles as



In 1971, the Volunteers of America presented DeWitt Wallace and Lila Acheson Wallace (cofounders of Reader's Digest) with the Ballington and Maud Booth Award for Distinguished Service to Humanity. (Bettmann/Corbis)

Playboy (1953), *TV Guide* (1953), *Rolling Stone* (1967), *Travel and Leisure* (1971), and Ms. (1972).

At the end of the nineteenth century, photography became an important part of magazine content. With the invention of the halftone in the 1880s, a photograph could be transferred onto a sensitized printing plate, eliminating the need for an artist and engraver-thereby cutting the cost of providing visual images. At the beginning of the twentieth century, a halftone cost \$20, compared to a wood engraving at \$300. Many magazines such as McClure's and Munsey's began to use photographs to enhance articles, and Collier's became noted for its news photography after its coverage of the Spanish-American War in 1898. It was other magazines, however, such as National Geographic, Life, and Look that took full advantage of this new technology, basing their content on the image before the word. In addition, fashion magazines in the 1920s such as Vogue, Vanity Fair, Town & Country, and Harper's Bazaar embraced photographic content.

As readers began to see more photographs and color in magazines, they became more demanding of magazine appearance. Art directors joined the staffs of writers and editors in the 1930s and 1940s. Two of the noteworthy groundbreaking art directors were Alexey Brodovitch at *Harper's Bazaar* and Mehemed Fehmy Agha at *Vogue* and *Vanity Fair*. They led the way for magazines to gain distinctive visual styles.

In the latter half of the twentieth century, advancements in computers and satellite technology decreased the time needed to place advertising and deliver fast-breaking news. Enhanced computer technology also had an effect on magazine production—first in design and production and later in editorial. Gradually, many magazines moved to computer-to-plate (CTP) production, where no film is shot, decreasing the amount of time necessary to get raw content to the press. At the same time, magazines began to accept digital art from advertisers, further streamlining the production process.

Postal rates remained a concern for magazine publishers throughout the twentieth century. In the early 1900s, transportation systems enhanced methods for delivering magazines, but postal rates became increasingly higher and more complicated. In 1917, editorial material was charged a single rate, while advertising was zoned and assessed fees accordingly. After the 1960s, some publishers actually found it cost-effective to cut circulation. In 1970, the Postal Reorganization Act took the rate-setting power from Congress and turned it over to the U.S. Postal Service. By 1980, postal rates had increased more than 400 percent, which led some publishers to begin experimenting with alternative carriers to combat the cost.

The Twenty-First Century

Despite the prolific use of personal computers to gain access to information and entertainment via the Internet, print magazines have retained popularity in the United States. Newsstands feature new titles regularly, creating competition within even the most narrowly focused niche markets. New technology should continue to make production of magazines faster and easier, while the interests of readers will continue to drive editorial content and garner advertising for one of America's favorite mediums.

See also: Editors; Gutenberg, Johannes; Magazine Industry; Magazine Industry, Careers in; Magazine Industry, Production Process of; Printing, History and Methods of; Writers.

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TRACY LAUDER

MAGAZINE INDUSTRY, PRODUCTION PROCESS OF

The production process of a magazine involves several steps that are often carried out simultaneously by all who contribute to the final product, including the editorial and advertising departments, the printer, and the circulation department. For this reason, communication, planning, and organization are vital in the process of turning ideas into a magazine. While every magazine varies in this process, a basic formula does exist.

Planning and Preparing Content

The process often begins with the end. The editor and the publisher determine a date that a magazine will reach the reader, and the printer and the circulation department provide deadlines that must be met to accomplish this. Once these dates are established, the scheduling and planning of the magazine can proceed.

With most magazines, the stories for each issue are planned several months, even one year, in

advance. An idea for a story can come from several sources: the editor, the staff, queries from freelance writers, and, occasionally, unsolicited manuscripts. The content of each issue is ultimately the responsibility of magazine editors. The staff is typically expected to submit ideas to the editor. They are often the best source of story ideas because they have a more developed understanding of the focus of a magazine. Queries from freelance writers are also sent to the editor. A query should clearly outline the story idea and any special knowledge or the sources to be used by the writer. A finder's fee may be paid to the author of a query if the idea is used but assigned to another writer. While many magazines do not read any unsolicited manuscripts, some magazines have found it worthwhile to sort through these works. Regardless of its origin, once an idea is approved by the editor, it is assigned to either staff or freelance writers.

When a manuscript is completed by a writer, it is usually given to a magazine in electronic format along with a hard copy. Depending on the size of the staff, an editor may route a manuscript through what is called a "reading line" of senior editors for their comments and evaluation. Often, a manuscript will need some repair to be usable. The writer is provided with suggestions for necessary changes and asked to make the revisions. After this step, if only minor changes are needed, the magazine staff may make the revisions themselves. The magazine will then officially accept or reject the manuscript.

If a manuscript is officially accepted, it enters the copyediting phase. It will be thoroughly checked for accuracy. Every fact used in the manuscript must be verified, including names, quotes, and statistics. A writer is commonly asked to provide his or her sources, so a fact checker may retrace every step. The reputation of a publication is at risk because its readers expect the publication to be a reliable source, and advertisers do not want to be associated with poor-quality product. Fact checking also helps guard against lawsuits. While larger magazines have an entire department of fact checkers, other magazines rely on editors or copy editors to verify the accuracy of each manuscript.

A copy editor then critically reviews the manuscript for any grammatical errors or misspelled words, rewrites any awkward phrasing, and solves any organizational problems. A manuscript must also comply with the style adopted or developed by a magazine, which governs the treatment of things such as abbreviations, punctuation, names, titles, and spelling preferences. The copy editor is responsible for the overall polishing of the manuscript for publication. Once the copyediting is complete, the manuscript is ready to be laid out by the art department.

By the time a manuscript leaves the copy desk, the art director and the editor or assigning editor have made decisions about illustration or photography to accompany the piece. A freelance photographer may have been hired for a photo shoot or the rights to print an image may have been purchased by a stock photography agency. Low-resolution scans of these images, text, and any captions or pull quotes written by the assigning editor are given to a designer in the art department to lay out. The art director and the editor will then review the design and send it back to the copy desk for proofreading and any minor trimming necessary. Once a layout is approved by the copy editor, editor, and art director, it is ready for printing.

Production, Printing, and Distribution

Deciding what articles and advertisements will run in an issue and where they will be placed is called the break of the book. The size of an issue and the ratio of advertisement to editorial must be determined. Once these variables are established, a production manager begins mapping out the magazine, usually making a thumbnail of each page. The editor and the art director provide an outline of stories they want to include in the issue. Most publications have departments and special sections that run in the same place each issue, which aids in planning the magazine. Regardless, the map will undergo several revisions throughout production—to accommodate any changes in advertisements and stories scheduled to run.

The production manager oversees the final preparations made for the printer. While the editorial pages are coming together, the production manager collects materials for the advertising pages. Because most of these pages are created by other advertising agencies and design houses, the production manager must be sure that each advertisement arrives on time and conforms to the specifications of the publication. Advertisements are often sent to the magazine as film or in electronic format, but they can also be sent as preprinted pages that will be bound into the publication.

Before the production manager gives the materials to the printer, the printer has already scheduled press time, ordered paper, and made any other preparations possible. As soon as the printer receives the materials, the prepress process begins. If low-resolution images have been used, they will be replaced with high-resolution files. Any final color adjustments to the images will also be made at this time. The magazine is now ready to go to film.

A printer will not run the press without final approval from the publisher. Therefore, a proof is pulled from the film so the magazine can sign off on it. Printers have several ways of making proofs, from blue lines to digital color proofs. At this point, the order of the pages is checked, and the entire publication is reviewed one last time for any errors. While the printer will charge for any changes that are made at this point, it is the last opportunity to make corrections without spending a great deal of money. Once this proof is approved, the magazine is ready to go to press.

The production manager or the art director may be present at the beginning of a press run for quality control purposes. This process is called a press check, and it involves working with the press operators to ensure that the pages will run in register with acceptable color quality. When the representative of a magazine is satisfied with the press sheet, it is signed and used as a reference throughout the press run.

After the magazine pages are printed and dried, they will be folded, trimmed, bound, and made ready for distribution. A circulation director is responsible for getting the magazine into the hands of the reader. Larger magazines have inhouse circulation departments that physically prepare the magazines for distribution. They also maintain records of subscribers and their subscription status and are responsible for fulfilling the agreement. Magazines are typically labeled with mailing addresses and bar codes and presorted for second-class mail. A circulation department must know the requirements of the U.S. Postal Service and meet these specifications to ensure a cost-efficient and timely delivery.

For single-copy sales, the circulation department may work with a national distributor to get the printed issues to retailers. A large magazine



A key issue in the production of a magazine is the creation and perpetuation of an editorial focus, such as the political focus that John F. Kennedy Jr. chose when he decided to create George magazine in 1995. (Reuters NewMedia Inc./Corbis)

will ship copies to wholesalers throughout the country provided by the national distributor. A wholesaler will record the quantities that they send to retailers such as supermarkets and convenience stores in their region. Any unsold copies will be returned to the wholesaler, who notifies the national distributor. The national distributor is able to provide sales figures for the publisher.

Maintaining Editorial Focus

The publisher and the editor must be in tune with their target audience to create a successful magazine. The publisher relies on sales figures and subscriptions as a source to track the progress of the publication. A magazine may also conduct or commission reader surveys, and it is the editor's job to use this information to ensure that the editorial content reflects the preferences of readers. Throughout the production process, the editor is responsible for keeping the big picture in sight, and ensuring that the decisions made will uphold the mission of the magazine. Most magazines are classified as either consumer or trade publications. Hundreds of categories exist in the consumer classification. Each targets readers by where they live, their interests, age, sex, income level, race, or any other defining characteristics. A consumer magazine finds a niche that allows advertisers to reach a target market that is relevant to their product. Advertising is a large portion of consumer magazine revenue, and these magazines are readily available to consumers. Trade magazines target specific professions, and while advertising is an important source of revenue, trade magazines can charge much higher subscription rates than consumer magazines.

The nature of a magazine is an important variable to consider in the production process. Scheduling is the most obvious factor that is affected by the focus of a magazine. For example, a news magazine does not have the predictability of other magazines. Special reports and investigations must be put together quickly if they are going to remain newsworthy by the time the publication is distributed. Fashion magazines have a little more predictability in that, typically, fall and spring issues are larger to accommodate the fashion shows and new styles of the season. Many photo shoots for fashion, lifestyle, and outdoor magazines must be completed one year in advance due to the change of seasons. For example, if a fall issue requires outdoor scenes, the photographer cannot capture the changing leaves with a photo shoot in May.

Editorial scheduling is just one of the many factors that are influenced by the type of magazine being produced. The size of a magazine staff, and the process a manuscript must go through, can also vary. For example, a cooking magazine typically has a test kitchen staff. Their job is to test any recipe for publication to ensure that it is usable and tasty. They also develop recipes for stories and contribute to story ideas. Thus, while a manuscript is being scrutinized by editors and copy editors, the accompanying recipes are being analyzed by the test kitchen. Other magazines may require a manuscript to be checked for accuracy and relevance by a field expert before it is officially accepted by for publication. Fitness magazines, for example, often have medical experts that review manuscripts for accuracy.

A magazine that has a heavy concentration of photography and images, such as an art magazine, caters to a more visual audience. Having a target audience with discriminating eyes makes the production and printing quality of the utmost importance, and it may require more color proofs and extensive press checks. Many art magazines use a higher quality of paper, which affects the size of the production cost per issue.

Technological Advancements

The magazine production process has changed tremendously since the mid-twentieth century because of technological advances. Most magazines have become digital, using personal computers and page layout software. This has eliminated several positions and steps in the production process. Prior to the desktop revolution, the production process was a closely linked chain, in which each person performed a specific duty without variation in a sequence without deviation. With the advent of desktop publishing, these specific duties became blurred as every staff member became more closely involved in the production process. Now, an editor can place copy in a layout while an art director can perform tasks that were normally left to the production staff. Therefore, it has become necessary for people working in a desktop publishing system to resolve these issues of responsibility in order to prevent conflict among the members of the staff and to avoid confusion in the production process.

Magazine staffs have also been reduced as computer software has simplified tasks that once required specialized training. Magazines enjoy the economic benefit of producing magazines with a smaller staff, yet members of the staff find themselves performing more duties than ever before. One person can edit text, format it, and perform pagination simultaneously, speeding up the process and eliminating the bottlenecks of the old process.

As technology has provided a faster, more efficient way of putting together a magazine, editorial and advertising deadlines have been pushed back. News magazines can add timely stories as they broke, and all magazine advertising departments enjoy the extra time to pull in more advertising. Yet this puts added pressure on the production staff to meet the tight deadlines. Constantly changing technology has also become an issue. As new software and systems are constantly being introduced and used in the publishing industry, production staffs must train and learn to use new tools, often for job security. Despite the new gray areas presented by technological developments, magazines have enjoyed the benefits of a faster, more streamlined production process.

The technological explosion has also contributed to the development of an entirely new category of magazine. Several computer magazines have been successfully established, while other magazines have added new sections that relate their editorial focus to computers, such as online shopping, guides to useful Internet websites, and reader e-mails. It is only natural that this new computer culture makes its way into editorial content as it becomes a part of the everyday lives of the readers.

Just as magazines cannot ignore this growing computer culture editorially, publishers have found themselves faced with questions about the future of printed medium versus electronic format. Most magazine professionals have realized that electronic media should be seen as another form for distribution of their information, rather than as a threat to their magazine. While most publishers have not rushed to embrace an electronic format completely, they have begun to take advantage of the technology in one way or another.

The CD-ROM became one of the avenues explored by magazines in the mid-1990s. The capacity of the compact disc (CD) to store not only text and large images but animation, video, and sound provides a new challenge editorially. An entirely new world became the realm of possibility for magazines. Readers can navigate through text and images with greater freedom-with crossreferences and indexes that literally lead the readers to whatever information they seek. Readers can interact with the electronic pages. Despite these advantages, computer compatibility and slower hard drives remain a challenge. Magazine publishers have found this a useful way to provide special one-shot publications or software that act as companions to their magazines. For example, cooking magazines have used the CD-ROM to provide recipe software that allows readers to access an entire database of recipes as well as to add their own recipes to the archived material.

Online magazines offer even more advantages to communicating ideas. While the World Wide Web offers more options for content than a printed magazine, such as sound and video, the immediacy of the web is perhaps its most powerful asset. The production process requires fewer steps than the printed magazine. This allows editors to update a page as quickly and as often as they choose, meaning that there are no "old issues" or obsolete stories. Magazines can finally have the same relevancy that only television and radio possessed in the past. Editors are also able to communicate directly with readers, responding to their questions and suggestions as quickly as they wish. An online magazine can set up a forum or "chat room" where readers can communicate with each other as well as with the editorial staff. While these advantages are undeniable, most printed magazines are not switching over to online formats. Instead, the magazines are expanding to include the online formats.

See also: Editors; Magazine Industry; Magazine Industry, Careers in; Magazine Industry, History of; Printing, History and Methods of; Writers.

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STACEY BENEDICT TRACY LAUDER

MANAGEMENT INFORMATION SYSTEMS

What are management information systems? A simple answer would be that management information systems are systems that are used to deliver management information. It could also be said that these systems might or might not be implemented by means of computing technology. They might be very formalized (i.e., explicit) or more informal (i.e., implicit). The real problem in understanding management information systems comes with what is defined as management information, as well as the particular view taken on how managers actually go about engaging with this information and these systems in doing managerial work on a day-to-day basis. Generally, the controversy with these systems is not about what they are but rather about why they are necessary or not and how they are actually used or not. It is in addressing these questions that a particular view of management information systems will tend to come to the fore.

Most contemporary authors would agree that it is useful to define management information as essential information extracted or filtered from the transactional or primary organizational activities to support management in identifying and solving problems as well as in making decisions to ensure the efficient and effective management of the organization. Again, this seems quite easy and intuitive to understand. It may be this intuitive need and the possibilities presented by computing technology that made H. Igor Ansoff claim, in his 1965 paper "The Firm of the Future" that "mancomputer decision making is potentially the most powerful competitive tool which will be available to the firm of tomorrow." Was it? Is it still? The answer must be yes and no. The history of management information systems, especially formalized computer-based systems, has been rather disappointing. Many of the promises of efficient and effective decision making and problem solving through real-time and accurate information has not materialized. Managers continue to talk of information abundance, even overload, but argue they often lack what is really relevant-this is mostly expressed by the phrase, "we are drowning in data but we are starving for information."

Is it that these systems are not real-time enough, or that they are collecting the wrong data, or perhaps that they are presenting it in inappropriate ways? All of these may be possibilities. However, it may also be more fundamental. If a look is taken back to the 1960s and early 1970s, it is seen that controversy surrounded the idea of computer-based management information systems from its inception. The two most prominent detractors were Russell Ackoff, with his paper "Management Misinformation Systems" (1967), and John Dearden, with his paper "MIS Is a Mirage" (1972). Both of these authors felt that the management decision-making processes were much more complex than suggested by the proponents of computer-based management information systems. They also argued that the proponents did not have an adequate understanding of the way in which managers used information in actual decision-making processes. The extensive studies by Henry Mintzberg in the early 1980s of managerial work seemed to confirm that managers were indeed much less structured, informal, and intuitive in their use of information in decision-making processes. By the end of the 1980s and in the beginning of the 1990s, it became evident that management information systems were not the "grand solution" to the management problem its proponents thought it would be. Nevertheless, there were many benefits indirectly derived from these efforts, especially an understanding of how mangers actually go about making decisions and solving problems.

Historical Roots

The logic that would make management information systems a self-evident need in the second half of the twentieth century started long before the first computer was applied in a business context. In fact, one could trace the origin of this logic back to the very inception of the modern period and the work of the seventeenth-century philosopher René Descartes. Descartes, considered the father of the modern worldview, was struck by the large number of competing, and often contradictory, systems of knowledge about the world that had been presented to him as part of his education. He believed that humanity will only progress if they establish an absolutely certain basis to separate true statements from false statements-that is, to secure knowledge on a trustworthy foundation. This principle forms the implicit basis from which the father of modern management, Frederick Winslow Taylor, two hundred years later shaped its essence.

Taylor, akin to Descartes, was struck by the unsystematic manner in which factory work was being conducted and the lack of systematic knowledge on how to achieve results with a required degree of certainty. With this in mind, Taylor developed standardized techniques and methods to measure work. Tasks were divided into the smallest possible unit-the rational division of labor. Every unit was then rationalized according to available knowledge provided by detailed study of workers' movements, actions, and techniques for executing work. Every unnecessary technique, movement, or action was illuminated until only that which can no longer be doubted remained. A similar procedure was then applied to the workers themselves. The optimized work and worker were then placed under detailed monitoring to ensure compliance and to provide feedback for improving the work process. The improvements that Taylor achieved were phenomenal-even for very basic work such as shoveling things. He reported improvements of hundreds, and sometimes even thousands, of percent.

There is no doubt that Taylor's scientific management (often referred to as "Taylorism") was spectacularly successful. It was rapidly adopted by many factories and became the self-evident model for managing work in that organizational setting. However, this success masked the implicit outcome of the scientific management logic. This outcome must be carefully considered because it helps reveal the logic for management information systems and shows why management information systems never realized the potential that was anticipated by its original proponents.

The important implicit outcome of scientific management was the separation of cognition and action—in other words, "thinking about work" and "doing the work" became separated. Thinking was transferred from the worker to the management function or process. Thus, through scientific management, thinking and worker action became separated for the sake of absolute efficiency, and the need for an information system to act as a bridge for this gap came about—initially messengers and telephones, later computer-based information systems.

In Taylorism, management becomes conceived of as the brain that moves the body (work processes) in a planned and coordinated way. The information system becomes viewed as the system that connects the brain with the body-the nervous system as it were. From this separation of work and thought about work, established by scientific management, management information systems emerged as a self-evident need. As organizations grew in size and complexity, this need became more and more acute. Likewise, the problem of allocating resources-workers, machines, material, and so on-could no longer simply be solved on "diagrams and maps," which acted as models for the reality. As organizations became more complex than can be represented on diagrams and maps, more sophisticated models were needed to act as representations of reality, where different possible allocations, or scenarios, could be developed and evaluated. Thus emerged the need for decision-support systems. Likewise, more and more detailed information about work in progress and work completed were needed so that the planning horizon could be up to date.

Evolving Role

It is therefore not surprising that Henri Fayol, in his seminal work *General and Industrial Management* (1949), concluded that the essential management activities were planning, organizing, controlling, and leading. These activities flow logically from the way management became articulated in scientific management. As these management activities became more clearly articulated, they became supported by an increasingly complex set of techniques for gathering data and reporting results. In this regard, the development of managerial accounting was significant, with the first work on budgeting appearing in 1922 and the development of "responsibility accounting" in the early 1950s. However, the development of computerbased management information systems to support management activities was not yet evident, as the first electrical computers, the ENIAC (1946) and the UNIVAC 1 (1951), were seen as primarily mathematical machines.

In 1954, the UNIVAC 1 was installed at General Electric as a business application to do payroll processing. The business community rapidly appropriated the computer as a business tool, with its use growing to 100,000 business computers by 1974. In its first decade of application, the computer was essentially used as a more efficient technology for automating work that involved laborious calculation, such as payroll calculations. The focus was on its speed and accuracy as a mathematical tool. However, it soon became evident that the capturing or recording of data required for the calculations could also be used to create reports for managers. As such, computer-based management information became an unintended consequence of the automation of calculating operations.

The automation of more and more work processes generated increasing amounts of data for the manager to consider. Herbert Simon, the Nobel laureate, realized that managers would need systematic methods to use this, now increasingly abundant, data. Simon produced the first systematic account of managerial decision making in his seminal work The New Science of Management Decisions (1960), wherein he makes the distinction between structured and unstructured decisions. In a structured decision, the nature of the problem and the data required to consider a solution for the problem are known in advance. In an unstructured decision, the problem needs to be structured before it can be considered. It is therefore not possible to know in advance exactly what information will be required. Together with this work, a number of other works started to appear that had a particular influence on the way management information systems was conceived.

Framework for Definition

The most widely used, and undoubtedly the most influential, framework for management

information systems was the framework presented by Anthony Gorry and Michael Scott Morton in 1971. This framework rapidly became the blueprint for the development of management information systems and is still used in most textbooks as the basis for discussing management information systems.

Gorry and Scott Morton proposed that the type of decisions and, therefore, information needs would vary according to the level of management control. Based on this idea, they suggested a framework for identifying the type of information required by each level of management. They concluded that operational management needed largely internal information, which is well defined, detailed, and narrow in scope. Furthermore, their information need tends to be current, usually referring to the most recent period-day, week, or month. They normally require a high level of accuracy and a structured and welldefined format of presentation. Typical examples of these would be the daily sales or production reports that provide detailed functional information such as sales per units, sales per salesperson, or sales per region. On the other end of the spectrum, they concluded that strategic management required general information that is broad and farreaching in scope-mostly from external sources. Their information tended to be aggregated and summarized with an emphasis on forecasting, prediction, and future scenarios. The presentation of their information often varied to accommodate the diversity of formats used by the variety of sources-both internal and external. Typical examples of these would be internal strategy documents, government and central bank economic forecasts, market analyst commentaries, and share price predictions. From this initial framework, they proposed different types of systems to support the three management levels in the organization. The operational control process-first line or supervisory management-tend to be supported by frequent, detailed reports on the most recent work completed or in progress. The systems implemented to automate the basic operational business activities (e.g., payroll systems)referred to as transaction processing systemsprovide the data for this management reporting. The management control level-referred to as middle management or tactical management level—is supported by some form of decision-support system. These systems implement the decision process as defined by Simon, using modeling techniques that were developed by the emerging management science field—as explained by Ralph Sprague and Eric Carlson (1982) and, more recently, by George Marakas (1999).

Management science field emerged out of the operations research field of study, where mathematical models were being developed to solve complex resource allocation problems. (Operations research was itself an outcome of resource allocation problems encountered in World War II.) It was only in the latter half of the 1980s that the concept of an executive information system for strategic planning emerged. As the organizational hierarchies increased, the senior managers felt increasingly isolated from the basic business operations; the management separation of scientific management affected them the most. Thus, one had a contradiction in which the operational managers had the direct experience and knowledge of the business and the senior managers had the authority to allocate resources but not the knowledge to do so effectively. The executive information system was seen as the solution to this problem. Robert Thierauf (1991) proposes that an executive information system would provide the executive access to information about the operations in an easy to use, aggregate format with the ability to "drill down" and look at the detail data behind the aggregate presentations. With the coming of the executive information systems, the three management levels were associated with three distinct types of systems: management reporting systems, decision-support systems, and executive information systems. These systems are best summarized in the following manner. Operational managers are mostly supported by management reporting systems that provide specific, detailed, and current information about operations in the form of regular management reports. These systems act as the essential feedback for operational control and short-term problem solving. Middle managers are mostly supported by decision support systems. They are interactive computer-based systems intended to help decision-makers use data and mathematical models (such as cash flow or scheduling models) to identify and solve unprogrammed, semistructured problems. The system supports, rather than replaces, managerial judgment. Its objective is to improve the effectiveness
of the decisions and not necessarily the efficiency with which decisions are being made. Strategic managers are supported by a variety of internal and external sources. One such internal source is the executive information system. It provides, in a useful and navigable format, direct online access to relevant, timely, accurate, and actionable information about aspects of an organization that are of particular interest to the senior managers. It allows the senior managers to identify broad strategic issues and then explore the information through increasing layers of detail, until they are able to explore the root causes of the issues.

From this discussion, it is evident why management information became viewed as essential information filtered from the transaction processing systems or primary organizational activities and processed, or structured, by the management information system to support management-in an appropriate manner for each level of management-in identifying and solving problems or making decisions to ensure the efficient and effective management of the organization. Gordon Davis and Margrethe H. Olsen, in the second edition of the influential text Management Information Systems: Conceptual Foundations, Structure, and Development (1985, p. 6), define management information systems as follows: "Management information systems are integrated, user-machine systems for providing information to support operations, management, and decision-making functions in an [organization]."

Unrealized Promise

These conceptual frameworks are useful to think through how management information systems could and ought to be designed and developed, but what about the actual implementation of these systems in organizations? With these conceptual models in mind, and based on the expected value of management information systems, organizations proceeded to invest huge amounts of resources in their design, development, and implementation. The management information systems project was the major concern for organizations in the 1970s and the 1980s. Even the functional unit responsible for information systems in the organizations was often referred to as the "Management Information Systems Department." Management reporting systems quickly became the backbone to support

operational control in organizations-and could be said to be the most successful and enduring element of management information systems. Data capturing became more real-time (at the moment when it happens) and end users became more proficient at creating their own reports, queries, and so on. Decision-support systems have been relatively successful in small and specific areas of application. However, it has become evident that modeling organizational processes is much more complex than anticipated and that the most important factors considered by managers in decision making are often part of their tacit and intuitive understanding of the particular situation at hand. The field of decision support systems has grown to include support for group decision making, embedding artificial intelligence technology into these systems. However, effective decision support in areas that really matter still remains elusive. Relatively recent developments include data warehousing and online analytical processing. Executive information systems also have been moderately successful and continue to be used to a lesser or greater degree.

As with decision-support systems, the intuitive and unstructured nature of executive work remains the Achilles' heel of executive information systems. Neither decision-support systems nor executive information systems have become pervasive in any sense of the word. There appears to be a consensus that management information systems have not quite delivered on the promises heralded in the early 1970s. Studies of the investment in this technology have shown high levels of investments with rather low, or even negative, returns on investment, as reported by Paul Strassman in his book *The Business Value of Computers* (1990).

Management information systems have become much less of a concern for organizations—as reflected in research agendas, development priorities, and general business discourse. Some of the concerns about management information have shifted to other areas, such as enterprise resource planning systems. The most important factor for this change in emphasis is the shift in organizational thinking and development. By the second half of the 1980s and the early 1990s, organizational theorists and practicing managers realized that the standardized and stable production processes assumed by scientific management were simply no longer feasible. Organizations needed to be more flexible and able to respond to the increasingly sophisticated, interconnected, and dynamic environment. The only way to gain this flexibility was to reconnect "thinking about work" with "doing work"-thereby reversing the ill effects of scientific management. This attempt has led to the development of new models for managing organizations. To name but a few, these new models include learning organizations (where employees are encouraged to think about and improve their own work), quality circles (where quality problems are solved through collaborative consultation), empowerment of workers (through authority and resources), and multiskilling (where the widening of the skill base of all employees is encouraged). The design of computer-based information systems has responded to these changes. Thus the development of information technology to support learning, collaboration, and sharing of knowledge occurred, rather than the development of technologies for management control. The new technologies included initiatives such as computer-supported cooperative work systems in the form of groupware (to support collaboration), intranets (i.e., Internet technology that is available to an organization for sharing data on an internal basis), and knowledge repositories (to share knowledge through the organization).

Although management information systems will undoubtedly remain in some form as an integral part of the information systems infrastructure of organizations, it will not perform the central role that was once envisaged by its early proponents. In the new (i.e., postscientific management) organizational climate, new technological solutions are needed and are being developed. There is no doubt that they will also disappoint, because the problem of information and information systems is always, in the final analysis, a social problem rather than merely a technical one.

See also: Artificial Intelligence; Chief Information Officers; Group Communication; Group Communication, Decision Making and; Knowledge Management; Knowledge Management, Careers in; Organizational Communication; Systems Designers.

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LUCAS D. INTRONA

MARCONI, GUGLIELMO (1874–1937)

Guglielmo Marconi, the originator of wireless telegraph signals, created the means of overcoming many of the hurdles to the commercialization of wireless. In particular, he was the first person to transmit radio signals across the Atlantic Ocean without the use of cables.

Marconi was born in the Italian countryside in somewhat modest circumstances. While he had little formal education (although his mother did tutor him), he loved to read about experiments with electricity that were described in the books in his father's library. Marconi audited courses at



Guglielmo Marconi is shown with his electrical wireless apparatus in an 1896 photograph. (Hulton-Deutsch Collection/Corbis)

the University of Bologna, because he could not gain admittance to the university for credit, and studied under Augusto Righi, a scientist who had worked with electromagnetic waves. Since Righi was also a neighbor, Marconi would often visit him with questions and ideas. Righi rarely encouraged Marconi's ideas about a practical system of transmitting information using these electromagnetic waves. Still, Marconi showed a dogged persistence in trying out method after method in his experiments.

In 1895, after following the experiments of Heinrich Hertz, Marconi (at twenty-one years of age) devised a system that allowed him to ring a bell that was two rooms away in his attic workshop. He was able to do this purely by striking a telegraph key that created electromagnetic waves. Marconi began producing this effect at longer and longer distances, eventually moving outside and sending the signals over a distance of several hundred yards. Initially, distances were overcome simply by using more powerful electrical charges, a condition that would never allow practical wireless communication to travel very far. Marconi eventually found that if he placed part of the transmitter on the ground, resistance was cut dramatically and the signal would travel much farther. Thus, Marconi invented the grounded antenna and began sending telegraph signals over distances of up to two miles (regardless of hills or other obstacles).

After the Italian Ministry of Post and Telegraph rejected his initial presentation of the invention, Marconi took it to England. After applying for a patent to protect his idea, he began working to gain British support. Since his mother was Irish, he had several family connections in England and was able to arrange a presentation of the invention to William Preece of the British postal system in 1896. Preece became an avid supporter and provided postal system personnel to help Marconi continue to develop his system. By 1899, Marconi had established a wireless link across thirty-two miles of the English Channel.

The wireless system as it then existed allowed for only one person at a time to transmit in a given geographical area. If multiple transmissions were sent simultaneously, they were incomprehensible or canceled each other out. Marconi looked for a way to tune the signal to specific wavelengths. By 1900, he had succeeded in developing a system of tuned multiplex telegraphy, which allowed multiple messages to be sent from the same transmitter simultaneously with each message being received accurately by different receivers in different locations.

Another obstacle to be overcome by Marconi was a belief by many scientists that electromagnetic waves would not be able to follow the curve of the earth and could, therefore, never transmit signals across the vastness of an ocean. In 1899, Marconi had transmitted signals from ship to shore over a span of sixty-six nautical miles, far more than enough to ensure that the waves were somehow bending around or traveling through the ocean to reach the shoreline. Marconi was convinced that the wireless could span the ocean, and he set out to prove it. He had a powerful transmitting station built in Poldhu, on the coast of England, and set sail for St. John's, Newfoundland. Once there, Marconi attached a receiving wire to a kite and flew the kite at a height of four hundred feet. To anyone who expressed interest in what he was doing, Marconi pretended that he was working on contacting passing ships on their transatlantic voyages. On December 12, 1901, he received the letter "S" several times and had an assistant verify the reception. He then announced to the world that he had received a message from England, which was more than twenty-one hundred miles away across the Atlantic.

Still, many people doubted Marconi's claim because of the bias of his only witness and the simplicity of the message. Therefore, Marconi outfitted the ship Philadelphia with sophisticated wireless equipment, a telegraph recorder that would mark the signals on paper tape, and a public listening-room so passengers and crew could serve as witnesses to the receptions. The experiment, which took place during a 1902 voyage where the ship sailed from Cherbourg to New York, was a success. Marconi recorded receiving signals from over a distance of more than two thousand miles. As a by-product of his experiment, Marconi also found that the signals traveled best at night, but this was a phenomenon that he was at a loss to explain.

In 1907, Marconi finally perfected the system of transatlantic wireless and began commercial service between Glace Bay, Nova Scotia, and Clifden, Ireland. His work on wireless brought him the Nobel Prize for physics in 1909.

The early 1910s were full of lawsuits in which Marconi was forced to defend his patent rights. He emerged victorious, however, and the results were financially profitable for his British, American, and international companies. In 1916, during World War I, America wanted to avoid foreign control in wireless properties that were being used by the military. As a result, the American Marconi Company was forced by the U.S. government to merge with General Electric. Thus, Marconi lost the influence he had established in wireless communication in America. In his home base of Britain, however, Marconi and his companies were influential in the startup of public radio broadcasting and helped to establish the British Broadcasting Company, which later became the British Broadcasting Corporation (BBC).

Marconi continued to experiment on improving radio broadcasting. He eventually was able to send messages in specific directions and around the globe. He also performed experiments with radar and with microwave, proving that microwaves could also travel beyond the horizon of the earth. In 1924, he set up a system of wireless stations that linked England to the British colonies around the world. He also set up a radio service for the Vatican in Rome in 1931 and created the first microwave link so that the Pope's messages could instantly be sent several miles away to the short-wave transmitter that could then broadcast the message live to the world. Failing health restricted Marconi's activity for much of the last ten years of his life. He died of heart failure in 1937.

See also: Edison, Thomas Alva; Morse, Samuel F. B.; Radio Broadcasting, History of.

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STEPHEN D. PERRY

MARKETING RESEARCH, CAREERS IN

Marketing research, by any name, essentially involves the collection, analysis, and presentation of data to answer some predetermined questions developed jointly by a researcher and a client. Individuals who are planning to engage in a marketing research career have a flexibility of choice that is not always obvious. The range of industries, types of companies, and types of data one can choose from for a marketing research career is surprisingly broad. Almost all industries-nonprofit organizations, multimillion-dollar manufacturing companies ranging from consumer goods to high-end industrial equipment, and even small Internet start-up companies-require marketing research specialists. Joining either an in-house marketing research department within a larger organization such as Kraft or Procter & Gamble, or an independent marketing research firm, which can range in size, is another option. The type of data that a marketing researcher works with is also flexible. One can choose to work primarily with quantitative (numerical) or qualitative data or with a mix of both. The data sets can range from economics and pricing, attitudes and intentions, secondary behavioral data, to management principles.

The advantages of such a selection are clear more options and greater flexibility. The disadvantages, especially for an individual who is new to the field, are potential confusion and the need to explore widely for opportunities. Career guides usually have a very narrow definition of marketing research. Most refer to the description merely as a marketing function. However, there are many careers with different titles that reflect the responsibilities and challenges of a marketing research career. Therefore, it is helpful to look for jobs with descriptions other than marketing research. For example, terms such as "economists," "management analysts," "sales forecasting," "consultants," or "sales operations" may include many positions in marketing research. Marketing research books may be more helpful than career guides in understanding the functions of a "marketing researcher." Books such as *The Market Research Toolbox: A Concise Guide for Beginners* (McQuarrie, 1997) or *Marketing Research: Methodological Foundations* (Churchill and Churchill, 1998) contain valuable descriptions of the scope and challenges of marketing research.

The process of marketing research proceeds in stages. First, the objectives and questions for which the information is collected must be established. The types of objectives and questions can range widely, encompassing short-term, immediate needs such as, "What promotion should be run for the Christmas holidays?" to long-term strategic questions such as, "When should a new product be launched and how much investment should be made in it?" These objectives and questions will then guide how data is collected. If the objective is to understand better the acceptance of a new product idea by customers, then focus groups might be the right approach. If the objective is to estimate the rate of new product adoption in a target group, then the best data might be secondary data showing past adoptions of similar products by a similar group. The common data-collection methods include focus groups (where individuals come together as a group to share their experiences and perspectives on a particular issue), conjoint studies (which obtain ratings from individuals on different product attributes to quantify the relative utility of each attribute), experiments, and various survey methodologies such as by mail and phone. Internet surveys are gaining popularity and have the advantage of being quicker and cheaper.

Once the data has been collected, the marketing researcher must determine which statistical analyses to perform and what recommendations to present. Both univariate and advanced multivariate analytical techniques are common in marketing research (Rao and Steckel, 1997). Sometimes, qualitative data are also subjected to quantitative analyses, but in general, greater value is placed on quantitative analyses than on qualitative analyses. This preference is largely due to the generalizability of large-sample quantitative studies (assuming that the sample is representative of the market) compared to small-sample nongeneralizable studies. Also, many marketing and management teams like to have strong, "solid" data with which to back their recommendations. As highlighted in the title of the book *How to Lie with Statistics* (Huff, 1982), numbers, however, are not always "solid." It is the ethical responsibility of the marketing researcher to be honest and to present the data and its results without bias. The presentation of the results and recommendations are usually done orally, accompanied by the use of computerized graphics. These are sometimes accompanied by a more detailed, written project report.

Throughout the process of identifying the objectives and questions, data collection, and data analyses, close collaboration with the client is required. In fact, the ability to develop and maintain strong, long-term client relationships is essential for promotion consideration and success at the higher managerial and director levels. Moreover, close client relationships tend to encourage better answers to better questions—the driving force behind marketing research.

To be a successful marketing researcher, one must be able to think broadly and yet pay attention to detail. Breadth of thinking is required when analyzing client business needs and selecting, from a wide range of possibilities, the best questions, the best methodologies, and the key recommendations to make. These decisions require a general knowledge about marketing environmental factors as well as the advantages and disadvantages of many different data collection and analysis methodologies. Once these larger issues have been dealt with, one must be able to organize data collection and analyze the data efficiently and carefully. A seemingly small mistake of forgetting to remove one code from the data set can easily result in erroneous recommendations harming the client, one's division or company, and one's career.

Successful marketing researchers tend to have strong mathematical, statistical, and marketing backgrounds. In addition, the ability to think conceptually, problem-solve, and take initiative are additional valued skills. According to the 1999 *Career Guide Management Consulting* (Hunn, 1998), other personality factors such as confidence and the ability to communicate clearly are also important. Most marketing research jobs request at least a four-year degree in math, statistics, operations research, or business. The exact degree, however, depends in large part on the industry. For example, many health-care marketing research firms require degrees not in business or statistics but in the sciences. Similarly, new Internet start-up companies look for individuals who have a strong knowledge of the industry and technology, and look primarily for a computer science or engineering degree. Most companies, however, prefer an M.B.A. or a master's degree in marketing research. In fact, to rise to senior marketing research positions, an M.B.A. is usually required. There is also an increasing push toward hiring individuals who hold a doctoral degree because such individuals are valued for their ability to think conceptually. Most of the individuals who fall into this category also have a strong quantitative background. Without a four-year degree, one would need to enter the marketing research field at the most junior level, as a dataentry operator or interviewer.

The financial returns of being a marketing researcher start for new entrants at slightly higher rates compared to new graduates from business schools and can rise to income levels equivalent to chief executive officers of smaller companies. The social rewards are equally attractive. Many market researchers branch out from established companies to open their own research firms, while some become independent consultants to large corporations. Others who remain in a corporate environment have the option of heading large cross-functional marketing research departments or of transitioning into marketing.

Overall, with the growing need for a better understanding of the needs of customers, the outlook for the marketing research field is very positive. According to Ron Krannich and Caryl Krannich (1998), research analysts and consultants are in one of the most promising career fields. In fact, they expect this field to grow at a higherthan-average rate.

See also: Advertising Effects; Psychological Media Research, Ethics of; Research Methods in Information Studies.

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EUGENIA YEW-YEN PECK

MCLUHAN, HERBERT MARSHALL (1911-1980)

Herbert Marshall McLuhan, universally known as Marshall McLuhan, combined Cambridge University's New Criticism of literary textual analysis with the political economy-inspired communication theory of fellow Canadian and University of Toronto colleague Harold Innis. McLuhan was a leading scholar of popular communication media from the mid-1940s until his death in 1980 (which followed a stroke that had left him without his greatest gift, speech). An unconventional, colorful, and controversial professor of English who became the director of the Center of Culture and Technology of the University of Toronto, McLuhan rose to popular culture status himself with a handful of best-selling books and nonbooks published in the 1960s, including The Gutenberg Galaxy: The Making of Typographic Man (1962), Understanding Media: The Extensions of Man (1964), The Medium is the Massage: An Inventory of Effects (1967), and War and Peace in the Global Village (1968).

McLuhan created his own iconoclastic mix of observations about media by adapting and popularizing the communication bias theory of Innis and drawing from an interdisciplinary array of humanist thinkers, including T. S. Eliot, I. A. Richards, F. R. Leavis, St. Thomas Aquinas, Lewis Mumford, and a group of scholars at Toronto in the 1950s, such as anthropologist Edmund Carpenter. Considered today to be a member of the loosely knit Toronto school of communication studies, McLuhan's well-turned theoretical aphorisms, including "the medium is the message" and



Herbert Marshall McLuhan. (Bettmann/Corbis)

"the global village," became part of scholarly and popular consciousness in thinking about the media. McLuhan helped create a humanistic, qualitative, cultural, and critical analysis of the complex relationship between technology and culture. He offered an alternative to mainstream mass communication research.

McLuhan contended that all media, or technologies, extend the human body and human functions. All material existence qualifies as media, including wheels, which extend the foot, and clothing, which extends the skin. Numbers, clocks, roads, architecture, and many other material technologies are media, in addition to the traditional communication media of speech, writing, printing, and electronic media. Individuals and societies respond to this extension of human form with a sense of shock and pain, associated with amputation of a limb, thus failing to recognize the ultimately human source of all technology, much as the Greek figure Narcissus failed to recognize his reflection as his own. McLuhan's stated goal was to make people aware of the humanness of technology in order to lead them to exert human control over technology.

Another important concept in McLuhan's thought was that media alter the perceptual or sensory ratios of individuals and cultures, so that all media, but most important the dominant media of a historical period, emphasize either the acoustic or the visual. Ear-based oral culture and multisensory or tactile electronic media culture both emphasize the acoustic. Eye-based literate and print media cultures emphasize sight and the visual, or the sense of vision operating in isolation of the other senses. In this scheme, the three stages of history are (1) the acoustic oral communication stage, from the emergence of speech to the advent of alphabetic writing systems and the rise of literacy, (2) the visual print communication stage, from the advent of movable type and the printing press in 1450s-era Europe to that of the telegraph in 1830s-era America, and (3) the acoustic electronic communication stage, beginning with the telegraph but intensifying with the rise of film, radio, television, satellites, and computers. Acoustic and visual cultures create opposing modes of consciousness and forms of social organization, including religion, politics, economics, and the arts, the last of which interested McLuhan the most deeply. Acoustic cultures are associated with tribal and sacred cultures, participatory local and global politics, noncapitalist economies, and both traditional and nonrepresentational art, music, literature, and media. Visual cultures are characterized by a focus on the individual and the secular, representative democracy and nationalism, socialism and corporatism, and representational art, music, and literature. The message of the medium, McLuhan argued, is the way it changes individual sensory perceptions and the cultures in which one type of medium is always dominant. As mechanization of the media has intensified from the natural forms of speech and ideogrammatic language to the printing press and industrial production, and more recently to the globally integrated field of television and beyond, the media environment now retrieves elements of the tribalism of village culture on a global geographic scale, thus creating a global village.

The style and tone, as much as the substance, of McLuhan's media and social theories drew increasingly sharp reactions from media researchers and educators. His first book, *The* Mechanical Bride: Folklore of Industrial Man (1951), critically and morally protested against the effect of popular culture. Print media advertisements, he argued, degrade culture, destroy individualism, and blur the distinctions between the human and the technological. Reflecting his contact with Innis and others in Toronto, The Gutenberg Galaxy (published more than ten years later) offered a humanistic and literary history of the harmful effects of print culture on psychology and society. With the publication of Understanding Media in 1964, critics argued that McLuhan was losing his critical stance and embracing technological determinism. Although he achieved widespread recognition in the late 1960s, McLuhan's spirited attacks on the print culture methods of education and social science research in mass communication and other fields made many adversaries, whose criticisms were strengthened by his collaborative turn to unconventional book forms filled mostly with graphic elements and aphorisms and by his confrontational and arrogant demeanor. By the time of his death in 1980, McLuhan had published little new material and had fallen from serious consideration by many media scholars.

In the 1980s, publications by media ecologists Joshua Meyrowitz (1985) and Neil Postman (1985), a biography by Philip Marchand (1989), McLuhan's letters (1987), and two posthumously coauthored books (McLuhan and McLuhan, 1988; McLuhan and Powers, 1989) helped rekindle interest in McLuhan's work. The emergence of a more cohesive and humanistic turn toward studies in culture and communication, and the continuing interest in McLuhan and Innis in Canada (Babe, 2000), also helped initiate what may be considered a renaissance in McLuhan studies, including comparisons of McLuhan to the Frankfurt School (Stamps, 1995) and to an array of critcultural, and postmodern ical. theorists (Stevenson, 1995; Grosswiler, 1997). McLuhan has even been characterized as a transitional postmodernist figure (Willmott, 1996). Drawing as he did from many disciplines with a focus on the whole cultural field. McLuhan remains an influential scholar and a fruitful source of study in communication and culture.

See also: Culture and Communication; Innis, Harold Adams; Social Change and the Media.

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PAUL GROSSWILER

MEAD, GEORGE HERBERT (1863-1931)

Whether they know it or not, nearly every communication scholar today works with ideas that George Herbert Mead helped to develop. It was Mead who urged scholars to think of communication as a collaborative interaction rather than a sequence of thoughts, coded, sent, and received. It was Mead who described the sense of self as social rather than individual, public rather than private, and emergent rather than permanent. And it was Mead who put these new theories of self and communication to work, in the service of social and educational reform.

The American philosopher John Dewey once described Mead as "a seminal mind of the very first order." Yet Mead's contributions went unappreciated for many years after his death in 1931. By that time, philosophy had become absorbed in narrower questions of language and truth, and social psychology had embraced quantitative modes of behaviorist research. By the 1960s and 1970s, however, in sociology, social psychology, and philosophy as well as communication, Mead's work had again gathered appreciative readers. Historians of social science have come to identify him as a key figure in the development of the "Chicago School of Thought." Sociologists view him as the seminal theorist for symbolic interactionism. Pragmatist philosophers study him as an early proponent of their views, a figure of equal importance with Dewey, William James, and Charles Peirce. Phenomenological philosophers praise his interest in human consciousness. Cultural studies scholars appreciate his model of a plural, emergent, dialogical self.

This belated attention is all the more striking given how sporadic and scattered Mead's writings were. The bibliography created by the Mead Project (at the Department of Sociology at Brock Uni-



George Herbert Mead. (Library of Congress)

versity, St. Catharines, Ontario, Canada) lists 116 items, many of them book reviews, editorials, and magazine pieces. Mead himself never published a book. The well-known book-length collections of Mead's work—The Philosophy of the Present (1932), Mind, Self and Society (1934), Movements of Thought in the Nineteenth Century (1936), and The Philosophy of the Act (1938)—were all assembled from lectures, unpublished manuscripts, and the class notes of former students after his death.

Like many American social scientists of his generation, Mead had a religious upbringing. He was born in 1863 in South Hadley, Massachusetts, but spent most of his childhood in Oberlin, Ohio. His father was a Congregationalist minister who taught at Oberlin Theological Seminary from 1869 until his death in 1881. Mead's mother was an English instructor who taught at Oberlin College and at Abbot Academy in Andover, Massachusetts, and later became president of Mt. Holyoke College. Mead earned his bachelor's degree at Oberlin in 1883. After graduation, he worked briefly as a schoolteacher and then spent three years as a railroad surveyor. In the autumn of 1887, Mead resumed his studies, this time at Harvard University, where he met the philosophers Josiah Royce and William James. A year later, he traveled to Germany for graduate studies, first at Leipzig and then at Berlin, where his teachers would include the physiological psychologist Wilhelm Wundt and the philosopher Wilhelm Dilthey. Mead never wrote a dissertation and thus did not finish his doctorate. In 1891, he took his first university teaching position at the University of Michigan, where he met John Dewey. In 1894, when Dewey was invited to be chair of the Department of Philosophy at the University of Chicago, Mead went with him. Mead remained a professor in Chicago's Department of Philosophy until his death in 1931.

Mead resembled many American intellectuals of his generation in rejecting the idea of a fixed moral order that underlies all human experience. Theologians and philosophers had typically believed that proper human behavior could be deduced from metaphysical or natural principles. Theologians had imagined a world governed by a God-given moral code; philosophers, a world governed by an underlying rational order. But Mead thought that evolutionary biology and the practical success of the scientific method had discredited such formalist beliefs. Evolution revealed a natural world that was constantly changing and adapting. And neither philosophical nor religious dogma seemed able to solve the vexing problems confronting a rapidly industrializing, multicultural, urban society. It was science, not metaphysics, that had provided clean water, vocational education, and vaccination.

Absent any guarantees of truth, Mead thought that humans should apply the experimental methods of science to the study of society. This insistence on studying the world as it presents itself in everyday experience led Mead and others to a philosophical approach that has variously been called pragmatist, instrumentalist, or functionalist. For later generations of communication scholars, this approach would prove invaluable. By the end of the twentieth century, communication would emerge, par excellence, as the study of the specific forms and practices by which humans connect, coordinate, and imagine their relations.

Mead insisted that any analysis of human behavior should start with action rather than thought. For Mead, thinking was a biological process by which humans orient themselves to the world. Though Mead was an early proponent of what was later termed the "social construction of reality," he also was interested in prelinguistic forms of interaction. He argued that, well before they acquire language, humans participate in a "conversation of gesture" that provides their first model of interaction. This description of thought as a social, public act led, in turn, to a radically new way of talking about the self. Philosophy and religion had typically treated the self as an irreducible inner essence—as a soul or mind or power of reason. Mead argued that people should treat the individual self as one outcome of social interaction. Instead of a single, unified self, he proposed a self that contained both subjective and objective aspects, which he called an "I" and a "Me." People are an "I" when they are acting in the present moment; they are a "Me" in retrospect, as they consider the public self that they have performed for others. In short, people become who they are by imagining how others have seen them.

Mead, like Dewey, believed that all these theories would find their richest expression in a democratic society. Pragmatist philosophy encouraged democracy by promoting dialogue and experimentation, and refusing appeals to custom or authority. But the actual experiences of American democracy also shaped pragmatist philosophy. It was in the high school, the settlement house, and the union hall, as much as in the German graduate school, that Mead discerned the arts of human communication.

See also: Dewey, John; Peirce, Charles Sanders; Society and the Media.

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JOHN J. PAULY

MEDIA EFFECTS

See: Advertising Effects; Arousal Processes and Media Effects; Catharsis Theory and Media Effects; Cultivation Theory and Media Effects; Cumulative Media Effects; Desensitization and Media Effects; Election Campaigns and Media Effects; Mood Effects and Media Exposure; News Effects; Nutrition and Media Effects; Parental Mediation of Media Effects; Social Cognitive Theory and Media Effects; Tobacco and Media Effects

MEDIA INDUSTRIES, GLOBALIZATION OF

See: Globalization of Media Industries

MÉLIÈS, GEORGES (1861-1938)

Born in Paris in 1861, the third child of a successful boot manufacturer, Georges Méliès showed interest in the visual arts of drawing, caricature, painting, and sculpture from childhood. As a young man, he briefly entered the family trade and worked with the shop machinery. He later said, "I was born an artist in my soul, very skilled with my hands, capable of inventing things and a comedian by nature. I was at once an intellectual and a manual worker." His knowledge of mechanics combined with his artistic talents later led him to undertake scenic and machinery design for the theater and films.

During an 1884 stay in London, Méliès was first attracted to the world of stage illusion. He returned to Paris in 1885, but rather than reentering the family business, he continued the study of painting and drawing. He married his first wife, Eugénie Genin, the same year. Their children, Georgette and André, were born in 1888 and 1901, respectively.

When Méliès's father, Louis, retired in 1888, Méliès sold his inherited share of the footwear business to his two older brothers and bought the famous, but run-down, Théatre Robert-Houdin from the widow of the famous magician for whom it was named. Over the next ten years, he created at least thirty illusions for the theater, many of which he later recast into motion-picture effects.

It is likely that Méliès attended the first public film screening in Paris by the Lumière brothers (Auguste and Louis) on December 28, 1895. He bought a projector and began to show films at the Théâtre Robert-Houdin in April 1896.

Between 1896 and 1900, Méliès started to develop the film genres and technical approaches that he would explore throughout his filmmaking career, which peaked between 1901 and 1904 and ended in 1912. Unlike the Lumière cameramen, who chose outdoor locations for their documentary style of production, Méliès selected a closed, interior space in which to compose his "artificially arranged scenes." This practice anticipated that of the great studios at the height of the film industry. He built the first permanent film studio and created the first company solely dedicated to producing films, the Star Film Company. He may have been the only filmmaker to use artificial light as early as 1897.

A perfectionist, Méliès worked meticulously on all aspects of production. He devised effects, designed period costumes, and drew backgrounds before writing a scenario to guide the action. In addition to handling logistical details, Méliès often joined with friends and family to act in his own films. His daughter, Georgette, who acted as a child, later became, perhaps, the world's first female camera operator. Although demanding, Méliès was concerned for the well-being of his actors and technicians; he was active in theatrical and motion-picture trade organizations throughout his career.

Shaky finances caused Méliès to return to the stage in 1910 and to leave filmmaking two years later. His wife, Eugénie, died in 1913, after a long illness. In 1917, during World War I, his film studio at Montreuil became a hospital for the warwounded. Méliès and his family staged variety shows after that in a second studio converted into a theater. He remarried in 1925, to Jehanne d'Alcy, a former actress and Méliès's mistress of many years. The two sold toys and candy at a small shop in the Gare Montparnasse. Méliès published his reminiscences in 1926 and made his last public appearance in 1929 at a gala retrospective of his work at the Salle Pleyel. The following year, his daughter Georgette died. In 1931, Méliès was awarded the Legion of Honor and hailed by Louis Lumière as "the creator of cinematic spectacles." In 1932 he, his wife, and his granddaughter were given lodging at an estate owned by an organization for people who had been involved with motion pictures. He died of cancer on January 21, 1938, and is buried in the Père Lachaise cemetery in Paris.

During his career, Méliès completed some 498 films. Many vanished or were destroyed during his lifetime. Some prints were recycled for their silver content during World War I, with the celluloid made, ironically, into boot heels for soldiers. Other film copies disappeared when the Théâtre Robert-Houdin was demolished in 1923. In the 1950s, however, thirty-three lost prints of Méliès films were rediscovered in the U.S. Library of Congress, preserved as rolled paper contact sheets submitted for copyright. A collection sold by Méliès's brother, Gaston, to the Vitagraph Company and privately held for many years added an additional thirty films that had been thought missing. In all, 137 Méliès films are known to have survived.

Méliès is best known for creating a vocabulary of special-effects photography, based on his stage illusions, that manipulates time and space. He first used stop-substitution, his single most important cinematic contribution, in *The Vanishing Lady* (1896); double exposure in *The Cabinet of Mephistopheles* (1897); reversed action in *A Dinner*



The French cinematographer Georges Méliès plays the role of a magician in one of his early films. (Hulton-Deutsch Collection/Corbis)

Under Difficulties (1898); and an early matte shot in *A Mysterious Portrait* (1898).

Méliès refined these techniques in hundreds of short fantasy films; his most famous, *A Voyage to the Moon* (1902), spread his name around the world. He explored other genres from historical recreation to political films. *The Dreyfus Affair* (1899) was probably the first film serial as well as the first film censored for political reasons. He also pioneered the "stag" film by feigning nudity in *After the Ball* (1897). It is possible that *Cinderella* (1899) alerted Cecil B. DeMille to the possibilities of spectacle, which he later became known for in Hollywood.

Early biographers and film historians saw Méliès's contribution to film as primitive and evolutionary toward the style that was later practiced by D. W. Griffith. Méliès's work was criticized for having no developed story line, only a series of scenes; for using only one camera angle; and for the technical impreciseness of mismatched edits. However, less-biased analysis examines Méliès's work from its own singular perspective. For Méliès, story line was always the finishing touch in a creative process, not the core. He started with a series of illusions costumed and set in an appropriate period. His editing process highlighted magical effect or comprehensive point-of-view, not narrative flow. In one instance, Méliès cut film to show a vehicle crashing through a building twice from two different perspectives; that way, his audience could see the reactions of those outside the building as well as those within the building. To Méliès, the stuttering effect of such reiteration on the narrative was not a concern. Although his camera remained physically stationary, Méliès simulated camera movement by shifting the visual perspective of scenes in his background painting. Scholars now acknowledge that Méliès's unique exploration and presentation of cinematic space is essentially different from films of the period that used three-dimensional space.

See also: FILM INDUSTRY, HISTORY OF; GRIFFITH, D. W.; LUMIÈRE, AUGUSTE/LUMIÈRE, LOUIS.

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TED C. JONES

MILLS, C. WRIGHT (1916-1962)

Charles Wright Mills grew up in Dallas in a thoroughly bourgeois family. His father was an insurance agency manager-one of the petty office workers that Mills would later identify as the new proletariat in his book White Collar (1951). After graduating from the University of Texas at Austin and flirting with a career as a car salesman, Mills went, in 1939, to graduate school at the University of Wisconsin. There he met his mentor and later collaborator, Hans Gerth, who introduced Mills to the work of classic European sociologists, in particular Max Weber. In addition to Weber, Gerth, as a German émigré and former member of the Frankfurt School, exposed Mills to the latest European neo-Marxist sociological thought. After his first teaching job at the University of Maryland, Mills moved to Columbia University in 1946, where he stayed until his death.

His most important books, in addition to *White Collar*, are *The Power Elite* (1956) and *Sociological Imagination* (1959). The basic theme of Mills's work is how power permeates every aspect of American society and how it is the duty of the critical sociologist to expose how power has compromised individual freedom. Many of his critics and supporters have emphasized the European elements in Mills's work. While it is certainly true that Gerth's influence had a decisive impact on Mills, fundamentally his thought is built on an American foundation, especially the work of Thorstein Veblen, and the American Pragmatists: Charles Peirce, William James, and John Dewey.

The core of Mills's sociological outlook is his concept of a mass society and its relationship to authority. In his book *The Power Elite*, he identified the American power elite as an alliance of political, military, and industrial leaders. Mills did not suggest that this elite acted in a conspiratorial manner. He argued that the members of the elite, because they were raised in similar social circumstances and went to the same privileged schools, were predisposed to think alike. Hence, their exercising of power was inevitably linked, if not explicitly coordinated.

What makes Mills's critique so radical, and powerful, is that he describes the power elite's relationship to the powerless majority by identifying the role of the mass media in maintaining the power structure. The sociologist asserted that the majority of the nation's citizens had been reduced to a politically inactive and uninformed mass, creating a mass society. According to Mills, in the past, America was directed by numerous groups of politically literate and active citizens. He referred to this decentralized society as a community of publics. The arrival of mass communications changed this liberal political culture. Mills admitted that the United State was never an ideal community of publics, nor had the mass society of the mid-twentieth century completely eliminated all vestiges of an informed and active public. Yet, in his view, by the 1950s the balance had shifted decisively toward the mass society.

To illustrate this shift, Mills described four distinguishing characteristics of a mass society. The first was the ratio of opinion givers to receivers. In a mass society, the number of opinion givers was limited while mass communication dramatically increased the number of opinion receivers. Thus, the sociological meaning of mass communication was the ability of authority to centralize and control information distribution. An additional attribute of the mass society was that the ability of the opinion receivers, or the masses, to reply was limited. Mills believed that the technology of mass communications had imposed uniformity upon opinion givers by concentrating them in mass media corporations while simultaneously rendering the opinion receivers mute.

The third characteristic of the mass society was that authority also controlled the institutions (e.g., legislative bodies, corporate boards, and the courts) that translated opinion into policy. Mills further argued that the inability of the mass society to respond to opinion and to influence public policy psychologically affected the individual. This social–psychological trait was highlighted in what he saw as the fourth distinguishing trait of a mass society—the "penetration" of the masses and their total lack of autonomy. By "penetration," Mills meant the ability of the elite to control virtually every aspect of the lives of the mass of the people by monopolizing the institutions of society.

Mills used Fascist and Communist societies as extreme examples of penetration. However, he also claimed that the power elite of the United States had penetrated American society and that the elite did not have to rely on crude and violent authoritarian measures. The elite's control of the mass media, combined with the vast scale of modern communications, allowed authority to psychologically manipulate the minds of the masses. In The Power Elite, Mills explained that the media of the 1950s-primarily television and radio-created a kind of "psychological illiteracy" where the "man of the masses" became dependent on the media for an understanding of the world. He argued that what was so insidious about this penetration of the minds of the masses was that most Americans developed their "identity and aspirations" from the media, as well as their conceptions of the outside world. Thus, Mills implied that contemporary American political culture was inherently, albeit by relatively subtle means, totalitarian.

There is an ironic nostalgia running throughout Mills's radical critique of modern society. His writings suggest that modern technological developments have enabled the elite to expand their power. Yet Mills did not idealize the past. Like Weber, Mills recognized that the preindustrial world was inefficient and ultimately unsustainable. Although he accepted the inevitably of the development of the modern world of mass industry and culture, Mills hoped that a critical intellectual tradition could point out the dangers that came with this historical progression. With an optimism that contrasted strongly with his pessimistic historical outlook, Mills believed that critical intellectuals like him could speak for the powerless masses.

One could argue that Mills was too optimistic about the ability of the critical intellectual to influence public policy and too pessimistic about the prospects of future technological development. His concept of a mass society was based on the technology of the 1950s. More than fifty years later, it appears that the technology of mass communication may be equalizing the ratio of opinion givers to opinion receivers through innovations such as the Internet. Nevertheless, despite the fact that the technological parameters of mass communication have changed dramatically since Mills's death, his



C. Wright Mills. (Archive Photos)

warnings about the tendency of the elite to concentrate their power institutionally is still very relevant in the era of the multinational corporation.

See also: Culture and Communication; Culture Industries, Media AS; Dewey, John; Globalization of Culture Through the Media; Peirce, Charles Sanders; Society and the Media; Weber, Max.

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MINORITIES AND THE MEDIA

The topic of race and ethnicity in the media has generated a wealth of research attention. In general, analyses of media portrayals show a great deal of variability both across time and across types of media content. These variations are reflected in studies of racial differences in use and enjoyment of media offerings, and are also evident in research exploring potential effects that media portrayals may have on the attitudes and beliefs that viewers hold about race.

Portrayals of Race and Ethnicity

In the late 1960s, Cedric Clark (1969) characterized the typical ways that minorities are featured in the media by identifying four distinct stages of portrayals. The first stage, labeled "nonrecognition," referred to the idea that initially, people of color are generally ignored by the media and are rarely seen in any type of portrayal. The second stage, "ridicule," referred to negative and stereotypical media images. The third stage, "regulation," referred to the portrayal of minorities in roles upholding social order or protecting the status quo (e.g., police officers, military). The final stage, "respect," referred to portrayals including a diversity of images, both positive and negative, that parallel characterizations of Caucasians. To what extent do these stages accurately describe images of race and ethnicity in recent media content? The answer to this question largely depends on the racial or ethnic group in question and the type of media content under consideration.

Frequency of Portrayals

The percentages of minority characters on television have increased dramatically over the last several decades, largely due to an increase in the portrayal of African Americans. For example, Bradley Greenberg and Larry Collette (1997) content analyzed the major characters who appeared on new television programs from 1966 to 1992. Across these years, the percentage of African-American characters increased from 6 percent in the 1960s to 14 percent in the 1990s. In contrast, virtually no new Asian or Hispanic characters were introduced in the 1990s. These results parallel those reported by Robert Kubey (1995) in his analysis of character appearance on network and cable stations. In his study, Caucasians accounted for 81 percent of all appearances, African Americans 9 percent, Hispanics 7 percent, and Asians 2 percent—with the remainder being coded as "other." Together, these studies suggest that television content at the beginning of the twenty-first century features a frequency of African-American portrayals that closely approximates population proportions, but continues to underrepresent other minorities including Hispanics, Asians, and Native Americans.

In addition to examining frequencies of portrayals in general, many analyses have also explored representation within specific genres, programs, or networks. For example, content analyses during the 1970s tended to report that although African Americans accounted for almost 10 percent of all characters, these appearances were extremely segregated and were almost entirely confined to situation comedies featuring all-black casts. Similar racial segregation continues to be apparent in television content. Kubey (1995) reported that although African Americans represented 11 percent of all characters appearing on cable television, this figure dropped to 6.6 percent when the Black Entertainment Network (BET) was excluded from the analysis. Similarly, the representation of Hispanic characters was almost entirely confined to Spanish-language channels; when those channels were excluded, Hispanic characters represented less than 3 percent of all appearances.

In terms of specific genres, many researchers have voiced particular concerns about the lack of minority representation in children's television programming. For example, Bradley Greenberg and Jeffrey Brand (1993) noted that only two of the twenty programs they examined contained regularly appearing African-American characters, only one featured a regularly appearing Hispanic character, and none featured Asian or Native American characters. These results parallel the earlier analysis by Francis Barcus (1993) of children's programs, which reported that only 18 percent of programming scenes featured interactions between Caucasian and minority children.

In addition to portrayals in entertainment, depictions of race in news content have received considerable attention by many researchers. For example, the analysis by Robert Entman (1990) of local television news in Chicago found that among all stories featuring African Americans, 41 percent of the air time was devoted to issues of violent crime. In contrast, portrayals of minorities in more-positive roles such as newsmakers appear to be less common. For example, David Dodd, Barbara Foerch, and Heather Anderson (1988) examined the covers of *Time* and *Newsweek* from 1953 to 1987. Of all primary individuals featured on the covers of these magazines, only 6.6 percent were racial minorities, and only one cover featured a Hispanic individual. In addition, among the sixty-one "Man of the Year" awards selected during that period, only two featured racial minorities.

Finally, analyses of minority representation in advertising reveals patterns of portrayals that mirror many of the trends found in programming content. That is, despite increases in the frequency of minority representation over the years, the prominence of the portrayals continues to lag behind that of Caucasians. For example, the content analysis by Robert Wilkes and Humberto Valencia (1989) of advertising during prime-time network programming revealed that approximately 6 percent of all commercials contained Hispanic models, and 27 percent contained African-American models. However, approximately 70 percent of all minority portrayals were contained in minor or background roles as opposed to major roles such as spokesperson. Similar findings were reported by Charles Taylor and Barbara Stern (1997) in their analysis of Asian Americans in network advertising. Although the total proportion of Asian characters in the commercials (8.4%) exceeded population proportions, the majority of Asian characters appeared only in minor or background roles.

Nature of Portrayals

In addition to exploring the frequency of media portrayals, a great deal of research has explored the manner in which minority characters are depicted. Earlier analyses of television content tended to report very negative and stereotypical images of minorities. In general, minority characters were often depicted as younger than Caucasians, as less likely to be employed in high-prestige occupations, and as more likely to be impoverished and from broken families. However, more recent analyses of prime-time programming suggest trends toward more-positive portrayals, at least among African-American characters. For example, the content analysis by Carolyn Stroman, Bishetta Merritt, and Paula Matabane (1988) of prime-time programming showed that the majority of African-American characters were portrayed as middle- or upperclass (73%), with the most-frequent occupations being professional (22%) or law enforcement (38%) roles. In addition, the majority of African-American characters (60%) were thirty-five years old or older, and most (60%) were characterized as members of families.

Though depictions in fictional program content appear to have shown considerable improvement from earlier decades, recent analyses of nonfiction content continue to report disparities in the portrayal of minorities versus Caucasians, and particularly so for depictions of crime and violence. In contrast to analyses of fictional crime programs that tend to find an underrepresentation of minorities as criminal suspects, analyses of news content tend to report that people of color are overrepresented as criminals. For example, Travis Dixon and Daniel Linz (2000) content analyzed a random sample of local television newscasts in the Los Angeles area for their portrayals of criminal activity and crime victimization. In general, African Americans were more than twice as likely to be portrayed as perpetrators than as victims of crime, whereas Caucasians were more likely to be portrayed as victims than as perpetrators. In addition, comparisons with actual, local crime statistics recorded during the same time period revealed that African Americans were underrepresented as crime victims and overrepresented as crime perpetrators in the news, whereas Caucasians were overrepresented as victims and underrepresented as perpetrators. Latinos were generally underrepresented as both victims and as perpetuators, suggesting a general underreporting of events within the Latino community.

Similar patterns of racial portrayals have also been reported in a related type of entertainment programming; reality-based police shows. These programs such as *Cops* and *America's Most Wanted* blur the distinction between fiction and news, but typically employ video footage or reenactments of actual crimes. The content analysis by Mary Beth Oliver (1994) of these shows revealed that 77 percent of African-American characters and 89 percent of Hispanic characters were portrayed as criminal suspects rather than police officers, compared to only 38 percent of Caucasian characters. In addition, African-American and Hispanic criminal suspects were more likely than Caucasian criminal suspects to be the recipient of police aggression, even after controlling for the type of crime portrayed and the use of aggression by the criminal suspect. Similar patterns of portrayals were also noted by Robert Entman (1992, 1994) in his analyses of national television news and local television news coverage in Chicago. Specifically, Entman reported that African-American suspects were more likely than Caucasian suspects to be shown as poorly dressed and as physically held or restrained by police officers, suggesting that they were more dangerous or "criminal."

Responses by Minorities to Media Portrayals of Minorities

Given that many media portrayals of race feature less-than-flattering images, how might minority viewers react to such depictions? Although at first glance it might seem that minorities would simply "tune out" and consume significantly less media content than would Caucasian viewers, overall viewing frequencies suggest that the reverse is actually the case, particularly among African-American viewers. In general, Nielsen Media Research (1998) reports that African-American households watch approximately two more hours of prime-time programming per week than do all other households combined, and five more hours of daytime programming per week. Similarly, Hispanic households watch approximately seven more hours of total television programming per week than do all other households, though this difference is largely attributable to a larger number of family members in Hispanic homes.

Although African Americans and Hispanics appear to view television more frequently than do Caucasians, these groups tend to view very different types of programming. While top-rated prime time and syndicated programs for non–African American households tend to feature predominantly Caucasian characters (e.g., *Seinfeld, Friends, Home Improvement*), top-rated programs among African-American households tend to feature a greater preponderance of African-American characters (e.g., *Living Single, Martin, Family Matters*). Similarly, Spanish-language programming receives the highest viewer ratings in Hispanic households.

These differences in viewing patterns are consistent with numerous studies examining the responses of viewers to media characters. In general, research suggests that viewers attend moreclosely to and have more-favorable impressions of characters in their own racial or ethnic group. Similarly, African-American children are more likely than Caucasian children to want to emulate African-American characters featured in the media. For example, Bradley Greenberg and Charles Atkin (1982) reported that while African-American and Caucasian elementary children were equally likely to agree that they wanted to "be like" a variety of white characters, a significantly larger percentage of African-American children (37%) than Caucasian children (11%) identified with black characters. Similar differences have also been reported among adult samples and for other types of media content, such as advertising. For example, the review by Tommy Whittler (1991) of the responses viewers had to commercials suggested that black viewers tended to respond more favorably and to better recall advertisements when the advertisements featured African Americans than when they did not.

Although minorities generally show more interest and more-favorable attitudes toward same-race media portrayals, there has been some concern about the potential harmful effect of overall television viewing on minority viewers and particularly on children. Specifically, given that the more-general media landscape tends to underrepresent people of color and to frequently feature stereotypical portrayals, there may be reason to suspect that frequent viewing could lead to lower levels of self-esteem or feelings of self-worth. However, the review by Sherryl Browne Graves (1993) of related research revealed mixed support for this hypothesized influence, at least among African-American children. While some studies suggested negative impacts of stereotypical images on black children's self-concepts, other studies reported that any portrayal (positive or negative) of African Americans increased favorable attitudes among black children. Similar results were also reported by Federico Subervi-Vélez and Juan Necochea (1990) in their survey of Hispanic elementary school children in California. Contrary to predictions, overall television viewing was marginally associated with more-positive self-concept scores, and viewing of Spanish-language television was unrelated to self-concept.

While the effects of media viewing on self-concept are not clear-cut, these mixed findings should

not be interpreted as suggesting that minorities are satisfied with media portrayals. For example, Ronald Faber, Thomas O'Guinn, and Timothy Meyer (1987) surveyed Caucasians, Hispanics, and African Americans in the Chicago area concerning their television viewing habits and their perceptions of media portrayals of race. Hispanic and African-American respondents were significantly more likely than Caucasian respondents to believe that Hispanics and African Americans were underrepresented in the media. In addition, heavier viewing among African-American and Hispanic respondents was associated with morenegative perceptions of racial portrayals. Similar indications of disapproval were reported by Debra Merskin (1998) in her survey of Native American college students. Approximately two-thirds of the respondents in her sample reported dissatisfaction with television programming aimed at both child and adult audiences.

Effects on Caucasian Viewers

In contrast to studies employing minority samples, most media research employing Caucasian samples specifically has focused on the ways in which media images of race may increase negative attitudes and stereotyping. In this regard, some researchers have employed a cultivation perspective to examine the influences of television on the beliefs that viewers hold about racial minorities. For example, Blake Armstrong, Kimberly Neuendorf, and James Brentar (1992) reasoned that exposure to different types of media programming would be related to the perceptions that viewers had of African-American socioeconomic status. Consistent with predictions, viewing of fictional programming was related to estimates that African Americans enjoy higher socioeconomic positions, whereas exposure to news programming was related to estimates that African Americans are relatively worse off economically compared to Caucasians.

This type of cultivation perspective has also been employed to examine nonfiction content and crime-related beliefs about racial minorities. For example, Mary Beth Oliver and Blake Armstrong (1998) surveyed white respondents about their beliefs of the prevalence of African-American and Caucasian involvement in crime. While greater viewing of both reality-based and fictional police programs predicted higher estimates of crime involvement for both racial groups, reality-based viewing was associated with greater increases in estimates for African-American than Caucasian involvement. These authors interpreted their findings as reflecting the typically more-incriminating portrayals of African Americans in reality-based than fictional crime programming.

In addition to exploring the ways in which media exposure can gradually cultivate attitudes and beliefs about race, other researchers have explored the idea that negative media images of African Americans can prime (or bring to mind) negative thoughts that can, in turn, affect subsequent perceptions of individuals. Thomas Ford (1997) demonstrated this type of priming effect in an experiment in which white participants viewed television comedy skits that featured either neutral portravals of African-American characters or stereotypical portrayals (e.g., poor, unemployed, and so on). In a subsequent task, participants read a brief description of a crime story that featured either an African-American or a Caucasian suspect. Ratings of the likely guilt of the African-American suspect were significantly higher among those participants who had viewed the stereotyped videos than among those who had viewed the neutral videos, whereas ratings of guilt for the Caucasian suspect were unaffected by the video portrayals.

In addition to suggesting that television viewing can lead to negative racial stereotypes under some conditions, research also suggests that the racial stereotypes held by viewers can influence the ways in which viewers understand, interpret, or react to racial images presented in the media. Research from this perspective typically makes the assumption that the responses that viewers have to media are not uniform, and that much of the variation in responses reflects different attitudes and beliefs that act as a "filter" of media messages. In terms of racerelated issues, research from this perspective has examined a variety of attitudinal or belief "filters" that may affect the reactions of viewers, including racial prejudice, punitiveness about crime, and authoritarianism. In general, these studies show that viewers tend to interpret or remember media portrayals in ways that are consistent with or that reinforce their existing attitudes or beliefs about race. For example, Neil Vidmar and Milton Rokeach (1974) examined the responses to the award-winning television program All in the Family. Although this program was designed to expose and

condemn racism, Vidmar and Rokeach found that viewers had very different perceptions of the program that varied as a function of their racial attitudes. In particular, viewers scoring lower on racial prejudice tended to interpret the program and the primary characters in ways consistent with the intentions of the producers, whereas viewers scoring higher on racial prejudice tended to interpret the program and the characters as more sympathetic to racially prejudiced attitudes.

The aforementioned line of research concerning interpretations of media content implies that attempts to use media to reduce racial stereotyping may meet with considerable challenges. However, some research, particularly with children, suggests that under some circumstances, favorable portrayals of race may lead to beneficial or prosocial outcomes. For example, the review by Robert Liebert and Joyce Sprafkin (1988) of research on the effects of multiracial portrayals in *Sesame Street* suggests that positive portrayals can lead to a host of benefits, including greater acceptance of, identification with, and desire to interact with racial minorities.

Conclusion

The frequency and nature of media images of race has experienced a great deal of positive change since the early days of the television. However, the most noteworthy changes have occurred for fictional portrayals of African-American characters. Other minorities remain largely ignored by the media or cast in minor or often negative roles. These types of portrayals (or lack thereof) are associated not only with differential viewing preferences among racial groups, but also with the potential danger of increasing racial prejudice and stereotyping among Caucasian viewers. Certainly, much additional research is needed to examine how media portrayals can work toward increasing racial harmony rather than creating or sustaining stereotypes.

See also: Cultivation Theory and Media Effects; News Effects; Sesame Street.

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MODELS OF COMMUNICATION

Models are representations. There are model airplanes, mathematical models, and models of buildings. In each case, the model is designed to provide a simplified view of some more complex object, phenomenon, or process, so that fundamental properties or characteristics can be high-

FIGURE 1. Aristotelian view of communication.



lighted and examined. Models highlight some features that their designers believe are particularly critical, and there is less focus on other features. Thus, by examining models, one learns not only about the object, situation, or process, but also about the perspective of the designer.

In communication study, models function in this same way, allowing for the simplification of complex dynamics to help scholars and students better understand the components and processes that are involved. As with other models, communication models also provide important insights into the perspectives of the designers.

One of the first scholars to examine the communication process in terms of its component parts was Aristotle (385–322 B.C.E.), who characterized communication (then called "rhetoric") in terms of an orator (i.e., a speaker) constructing an argument to be presented in a speech to an audience (i.e., listeners). This view is illustrated in visual form in Figure 1. This Aristotelian view of communication usefully highlighted the perspectives of communication thinkers until the midtwentieth century.

In the late 1940s, and through the 1950s and 1960s, a number of new communication models were advanced. Many of the new models preserved the basic themes of the Aristotelian perspective. In 1949, Claude Shannon and Warren Weaver published a model that they called the "Mathematical Model of Communication." Based on their research with telephones and telephonic communication, the model also used boxes and arrows to represent the communication process. However, their view was more complex. They began with the "information source" box and then, using arrows as the connections, progressed on to boxes for the "transmitter," the "channel," the "receiver," and, finally, the "destination."

Box-and-arrow models of communication, of which there have been many over the years, emphasize the components of communication (e.g., a sender, message, and receiver) and the direction of influence. Where arrows go from left to right, that is, from a sender to a receiver, the

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implication is that it is the sender who, through messages or speeches, brings about communication influences on the receiver.

Other models, including a helical–spiral model developed by Frank Dance (1967), a circular model proposed by Lee Thayer (1968), and a "sawtooth" model advanced by Paul Watzlawick, Janet Beavin, and Don Jackson (1967), emphasized the dynamic and evolutionary nature of the communication process rather than the components or the directions of influence.

A "sawtooth" model that is similar to the sort advanced by Watzlawick, Beavin, and Jackson (1967) is shown in Figure 2. The lines represent messages that are exchanged during the course of a communication event. The downward lines with arrows represent messages sent by Person 1, while the upward lines represent messages initiated by Person 2. A model of this sort highlights the communication process, dynamics, and history, while it minimizes the emphasis on direction of influence.

Other types of models that have become popular emphasize communication networks—the flow of messages among individuals in a group or organization, for example. Such a model for a hypothetical group is depicted in Figure 3. Each circle represents an individual, and the arrows denote messages.

Communication models serve to clarify the nature of communication, to provide a guide for research, and to offer a means of displaying research findings. Such models are a tool by which scholars, practitioners, and students can illustrate their thinking about what they consider to be the most important aspects of communication.

See also: Evolution of Communication; Group Communication; Instructional Communication; Interpersonal Communication; Networks and Communication; Nonverbal Communication; Organizational Communication; Paradigm and Communication.

FIGURE 3. Group communication model.



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MOOD EFFECTS AND MEDIA EXPOSURE

Moods are generally considered to be similar to acute emotions but characterized by lower excitatory intensity, longer experiential duration, and greater diffuseness in terms of both causal circumstances and motivational implications. Nico Frijda (1993) considers the motivational nonspecificity of moods to be their primary defining property. Acute emotions, such as fear or anger, tend to be attributed to inducing conditions and are typically associated with specific behavioral objectives. Moods, in contrast, need not be connected to par-



ticular causes and are marked by the absence of impulsion toward specific courses of action.

There appears to be little consensus, however, on whether or not the experience of mood requires conscious awareness. William Morris (1989), for example, suggests that moods may be consciously experienced or may manifest themselves without awareness. The stipulation that individuals need be neither conscious of their moods, nor cognizant of potential consequences of these moods, carries with it the assumption that nonconsciously experienced moods are nonetheless capable of influencing cognition and action. Robert Thayer (1989), on the other hand, insists that mood experiences necessitate awareness, and he suggests that this awareness provides vital feedback to individuals about their state of wellness. Thayer highlights the hedonic distinctness of moods, a feature that moods share with acute emotions. Specifically, he distinguishes between moods marked by energetic arousal (i.e., moods linked with sensations of energy, vigor, and peppiness), and tense arousal (i.e., moods associated with feelings of tension, anxiety, and fearfulness). These arousal types are consistent with the hedonic classification of moods into good or pleasant versus bad or unpleasant. Thayer conceives of a depression-elation continuum onto which all moods can be mapped, and he emphasizes that all of these states favor consequences that are in the interest of individuals' wellness.

Morris (1992), in a biopsychological theory of mood functions, similarly stresses consequences for wellness. Specifically, he proposes that good moods express the organism's effective coping with environmental demands, whereas bad moods are manifestations of deficient coping and failure in meeting ecological demands. Individuals in pursuit of wellness thus should be motivated to alter, to the extent possible, depressive states to experiences of elation and to seek courses of action that hold promise of accomplishing this objective.

Mood Management

Dolf Zillmann (1988a, 1988b), in developing a theory of self-administered mood management, accepted the hedonistic premise that individuals, in their continual efforts to improve affective experience, follow an impulse toward pleasure maximization. Specifically, his theory suggests that people tend to arrange their stimulus environment so as to increase the likelihood that (1) bad moods are short-lived and their experiential intensity is reduced, (2) good moods are prolonged and their experiential intensity is enhanced, and (3) bad moods are terminated and superseded by good moods of the highest possible experiential intensity.

The arrangement of stimulus environments may be conscious or nonconscious. It is conscious when people are aware of their moods and engage in deliberate efforts to alter them in accordance with the stipulated management objectives. It is nonconscious when people pursue these objectives without cognizance of moods and intentions to modify them in particular ways. For the presumably prevalent case of nonconscious mood management, Zillmann proposed a mechanism that is primarily based on negative reinforcement (i.e., the removal of negative stimulation). It is thought that people initially sample stimulus conditions in a random fashion. Given that they experience bad moods, the encounter of stimuli that provide relief leaves a trace in memory that makes it likely that the relief-providing stimuli will be sought out during future bad moods. The frequent experience of relief under these circumstances eventually establishes a mood-specific preference for particular stimulus environments. The enhancement of good moods by the encounter of pleasant stimuli functions analogously, except that the preference is mediated by positive reinforcement.

Although mood-management theory applies to the arrangement of stimulus environments generally, the readily manipulable media environment, especially the wealth of choices offered in media entertainment, has been of focal interest in considering the management of moods.

Media Effects on Moods

Mood-management theory entails the assumption that exposure to environmental stimuli, to media displays in particular, is capable of modifying prevailing moods. If this capability did not exist, mood repair through relief and mood enhancement through added pleasure could not happen, and mood-specific preferences for particular displays could not be formed. Fortunately, however, the mood-altering capacity of media portrayals has been amply documented and is not in question (cf. Kubey and Csikszentmihalyi, 1990; Morris, 1989; Thayer, 1989). By way of illustration, Joseph Forgas and Stephanie Moylan (1987) ascertained the moods of large numbers of theater patrons who had just seen predominantly funny or sad movies. They found postexposure moods to correspond closely with content classifications; that is, comical contents induced good moods, tragic contents induced bad moods. Moods also manifested themselves in a comparatively positive versus negative outlook on various social issues.

Edward Hirt and his collaborators (1992) exposed sports fans to live televised basketball games that involved their favorite teams. Their teams won some of these games and lost others. Moods, and along with them the self-esteem of the fans, were positive after hoped-for wins and negative after feared losses.

News reports were found to induce moods in a similar fashion (Zillmann, Taylor, and Lewis, 1998). Bad news about publicly known people and groups fostered bad moods when the people and groups were liked, whereas it fostered good moods when the people or groups were disliked or despised.

In the elicitation of moods by media content, individual differences along gender and personality lines may be pronounced. Mary Beth Oliver (2000) aggregated evidence suggesting that, among adolescents, males extract more positive moods from violent and horrifying films than do females, whereas females respond more favorably to so-called melodramatic tear-jerkers than do males. Such gender differences derive in part from personality characteristics that transcend gender.

Mood Management through Communication Choices

Mood-management theory has been supported by numerous research demonstrations. In general terms, it has been shown that the stipulated hedonistic objectives are best served by the choice of exposure to material to which the likely reaction (1) is excitationally opposite to prevailing moods derive from noxiously experienced that hypoarousal or hyperarousal, (2) has positive hedonic valence above that of prevailing moods, and (3) during distinctly negative affective experiences, has little or no semantic affinity with the inducers of these moods (cf. Zillmann, 1988b, 2000).

The merits of counterexcitatory exposure choices have been explored experimentally (Bryant and Zillmann, 1984). Respondents were placed into either a state of boredom or stress and then provided with the opportunity to watch television in privacy. Unknown to them, only programs that had been preevaluated as either exciting or calming were available. The viewing choices of the respondents were secretly recorded, primarily in terms of accumulated time dedicated to exciting or calming programs. The findings revealed that bored viewers preferred exciting over calming programs, whereas viewers in acute stress preferred calming over exciting ones. The spontaneous selections of the respondents thus did serve excitatory homeostasis, as expected, in that the return to normal levels of sympathetic excitedness was accelerated for both hypoaroused and hyperaroused people. Their intuitive choices were correct in minimizing aversive experiences, thereby serving wellness.

Similarly conducted selective-exposure research gives evidence that viewers who sample entertaining programs attempt to elude, diminish, or terminate bad moods-such as being disappointed, depressed, frustrated, annoyed, or angry-by consuming comedy or engaging drama with a pleasing and appeasing overall message (e.g., Helregel and Weaver, 1989; Kubey and Csikszentmihalyi, 1990; Meadowcroft and Zillmann, 1987; Zillmann and Bryant, 1986; Zillmann and Wakshlag, 1985). All of these choices are supportive of the proposal that exposure is sought to programs that promise relief from bad moods and the enhancement of mildly pleasant affective states. In more general terms, exposure is sought to programs that appear capable of providing a degree of pleasure above that already manifested in the prevailing mood.

The proposal that the repair of noxious experiential states is best accomplished by seeking exposure to contents with little or no affinity to these moods, as well as by avoiding exposure to contents with such affinity, is directly addressed in an investigation on crime apprehension (Wakshlag, Vial, and Tamborini, 1983). After the respondents' fear of victimization was made salient to them or not, they could choose a drama from a set of crime dramas that differed with regard to the amount of featured violence and the justness of the resolution. It was observed that respondents who were acutely crime-apprehensive showed a stronger tendency than others to avoid drama dwelling on violence. These respondents also showed a stronger interest in drama featuring the triumph of justice in its resolution. It seems that in making such choices it is tacitly understood that diversionary stimulation has a more beneficial effect than mulling over the conditions that fostered the noxious experiential states that are in need of repair, and that exposure to material related to these states could only exacerbate the situation by frequent reminder of the aggravating circumstances.

Nonexperimental research produced further corroboration of mood management through specific and, at times, nonspecific choices of available media offerings. Daniel Anderson and his collaborators (1996), for example, conducted a massive behavior survey of television consumption in the family context. Specifically, these investigators assessed family stress levels and related them to television program choices. High stress levels proved to be associated with increased comedy viewing and decreased news consumption. This accords with mood-management theory in that comedy is considered programming with great absorption potential and high positive hedonic valence-in short, programming with a high capacity for disrupting and alleviating bad moods. News programs, usually laden with reports of threatening events, do not have this capacity and thus are likely to perpetuate bad moods based on troubling experiences. In addition, Anderson and his colleagues observed that stressed women, compared to non-stressed women, watched more game and variety programming as well as more television overall.

This research relates to the work on conflict management, specifically to such management through media choices that affect mood improvements. Rena Repetti (1989) conducted an investigation on the media behavior of air-traffic controllers, a profession known for pronounced daily variation in stress levels. The air-traffic controllers were observed in their homes after normal and highly stressful days at work. Acutely stressed controllers invariably attempted to watch television in order to calm down. When family circumstances allowed such diversionary stimulation, family life proceeded in a comparatively tranquil fashion. When circumstances prevented this relaxation, friction with family members tended to escalate to aggravated conflict, often with destructive results.

Nonexperimental research conducted with the experience sampling method (Kubey and Csik-

szentmihalyi, 1990) further substantiates the stress-reducing capability of extended television consumption. In predetermined random intervals during waking hours, large numbers of research participants were contacted by beeper and instructed to record their activities and moods at these times. The findings show that television viewing, across all contents, is primarily a relaxing experience called on when relaxation is in demand. Extended television viewing was invariably preceded by particularly bad moods. When bad moods were more moderate, viewing was less extensive. In this analysis, loneliness emerged as a salient mediator of bad mood. Television viewing thus seems to serve the dual function of providing relaxation and substituting for social interaction. Additional comparisons of elements of mood before and after television viewing corroborate its agitation-diminishing and calming effect, but they fail to give evidence of affect enhancement in terms of increased happiness, cheerfulness, friendliness, and sociability.

All this is to say that a considerable amount of evidence indicates that media offerings are indeed used to manage moods in predictable ways. It also is to say that such mood management is not merely a matter of fostering potentially trivial amusements, amazements, pleasant titillations, and cheap thrills, but that the management of moods can have significant social consequences and even health benefits.

Nonconscious Choices

At times, people are fully aware of seeking mood improvements by selecting particular media environments. At other times, however, they are not cognizant of what it is that guides their selections. This point is compellingly made by research on women's media preferences during the menstrual cycle. It has been shown that women, several days prior to the onset of menstruation as well as during menstruation, are more partial to comedy than at other times throughout the cycle (Meadowcroft and Zillmann, 1987). All indications are that women are unaware of these changes in their entertainment preference. They are similarly unaware of their greater attraction to drama at midcycle. It appears that when hormonal fluctuations place women into a diffuse bad mood, they are intuitively drawn to those entertainments that hold the greatest promise for effective mood repair—that is, for cheering them up, if only for a limited period of time.

A similar relationship between hormonal variation, bad moods, and women's nonconscious preference for light-hearted entertainments has also been observed in connection with pregnancy, with comedy preference being especially pronounced during the so-called postpartum-blues period after delivery (Helregel and Weaver, 1989).

Utilities of Bad-Mood Perpetuation

The evidence concerning mood management through communication choices is not entirely supportive of mood-management theory, however. Nor should this theory be construed as an allencompassing theory. Findings that are difficult to reconcile with the theory have been reported, and exception-accommodating expansions of the theory have been suggested (Zillmann, 2000). There seem to exist a number of conditions under which people deliberately seek to retain their moods. Retaining good moods does not pose a problem, as the motivation to do so is part of management theory. The perpetuation of bad moods, however, and with it the avoidance of good moods, can be considered to challenge the hedonistic premise of the theory.

Gerrod Parrott (1993) examined the motives for seemingly counterhedonistic behaviors and provided a listing of idiosyncratic pursuits of this kind. He focused on dispositions such as character building and the striving for spiritual betterment. Considering mood management through communication choices, these dispositions certainly can, on occasion, inspire people to forego pleasant stimulation in the interest of retaining their somber moods. However, retaining these moods has its rewards, too, as those who manage to resist the temptation of easy pleasures, entertainment pleasures in particular, can celebrate their accomplishments, thereby gaining access to pleasures they deem superior. Behaviors of this kind, then, are counterhedonistic only if their ultimate end is ignored.

Parrott further enumerated conditions under which bad moods are retained and good moods avoided in a shorter, more mood-specific time frame. Two sets of conditions apply to media choices most directly: (1) people can feel bad about feeling good, when feeling good is situationally inappropriate and (2) people can try to prevent worse moods. Bad moods may thus be tolerated for some time because avoiding them would have punitive consequences. Considered in context, the behavior is again not counterhedonistic. Not knowing the context greatly complicates the prediction of media choices in bad-mood situations, however.

Emotional Utility

The cliché of such a situation is the apparent appeal of love songs whose lyrics bemoan abandonment by a lover to those who suffered a similar abandonment. In agreement with this cliché, it was found that people who had lost their lover declared a preference for sad love music over happy love music (Gibson, Aust, and Zillmann, 2000). In contrast, people who had just experienced romantic success declared the opposite preference. People in acute distress over their loss of love, then, appear to find solace in symbolically commiserating with others. Additionally, hearing about the romantic triumph of others in happy love music seems offensive to them, and avoiding such pleasure music is obviously in the interest of minimizing bad moods.

It can have similar emotional utility to retain a negative mood state if it helps maintain the motivation for mood-resolving actions. People may seek to retain anger, for example, in order to resolve a situation that, if left unresolved, is likely to manifest itself in an extended period of distressing moods. Edgar O'Neal and Levi Taylor (1989) conducted an investigation that demonstrates such emotion maintenance by entertainment choices. Specifically, it was observed that acutely angry men took an exceptionally strong interest in programs that featured hostility and violence, but only if they believed they would have the opportunity to retaliate soon against the person who instigated their anger. In contrast, equally angry men who believed they would never get the opportunity to retaliate showed comparatively little interest in violence-laden drama. They exhibited increased appetite for mood-improving comedy, instead. For those who expected the chance to retaliate, the choice of violent contents apparently prolonged the related adverse experience of anger in the interest of future (retaliatory) behavior believed to be of superior hedonic quality. Temporarily perpetuating a bad mood thus can have emotional utility without challenging the principle of hedonism.

Informational Utility

The limitations of mood management by communication choices are more directly apparent in the selection of nonfictional materials. Exposure to the news and educational material tends to be motivated by curiosity and informational needs whose satisfaction has little, if anything, to do with hedonism. Such messages have informational utility that is essentially independent of gratification in affective terms. Revelations in the news may be elating or depressing. If they are distressing, or if recipients anticipate distress reactions, exposure to the news may nonetheless be accepted, if not actively sought. On occasion, however, even news reports are bypassed in order to prevent bad moods or their exacerbation. This seems especially likely when distressing news revelations are of little consequence for the recipients. The only available investigation on that subject shows that during bad moods, women tend to avoid bad news (Biswas, Riffe, and Zillmann, 1994). Men, however, tend to seek exposure despite the prospect of worsening moods.

Regarding educational material, Marie-Louise Mares and Joanne Cantor (1992) observed that informational utility can readily overpower hedonistic selection motives. These investigators assessed the degree of loneliness experienced by elderly people and then had them evaluate the desirability of viewing various hedonically positive or negative programs. The programs were introduced as documentaries focusing on elderly people. Some were said to feature unhappy, lonely people; others were said to feature happy, successful people. The lonely elderly viewers indicated a preference for seeing programs that featured unhappy people. More contented elderly viewers indicated a preference for seeing programs that featured happy people. The fact that the programs that dealt with the problems that lonely elderly people face were selected by lonely elderly people would seem to suggest that these people hoped to learn from the documentaries how best to cope with the indicated problems. The programs did not have such informational utility for the comparatively contented elderly, who consequently could turn to material with greater propensity for mood enhancement.

Scope and Limitations of Mood Management

Hedonism, the driving force of mood management, defines only one motive in a set of motives that influence the public's selection of media content. Such content may have utilities that are relatively independent of hedonistic considerations. These extrahedonistic motives tend to exert their influence in concert with the hedonistic force. In fact, this confounding in the operation of selection motives can be considered the rule rather than the exception. Domains of dominant influence of competing motives can be specified, however.

Hedonism must be regarded as the dominant choice determinant for entertaining media content, with informational utility being a secondary factor in this domain. The primary object of entertainment choices is, after all, the repair of undesirable moods along with the attainment and enhancement of desirable ones. Mood management may thus be considered as the central model for choices in the realm of media entertainment. Informational utility, in contrast, must be regarded as the dominant choice determinant for informational and educational media content, with hedonism being a secondary factor in these domains. News and education thus define domains of media content in which the application of mood-management considerations may be of limited value.

See also: Arousal Processes and Media Effects; Gender and the Media; News Effects.

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DOLF ZILLMANN

MOORE, ANNE CARROLL (1871-1961)

Anne Carroll Moore was a pioneering children's librarian who shaped the profession of children's services in American public libraries. Devoting her career to children's librarianship, Moore touched every aspect of the field–writing, reviewing, lecturing and teaching, training staff, administering children's services at the New York Public Library, and consulting with publishers. Her insistence on quality literature for children stimulated the growth of American children's literature in the twentieth century.

Born and raised in Limerick, Maine, Moore was the only daughter of Luther Sanborn Moore and Sarah Barker Moore. She and her seven brothers lived on a farm named Alderwood in southwestern Maine, in sight of Mt. Washington. Moore's parents were clearly influential in developing her strong personality. Luther Moore was a farmer, lawyer, and politician who brought his daughter along as company in visits and read to her. Anne absorbed her mother's love of beauty, particularly in the form of flowers and gardens. Her educational experiences were particularly positive, both at Limerick Academy, a preparatory school in Maine, and the Bradford Academy in Massachusetts, a two-year college with which she sustained a long association. After her formal education, she returned home to study law under her father's tutelage, despite the unpromising prospects for women in the field.

All her plans drastically changed when her parents died suddenly in 1892 from a severe bout of influenza and then her sister-in-law died later in that same year. She helped her widowed brother raise his two children for several years, her only child-rearing experience. Career options seemed unappealing to her—either missionary work or teaching. One brother, recognizing her kinship with books, suggested the new field of librarianship. She applied to the state library school in Albany, New York, for which she lacked the requisite college degree, and then applied to Pratt Institute Library School in Brooklyn, New York, where she began her professional studies and career.

At Pratt, Moore began a tutelage under Mary Wright Plummer, director of the library. Plummer, a librarian with international stature, was made director in 1894, after which she helped design an expanded facility that included a children's room-the first of its kind in the country to be built. The one-year training course did not yet include the subject of children's librarianship. Moore's intention was to return after graduation in June 1896 to Maine in the new area of county library service, which did not materialize as a prospect. On her way to the American Library Association convention in Cleveland, she met Caroline Hewins, the director of the Hartford Public Library, who pioneered the professional interest in library services to children. After returning from the conference, Moore received a job offer from Mary Wright Plummer to assume responsibilities for the new children's room at Pratt. These two women—Plummer and Hewins—became Moore's mentors in the field.

At Pratt, Moore developed the professional practices that shaped her subsequent career: managing the children's room, participating in professional activities, and writing. Moore's intention, which included methods of the new kindergarten movement, was to open access to books for children, to organize a system of circulation, to create thematic exhibits of pictures and books with accompanying reading lists, and to extend the influence of the library beyond its walls. In 1898, she introduced her well-known register pledge, which pledged the child to take good care of all books, to pay all fines, and to obey all rules. She also began work with schools: making contacts, giving talks, and providing special library services, such as storytelling.

It was during the Pratt years that Moore became a leader in the profession in the new practice of children's services. Moore was chosen as chair of the Club of Children's Librarians, which later became the Children's Services Division of the American Library Association. She presented a landmark paper at the 1898 conference, "Special Training for Children's Librarians," in which she stated for the first time what was needed in this new field. Her leadership role in the American Library Association was instrumental in forming an organizational identity of children's librarians and in raising concerns of critical importance to the field.

Moore was recruited for the position of Superintendent of Work with Children at the New York Public Library in 1906, where she served until her retirement in 1941. Moore developed the Children's Room into a cosmopolitan site of international interest, where foreign visitors often toured, and immigrant populations felt connected to their own native culture. It was here that the expanding children's book community was centered as Moore became a leader in both the publishing and the provision of books for children.

After her first decade at the New York Public Library, Moore's interest began to shift from professional issues to the literature of childhood. Her interest in communities now encompassed the publishing industry, which was just beginning to diversify into the children's book market. These interests emanated from her high standards of selection for branch libraries and her heightened sense of the quality desirable in the content and production of children's books. Her exhibits and reading lists were an economic impetus for publishers to heed her counsel. Moore began writing reviews in The Bookman, which was the first ongoing critical column on children's books, and later in the New York Herald Tribune and the Horn Book magazine.

Moore also wrote two novels for children: *Nicholas: A Manhattan Christmas Story* (1924) and *Nicholas and the Golden Goose* (1932). The books were modeled on a doll, which became for Moore an imaginary companion, whose existence disconcerted colleagues. Her presence was long felt in the New York Public Library and book community even after her retirement. She served as a visiting lecturer, received an honorary doctorate from

Pratt Institute, and was honored with the Regina Medal by the Catholic Library Association.

Moore died on January 20, 1961. Despite subsequent reevaluations of her reputation, she remains one of the most influential figures in the history of children's services in American public libraries.

See also: LIBRARIANS; LIBRARIES, HISTORY OF; STORYTELLING.

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ANNE LUNDIN

MORSE, SAMUEL F. B. (1791-1872)

Samuel Finley Breese Morse is recognized as the most influential figure in the development of the electromagnetic telegraph. It is interesting to note that although Morse is remembered as an inventor, he endeavored most of his life to become a great artist.

Morse was born in Charlestown, Massachusetts, on April 27, 1791, to Elizabeth Breese Morse and Jedidiah Morse. His mother was a strongwilled individual who held tremendous influence over Morse and his two brothers, Sidney and Richard. His father, the town pastor, was also active as an author and geographer.

Morse learned of electricity while attending the lectures of Jeremiah Day at Yale University. Nevertheless, he wanted to become an artist, and he was fortunate to be acquainted with the American painter Washington Allston. Morse's parents supported his ambition to travel with Allston to London to further his training. There, Morse assumed Allston's practice of sculpting the images of his paintings. His first sculpture, *Dying Hercules* (1812), earned Morse international recognition from the Adelphi Society of Arts in London.

Morse began a prolific career in portraiture after marrying Lucretia Pickering Walker and establishing a residence in Charleston, South Carolina, in 1818. Morse and his brother Sidney dabbled briefly in invention, but their failed attempts motivated Morse to refocus on painting and the New York art community after moving to New Haven, Connecticut, in the early 1820s. In late 1824, Morse received word that the Common Council of the City of New York had chosen him to paint a portrait of the Marquis de Lafayette during his tour of the United States. In February 1825, while Morse was in Washington, D.C., for a sitting for the painting, he received word of his wife's death and quickly returned to New Haven. His father died shortly thereafter, and a distraught Morse moved to New York. In November 1825, he and thirty other artists founded what would eventually become known as the National Academy of Design. Morse, who served as the first president of the academy, completed the painting of Lafayette in 1826. (That portrait now hangs in New York's City Hall, and the related bust is in the possession of the New York City Public Library.)

In November 1829, with his three children entrusted to the care of various family members, Morse decided to leave New York for a three-year tour of Europe. While in France, Morse met with Daguerre. (Morse, impressed with Louis Daguerre's precursor to modern photography, eventually opened his own daguerreotype studio in New York, where he taught Mathew Brady, the famed American Civil War photographer.) While in France, Morse also had seen the Chappe semaphore telegraph, which was a visual signaling device that used movable arms on tall masts. Morse was intrigued still with the signaling device when he boarded the Sully, the ship on which he returned to New York from Le Havre, France, in 1832. Aboard ship, Morse met and held long discussions with Charles T. Jackson concerning his ideas for a form of telegraphy that used electricity. Later, each would make claims to the invention of



Photographs of Samuel F. B. Morse and Alfred Vail are included with an image and descriptive details of the first telegraphic instrument. (Corbis)

the electromagnetic telegraph. While Morse provided more evidence for his claims than Jackson sh did, the evidence revealed that neither could claim wl

sole credit for the invention.

Morse began teaching art at New York University in 1835. While there, he began developing his telegraph. Early in 1836, Morse attempted to make the model work through forty feet of wire, but such early attempts failed. Leonard D. Gale, a professor of chemistry at the university, became interested in Morse's work. Gale helped Morse correct many problems in his model. Another important contributor to the Morse telegraph was Alfred Vail (a former art student of Morse), who understood mechanical engineering. Vail provided technical assistance, funds, and facilities in Speedwell, New Jersey, for equipment construction. Although many historians argue that Gale and Vail probably provided most of the innovation for Morse's final working product, each received small shares of the patent for the telegraph, the caveat of which was filed by Morse on October 3, 1837.

On March 4,1843, the U.S. Congress provided approximately \$30,000 for the construction of a telegraph line between Washington, D.C., and Baltimore. The original idea was to lay telegraph lines underwater and underground, but wire insulation was too unreliable. As an alternate, Vale and Ezra Cornell (the designer of the plow Morse used for burying cable) suggested stringing wire overhead on poles. Finally, on May 24, 1844, the line opened with the message "What hath God wrought!"

Morse had attempted to develop a telegraph code in 1832 using dots and dashes to represent actual words, but that method proved too cumbersome. American Morse Code, which uses dots and dashes to represent letters and numbers directly, was developed in 1844. In 1850, sound reading of Morse code replaced visual reading of telegraph tape. Continental code, which transmits better through undersea cables, was adopted in 1851.

At the age of fifty-five, when he was a superintendent of the Washington–Baltimore telegraph, Morse proposed to finish a panel of art in the rotunda of the U.S. Capitol. Morse ended his art career with the rejection of that proposal. While in his late fifties, Morse married Sarah Elizabeth Griswold, his second cousin, with whom he had four children. Their marriage was overshadowed by intense patent litigation against Morse and his telegraph.

Versions of electric telegraphy had been developed as early as 1774. Several versions of telegraphy appeared almost simultaneously after Hans Christian Oersted's discovery of electromagnetism in 1819. Models were developed in England by Peter Barlow and Charles Wheatstone in 1824 and 1837, respectively. Wheatstone became involved with others in the United States in litigation against Morse, his patent, and his claim to be the inventor of the electric telegraph. Joseph Henry was found to have produced a working model in 1831; Harrison Gray Dyar strung telegraph wires on poles in Long Island for his static electricity model in 1827. While these cases illustrated clearly that other individuals had created working electric telegraphs before Morse had, the courts determined that none of the other innovators had applied for U.S. patents for models that were direct challenges to Morse's design.

Morse died on April 2, 1872, in his winter home in New York. Based on the facts of his life history, it might be more appropriate if Morse were remembered predominantly as the artist who helped to found the National Academy of Design rather than as the inventor of the telegraph. This would certainly have been the view of those people who criticized Morse and alleged that he had claimed the work of others as his own. Nevertheless, his efforts did lead to the worldwide adoption of a common system of telegraphy.

See also: TELEPHONE INDUSTRY, HISTORY OF.

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MARTIN L. HATTON

See: Film Industry

MURROW, EDWARD R. (1908-1965)

Edward R. Murrow's use of word pictures while reporting from London during World War II made him an American hero. He rewrote the rules of broadcast journalism on radio and then wrote most of the rules for television journalism and documentary reporting. For years, he was the most respected voice in broadcast news, and yet, he also hosted the earliest version of the celebrity tabloid show.

Murrow was born into a farming and logging family in North Carolina, but he grew up in Washington state. While attending Washington State College, he studied speech and played the lead in many theater productions.

In 1934, Murrow began arranging, through the International Institute of Education, for the placement of Jewish intellectuals from Germany in institutions of higher learning in the United States. Because it was during the Great Depression, he also had to arrange for financial support for these intellectuals. Some of these leading scientists, including Albert Einstein, participated in interviews that Murrow set up with the radio networks.

As a result of his work with German refugees, Murrow was offered a job with the Columbia Broadcasting System (CBS) as "Director of Talks" in 1935. He was promoted in 1937 and became the head of CBS operations in Europe. In this position, he was not supposed to report news; he was not considered to be a journalist. However, Murrow broke the rules when, in 1938, Adolf Hitler's armies entered Austria. Murrow went to Vienna and filed a report on the invasion. His style was unique, allowing sounds and the words he chose to paint pictures for the listeners. In doing this, he had developed a new type of reporter, the radio correspondent.

Back in London, during the bombing raids by the Germans, Murrow remained above ground, out of the bomb shelters. This made it possible for him to report to an anxious audience every night on the nature and events of the war. These reports, which would always start with his trademark phrase "This is London," made him famous in America and a hero to the British.

Murrow tried to create reports that caused those who listened to live the experience and to be moved by it as he had been moved. In order to do this, he often put himself in great danger against his boss's orders. He flew along on bombing runs over Berlin, and he moved with the troops during the Allied thrust into Europe. One of his most moving broadcasts was of the Allied arrival at the Buchenwald concentration camp, wherein he described the horrors that had been inflicted upon the people who had been interred there.

When the war ended, Murrow returned to America, where he became the vice-president of CBS News. As the most famous radio news voice of World War II, Murrow was not satisfied with the desk job, so he went back to being a reporter in 1947. He then collaborated with Fred Friendly on a series of recorded documentaries called *I Can Hear It Now* (an oral history of the period from 1932 to 1945). After Murrow returned home from reporting on the Korean War, he and Friendly turned their collaboration into a weekly radio program on CBS. It was called simply *Hear It Now*, and it ran from December 1950 to June 1951.

Murrow did not like television, with its natural emphasis on pictures instead of ideas, as a medium for news. However, he could not stop the wheels of progress, so in 1951, he and Friendly created *See It Now*, a television version of their radio series. This program, which ran until 1958, helped to create the television documentary. *Person to Person*, Murrow's more popular television program, was of a completely different nature. Running from 1953 to 1959, this program was a celebrity interview show that featured guests such as Marilyn Monroe, Roy Campanella, Arthur Godfrey, and even then-Senator John F. Kennedy. Through remote hookups, Murrow (in New York) would question the celebrities (in their homes)



Edward R. Murrow. (Bettmann/Corbis)

about their lifestyles. While the program disappointed fans of Murrow's serious work, it made a lot of money for both CBS and Murrow. In addition to these two television programs, Murrow continued to broadcast a nightly radio show.

One of the principles that Murrow lived by was "Tell the truth, and fear no man" (which had been ingrained in him as part of his Quaker upbringing). This principle would play a prominent role in the most important moment of his television career. Senator Joseph McCarthy was heading the House Un-American Activities Committee, which had fostered and exploited a fear of communism infiltrating America. CBS, along with other media organizations, had "black lists" of people who reportedly had Communist connections and were, therefore, unemployable. CBS also had a loyalty oath that employees were required to sign, thereby disavowing any Communist ties and affirming their loyalty to America.

While Murrow signed the oath, he knew the procedures being used by McCarthy were wrong, and he looked for a television story that would be appropriate for *See It Now* and would expose McCarthy's tactics. On October 20, 1953, Mur-

row chose to air a story that questioned the methods that were used in discharging a lieutenant, Milo Radulovich, from the U.S. Air Force Reserve. Based on sealed evidence and closed hearings, the soldier had been dismissed as a security risk because his father and sister had what were considered to be leftist leanings. After the show aired, the lieutenant was reinstated, but one month later, it became clear that McCarthy was trying to blacklist Murrow in retaliation for his stand in defense of the lieutenant. Murrow, who respected McCarthy's power but refused to fear him, ordered the See It Now crew to prepare a show about McCarthy's authoritarian tactics. After three months, he decided on March 9, 1954, that the time was right to go ahead with the program, regardless of the consequences. Fortunately, Murrow was the most respected reporter in America, and the vast majority of people supported his program. Murrow had given voice to a majority view that had been silenced. Finally, it was okay to disagree with McCarthy-because Murrow had done it. When Murrow was criticized for his personal attack on the senator, he said that history would judge whether he or McCarthy had served America better. In 1954, the answer to this question came when the U.S. Senate overwhelmingly censured Senator McCarthy for his actions.

One of Murrow's follow-ups to See It Now was Small World, which ran from 1958 to 1959 and extended the technology of electronic newsgathering by using simultaneous hookups around the world to present unrehearsed discussions among important international opinion leaders. Murrow then began producing documentaries for another series, CBS Reports. His most famous documentaries included Harvest of Shame (1960) and Biography of a Bookie Joint (1961). Murrow left CBS in 1961 to join the John F. Kennedy administration as the director of the U.S. Information Agency. He received the Presidential Medal of Freedom from Lyndon Johnson in 1964 and was named an Honorary Knight Commander of the Order of the British Empire by Queen Elizabeth II in 1965 (shortly before his death from lung cancer).

See also: Journalism, History of; Radio Broadcasting, History of; Television Broadcasting, History of.

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STEPHEN D. PERRY

MUSEUMS

The word "museum," from the ancient Greek *mouseion*, originally referred to any location sacred to the Muses (*Mousa*). The Muses, who were the ancient Greek goddesses of the arts, were honored and revered by poets, playwrights, and artists. Any place inhabited by the Muses was likewise considered sacred and a source of divine inspiration. The playwright Euripides, for example, in the fifth century B.C.E., described *mouseia* as places of beauty and nature where birds sang and poets were inspired.

In the fourth century B.C.E., a formal sanctuary dedicated to the Muses was established just below Mount Helicon, a mountain in central Greece. According to legend, the Muses first appeared to the poet Hesiod (ca. 700 B.C.E.) on this very hillside, telling him to sing of the gods as he tended his father's sheep. The sanctuary featured an openair amphitheater, where statues and other works of art were displayed, and supposedly held a manuscript copy of the collected works of Hesiod. This was, perhaps, the first place ever called a "museum."

The History of Museums

Over the centuries, the notion of a museum evolved from any place sacred to the Muses to the multifaceted museums of today. In the modern world, a museum is defined as any institution that maintains a collection of objects to be preserved, studied, and displayed for educational or aesthetic purposes. This is very different from the original definition of a *mouseion*.

The notion of collecting objects is deeply rooted in human history. Collecting is an activity with great symbolic significance. Collections have been used to honor the dead; Neolithic burial sites often show the dead interred with objects of personal or religious significance. Collections of sacred objects honor the gods; sacrificial offerings accumulate at altars and in temples. Collections of plunder signify conquest and domination; plundered artifacts convey a sense of power over the vanquished. Collections of all types can express admiration or fascination with whatever the objects represent; sports fans, for example, collect memorabilia from their favorite teams or players. However, the mere act of collecting things does not make the resulting collection a museum.

Museums in Antiquity

In the classical world of Greece and Rome, sacred objects were often collected and placed in temples or sanctuaries as offerings to the gods. The Parthenon in Athens, for example, contained many valuable objects ranging from gold and silver artifacts to inlaid statues and carved marble reliefs. These works of art, although now scattered in museums around the world, were originally intended as gifts to the gods; they belonged to the divinity to whom they were offered. The treasuries of classical temples, usually filled with a clutter of precious objects, were generally not open to the public, and the objects contained therein were displayed only on rare occasions. Thus, these temples could not be considered museums.

Collections of objects were not restricted to temples and other religious sites in the ancient world. Works of art were also collected by individuals and displayed in public spaces. Individual aristocrats in ancient Rome would fill their urban homes and country villas with exquisite art. Great public arenas in ancient Greece, such as those at Delphi or Olympia, would feature works of art dedicated in commemoration of great accomplishments. Likewise, the Forum in Rome was filled with exquisite statues representing important historic figures. Although the works of art displayed in these settings would all be considered museum artifacts today, none of the original locations would have been referred to as museums.

There were a few locations in the classical world that could possibly have been considered museums. For example, famous schools in Athens, such as the Lyceum or the Academy, maintained collections of objects that were used for educational purposes. Philosophical classes in Athens were often based on empirical observations of natural objects. The philosopher Aristotle, tutor to Alexander the Great, encouraged his students to collect specimens from the natural world for the purposes of examination. During his conquest of Persia, Alexander had exotic specimens captured and sent home to Aristotle for further study.

The Museum at Alexandria

It was not until the early third century B.C.E. when an institution emerged that most closely resembled the modern notion of a museum. This occurred with the creation of the Museum at Alexandria in Egypt, one of the most famous institutions in the ancient world. Established in 290 B.C.E. by Ptolemy I, the Museum was a place devoted to learning and intellectual reflection, where scholars gathered to study collections of objects. Designed by Demetrius of Phaleron, a former student of Aristotle, the institution was destined to become the center for intellectual learning in the classical world.

Funded by the Egyptian Ptolemaic monarchy, the Museum featured extensive collections of objects, an observatory, lecture halls, gardens, living quarters, and a library. The Library, perhaps the most famous branch of the Museum, grew rapidly over the centuries and at its height contained almost half a million volumes. For almost six centuries, scholars from around the world would travel to Egypt to study the resources of the Museum and contribute the fruits of their own knowledge to the Museum's holdings.

The scholars who worked at the Museum formed the world's first academic community. They were governed by a priest and supported by the state. Like scholars in an early university, they lived, worked, and studied within the institution. Their primary activity was research, and they gave few lectures.

Museums in the Middle Ages

The Museum at Alexandria was destroyed during civil warfare around 270 C.E. After this, the collecting of artifacts once again became a private affair. Rich individuals would collect great works of art according to their interests and tastes for their own personal enjoyment. Communities of scholars, such as monks in monasteries, would collect great works of literature or artistic effort for posterity, hiding them from the public in order to protect them for the future. The first university museum, the Ashmolean, was founded in 1683 at Oxford University in England. However, even universities would restrict access to their collections by the general public.

Over the centuries, displaying works of fine art grew into an art itself for individual collectors. These collectors would exhibit their collections in elaborate displays that ranged in size from vast galleries to tiny cabinets. During the seventeenth and eighteenth centuries, a specialized type of collecting emerged and grew in popularity. Referred to as wunderkammer, these were cabinets of curiosities. The owners of these cabinets took great pride in gathering together objects that were rarely seen and hard to acquire. They particularly prized rare specimens of natural history, such as butterflies or fossils. Yet these collections existed almost exclusively for the enjoyment of the collectors, their friends, and their families; the collections were rarely opened to the public.

Early Modern Museums

The first true public museums were created as royal collections of art and were gradually made accessible for the public to enjoy. In Paris, for example, galleries of art initially housed in royal palaces and collected by generations of French kings were made available to select members of the public in the 1750s. However, it was not until 1793, during the French Revolution, that these galleries were opened to the public as the Louvre Museum.

The British Museum was founded in 1753 as perhaps the first public museum. In contrast to earlier museums that focused primarily on art, the British Museum emphasized both natural history and cultural heritage materials. However, its resemblance to the modern version of the museum was slight. Prospective visitors had to apply for admission in writing and in advance, and it could take two weeks to receive permission to enter the facility. Groups of visitors were limited to fifteen people or less and visits had to be restricted to two hours in length. Moreover, visitors had to stay together on their tour, and only two such tours were allowed each day.

The idea that museums should be institutions open to the general public gained in momentum with the growing notion that the nation–state could display collections of prestigious works of art for its own glorification. Thus, during the lateeighteenth and early-nineteenth centuries, countries around the world began to open national museums. Well-known examples include the Vatican Museum in Rome, the Royal Danish Museum in Copenhagen, the Hermitage Museum in St. Petersburg, and the Smithsonian Museum in Washington, D.C. These institutions paved the way for the modern museum.

The Modern Museum

Today, many different types of institutions can be called museums. These include zoos, planetariums, aquariums, art galleries, nature centers, historical monuments, botanical gardens, science and technology centers, and so on. The wide range of institutions that consider themselves museums means that it can prove very difficult to classify museums neatly into distinct categories. Museums are thus often classified in many different ways and using many different methods. They can be grouped by the nature of the objects they collect, by the audience they serve, by their intended purpose, by their size, by their source of funding, and so on.

Types of Museums

The most popular method of classifying museums is by the nature of their collections. This can be difficult to determine as collections in various museums often overlap. Some museums have very specialized collections while some have very general ones; most museums fall somewhere in between. Many museums include collections of more than one type. However, despite unavoidable overlaps between categories, this method of classifying museums has the advantage of being based on the collections themselves. This approach arranges museums into categories in a way that seems logical to most museum visitors. Moreover, it provides a way of illustrating some of the key differences in approaches different types of museums bring to their collections and intended audiences.

For the purposes of this entry, museums can be divided into four general types: (1) art museums, (2) science and technology museums, (3) natural history museums, and (4) cultural history museums.

Art museums collect and present a variety of artifacts considered to be of aesthetic value. Arti-
facts exhibited in art museums include paintings, sculpture, and the decorative arts. Art museums often include historical objects, traditionally drawn from classical antiquity, among their collections. However, most art museums collect artifacts based on their aesthetic merits rather than their cultural or historical importance. Thus, it is usually sufficient for artifacts in art galleries to be exhibited loosely arranged by time period or artist. When displaying artifacts of aesthetic value, the context in which the collections are displayed is less important than in other museums where artifacts might have to be displayed in an appropriate historical context to be understood. In general, art museums tend to be more focused on personal appreciation of art, with the interpretation of artifacts left up to the individual. Exhibits in art museums, therefore, are usually less didactic in nature than in other forms of museums. Modern art museums are often considered experimental; many are designed and constructed in an attempt to show the latest in modern artistic styles. The Guggenheim Museum in New York or the Georges Pompidou Center in Paris are good examples of museums of modern art that attempt to embody modern art conventions in their own construction. Other well-known art museums include the Museum of Modern Art in New York, the San Francisco Fine Arts Museum, the Art Institute in Chicago, the Louvre Museum in Paris, the Tate Gallery in London, and the Guggenheim Museum in Bilbao, Spain.

Museums of science and technology collect objects and design exhibitions that demonstrate scientific principles, illustrate important discoveries in the history of science, or describe important technological innovations. Sometimes these objects are valuable and irreplaceable artifacts of science and technology, such as the Orville and Wilbur Wright's airplane, Galileo's telescope, or Charles Babbage's analytical engine. Often, however, the emphasis in the exhibit is placed not on the artifacts themselves but on the process the artifacts illustrate. In these situations, the museum will collect objects that can be used to demonstrate lessons, processes, or scientific principles to their visitors. For this reason, exhibits in science museums are typically very hands-on, featuring demonstrations and interactive displays with an emphasis on education. Well-known examples of museums of science and technology

include the Museum of Science and Industry in Chicago, the Exploratorium in San Francisco, and the Air and Space Museum at the Smithsonian in Washington, D.C.

Natural history museums preserve and present specimens collected from the world of nature. Objects collected by natural history museums include birds, mammals, insects, plants, fossils, rocks, and reptiles. Exhibits within these museums cover such academic fields as botany, geology, paleontology, and zoology. Natural history collections were found among the earliest types of museums, such as the British Museum in London. Natural history was a popular hobby for individuals in the eighteenth and nineteenth centuries, and large collections of interesting specimens were often donated to growing national museums of natural history. From an educational standpoint, museums of natural history have proven useful for scholars and students of all ages and from all disciplines. By providing collections of animals, plants, and minerals, neatly organized and arranged by type or classification, such museums provide an invaluable service to individuals who may not otherwise have access to rare specimens. Well-known examples of museums of natural history include the National Museum of Natural History in Paris, the Natural History Museum in London, the Smithsonian's Museum of Natural History in Washington, D.C., the Field Museum in Chicago, and the American Museum of Natural History in New York.

Cultural history museums cover a variety of topics, cultures, and time periods. They can be found at many different levels in society. They range from museums of local history that illustrate the history of a city or county, to national museums that exhibit the history of an entire country, to museums of world history that display artifacts collected from all cultures throughout history and around the globe. In addition, museums of history often focus on different types of collections. Cultural history museums with a focus on archaeology, for example, gather artifacts from antiquity, such as Greece, Rome, Egypt, or Mesoamerica, to almost present day, such as colonial America. Anthropological or ethnographic museums typically present artifacts arranged by culture and attempt to provide the visitor with a new way of looking at different world cultures. History museums of a general nature often present



On August 11, 1999, the Exploratorium in San Francisco allowed a select group of participants to stay overnight to view a total solar eclipse by using high-speed Internet connections and live video links from an Exploratorium field station in Amasya, Turkey. (AFP/Corbis)

their collections chronologically, allowing their visitors to follow the evolution of objects in their collections through time. Usually, cultural history museums display artifacts that were once of utilitarian value, not just aesthetically pleasing. Such museums make an effort to situate their artifacts in a historical context; many often use models or simulated environments to provide an appropriate setting for their artifacts. These museums are essentially educational in their exhibit design philosophy; they usually offer more interpretation and explanation than other types of museums. Well-known examples of cultural history museums include the Museum of American History at the Smithsonian in Washington, D.C., and the British Museum in London.

Finally, there are also specialty museums of various miscellaneous types that do not fit neatly into the above classification scheme. These include museums that feature collections of unusual artifacts of a particular type, like baseball cards or Superman memorabilia; museums that cater to a specialized audience, such as children's museums; or museums dedicated to a specialized time period or geographic area, such as a museum of a small town or community.

The Purpose of Museums

All museums collect, preserve, and interpret objects. When working with their collections, modern museum professionals aim to accomplish three goals of equal importance: (1) to preserve the artifacts entrusted to their care; (2) to research and study their collections; and (3) to educate the public about the value, educational or aesthetic, of their holdings. All museums face the same problems in achieving these goals.

A fundamental aspect of collecting is the desire to preserve that which one collects. From the moment an artifact enters a museum's collection, museum professionals must take every precaution to ensure that no further damage or deterioration occurs to the artifact. This is called preventative conservation. Conservation activities form an important part of the artifact lifecycle in the museum. Although many visitors to a museum believe that the only responsibility the museum has is to care for the artifacts on exhibit, usually only 5 percent to 10 percent of a museum's entire collection is displayed to the public at any one time. The vast majority of a museum's collection remains locked away in storage facilities. It is crucial that proper care be taken of those artifacts in storage. This includes careful monitoring of environmental conditions, the storage of artifacts in nonreactive, nonharmful containers, and occasional conservation activities to ensure that artifacts remain undamaged over the years. If museum professionals do not take steps to preserve their collections, then their artifacts will eventually deteriorate beyond repair. Therefore, preservation is an essential goal of the modern museum professional.

For thousands of years, scholars have relied on museums to provide collections of objects worthy of study. Likewise, it is essential that the collection of a museum be properly examined, studied, and researched by the appropriate experts. The role of the curator in the museum is to ensure that the museum's artifacts are identified, made available to experts for study, and the resulting knowledge recorded and preserved for future scholars. In this way, the museum is fulfilling its role as an academic institution that began in Alexandria more than two thousand years ago. Today, many university museums maintain research collections; these collections are usually not displayed to the public and are reserved for academic research only. Such museums pride themselves on having extensive research collections, ranging from rare books to herpetological specimens, which attract researchers from around the world to come and study at their facility. For the museum professional, research is required to create programs for both educational and scholarly purposes. Research is also necessary to learn proper methods of preserving the artifacts in the care of the museum. Some artifacts will require special conservation methods. Other artifacts, such as bones from ancient graves, may be culturally sensitive and require special handling or display. Only with appropriate research can the museum ensure that its collections are being properly handled, treated, and exhibited.

Visitors to a museum today take for granted that their experience will be an educational one, but this was not always the case. The notion that a museum should serve an educational role outside of the academic sphere is a relatively new idea, rooted in the nineteenth century. The Royal Danish Museum in Copenhagen was one of the first museums to present its collections in an instructional manner-metal artifacts, for example, were arranged to illustrate the evolution of the Copper, Bronze, and Iron Ages. Today, virtually all artifacts are displayed in a manner that emphasizes the educational experience of the visitor. Exhibits introduce important themes, label copy keeps the visitor informed of the facts as well as the museum's interpretation of the artifacts, and tour guides emphasize the most important lessons to be learned from any given display. Museums today have different means of reaching their audiences. Most museums maintain education departments that train docents and other volunteers, offer special education programs, or bring educational outreach activities to the schools. Additional items. such as paper guides, booklets, or audiocassettes, allows visitors to delve into exhibit topics of interest to them in more depth without overwhelming other visitors with extraneous labels and displays. In general, museums have found that by educating the public, they increase the public's interest in the collections of the museum, benefiting both museum and museum visitor.

It is important to remember that from the moment an artifact enters a museum, it enters an artificial environment. An artifact on display or in storage in a museum will follow a life very different from its original or intended purpose. A cup that one thousand years ago was used for drinking will sit in a case, be kept for study, or be displayed to schoolchildren. No longer a utilitarian object, its utility lies in its value as an educational or research tool. Once an object becomes a museum artifact, it enters a new environment. The role of the museum professional is to facilitate this transition through preservation, research, and education.

Museum Organizations

The job of the museum professional is complicated, and many organizations exist to help museum professionals in their daily work. The American Association of Museums (AAM) was founded in 1906 to assist museums and museum professionals across the country. The AAM serves as an accreditation organization for museums, offers guidance in maintaining professional standards, and educates museum professionals through annual conferences, journals, and publications. More than sixteen thousand members, both individuals and institutions, are represented by the AAM. The International Council of Museums (ICOM) was founded in 1946 and has more than fifteen thousand members from 150 countries. ICOM is affiliated with the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and provides an international forum for museum professionals to discuss global issues of museum education, responsibilities, and professionalism.

With the assistance of such organizations, the job of the museum professional has steadily evolved from an amateur to more professional status. In addition, museum studies has emerged as an approved field of study in its own right. It is now possible to obtain a master's degree in museum studies at many universities. Museumstudies programs worldwide train future museum professionals in the techniques and methods of the museum field. The establishment of museum studies as an approved academic discipline has helped museums around the world become more professional in managing their valuable resources.

Museums and Information Resources

Museums are responsible for maintaining and preserving many valuable resources, the most important of which are their collections of artifacts. These objects are vital information resources that document the worlds of art, science, nature, or history. By preserving their artifacts, museums are often preserving a direct link to the human past or to the natural world that may no longer exist outside the walls of the museum.

Equally important, however, are the data museums collect about their artifacts through research and study. Knowledge about a collection is accumulated through the efforts of curators, academic scholars, and other museum professionals. This information is then recorded in permanent form. The resulting documents form surrogate records that both describe and represent the artifacts of the museum. Surrogate records provide a valuable service by offering a source of data about artifacts that can be manipulated and accessed far more easily than the actual objects themselves. Thus, when a curator needs to know how many paintings a museum has collected from a particular artist or a scholar wants to study a certain type of ceramic vessels, these individuals can consult data contained in the surrogate records while the artifacts themselves remain safely in storage. As museums become more professional, there is an increased awareness of the need to keep artifacts safe, secure, and undisturbed. The less frequently a museum artifact needs to be handled, the longer it will remain undamaged. To this end, more museums are limiting access to their collections, and more museums are encouraging research to be conducted using surrogate records. It is essential, therefore, that the data in the records of the museum be accurate and up-to-date.

The task of managing information resources in museums has now become a science. The integration of advanced information technology into museum environments has had a serious effect on the way modern museums manage their data records. Information science professionals worldwide now study the role of information technology in managing museum information resources. This field of study is generally known as "museum informatics."

Information Management in Museums

Museums have always had a need to manage their information resources. They need to know not only what they have but also what they know about what they have. In the past, information about museum collections was maintained in paper and card files. Access to these records was usually restricted to museum employees; moreover, search capabilities in these files were usually limited to only a few key fields. For example, card files may have been sorted by donor name, by accession number, or by title of object. Assuming the cards were kept up-to-date and properly organized, accessing data by any of these fields was usually straightforward. However, locating a set of records sorted by culture or material type would have been a difficult if not impossible task for even the most skilled and knowledgeable museum employee.

Modern information systems in museums offer museum professionals many new methods of organizing and accessing data. Such systems work in conjunction with existing paper records to augment the information-management capabilities of the museum. Electronic database systems allow museum employees to search and sort their computer records by almost any field. In addition, museum professionals are now able to store far more data about their artifacts on the computer than ever before possible on accession cards or ledger files. Also, by maintaining artifact data in electronic format, modern museums now have the capability to share data about their collections with other institutions in ways never before possible. Organizations are currently working to devise standards that will allow museums around the world to collaborate in their efforts to identify and research their collections. By sharing artifact records from one organization to another, museums may be able to advance significantly the state of knowledge in their fields.

However, as museums work to increase access to their information resources, some problems have been exacerbated; especially troublesome are those that concern copyright and intellectual or cultural property. The question of ownership of artifacts has traditionally been a difficult one for museum professionals. Whether or not the British Museum should return the Parthenon Marbles (also known as the Elgin Marbles) to Greece, for example, has been hotly debated since Lord Elgin removed these massive carvings from Athens in the late-eighteenth century. Laws such as the Native American Graves Protection and Repatriation Act (NAGPRA) exist to ensure that the rights of the original owners of museum artifacts are protected. As museums increase their online presence, many of these issues are now returning to the forefront of intellectual debate. Additionally, many museum professionals worry that by making electronic images and data about their collection available online, they are encouraging individuals to violate copyright regulations by making their own digital copies of works of art.

New Opportunities for Digital Museums

Despite these difficulties, the "wired" museum raises all sorts of new possibilities for the museum professional. Within the museum itself, interactive exhibits offer visitors new options for an indepth exploration of exhibits. Computer displays can provide additional detailed data about each exhibit in the museum and allow visitors to interact with museum displays in ways never before possible. Electronic displays can help museums meet the accessibility needs of their visitors, providing audio, enlarged text, and so on, as needed. Note that electronic systems augment the artifacts



A tourist at the British Museum photographs a portion of the Elgin Marbles, the ownership of which has long been a contentious issue between Great Britain and Greece. (Reuters NewMedia Inc./Corbis)

of a museum, enhancing the experience of visiting a museum but never completely replacing the original collections.

Online, virtual museums offer digital visitors everything from information about the museum's location and hours of operation to virtual tours of the museum's galleries and collections. Many museums have information records about their artifacts linked to their websites in a manner that allows the general public to retrieve digital images and detailed textual descriptions of any artifact in the collection of the museum. Many museum educators create specialized educational outreach programs for schoolchildren. These programs, available online over the museum's website, are often integrated with school curricula and national educational standards. Finally, interactive online exhibits are able to offer virtual visitors specialized access to artifact data. For example, by gathering information about visitor interests online, museums can offer dynamic exhibits over the Internet that are specifically created for each individual patron.

The museum of the future will use technology to connect distant museums, museum professionals, and museum patrons. A scholar from New York who is examining over the Internet the rich collections of the Hermitage will be able to interact, via a three-dimensional virtual display, with a fellow researcher from Berlin who is studying the same collection. Students, teachers, scholars, and members of the general public, armed with only a computer and an Internet connection, will be able to browse the collections of every museum worldwide, including artifacts not currently on display in the museum. Individuals will have immediate access to the accumulated knowledge of a wide variety of experts in every field from every country. Virtual visitors physically located thousands of miles apart will stand next to each other in threedimensional representations of archaeological sites so realistic as to be indistinguishable from the real thing, will handle three-dimensional virtual representations of priceless artifacts rendered with laser mapping accurate to the micrometer, and will share data and other information resources in ways never before possible.

See also: Archives, Public Records, and Records Management; Archivists; Curators; Databases, Electronic; Internet and the World Wide Web.

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PAUL F. MARTY

MUSIC, POPULAR

Public outcries about possible negative effects of popular music on youths are not new. They accompanied, for example, the emergence of jazz in the 1920s, the shaking of Elvis Presley's hips in the 1950s, and much of the politically influenced rock-and-roll of the 1960s. With few exceptions, however, social scientists began to pay systematic attention to the role of popular music in the socialization of youths only in the 1980s. Increased research on popular music resulted from the extreme, "edgy" nature of the messages that began to appear in songs and music videos near the end of that decade. Popular music regularly draws fire from parents, teachers, and mainstream cultural authorities for reputed sexual explicitness, demeaning of women, violence, racism, and glorification of drugs and alcohol and because the hard-edged music of performers such as Marilyn Manson has been charged with influencing the people who have been responsible for several school shootings. Oversimplified and alarmist as such charges tend to be, they bespeak a growing awareness of the role of popular music in the process of growing up. As European researcher Keith Roe (1987, pp. 215–216) writes, "in terms of both the sheer amount of time devoted to it and the meanings it assumes, it is music, not television, that is the most important medium for adolescents."

Uses and Gratifications

Although many studies report that adolescents spend more time with television than with music, surveys often underestimate young people's total exposure to popular music. Numerous studies base estimates of music listening on radio use, ignoring exposure from other sources, such as CDs, tapes, and music videos. Moreover, music listening is often a secondary, background activity, appearing in the environment of adolescents without any conscious decision to introduce it, and such secondary exposure often goes unreported. Secondary exposure is important, however, and can often be observed when an adolescent is studying, chatting, or doing chores and still reacts if the "background" music is turned off. According to 1990 data gathered by Donald Roberts and Lisa Henriksen, when all popular music listening is counted, whether from radio or other sources and whether in the foreground or the background, preadolescents and adolescents spend somewhere between three and four hours a day with popular music. Girls listen more than boys-substantially more by the high school years-and African-American youths listen more than white youths. Music-video viewing occupies about fifteen to thirty minutes a day for adolescents.

Music matters to adolescents in ways that go beyond the mere filling of time. It can reduce tension, provide escape or distraction from problems, relieve loneliness, ease the drudgery of repetitive chores, fill uncomfortable silence, provide fodder for conversation, energize parties, and delineate the boundaries between subgroups. How important is music to adolescents? One study reported that, when asked what medium they would choose to take with them if they were stranded on a desert isle, junior and senior high school students from northern California chose music ahead of all other media, including television. By eleventh grade, music was selected over television by a margin of two to one (Roberts and Henriksen, 1990).

Research on popular music uses and gratifications suggests "the primacy of affect." That is, for most youths, music use is governed principally by

the desire to control mood and enhance emotional states. When teenagers feel lonely or seek distraction from their troubles, music tends to be the chosen medium. The listening experience can be quite intense, often associated with the "peak" experiences of life, both positive and negative. As in many areas related to popular music use, gender makes a difference in terms of mood management. Males are more likely than females to use music as a tool to increase energy level and seek stimulation-to get "psyched up." Females, on the other hand, are more likely to listen in order to lift their spirits when they are down or even to dwell on a somber mood. In the same way that girls often listen to sad songs when they are sad, many male heavy metal fans apparently listen to angry music when they are angry. In one study, a typical heavy metal fan said he sought out "full-blown thrashing metal" when he was "mad at the world" (Arnette, 1991).

Several scholars contend that the social uses and meanings of popular music provide the real key to understanding its place in the lives of youths. Popular music is central to many adolescent social occasions. It accompanies courtship and sexual behavior, offers a basis for friendships, and provides the backdrop at parties and dances. Perhaps the strongest testimony to the importance of music in socializing is the near impossibility of teenagers having a party without music. Music can replace or invoke the presence of absent peers, thus relieving feelings of loneliness. Music listening may also prepare adolescents for future peer interactions and relationships. To a large extent, youths who know little about pop culture or current music trends are consigned to the margins of teenage culture, whereas pop music "experts" tend to enjoy both more friends and enhanced status.

Music Preferences

Many adults tend to lump contemporary popular music into three categories: rock, heavy metal, and rap. Youth culture, however, recognizes a mind-boggling array of genres. An inventory of popular music types might include Top 40, rap/hip-hop, contemporary hits, easy listening, album rock, soft rock, hard rock, classic rock, grunge, alternative, new age, world beat, progressive rock, reggae, protest rock, industrial rock, salsa, house, ska, high life, technopop, synthpop, college rock, alternative rock, death metal, thrash metal, and thrash punk, as well a number of still-popular categories from the past, such as new wave, punk, surfer music, Motown, and psychedelic rock. Many teenagers or college students could probably add another dozen entries to the list.

The important point is that young people do not listen simply to "popular music"; rather, they select a certain type of music, often to the exclusion of most other types. For example, heavy metal fans typically abhor Top 40 songs; rap fans pay little attention to classic rock. Such diversity and selectivity of popular music tastes matter. To the extent that popular music influences adolescent beliefs or behavior, the effect of the music depends on the specific genre. Three hours a day of "death metal" provides different messages than three hours a day of soft-rock ballads, and the effects of the two would be expected to be different.

Music preferences also matter because of their link with individual and group identity. They suggest who adolescents think they are and how they function in their society. Differences in music preference are not random or idiosyncratic; they are related to various background, peer group, and individual differences. Of all the demographic predictors of music taste, race and ethnicity may be the most powerful. Entire genres of popular music are linked unambiguously and proudly with their racial and ethnic roots—R&B, soul, and rap with African-American culture, salsa with Hispanics, reggae with its Jamaican heritage, and so on. In a 1999 study of U.S. youths' media use, Roberts and his colleagues found that more than 70 percent of African-American teenagers cited rap as their favorite music; only 22 percent mentioned either pop rock or "Top 10," and very few cited rock, heavy metal, punk, or country. The preferences of the white youths were distributed much differently; both rock and heavy metal drew a quarter of the responses and only 13 percent mentioned rap.

Gender is also associated with fundamental differences in music preferences. Whatever the historical era and whatever the population being studied, females are more attracted to softer, more romantic, more mainstream forms (pop, disco, soft rock, Top 40). Males gravitate to harder-edged genres (heavy metal, hard rock, punk, grunge, psychedelic rock). Males are also more likely than females to adopt nonmainstream, fringe or "progressive" music affinities.

Music preference is also connected to where youths stand in their peer culture. "Music style" (i.e., the selection of a certain type of music and a personal style to go with it) functions as a powerful identifying marker in the school crowd structure. Some groups, such as "alterna-chicks," "punkers," "metalheads," "rastas," and so on, are labeled primarily on the basis of music choice. Research by Roe (1987) in Europe indicates that the link between school experience and popular music taste springs inevitably from the process of academic evaluation, which creates an "in-group" of people who are popular with other youths and share the dominant values and goals of the school structure, and an "out-group" of people who operate on the margin and harbor antischool, antiadult feelings.

Interpretation and Effects

Much of the criticism aimed at popular music and music videos stems from two assumptions: (1) that a given lyric has a single, relatively evident meaning and (2) that the values and behaviors portrayed in lyrics and music-video images influence how young listeners think and act. It is not surprising that most commentators emphasize the negative. Public anxiety is fueled by trends toward sexual explicitness and a clear increase in lyric treatments of such topics as violence, misogyny, racism, suicide, Satanism, and substance use. The emergence in the early 1980s of music videos, which made it possible for adults ostensibly to "see" what their children were listening to, added to the criticism.

Although most adolescents say it is music's "sound" that attracts them, "content" clearly matters. A significant number of youths mention lyrics as a primary gratification and most cite them as a secondary gratification. For better or worse, young people attend to, process, discuss, memorize, and even take to heart what lyrics and music videos say. The important issues are what meanings accrue from this process, and what influences they exert on the attitudes and behavior of young people.

To assume a single, "correct" meaning for a song ignores the constructive nature of interpretation. Wide variations exist in the sense audiences make of popular lyrics and music videos. For example, some people read a refrain such as "Let's get physical" as an invitation to casual sex, while others see it as a call to aerobic exercise. Such differences, however, are far from random. Different psychological and social experiences influenced by factors such as age, gender, race/ethnicity, and socioeconomic status are related to the meanings that different listeners impute to a given lyric. Younger adolescents and teenagers from lower socioeconomic status backgrounds make more concrete interpretations, often failing to recognize metaphors. Girls focus on different aspects of romantic lyrics than boys. A video image interpreted by white adults as gratuitously violent may be read by African-American youths as an honest political statement. Sexually active teenagers interpret lyrics about teenage pregnancy quite differently from less experienced counterparts (Christenson and Roberts, 1998). Moreover, right or wrong, particular performers and genres become associated with particular themes (e.g., heavy metal with drugs, violence, and suicide; rap with violence and misogyny), leading audiences to develop schemas (i.e., generalized images) that can result in agreement about a song's general themes, if not the particular details. In short, although variant readings of popular songs are more common than many critics assume, the variance is related in predictable ways to group and individual differences and to the degree to which different genres and performers are associated with particular themes.

Peter Christenson and Roberts (1998) have summarized a growing body of experimental research indicating that music content, particularly in music-video form, exerts at least short-term influences on the perceptions and attitudes of adolescents. For example, music videos laced with antisocial or violent images made viewers more antagonistic toward women and more likely to condone violence. Highly gender-stereotyped videos increased acceptance of gender-stereotyped behavior in others. Sexually charged videos influenced viewers to perceive subsequently observed ambiguous behavior as "sexier" and to express more accepting attitudes toward premarital sex. White youths exposed to politically radical rap videos became more racially tolerant and less likely to sympathize with reactionary racial political positions. Although these findings have not been replicated using lyrics only, there is evidence that once young people have seen a music video, the visual images are "replayed" during subsequent exposure to audio-only renditions of that song.

It is a huge leap from the short-term outcomes found in experiments to claims about the role of popular music in suicides and shootings by teenagers. Millions of heavy metal and "gangsta rap" fans spend hours with their chosen music genres and never threaten others or themselves. Most professionals who are concerned with the causes of violence and suicide point to numerous conditions that are unrelated to popular culture (e.g., depression, access to guns, substance abuse, "conduct disorders") as necessary precursors of such drastic acts, and such conditions have been at work in most of the incidents that are cited in the debate. In short, the argument that exposure to popular music can function as a primary cause of such drastic behaviors seems tenuous.

This does not, however, negate the potential role of popular music in at least some suicides and violent incidents. As noted above, music is frequently used for mood control, and its influence on mood suggests an "amplification effect," a strong tendency for music to heighten whatever emotional state a listener brings to a listening situation, including anger and depression. To immerse oneself in angry, depressing music, then, seems a poor strategy for coping with anger and despair. Given substantial evidence that adolescents who are depressed, angry, alienated, abusing drugs, and so on are particularly drawn to the kinds of angry, nihilistic music that celebrates such "troubled" states and traits, there is legitimate cause for concern. While by no means a first cause of suicide or violence, there is good reason to argue that these kinds of music can certainly play a contributory role.

Most of the time, however, popular music is simply a source of pleasure for young people. They listen because they like it. In addition, popular music teaches young listeners about the world, helps them sort out emotions and manage moods, and facilitates social interaction. This is not surprising since popular music is of, by, and for youths, addressing issues that are central to them (e.g., love, sex, loyalty, independence, friendship, authority) with a directness that they seldom get from adults. In other words, popular music is perhaps the primary vehicle of youth culture.

See also: Pornography; Sex and the Media; Vio-Lence in the Media, Attraction to; Violence in the Media, History of Research on.

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NATIONAL TELEVISION VIOLENCE STUDY

Violence on television has been the subject of debate for decades in the United States. It seems as though everyone has an opinion on the topic. Many observers argue that there is an excessive amount of bloodshed on television. In fact, a 1999 national poll by the Pew Research Center found that 70 percent of Americans believe that enter-tainment programs contain too much violence. Others criticize certain types of portrayals that seem overly graphic or gratuitous. Still others defend the use of violence in the media by pointing to movies such as *Schindler's List* (1993) and *Saving Private Ryan* (1998), both of which contain a great deal of physical aggression but have educational value.

Spending an evening with the television remote control can fuel this debate. After the 1999 shooting at Columbine High School in Colorado, Josh Getlin (1999, p. A17), a reporter for the *Los Angeles Times*, described television in the following way:

Scenes of unspeakable carnage from Columbine High School (click) gave way to images of buildings burning in Belgrade after a NATO attack (click) followed by a hidden-camera video showing a nanny beating a toddler (click), then a Western shoot-'em-up (click) and more scenes from the suburban campus where students were gunned down like targets at a carnival arcade. It was just another night on American television and a disturbing reminder of how deeply ingrained violence is in our culture.

Is the television landscape truly saturated with violence? Does all violence on television look the same? In 1994, researchers at four American universities set out to answer these questions. The result is the National Television Violence Study (NTVS), a comprehensive, scientific analysis of the nature and amount of violence on American television. The researchers monitored more than eight thousand hours of television across a three-year period, from 1994–1995 to 1996–1997. Three annual reports were released as part of the project (*National Television Violence Study*, 1997, 1998a, 1998b).

The study was a milestone in the history of television research for two reasons. First, it went beyond simple counts of violent behaviors in a program and instead provided an extensive analysis of how violence is portrayed on television. Contextual features such as whether a perpetrator is attractive and whether the violence is rewarded are far more important than the sheer amount of aggression in trying to understand how harmful a portrayal might be for viewers. Second, the study was based on the largest and most representative sample of television programs ever evaluated in a single project.

Background

The NTVS came about during a decade of intense political and public criticism of the media. During the early 1990s, there were numerous bills before Congress that involved some attempt to regulate television content. In a study of newspaper coverage during the time, Cynthia Hoffner (1998) found that 50 percent of the articles about television violence focused on possible solutions to the problem, most notably, government regulation.

In 1993, in the midst of this public scrutiny, Senator Paul Simon (D-IL) and other policymakers called on the entertainment industry to examine more closely the way in which violence is depicted on television. The National Cable Television Association (NCTA), a trade association representing the cable industry, responded to this call by sponsoring a study of television content to be conducted independently of Hollywood. After reviewing proposals from many expert researchers across the country, NCTA commissioned the NTVS, funding the project at a cost of \$3.3 million.

The NTVS involved a team of media researchers from four universities. Researchers at the University of California, Santa Barbara, assessed violence in all types of entertainment programming such as drama, comedy, movies, children's shows, and music videos. It is this portion of the study that will be reported here. Researchers at the University of Texas at Austin provided an in-depth analysis of violence in a specific type of programming-reality-based shows, such as real-life police and rescue shows and talk shows. Researchers at the University of Wisconsin, Madison, studied the role of television ratings and advisories, including their effect on the viewing decisions of parents and children. Researchers at the University of North Carolina, Chapel Hill, examined the effectiveness of antiviolence publicservice announcements.

In addition to the researchers, NTVS involved an advisory council, whose role was to protect the integrity and independence of the research, especially since the funding was coming from the cable industry itself. The council also provided the researchers with advice and feedback on the design, findings, and implications of the study. The council included representatives from seventeen national organizations concerned with the effect of television on society. Among these were the American Academy of Pediatrics, the American Medical Association, the International Communication Association, and the National Parent Teacher Association. In addition, one-third of the members came from organizations representing the entertainment industry, such as the Producers Guild of America and the Caucus for Producers, Writers, and Directors.

Foundations of the Study

The NTVS is a content analysis that is strongly based on what is known about how media violence affects viewers. The following conclusions served as the four basic "foundations" for the project:

- 1.Television violence contributes to harmful effects on viewers.
- 2. Three types of effects can occur from viewing television violence: (a) learning aggressive attitudes and behaviors, (b) desensitization to violence, and (c) fear of being victimized by violence.
- 3. Not all violence poses the same degree of risk of these harmful effects.
- 4. Younger children are a special audience.

These foundations resulted from an extensive review that the researchers conducted (before beginning the project) of all the scientific studies that had examined the effects of television violence.

Foundation 1

The conclusion that television violence contributes to harmful effects on viewers has been reached by virtually every major professional organization that has reviewed the research, including the American Psychological Association (1993), the American Medical Association (1996), and the National Institute of Mental Health (1982).

Foundation 2

Literally hundreds of studies show that television violence can contribute to aggressive behavior in children. Moreover, this effect can persist into adolescence and adulthood. For example, one study by Rowell Huesmann (1986) found that exposure to television violence at the age of eight years helped to predict criminal behavior in a sample of adults. In addition to increased aggression, there are two other types of harmful effects that can occur. Repeated exposure to violence can cause viewers to become more callous, or desensitized, to the harmfulness of violent behavior. Also,

Content Analysis

A content analysis is a scientific method for studying the features of different communication messages. Researchers can use a content analysis to analyze messages in newspapers, on the radio, on television, and even in people's diaries. Any recorded document can be studied by this method.

As an example, Roger Johnson (1999) was interested in looking at the types of stories featured on television news. He decided to study four different types of news programming: national network news (CBS), local news (a CBS affiliate), cable network news (CNN), and independent superstation news (WWOR, New York). The first step in a content analysis is to draw a representative sample of the documents to be studied. If Johnson had chosen a single night from each type of programming, his sample would have been limited to a certain set of stories or events occurring on that particular day. Instead, he randomly selected one newscast a week over a six-month period for each type of programming, resulting in a total sample of one hundred programs. In this way, Johnson's sample covers a range of time periods and possible news stories.

Next, the researcher must precisely define the measures and categories that will be analyzed within the documents. In this case, Johnson specified six categories of news stories: violent crime, tragedy, nonviolent conflict, social protest, war/military affairs, and all others. Two coders were trained to recognize these themes. Then, working independently, the coders watched the videotaped programs and placed each of the 1,798 separate news stories into one of the six categories. By having the two coders work alone, Johnson made sure that the judgments were as objective as possible. What did he find? Slightly more than half of all news stories (53%) featured violent crime, tragedy, or conflict, leading Johnson to conclude that news programming is dominated by "bad" news.

Content analyses differ in how good or scientifically valid they are. A valid content analysis should include a representative sample of documents, precise definitions of the measures, and independent coders who show a high level of agreement on their judgments. Johnson's study is characterized by all of these elements. As a contrast, compare it to a hypothetical study that looks only at network news during a particular week and that involves a single person judging the content. This may be how viewers themselves draw opinions about the nature of television news, but it is not very scientific or generalizable.

A content analysis can provide information about what is contained in mass-media messages, and it can even be used to compare the mass media with the real world to see how realistic or distorted the messages are. It cannot, however, be used to test the effect of media messages on the audience. Quite simply, it is not a study of how people react to the messages; rather, it is a study of the messages themselves.

long-term exposure to violent portrayals can exaggerate people's fear of being attacked by violence in the real world.

Foundation 3

There are many ways to depict violence on television. For example, a fistfight can last only a few seconds and be shot from a distance, or it can persist for several minutes and feature many closeups of the action. There are also differences in the types of characters who commit violence—some are heroes trying to save lives and others are criminals acting out of greed or anger. There are differences also in the outcomes of violence—some portrayals show the pain and suffering of the victim, whereas others do not. In other words, not all television violence is the same. In fact, the way in which violence is presented helps to determine whether the portrayal poses harm to the viewer. Certain features of violence increase the risk of a harmful effect such as learning aggression or desensitization, whereas others decrease that risk.

NTVS identified eight contextual features that help to predict the likely effect of violence on viewers. First, the nature of the perpetrator must be considered. An attractive perpetrator is a potent role model, especially for children, and can increase the likelihood that viewers will learn aggression from a portrayal. Second, the motive or reason for violence is important. Acts that seem justified or morally correct can increase viewer aggression, whereas unjustified violence can actually decrease the risk of learning aggression. Third, the presence of weapons, especially guns and knives, can enhance aggression because such devices often trigger violent thoughts and memories in the viewer. Fourth, violence that is extensive or graphic can increase the risk of viewers learning aggression from a program. Exposure to extensive graphic violence also produces desensitization and can increase fear among viewers, the other two harmful effects mentioned above. Fifth, portravals of violence that seem realistic are more likely to increase viewer aggression than are unrealistic scenes. Realistic violence also can increase audience fear. However, this does not mean that cartoon or fantasy violence on television is harmless, as discussed below. Sixth, violence that is explicitly rewarded or that simply goes unpunished increases the risk of learning aggression, whereas violence that is condemned decreases that risk. In addition, violence that goes unpunished can elevate fear, particularly when it appears to be unjust or random. Seventh, the negative consequences of violence for the victim are an important contextual cue. Showing the pain and suffering that result from violence can discourage the learning of aggression among viewers. Finally, violence that is cast in a humorous light can contribute to viewer aggression by making it seem rewarding. Humorous violence also may desensitize viewers to the seriousness of such behaviors.

Given the importance of context, NTVS created measures of all eight of these features so they could be evaluated anytime a violent portrayal was found on television.

Foundation 4

Both children and adults are influenced by the contextual features described above. Nevertheless, some unique concerns arise with regard to young children, particularly those under the age of seven years. Young children's cognitive abilities are still developing, so they often have interpretations of the television messages that are different from the interpretations of mature viewers. For example, studies by Peter Nikken and Allerd Peeters (1988) and by John Wright and his colleagues (1994) show that young children often have difficulty distinguishing reality from fantasy on television. In other words, what seems unrealistic to an older child or adult may be quite real to a preschooler. This helps to explain why researchers such as Lynette Friedrich and Aletha Stein (1973) found that young children will readily imitate violent cartoon characters.

Younger children also are more vulnerable to television violence in general. In a meta-analysis of 217 studies, Haejung Paik and George Comstock (1994) found that compared to older viewers, preschoolers showed the strongest effects of television violence on aggressive behavior. Because of these age differences, NTVS identified younger children as a special audience when monitoring the content of television and reporting the findings.

Definition of Violence

Most people would agree that when a character shoots someone with a rifle, it is an example of violence. But what if they found out that the character tripped over a rock while hunting and the shooting was accidental? Violence can be defined in numerous ways, with each decision about the definition having important implications for the findings of a given study. For example, should verbal assaults be considered as violence? Should physical aggression directed at animals be included? What about humorous depictions of violence, such as slapstick?

Obviously, there are no "true" or correct answers to these questions. Yet researchers must clearly specify what gets "counted" as violence and what does not before embarking on a content analysis. According to NTVS, three key features must be present for a portrayal to qualify as violence: (1) the perpetrator as well as the target of violence must be animate or living beings, (2) there must be a clear intent to harm, and (3) the harm must be physical in nature as opposed to psychological or emotional. The following is an even more precise definition:

[Violence is] any overt depiction of a credible threat of physical force or the actual use of such force intended to physically harm an animate being or group of beings. Violence also includes certain depictions of physically harmful consequences against an animate being or group that occurs as a result of unseen violent means [National Television Violence Study, 1997, p. 41]. Thus, three forms of violence were included in the study: credible threats, behavioral acts, and harmful consequences of unseen violence.

Sample

One of the hallmarks of the NTVS project is its sample, which is substantially larger than that of any other single content analysis of television violence. Previous studies of television violence typically analyzed anywhere from 80 to 120 hours of programming. In contrast, NTVS videotaped about 2,700 hours of material each year during the three-year period, resulting in a total sample of more than 8,000 hours. Furthermore, most of the earlier studies examined programming on the three major broadcast networks only (ABC, NBC, and CBS). Although this may have reflected American viewing patterns in the past, more than twothirds of American homes had cable television by 1995. To more fully capture the universe of American television in the 1990s, NTVS looked at programming across twenty-three different broadcast and cable channels.

Another strength of the sample is that instead of choosing intact days or weeks of programming, NTVS selected each individual program randomly from a population of all programs appearing across a nine-month timeframe. This approach ensured that an unusual news event, such as a schoolyard shooting or the breakout of war, would have much less effect on the overall representativeness of the sample. If an entire day or week had been chosen, such atypical news events could have dominated and therefore contaminated the sample.

Each year from October to June, the researchers randomly selected programs on twenty-three television channels to create a composite week of content for each channel. Programs were sampled between the hours of 6:00 A.M AND 11:00 p.m., across all seven days of the week. The twenty-three channels were those most frequently viewed by the American public, with the exception of CNN and ESPN, which were excluded because sports and breaking news were not evaluated in the study. The channels were grouped into five categories: broadcast network (ABC, NBC, CBS, and Fox), independent broadcast (Los Angeles-based KCAL, KCOP, and KTTV), public broadcasting (PBS), basic cable (A&E, AMC, Cartoon Network, Disney, Family Channel, Lifetime, Nickelodeon, TNT, USA, VH-1, and MTV), and premium cable (Cinemax, HBO, and Showtime).

In total, the 2,700 hours of television sampled each year resulted in more than 9,500 programs observed across the three-year period. As stipulated in the research contract with the study's funder (NCTA), all types of programs were analyzed for violence except for religious programs, game shows, infomercials, instructional shows, and breaking news. These five categories represented less than 15 percent of the programming each year.

Measuring Violence across Incidents, Scenes, and Programs

NTVS measured violence across three distinct levels or units of analysis. The "violent incident," the smallest unit, was defined as a violent interaction between a perpetrator and a victim. The "violent scene" was defined as a series of related violent incidents that occur without a significant break in the flow violence, such as a bar fight. The largest level of analysis was the entire "violent program." Some contextual features of violence were judged at the level of each violent incident, such as whether the perpetrator was attractive. Other features were evaluated by taking the entire violent scene into account, such as how graphic was the violence. Still other features required a consideration of the entire program as a unit, such as whether there was an overall theme of antiviolence in the show. By analyzing violence at all three levels, the researchers were able to provide comprehensive information about the meaning of violence on television.

Coding and Training

An elaborate codebook was developed to provide detailed and precise definitions of terms such as "credible threat," "rewarded violence," and "long-term consequences." The codebook also provided extensive rules of judgment for coding. Each year, more than fifty undergraduate students at the University of California, Santa Barbara, were trained to become highly skilled at applying the definitions and rules laid out in the codebook. These coders received approximately forty hours of classroom instruction and twenty hours of laboratory practice to help them learn the complex coding scheme. Once trained, the coders worked individually in quiet laboratories as they assessed programs for violent content. It took approximately twenty weeks each year to complete all the coding. Every week during this time, half of the coders independently evaluated the same program to assess consistency across individuals. Agreement or reliability was at least 80 percent on nearly all the measures coded each year.

Major Findings

The NTVS researchers found a remarkable degree of consistency in how violence was portrayed across the three years of the study. They also found that the way that most television violence is portrayed does in fact pose risks to viewers. What are some of the portrayals that can be harmful?

First, much of television violence is "glamorized," or cast in a positive light. Across three years of the study, nearly 40 percent of the violent incidents on television were initiated by "good" characters who can serve as attractive role models (see Figure 1). The risk here is that viewers of all ages, but especially children, are likely to emulate characters who are perceived as attractive.

Another aspect of glamorization is that physical aggression is often condoned on television. For example, more than one-third of violent programs featured bad characters who are never punished anywhere in the plot. Violence that goes unpunished poses risk because it can encourage the learning of aggression among viewers. In addition, fully 71 percent of violent scenes contained no



FIGURE 1. Patterns of glamorized violence on television.





remorse, criticism, or penalty for violence at the time that it occurs. This is especially problematic for viewers under the age of seven years who focus mostly on immediate repercussions and lack the cognitive ability to consider punishments for aggression that may occur later in a program.

Second, most television violence is "sanitized," or shown with minimized negative consequences. In fact, roughly half of the violent incidents on television showed no physical harm or pain to the victim (see Figure 2). Not only are short-term outcomes often missing, so are longterm consequences. Over the three-year period, only 15 percent of the violent programs showed any prolonged negative effects of violence on the family, friends, or community of the victim. As discussed above, the portrayal of negative outcomes such as pain and suffering can decrease the chances that viewers will learn aggression from media violence.

Third, much of the serious violence on television is "trivialized," or shown as less serious than it is. Across the three-year study, more than half of the violent incidents featured physical aggression that would be deadly or incapacitating if it were to occur in real life (see Figure 3). Yet much of this serious violence is undercut by humor. In fact, about 40 percent of the violent scenes on television are shown in a humorous context. Exposure to serious violence that is made to seem trivial can contribute to both desensitization and imitation among viewers.



FIGURE 3. *Patterns of trivialized violence on television.*

Fourth, very few programs emphasize an antiviolence theme. A program can include violence in a way that is actually educational rather than promotional of violence. For example, violence can be shown to have strong negative consequences or alternatives to violence can be promoted. Less than 5 percent of violent programs featured an antiviolence message across the three years of the study.

Thus, what is the prevailing message? Violence on American television is typically presented as an acceptable and often beneficial way to solve problems, and it rarely results in any serious or lasting damage.

The NTVS researchers also looked at the sheer prevalence of violence, independent of how it is portrayed. Over the three years of the study, a steady 60 percent of programs across the television landscape contained some violence. However, the prevalence of violence varied quite a bit across the different channel types, with premium cable the most likely to feature violent programs (more than 80% of the programs on these channels contained violence) and public broadcasting the least likely (fewer than 20% of the programs on this channel contained violence) (see Figure 4).

The researchers also looked at the concentration or amount of violence within a program. They found that the typical violent program featured at least six violent incidents per hour. Each of these incidents involved a different perpetrator and victim, and many of them included multiple acts of physical aggression. In fact, more than 60



FIGURE 4. Programs with violence by channel type.

percent of the violent incidents contained repeated behavioral acts of aggression on a victim. In other words, it is rare for a television perpetrator to hit, shoot, or stab someone only once.

The last major finding concerns what the NTVS researchers called "high-risk" portrayals. Depictions were labeled "high risk" when several plot elements that encourage the learning of aggression are all featured in one scene. A high-risk portrayal features an attractive perpetrator, engaging in justified violence that goes unpunished, that results in minimal consequences to the victim, and that seems realistic to the viewer.

The researchers found that for children under the age of seven years, high-risk portrayals of violence that teach aggression are found most often in cartoons, the very programs that are targeted to this age group. Of course, cartoons pose little risk for older, more mature viewers who routinely discount animated content as unrealistic. But preschoolers have difficulty distinguishing reality from fantasy on television, and therefore are susceptible to imitating fantasy violence that occurs on television.

Taking into account the typical viewing habits of children in the United States, the researchers concluded that the average American preschooler who watches mostly cartoons is exposed to more than five hundred high-risk portrayals of violence each year. These portrayals contain a potent set of plot features that strongly encourage the learning of aggression in some of the most vulnerable members of the television audience: young children.

Implications

The NTVS received a great deal of public attention. The findings each year made headline news in major newspapers such as *The New York Times*, *The Washington Post, USA Today*, and the *Los Angeles Times*. In addition, the study was featured on CNN, on the ABC, CBS, and NBC news programs, and on the "Jim Lehrer Online NewsHour."

The study also was recognized by prominent policymakers. Senator Paul Simon (D-IL) described it as "a solid report that should be a strong signal to the television industry and to the public that glorified violence is harmful and that we still need improvement" (Simon, 1996). Representative Joseph P. Kennedy (D-MA) stated that "The National Television Violence Study shows the problem is not going away. The television industry must work together and clean up media violence for the sake of public health-our children's health" (Kennedy, 1997). Even the president of the United States acknowledged the study. The researchers briefed the White House regarding the findings, and President Bill Clinton issued a statement noting that the study "shows that there is still too much violence on the television, and that we must all continue the important work we have begun" (Clinton, 1997).

However, the effect of the study was not limited to political rhetoric alone. In 1996, Representative Edward Markey (D-MA) argued that NTVS was instrumental in helping to pass V-chip legislation, mandating that a blocking device be installed in new television sets. Markey (1996, pp. 5–6) described the study's report as "devastating" for the television industry, noting the following:

It shredded the industry argument that the V-chip was unnecessary because voluntary action was working. Instead, the authors found that in the programs studied, perpetrators were going unpunished in 73% of all violent scenes, and only 4% of violent programs emphasized anti-violence themes.... This may have been the greatest paradox of all—that a study initiated in 1994 to block passage of the V-chip should become one of the most powerful arguments to go forward with the V-chip in 1996.

Beyond policymaking, the study has had an effect on science as well. The American Psycho-

logical Association (1998) called it "the gold standard against which other research on television violence will be measured." George Comstock and Erica Scharrer (1999) described NTVS as "the most powerful content analysis in the history of mass communication research." And Steven Chaffee (1999), a distinguished scholar of media effects, described the content analysis as "an exemplary model for researchers for years to come." Already, researchers in Great Britain and Portugal have used the NTVS methods and coding scheme to analyze television violence in their own countries.

Conclusion

The ultimate measure of the effect of any study is whether it has long-term scientific and practical significance. If NTVS encourages future researchers of television violence to focus not so much on the number of shootings, stabbings, and fistfights, but instead on the meaning of this aggression within the context of the plot, then it will have lasting scientific value. If the study helps parents to navigate the television landscape and make informed choices about their children's viewing habits, then it will have practical significance as well.

See also: Antiviolence Interventions; Arousal Processes and Media Effects; Children's Preferences for Media Content; Desensitization and Media Effects; Fear and the Media; Ratings for Television Programs; Social Cognitive Theory and Media Effects; Talk Shows on Television; V-Chip; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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NETWORKS AND COMMUNICATION

Network analysis is the study and interpretation of influences on, forms of, and outcomes from, patterns of relations among entities. The overall structure of a network, the relationships among the network members, and the location of a member within the network, are critical factors in understanding social behavior. They influence, among other things, access to resources, the distribution of social and organizational power, the spread of new ideas as well as diseases, career success and mobility, workplace diversity, job satisfaction, and even personal health and longevity.

The network approach has been applied to studying a wide range of topics, such as referrals among community helping agencies, overlaps in company boards of directors as part of antitrust investigations, changes in friendship among elementary school students, rumor diffusion in organizations, interactions among transients and regular patrons at late-night diners, citation patterns among members of scientific disciplines, the role of formal organizational communication networks compared to emerging informal networks, the structure of international telecommunication traffic, and contributions to nonprofit agencies. Georg Simmel's 1908 The Web of Group Affiliations, and Jacob Moreno's 1934 Who Shall Survive? were some of the first books to describe and apply this approach. Other early studies considered kinship networks in tribal villages, relational patterns among families, interactions among workers in manufacturing or mining sites, and the development of class and group identity through joint attendance at social events.

Network Data, Measures, and Analysis

Network data are fundamentally different from the typical social science approach, which

collects information about a variety of variables (such as demographics, attitudes, performance) from a (ideally) random set of individuals (such as students, managers, organizations). This approach assumes that the individuals are independent, so the topic of interest is the association among variables. Typical data are thus a "people by variable" matrix.

For network analysis, the data consists of the relationships among the entities. The entities may be people, organizations, words, events, and so on. The relations may be communication, trade, cooccurrences, hierarchies, or the like (though the rest of this entry will refer to "people"). The strength of such relations among the people might be measured by such things as frequency, attraction, length, and dependency. This is thus a "people by people" dataset. The relations among people might be identified by observation, surveys, archival data, information-system-collected data, transcribed conversations, or analysis of printed material, diaries, legal records, and so on. For example, an organizational study might use a survey that has a section listing all the members of the organizational department, which asks respondents to indicate how frequently they communicate with other members of that department. Note, however, that network data are usually collected along with variable data, and often analyzed together. Further, a "people by variable" matrix can be converted into a "people by people" matrix.

Data about these relationships can be collected at, and analyzed by, several levels of analysis. The most basic levels are the individual and the network level.

Data collected at the individual or "ego" level involves measures of the relations in general of a set of individuals or their relations to specific others, without knowledge of the complete network of relations among all the others. These might include the number of friends a person has at school; the number of times a manager asked for advice from, or gave advice to, coworkers; or the number of suppliers an organization uses. Analyzing such individual-level data would allow researchers to differentiate the people as being more or less popular, seekers or givers of advice, or more or less dependent. The network level of analysis would describe or compare groups of people (say, part-time and full-time employees) on such individual-level measures.

Data collected at the network level involves measuring relations among all the members of a particular network (a group, an organizational department, an academic discipline, an industry). This allows analysis of the interdependencies among the members, including indirect relations and both presence and absence of relations. Such analysis can characterize individuals' network properties, including the in-degrees (the number of links a person receives from others), out-degrees (the number of links a person gives to others), density (percentage of all possible links each person has), centrality (the extent to which the person is close to or is part of all other relations in the network), integrativeness (the extent to which a person's direct relations are also related), power/prestige (the extent to which a person receives relations from others who are also powerful), reciprocity (the proportion of relations that flow both to and from a person), and roles or positions.

Typical organizational communication network roles include being a member of a group (or "clique"), the liaison (who connects groups but is not a member of any group), the bridge (who belongs to one group but provides a direct link to another group; this may include the "gatekeeper"), the isolate (who does not belong to any particular group), the opinion leader (to whom others turn for leadership and legitimization of group norms), and the boundary spanner, environmental scanner, or cosmopolite (who provides a link between the organization and the environment). Other roles include the broker (who passes information or resources along), a follower (who provides links to but not from others), a leader (who receives links from but may not provide links to other), and people who occupy similar positions (who are "equivalent" even though they may not have direct relationships among themselves).

Such analysis can also characterize network properties of dyads (such as reciprocity and similarity in the network) or triads (such as transitiveness, the extent to which a relation between entity A and B and a relation between B and C also involves a relation between C and A). Finally, network-level analysis can characterize properties of the network as a whole, such as overall density, centrality, integrativeness, power/prestige, reciprocity, transitiveness, and other measures of structure. However, network-level analysis can also provide a wide array of network-level portrayals, such as separate and overlapping cliques within the network, positions within the network that include people that are similar to each other with respect to their relations to all other entities, multidimensional visual portrayals of the relations among the entities within the whole or portions of the network, or clusters of people that are grouped together in hierarchical fashion depending on the strength of the relation.

To summarize, then, researchers can collect network data at the individual or network level. They can then analyze individual-level network data at the individual level, or describe and compare that individual-level network data within different groups. Or researchers can collect network data at the network level, and then analyze that data to produce individual-level or network-level measures and results. Finally, they can analyze the combined individual- and network-level measures. Further, researchers can collect any of these kinds of data across time, to compare individuals and networks longitudinally. For example, studies have shown that organizational mergers often fail because the work networks of the two companies do not become more densely connected over time, or the network of the acquiring company remains centralized. Or, the use of electronic mail allows organizational members to overcome physical, temporal, and hierarchical obstacles and thus participate in more decentralized communication networks over time. Researchers can also collect and combine data from several networks, such as within an organization, formal and informal work relations, interdependence among tasks, sources of resources, and power relations, and test their relative influence, interaction, or change over time.

Developments and Debates

Network analysis has typically been used to study relations among individuals or organizations, but, as noted above, the possible applications are endless. One specific application is semantic network analysis, where text is analyzed to determine some measure of the extent to which words are related (such as how frequently words co-occur) within a given meaning unit (such as paragraphs in organizational documents). Then, this word-by-word network of relations is analyzed to produce measures for or clusters of the words. These results can be directly interpreted, used in other analyses, or compared between different groups, such as types of organizations, or a single organization before and after a major change.

A primary enduring theoretical issue involves the relative influence of "structure" (location of the individual in the network, and overall network characteristics) and "agency" (individual attributes and behaviors). An extreme structuralist would argue that almost all individual attitudes and behaviors are heavily constrained by the networks in which one is embedded. Extreme agency argues, in turn, that individuals shape the form and nature of their relationships and the resulting networks. More-integrated approaches attempt to understand the relative influences of individual and network factors on particular social phenomena, and, in turn, their effects on individual and network factors. Networks both constrain and facilitate social action, and, in turn, are constrained and facilitated by social action. Thus, one can study both the effect of preexisting networks and what affects the development and emergence of new network structures. Typically, then, network research would measure both individual and network attributes across time periods, and test one or more theoretical models as to the relative influence and causality of structure and agency.

An application of this debate in an organizational setting is the analysis of the extent to which members use a new communication medium, such as the Internet, because of task/individual factors (such as simplifying the work to be done) or because of social/structural influences (such as a manager expresses the opinion that the medium should be used or a coworker demonstrates extensive use of the medium). Network analysis provides both theory and measures to test the relative role of individual versus social influences. For example, a traditional study would measure each individual's usage of, attitudes toward, and outcomes from, electronic mail, as well as individual attributes such as demographics, type of task, prior experience, personality traits, and so on. A network study would also measure the extent to which all members of a department communicate with each other about work in general, and the new medium in particular, and other structural measures such as location in the organizational hierarchy, from which network measures would be computed. By combining these two kinds of data, analysis could then show how individual

and network factors interact to explain each individual's assessment of the new medium. These kinds of studies have shown that such network influence as exists is predominantly from coworkers (though also from managers when that person is a role model or opinion leader), is more likely if the medium is perceived as highly innovative or uncertain, and is stronger early on in the process, giving way to more individual-level influences such as task demands, perceived benefits, access and ease of use.

Another central theoretical and empirical debate centers around the distinction between cohesion and position. Cohesion approaches presume that direct relations among entities best represent network influences. Cohesion measures include in- and out-degrees, reciprocity, and cliques of densely interconnected members. So, for example, diffusion of an innovation would be best explained by patterns of direct and multistep communication between an early adopter and later adopters. Position approaches presume, instead, that what is more important than direct relations is the extent to which people occupy the same, or even similar, positions in the network. Position measures include the similarity of present and absent relations (as well as similarity of the relationships among the relations of an entity) throughout the network, such as correlations, closeness in multidimensional space, clusters, factor loadings, and various measures of equivalence. So, for example, here diffusion would best be explained by initial adoption by members of one's own position, even if those members do not communicate directly with each other, or by members attempting to emulate the adoption behavior of an influential position (such as "managers," not necessarily one's own manager). There are theoretical arguments supporting each approach, and many studies attempt to test the relative influence of cohesion versus position conceptualizations of networks. As with the structure and agency debate, studies often find that both approaches provide somewhat different contributions to explaining social behavior and attitudes.

Resources

Simple network analysis (such as drawing "sociograms" that show the relations among entities and computing some individual-level measures such as in- or out-degrees) can be done by hand. Somewhat more complex or large-scale networks can be analyzed through standard statistical software. However, it is more typical that proper processing of the data and analyses will require specific network analysis software. Perhaps the most widely used software of this type is UCINET (originally used at the University of California, Irvine).

See also: Community Networks; Internet and the World Wide Web; Organizational Communication; Relationships, Types of; Research Methods in Information Studies.

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NEWS EFFECTS

According to Harold Lasswell (1948), communication in society serves three essential functions: (1) the surveillance of the environment, (2) the correlation of adaptive responses to the environment, and (3) the transmission of social inheritance. The institution of the news certainly serves these functions, although it does each to different degrees. Surveying the physical and social environment for threats and opportunities would have to be considered the primary function of news. Citizens are informed of happenings; but as a rule, actions toward these happenings are not suggested. The news may also, however, aim at instigating and coordinating civic action when such action can be considered, with some degree of consensus, to serve the welfare of the citizenry. Finally, the transmission of cultural information is obviously another component of the news.

In the interest of survival, humans have, no doubt, monitored their environments throughout the ages, looking for both perils and opportunities. For thousands of years, individuals had to rely on personal observation and the observations of a limited number of other people. This condition was dramatically changed, of course, with the coming of message distribution by the mass media via print, radio, television, and computer. Countless others now share, through these media, their experiences, observations, and beliefs quasiinstantaneously with massive audiences. Lasswell characterized this development as an extension and an overcoming of the limited capacity of people to survey their environment. The surveyed environment is now truly global. News organizations gather enormous amounts of information from around the world, reduce it to what, according to some agreed-upon criteria, is deemed newsworthy, and present it to the public for further selective sampling. It is this multitude of available information that defines the context for the exploration of news effects.

News Reception and Interpretation

Whatever the format of presentation, news must be perceived and interpreted. Whether the informational displays that convey the news are manifest in printed language, spoken language, or language that is supplemented by drawings and photographs or by motion-picture sequences, recipients must pay attention to these displays in order to obtain information from them. The interpretative extraction of meaning is necessary, in turn, for news to have the effects that news is designed to bring about-first and foremost, to inform the citizenry of pertinent environmental and social developments (in terms of both threats to the well-being of citizens and opportunities for improving their wellness), and, according to writers such as Davis Merritt (1995), to inspire or instigate social action in the interest of communal or societal welfare.

Before these ends can be served, it is obviously necessary for recipients to comprehend the news. The mediation of comprehension is commonly considered in the context of schema theory. Doris Graber (1988), among others, has employed this theory to elucidate the information processing and information elaboration that is entailed in making sense of the news. Schemata are conceived of as discrete yet interconnected active memory structures that consolidate related past experiences and that foster expectations and interpretations that are based on these experiences. According to Graber, schemata control all relevant processes in news reception and interpretation. Specifically, they are thought to determine what recipients notice, process, and store during exposure to the news; to help recipients to evaluate and structure information in accordance with established beliefs; to facilitate the interpretation of information about unfamiliar, novel situations; and to aid in the construction of coping strategies. Essentially, then, the reception and interpretation of news is seen as a result of sequential filtering by the subjectively defined schemata of the recipients.

An experimental investigation conducted by Mary Beth Oliver (1999) of stereotypical interpretation illustrates the suggested filtering. White viewers were exposed to a news broadcast that included a wanted poster of a murder suspect. The race of the suspect was indicated solely by the poster, which featured either a white or a black person. A person identification test was administered immediately after exposure and again three months later. The findings revealed that, especially with the passage of time, white respondents tended to misidentify white suspects as being black. Additionally, negative attitudes toward blacks led over time to fewer misidentifications of white suspects and more frequent misidentifications of black suspects. Such findings could be interpreted as a result of stereotypes manifest in "race filters," stereotypes that appear to have been particularly pronounced in the filters of recipients with negative attitudes toward blacks.

It should be clear from this illustration that schema theory can be profitably applied, *post facto*, to shed light on the subjectification of the news. It should also be apparent, however, that the theory lacks predictive power in that specific interpretations of the news cannot be forecast, as the mediating schemata are typically presumed rather than empirically ascertained.

Information Acquisition and Retention

Much is known about the acquisition of information from the news and about its retention. It has been shown, for example, that when news items are presented in sequence, as is typical for radio and television broadcasts, items that are placed at the beginning or toward the end of a sequence are better recalled than items in the middle of the sequence (Gunter, Furnham, and Gietson, 1984). It is also apparent that attention to, and recall of, news items can be influenced by the contents of preceding and following items. It has been shown, among other things, that emotionarousing news items foster extended cognitive preoccupation after exposure and that, as a result, attention to subsequently presented items tends to be greatly impaired (Scott and Goff, 1988; Mundorf, Drew, Zillmann, and Weaver, 1990). It is further apparent that the presence of images generally improves the recall of information from news reports (Graber, 1990). Imagery that is consistent with and that highlights the verbally presented focal message of news reports has been found to be particularly effective in enhancing recall (Brosius, Donsbach, and Birk, 1996). Attention to specific content categories has also been examined. It has been observed, for example, that violence-laden news items, irrespective of their mode of presentation, are better recalled than nonviolent items and that men recall violent news items better than do women (Gunter, Furnham, and Gietson, 1984). Influences of other contents, of style, and of display variables on recall have also been examined. It has been demonstrated, for example, that image-evoking text can facilitate recall almost as much as actual images (David and Kang, 1998) and that actual images tend to facilitate the recall of accounts of concrete, perceivable situations more than that of abstract, difficult to visualize phenomena (David, 1998).

In research, news recall is commonly ascertained shortly after exposure to the news. Such assessment can be seen as tapping information extraction and comprehension. Research that focuses on longer-term retention of the acquired information has essentially shown that most of this information is soon lost (Gunter, 1987). The surprisingly poor retention of the news after days, weeks, or months has been deemed deplorable by some observers. It may also be seen as serving the public well, however, because retention of the specifics of news reports (which is what recall tests usually assess) tends to have little utility. Part of the subjectification of the news by filtering in schema-theoretical terms, as suggested by Graber (1988), allows recipients to select personally salient messages from the flood of news information, focus on them, and commit them to memory, while proficiently discarding the remainder.

It should be recognized that attention to, information acquisition from, and recall of the news does not constitute a meaningful end in itself. The object of the news, put simply, is to apprise the public of developments that affect their welfare. It is to provide a reliable overview of happenings in the immediate communal environment of citizens as well as in extended frames, such as state, nation, and the world at large. The purpose of the news, in other words, is to furnish the material for the construction of perceptions of, beliefs about, and dispositions toward relevant incidents and phenomena. As the mediators of individual and social actions, these perceptions, beliefs, and dispositions constitute the ultimate news effects that are worth examining. Receiving, interpreting, and comprehending the news, then, are necessary intermediate processes for news to serve its designated purpose.

News and Public Discourse

In contrast to the limited capacity of citizens to survey their extended environments by their own actions, news organizations can gather information about countless happenings around the globe and relay this wealth of information quasi-instantaneously to local, national, and worldwide audiences. Information is not gathered in random fashion, however. Editors and news directors give specific assignments to reporters and correspondents, and they further reduce the number of incoming reports by selecting only those that, according to prevailing news criteria, are considered newsworthy. Reports are thus judged, classified, and implicitly or explicitly ranked by importance. Those deemed important are included in the news, and those deemed especially important are featured more prominently than others.

The news, then, predetermines what the public will get to know (by implication, also what it will not get to know) and signals the degree of importance of individual reports. Maxwell McCombs and Donald Shaw (1972) explored this function of the news and labeled it "agenda setting." The influence focus of this approach is on the determination of issue salience. News is seen as bringing significant issues into public consciousness, as inviting reflection, and as providing the means for independent judgment rather than as influencing the public to adopt suggested positions on the issues.

The agenda-setting paradigm has generated much supportive research. It has been tested, essentially, in the correspondence between issues presented in the news and, usually after some passage of time, public awareness of these issues (McCombs, 1994). Additional demonstrations showed a correspondence between presentational prominence of items in the news and the perception of the importance of these items by the public. It has also been observed, however, that the news media are sensitive to public awareness of issues and respond to it with pertinent news reports (Brosius and Kepplinger, 1990). The news may thus set the public agenda while, on occasion, the public also sets the news agenda.

News and Issue Perception

News influence is not limited, however, to signaling the salience of presented issues and then letting the public render judgment. The news, by presenting events in particular ways, can narrow interpretational leeway and thereby guide recipients to adopt specific perceptions of relevant issues. By framing or contextualizing reports, aspects of secondary importance can be highlighted and given disproportional influence on the interpretation and perception of issues and, ultimately, on expectations and dispositions concerning the issues.

The contextualizing exemplification of phenomena of public interest (i.e., the presentation of selected cases to illustrate broader phenomena) has been found to have especially potent influence on the perception and evaluation of issues. Dolf Zillmann and Hans-Bernd Brosius (2000) examined exemplification in this context. They found exemplars to permeate all facets of the news. In the form of people who relate their experiences, exemplars are considered to humanize the news. If employed in impartial fashion, exemplars may be expected to aid recipients in forming appropriate perceptions and judgments. It appears, however, that exemplars are often arbitrarily, sometimes carelessly, and, on occasion, recklessly selected. When this occurs, the resulting selections are biased and likely to foster inappropriate, distorted perceptions and dispositions.

The influence of exemplification has been demonstrated, for example, in an experiment employing a news report on the crime of carjacking (Gibson and Zillmann, 1994). The report, presented as a news-magazine article, related facts about carjacking, including information about the risk of harm to its victims. Specifically, the report indicated, either verbally in "greater than" comparisons or numerically in percentages, the ratios that were associated with fatal outcomes, crippling injuries, minor injuries, and trivial injuries. Fatal outcomes were said to be extremely rare (or less than 1%), crippling injuries to be rather rare as well (or about 4%), minor injuries to be comparably frequent (or about 20%), and trivial injuries to be very frequent and typical (or about 75% of all cases). The report featured two exemplars (i.e., explicit and vivid descriptions of the carjackings, especially with regard to the outcome for the victims). The carjackings either resulted in the brutalization and death of the victims, led to crippling injuries, yielded only minor injuries, or were inconsequential for the health of the victims.

Respondents indicated their perceptions of the danger of carjacking to the public either shortly after reading or one week after reading one of the eight article versions (i.e., they read an article in one of four outcome conditions with the incidence rate of the particular outcome indicated either by rather vague verbal description or in exact percentages).

The findings indicated that concrete and vividly detailed exemplars can profoundly influence the assessment of issues. They also suggest that, in contrast, the provision of abstract, pallid, quantitative information, although usually more reliable, tends to be of little moment. Specifically, on the basis of two exemplars of extremely violent but rare occurrences, the respondents grossly overestimated the incidence rate of fatal and crippling carjackings. At the same time, these respondents grossly underestimated the incidence rate of carjackings that resulted in minimal harm to its victims. This misperception of the danger of carjacking to the public grew markedly over time (i.e., it was more pronounced after a week's time), and it materialized despite the presence of corrective quantitative information (i.e., verbal specifications or percentages). Numerous similar investigations (e.g., Brosius and Bathelt, 1994) have shown the same dominant effect of exemplars over abstract, quantitative information in the perception of social issues. Recipients were found to base their assessments of issues on the distribution of exemplars, even in cases where quantitative information suggested the opposite.

Experiments on the influence of exemplification in the news have also demonstrated that this influence extends to personal dispositions toward issues. Research on the effects of socalled gut-wrenching interviews with people who are suffering various misfortunes, as frequently featured in broadcast news, suggests that recipients not only perceive an increased risk of such misfortunes for the public, but for themselves as well. For example, respondents considered themselves at greater risk of salmonella poisoning from dining in fast-food establishments after seeing highly emotional footage of victims than after seeing nonemotional footage of the victims or no such exemplification at all.

A related investigation on the danger of contracting skin cancer from excessive sunbathing revealed that protective dispositions can also be created (Zillmann and Gan, 1996). An informative health newscast that urged the use of sun-block lotions was manipulated to show melanoma either in sanitized images or in explicit, shocking images. Two weeks after exposure to the program, respondents who had seen the version that contained shocking images considered the melanoma risk to the public and to themselves as being greater than did those who had seen the version with sanitized images. The former group also indicated greater commitment to using sun-block lotion than did the latter group. News influence, then, is not limited to the perception and interpretation of social issues. It is capable of affecting beliefs about dangers and opportunities, and these beliefs are capable, in turn, of affecting related dispositional changes.

The theoretical framework used to explain the indicated influence is that of cognitive heuristics (Higgins, 1996). Built-in automatisms of information processing are thought to yield efficient but often imprecise assessments of phenomena. Regarding news influence, the accessibility heuristic is of particular importance. It projects that memory access to information related to phenomena under consideration is a function of the frequency and recency of activation of this information. Novelty and perceptual vividness of the stored information are also known to facilitate access.

The effect on the assessment of the risk of contracting melanoma that was observed two weeks after exposure to the newscast that featured threatening images, for example, becomes explainable as the result of the vivid memory of these images (in contrast to the sanitized images) that imposes itself at the time when the risk is assessed or reassessed. Essentially, then, aspects of a phenomenon that enjoy superior chronic accessibility come to exert disproportionally strong influence on judgments that are rendered some time after exposure. The paradigm also applies, however, to immediate interpretational influences, such as those that are fostered by framing. It has been shown, for example, that directly quoting sources, as compared to paraphrasing their statements, shifts attention and emphasis, thereby facilitating access to the contents and enhancing influence on judgments that are rendered shortly after message reception (Gibson and Zillmann, 1998).



In order to bring a personal angle to the story of famine in Somalia, a news camerawoman followed a U.S. Marine around as he shook hands with Somali children in the city of Baidoa in 1992. (David & Peter Turnley/Corbis)

News and Emotions

An essential part of the news function is to apprise the public of immediate and impending threats and dangers. This assignment accounts for the preponderance of reports of the victimization of others only in part, however, as most of the reported ill fortunes, tragedies, disasters, and catastrophes are of no direct consequence to the news recipients. The well-documented dominance of so-called bad news appears to reflect a strong interest in reports of danger and mayhem on the part of the news audience, an interest that is commercially exploited.

The bad-news dominance has been amply criticized, mostly on grounds of the suggestion that it fosters bad moods and feelings of depression in the audience. The research evidence tends to support this contention. Tragic revelations, especially displays of the suffering of victims, are consistently found to evoke emotional distress, this distress being particularly intense in highly empathic recipients (Aust and Zillmann, 1996). To the extent that threats of reported victimizations are also directed at the news recipients, emotional reactivity is adaptively involved in the creation and maintenance of apprehensions and fear. Such fears may be warranted and inspire due caution. If reported dangers do not threaten the news recipients at all, however, the formation of apprehensions and fear can be maladaptive and unduly burden recipients emotionally.

The convention of placing an uplifting or amusing report at the end of television newscasts appears to have been instituted in an effort to counteract adverse emotional reactions to preceding distressing reports. There is an indication that these efforts are effective. In an experimental investigation that was conducted by Zillmann and his colleagues (1994), respondents were exposed to a broadcast of a series of reports that presented threatening, depressing national and international issues. The newscast was varied only in that it either ended with a threatening report or featured an added-on human-interest story. Respondents evaluated the threats upon conclusion of the entire newscast. It was found that the concluding addition of an entertaining and amusing report altered the retrospective assessment of the threats. Specifically, after being amused by the concluding report, respondents deemed the national and international threats that were presented earlier to be less severe and less depressing.

Reports of the misfortunes and suffering of others need not result in depressive emotions, however. They may evoke indignation and outrage or feelings of pity. These reactions, in turn, may instigate social action that is aimed at correcting the deplored conditions. A case in point is the news coverage of the famine in Somalia during the early 1990s. In particular, the barrage of images of starving and deformed Somali children is believed to have greatly upset American viewers and compelled them to action. In fact, the resulting public pressure on the government to intervene in Somalia in order to end starvation is believed to have driven, if not dictated, foreign policy (Sharkey, 1993).

Moreover, conditions exist under which news reports of the setbacks, misfortunes, and suffering of others evoke joyous rather than depressive reactions. It has been demonstrated that negative affective dispositions (i.e., disrespect, contempt, resentment, anger, and the like) toward publicly known people are commonly held and motivate pleasure in response to news revelations of the misfortunes of such people (Zillmann, Taylor, and Lewis, 1998). Some politicians, for example, may be disliked, even despised and hated, and these dispositions may foster euphoric reactions to news about their demise. Analogously, negative dispositions that are manifest in the news recipients' opposition to particular political causes and social objectives can foster reactions of joy upon learning of failure by, and the devastation of, the opposed parties.

The emotions of the public in response to news about the misfortunes and suffering of others thus should not be expected to be uniformly negative. Because emotional reactivity is mediated by affective dispositions toward the parties whose bad fortunes are reported in the news, reactions of either distress or delight may be expected as a result of the status and intensity of prevailing dispositions.

See also: Arousal Processes and Media Effects; Minorities and the Media; Mood Effects and MEDIA EXPOSURE; NEWS PRODUCTION THEORIES; SOCIAL CHANGE AND THE MEDIA; SOCIAL GOALS AND THE MEDIA; SOCIETY AND THE MEDIA.

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DOLF ZILLMANN

NEWSPAPER INDUSTRY

At the same time that the debate over the structure and effects of the emerging global media industry is being influenced by the values that are most represented by newspapers, the newspaper industry is in what appears to be an almost certain and inevitable decline. Although there is substantial evidence to refute the charges that the industry is a "dinosaur" and in terminal danger, there is little doubt that the relative importance of the newspaper as an information conveyer, a public policy agenda-setter, and an economic power is declining.

Indications of decline have been around since the nineteenth century. Some people in the 1830s criticized the change that transformed newspapers from expensive business, political, or literary publications (limited to elite audiences) into inexpensive, advertising supported, mass media. Certainly, the pejorative terms "yellow journalism," "tabloids," and "jazz journalism" were part and parcel of the criticism that newspapers had lost their way in the 1890s and 1920s. Of course, these are qualitative judgments that neglect the power of newspapers' importance in cultural development, particularly in the pretelevision era. This power can be seen in the contributions that newspapers have made in the struggle to expand literacy, create a common language and national culture, argue for social and political reform, entertain the masses, encourage and implement technological change, and develop the most important of all journalistic values-the hallmarks of objectivity, fairness, the watchdog function, and civic responsibility.

A Future for Newspapers?

In addition to the qualitative criticisms that have long been made about the newspaper industry, discussions of the decline of the newspaper follows one of the most conventional wisdoms in media analysis. This is that the combination of digital and online communications and the World Wide Web component of the Internet, in particular. will become *the* conduit for virtually all forms of mediated communication that are delivered in homes and based on the specific desires of the user. Although there is not yet enough distance between diffusion, adoption, and use of new technology to be sure of this "wisdom," traditional mass communication vehicles such as the newspaper and broadcast television clearly are making efforts to adapt to changing circumstances. As is common, old media adapt to new media, but they do not disappear.

There will continue to be print newspapers in the future. They will exist along with many other forms of digital media that are brought about by technological diffusion and economic policy decisions. The qualities of ease of use, reasonable cost, and utility will still be relevant for the preservation of newspapers in the digital online era.

However, the ongoing redefinition of media communication cannot be reversed, and it will have enormous effect on all aspects of the newspaper industry. The brand name of many newspapers will be used in virtually every media form. The websites and the cobranding arrangements with local television and radio, which are becoming ubiquitous, will continue and expand. As is increasingly clear, the newspapers that prosper will increasingly generate revenues as electronic conduits or portals for information and entertainment in various forms. An increasing number of people will choose to have their "newspaper" delivered electronically, and many of these people will print out a hard copy. Journalists will see their work presented in various formats and will increasingly be trained to be writers and multimedia producers. A considerable number of "users" (a more accurate term than "readers") will choose to design and edit their newspapers, individually emphasizing only the content that they choose. Advertising will be targeted according to these choices, as well as the demographics and psychographics of the audience.

Traditional versions of newspapers that offer a little something for everyone will become more expensive, as the consumer has to pay for the privilege of being in a niche group that depends on or prefers a carefully edited product with a diversity of information. As is the case with magazines, careful testing of consumer cost and advertising mix will become more important for newspapers as they seek to maximize desirable audiences for sale to advertisers and to eliminate undesirable audiences (i.e., those who have little or no value for advertisers).

As for content, print newspapers are likely to become increasingly local in orientation in a continuation and enhancement of the trends toward suburban metropolitan zone newspapers and such movements as civic journalism. National news is likely to get minimal attention, as it will be so readily available from other media sources. However, analysis and interpretation of all types of news are likely to take up even more space, as will local sports, entertainment, and lifestyle information. Moreover, more and more material is likely to be bylined by highly paid and heavily promoted "stars" who can help the print newspaper stand out as an important "brand" among a glut of competitors for the attention of consumers.

These relatively mild predictions are based on the acceleration of existing trends, many of which came into existence with the advent of television. As is the case with almost all media, as the newspaper has peaked in terms of influence and faced the challenge of new competition, it has had to refocus and, to some degree, specialize. Although this seems economically necessary, too much or the wrong type of specialization has a high cost for newspapers—the loss of identity as a mainstream medium.

What Is the Newspaper Market?

Tables 1 and 2 provide snapshots of the status of the U.S. newspaper industry. In many respects, the industry is financially healthy and culturally influential. Despite the evident decline in the percentage of Americans who read a daily newspaper, more than half continue to read a daily. Although the number of daily newspapers is decreasing, the ones that remain are, in most cases, left in a dominant if not monopoly position within their markets. Because of their ability to offer a blend of classified, local, and national advertising of various types at a reasonable cost, daily newspapers still generate about 25 percent of all U.S. advertising revenues.

Two of the major trends in newspapers since the 1950s have been the lessening of competition and consolidation of ownership. Newspaper chains own about 80 percent of all daily newspapers, with the largest chains, in terms of total circulation (Gannett, Knight-Ridder, Newhouse, Times Mirror, New York Times), also typically having ownership interests in other media, including various forms of television and online ventures. Perhaps instructive of the future of media consolidation is that the largest newspaper group in assets as of the mid-1990s was Capital Cities/ABC (a part of the Walt Disney Company), which generates most of its income from nonnewspaper media and entertainment activities.

Here, as in most accounts of newspapers, the large metropolitan daily newspaper is given the most attention for the obvious reasons of its economic position and social influence. However, there are other forms of print newspapers that

Year	Number of Dailies	Number of Sundays	Daily Circulation (in millions)	Sunday Circulation (in millions)
1950	1772	549	53.8	46.6
1960	1763	563	58.9	47.7
1970	1748	586	62.1	49.2
1975	1756	639	60.7	51.1
1980	1745	736	62.2	54.7
1985	1676	798	62.8	58.8
1990	1611	863	62.3	62.6
1995	1533	888	58.2	61.2
1998¹	1489	898	56.2	60.1

TABLE 2.

Year	Men	Women	All Adults
1970	77.5	77.8	77.6
1975 ¹	73.2	71.4	72.3
1980	69.2	64.8	66.9
1985	67.1	61.6	64.2
1990	64.5	60.5	62.4
1995	63.1	56.0	59.4
1998 ²	62.2	55.2	58.6
1999 ^{2, 3}	_	_	56.9
2000 ^{2, 3}	_	_	55.1
 ¹ Combined ² Top 50 mail ³ Fall quarter 	data for 1974 and 1 rket data only. ^r only.	975.	

should be considered in any overview. Robert Picard and Jeffrey Brody (1997, pp. 8–10), for example, define nine "general categories" of newspapers, with an example of each:

- 1. international and national daily newspapers (*USA Today*),
- 2. metropolitan and/or regional daily newspapers (*Pittsburgh Post-Gazette*),
- 3. local daily newspapers (North Hills News Record),
- 4. nondaily general audience newspapers (small towns and alternative city newspapers such as *In Pittsburgh*),
- 5. minority newspapers (New Pittsburgh Courier),

- 6. newspapers that are published in secondary languages (*El Diario-La Prensa*),
- 7. religious newspapers (National Catholic Register),
- 8. military newspapers (on most major bases), and
- 9. other specialty newspapers (Baseball Weekly).

Not included here are the free shoppers that increasingly have suburban or neighborhood news in addition to many local advertisements. These categories are helpful in reminding people that a newspaper can be many things and has strengths of convenience and cost that will ensure a future for print. They also remind people, by their continuing success, that specialization works in print as it did in motion pictures, radio, and, increasingly, television. As the "mass" in mass communication continues to be redefined as a mass of people who are making use of various specialized or niche media, this will become more and more important.

The various types of newspapers are also commonly used by media economists, such as Picard and Brody (1997) and Stephen Lacy and Todd Simon (1993), to demonstrate via the "umbrella model" that even with fewer than 2 percent of communities having competing newspapers, there is a competitive market for newspapers because most Americans have easy local access to several different types of newspapers.

The U.S. newspaper industry employs about 500,000 people who work in editorial, advertising, circulation, production, or other types of business operations. Technology and the consolidation of operations, along with a decrease in the number of newspapers, leads to a relatively gloomy U.S. government assessment of employment prospects, particularly in the newspaper reporter workplace. According to the U.S. Bureau of Labor Statistics (1999), employment in this area is expected to continue to decline for print newspapers. However, the bureau concludes that "online newspapers and magazines should continue to grow very fast and create numerous job opportunities."

Eras and Adaptations

The U.S. newspaper industry faces major issues about its place in the American economy and in the hearts and minds of the public. This is not the first time that this has occurred. The first "end of an era" occurred with the corresponding development of broadcast news and the suburbanization of the United States, which eventually relegated the newspaper to a secondary medium for an ever-increasing number of people. Tables 1 and 2 show that the trend is continuing with a shrinking, albeit still substantial, percentage of the population being regular newspaper readers and an overall circulation that is beginning to slip noticeably. Another particularly ominous concern for newspapers is that younger people do not read newspapers regularly, and they show little inclination to become regular readers as they age. In a report prepared for the Newspaper Association of America, Stu Tolley (1999) presents data that suggests that if this trend is not reversed, the audience for daily newspapers will decline to zero in the latter part of the twenty-first century.

Despite their decline as the primary news source since the 1950s, newspapers were able to adapt well to a changing media environment by using such tactics as increasing industry consolidation and group ownership, switching to mainly morning publication cycles, getting the government to legalize joint operating agreements (JOAs), offering more specialized content, increasing the amount of analytic and opinion pieces, and upgrading the graphics and visuals. In addition, the newspaper industry was able to maintain a major, if no longer dominant, position as a national cultural power through its continuing ability to set the agenda for issues by helping to define what was newsworthy and by setting the standards of what constituted proper journalistic practice. These standards have long been the foundation of journalism education in the United States, and they follow students into various media positions. In addition, many radio and television stations continue to rely on major newspapers to set the agenda for what they are going to cover.

A look at the data in Tables 1 and 2 demonstrates that as long as broadcasting was the primary competition for news consumers, the newspaper industry did extremely well economically and in reaching the masses. Despite the many critics who believe the marketing orientation of the newspaper business has compromised its ability to serve the public properly, this type of orientation has been essential in keeping the industry economically strong in the face of considerable adaptation and change. The newspaper industry, and for that matter the entire media industry, in at the end of another era. The twin "Cs" of economic consolidation and technological convergence are changing the traditional role and nature of media in ways that are difficult to predict. However, one thing that is very clear is that the dividing lines between once disparate media, such as the telephone and the television or the television and the newspaper, are fading in importance to users, media owners, and policymakers. The end result is that the newspaper increasingly is becoming just another platform for a rapidly developing global media oligopoly, losing much of its distinctiveness.

Another obvious result of consolidation and convergence is the increasing number of information and entertainment options that are available to the average person. The number of options dwarfs the competition that newspapers have previously had from electronic media. To stand out and maintain distinctiveness as a major medium in such a crowded landscape is *the* major issue for the newspaper industry.

Beginning in the mid-nineteenth century, newspapers ushered in the era of mass communication and relatively democratic access to news and information. Their low cost, easy availability (at least in urban areas), and mass appeal content, all spurred by the growth of industrial capitalism and the accompanying rise of mass advertising, made the newspaper a powerful instrument for the setting of civic agendas from the municipal to the federal level. Newspapers were often involved in campaigns against perceived social ills and for social improvements. They were powerful enough forces in American life to contribute to the development of local civic identities, the leveling of cultural differences, and the development of a distinctive American culture. They have reflected and sometimes helped to create local values, and, in many cases, they themselves became important business and cultural institutions within their market areas. At the same time, standardization of industry operations and techniques, the development of wire services and syndicates, the corporatization of ownership, and the national expansion of advertising helped to develop a set of national media values that are associated with journalism.

Despite the relatively successful adaptation of newspapers to broadcasting, the pretelevision era

is likely to be regarded as the heyday of newspapers. This was the time when the newspaper *was* the news for the vast majority of the population. It was a time of enormous political and economic power for the industry, as politicians and businessmen sought favor and support from major newspapers in a way that has since become more common for television. It was also a time in which the industry codified standards of journalistic practice in professional codes, trade associations, and higher education. The newspaper industry will never again be as prominent in the United States or in the world. There are several interrelated reasons for this assertion.

First, broadcasting and especially television took away the immediacy of the newspaper, one of its fundamental reasons for being. Ever since the 1950s and 1960s, Americans have looked more to television as their primary news source. The Internet and other newer communication technologies expand the competition to an unparalleled degree.

Second, television in its various forms (i.e., local, national, syndicated, broadcast, cable, satellite) has consistently chipped away at the leading position that newspapers hold in the generation of advertising revenue. Although daily newspapers continue to generate more advertising revenue than any other medium, their percentage continues to decline as new forms of television and the Internet are increasingly able to compete for the lucrative local display and classified advertising that has long been the major strength of print newspapers.

Third, the newspaper industry is beginning to see the firewall between editorial and advertising dissipate, as marketing becomes a primary mantra for the industry and newspapers work to service better their primary customer—the advertiser. Although this is also true of other media, the cost is much higher for newspapers because of their position as the originator and keeper of such values as objectivity and the watchdog function. In allowing the erosion of the firewall, the newspaper becomes just another medium, just another platform for the display of commercial messages, just another media commodity.

Fourth, the Internet is a decidedly mixed blessing for the industry. It certainly does provide a critically important new distribution system and potential revenue center. Of course, this would not be all that important if the Internet did not provide the outlet for all sorts of new competition for the newspaper. There are two particularly important effects that the Internet has on newspapers. First, it is rapidly developing the capacity to serve local display and classified advertisers at reasonable cost with increasing market penetration in a visual and interactive fashion that is impossible for print to replicate. Second, while many newspapers have been early adopters of Internet publishing, they are forced to compete in a more direct way with the many other content providers that do not have "roots" in the newspaper business. Although the brand equity of many newspapers is substantial and certainly lends credibility to Internet efforts, the World Wide Web makes other providers functionally equivalent for many readers and consumers. For example, CNN's website looks and reads very much like many newspaper-operated sites. The distinctiveness of the newspaper as a print medium and the cultural cache that it carries (e.g., literate, thorough, for the thinking person) versus television and its traditional cultural baggage (e.g., headline service, shallow, emotional appeals) is being obliterated by the Internet.

Fifth, the newspaper industry faces a continuing dilemma in terms of purpose and function. The trend of specialization in media, which was set in motion with the introduction of commercial television, continues to accelerate as advances in digital technology and the Internet provide a seemingly ever-increasing number of specialized and navigable "channels" for many Americans. Although the newspaper industry has reacted to this with increased internal specialization for zoned editions, the newspaper remains so amorphous (with "a little something for everyone") that it continues to decline in relevance for a public that is increasingly offered more specialized content in virtually all competing media. However, the traditional daily newspaper is constrained in making more radical changes toward unit specialization (i.e., all content on a similar subject or appealing to a specific audience target). To move in this direction would seriously risk both its financial well-being (by alienating traditional advertisers and readers) and its cultural capital (by compromising its position as a relatively objective "voice" of the community). This dilemma has led to much soul searching within the newspaper industry as it struggles to maintain its position. At

the same time, there is little doubt that the biggest success stories in the industry are related to those newspapers that serve smaller and, at least geographically, specialized audience segments.

The Newspaper Legacy

The importance of print newspapers is fading, but they will remain influential far into the future. This will be true even as the distribution system evolves into some form of online digital transfer for an increasing number of users. The hope is that this will also be true even as the newspaper becomes more commodified as a constituent part of a complex and increasingly global multimedia entertainment and information industry. Print is too convenient a form to disappear completely, and newspapers have built up such strong brand equity that they will be able to extend their brand in both print and electronic forms. In addition, the vitality of specialized print publications will continue to provide much traditional reading material to the public.

Perhaps more important, the values and traditions of civic responsibility that were developed primarily in and by the U.S. newspaper business are infused to one degree or another in all American mass media (and for that matter, much international media), they form the basis of the educational system for newspaper workers, and they often frame the debates about the proper function and structure of all communication industries. Included here would be the tension between economics and service or, more specifically, between the seeking of ever-higher profits and the role of public forum that newspapers have, at times, provided. Unlike the electronic media, with its public-interest roots in transportation law and policy and the concomitant emphasis on licensing and regulatory oversight, the U.S. newspaper has a direct link to the U.S. Constitution and the philosophers who influenced it. As explained by Lacy and Simon (1993), this is one of the keys to the intellectual market of newspapers. In fact, without the newspaper and its print "brethren" (e.g., one-sheets, pamphlets, books), many of the ideas that influenced the Constitution would not have been disseminated as powerfully and as rapidly as they were. The newspaper in the United States has, with few exceptions, been the commercial media form with the greatest influence in promoting relatively free and democratic speech.

This legacy is more important than ever in a time when complex shifts are occurring in the dynamics and definition of mass communication and media. Major media firms increasingly have holdings in various media forms and in various parts of the world. As television and online communications become one, and as newspaper content becomes available to new audiences through the Internet and other technology, differences between media—in terms of form, mission, and national orientation—have the potential to narrow and be subsumed by purely revenue-generation goals.

Using the values and traditions of U.S. newspapers to frame the argument is perhaps the best and only way for interested citizens and media professionals to work toward the goal that the newspaper first promised and that newer communication technologies have the potential to deliver. These values and traditions include the insistence on fairness in coverage, public participation in the information forum, and limits on government or corporate power over media. The challenges obviously are staggering. Much of media history is riddled with promises that were either unfulfilled or subverted. However, to give up or not even try is more than acquiescence. It is a subversion of the original ideals of the U.S. newspaper industry.

See also: Internet and the World Wide Web; Journalism, History of; Journalism, Professionalization of; Newspaper Industry, Careers in; Newspaper Industry, History of; News Production Theories; Technology, Adoption and Diffusion of.

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ROBERT V. BELLAMY JR.

NEWSPAPER INDUSTRY, CAREERS IN

Careers in the newspaper industry offer a breadth of opportunities from story composition to publication layout to advertising design. The reporter is the most basic unit of a newspaper staff. Reporters serve as the eyes and ears of the newspaper and its readers. General assignment (GA) reporters cover any type of news from city council meetings to murder trials. Beat reporters are assigned to focus on specific topics, such as the local textile industry or school news. A key difference between the two types of reporter is that beat reporters typically generate their own stories while GA reporters are tipped to breaking news.

In addition to reporters, newspapers employ other types of writers. Investigative journalists spend days or months sorting through facts in an attempt to find and uncover news. Columnists write specifically about topics that are important to them, and they are allowed to mix personal opinions with facts. Finally, editorial writers, similar to



The prominence of computers in the offices of London's Daily Mirror underscores the necessity for newspaper editors and writers to have a strong computer background or at least a high degree of computer literacy. (Adrian Arbib/Corbis)

columnists, express personal stances on social issues that are of interest to readers. Editorial writers are under no obligation to present both sides of an issue, and they commonly promote a stance that is taken by the editorial board of the newspaper.

Newspapers also employ staff other than writers. Photojournalists tell stories through photographs, relaying the relationship between individuals and events to readers by supplying images to go with the copy. Editorial cartoonists offer humorous and often satirical comments on society through combining artistic skill with a critical eye. Overseeing writers, photographers, and design artists are various types of editor. Editors coordinate news activities by assigning stories, scrutinizing copy, and overseeing layout for final publication. Assisting with the editing function are copy editors and proofreaders. Copy editors are usually entry-level employees who read manuscripts for errors in grammar, spelling, punctuation, and style. Additionally, they check facts and occasionally assist in layout. Proofreaders serve much the same function but are more concerned with comparing materials that are ready for printing against the edited manuscripts from which those materials were created. Once materials have been edited, page and layout designers manufacture the newspaper using copy, headlines, photographs, graphics, and advertisements. Ultimately, layout staff serve a unique

journalistic function in that they control the means by which information is disseminated.

In addition to these careers that are traditionally associated with the industry, newspapers also employ people in advertising sales and circulation departments. Because advertising is responsible for up to 80 percent of the revenue of a newspaper, the advertising staff is vital. Advertising staff employees oversee local and national advertising sales as well as the classified advertisements department. Also, on many newspaper staffs, the advertising department often designs local advertisements. In the circulation department, employees must coordinate street sales, home delivery, and mail subscriptions. Working in the circulation department also entails developing marketing campaigns and subscription promotions.

Outside of local opportunities that are available for a journalist, some careers in the industry allow the reaching of a wider audience through news organizations, regional publication of national newspapers, and syndication. News organizations establish bureaus in various locales, cover the news as it occurs in the area, and then sell stories and photographs to newspapers that are unable to send correspondents to the location. The Associated Press, for example, is a news organization with 3,500 employees working at 240 worldwide bureaus. More than 1,500 U.S. newspapers subscribe to the service of the Associated Press. Certain national newspapers also establish bureaus to facilitate covering of regional news and attracting of wider audiences. For example, The New York Times has twelve national bureaus and twentyseven foreign news bureaus. In addition, the national edition of The New York Times is printed at ten sites throughout the United States, providing additional career opportunities. Finally, columnists on large newspapers often sell their columns to other newspapers via syndication.

Preparing for a career in any of the copy-production positions on a newspaper staff or in a news organization typically involves training in news reporting. Because reporters make up the majority of newspaper staffs, most entry-level employees begin their careers as reporters. These employees are expected to have earned a journalism degree or a degree in English with extensive training in writing for the press. More than four hundred colleges and universities offer journalism degrees consisting of three-fourths liberal arts classes and one-fourth journalism classes such as basic reporting, copy editing, and media law and ethics. A college degree in journalism alone, however, is often not enough to land a job on a newspaper staff. Increasingly, entry-level employees are expected to have experience working for the press. School newspapers and internships afford media students the opportunity to apply classroom knowledge to a real-life press environment. Students should make an effort to garner this experience before entering the job market. While photojournalists and layout specialists may not anticipate a career in producing copy, the entrylevel requirements are not dissimilar from those of reporters. Journalism degrees and experience again are prerequisites for these careers.

Individuals who are aspiring to editorial positions normally begin their careers as reporters or copy editors and advance through the ranks of the staff. A typical newspaper has a number of editors, beginning with copy editor and progressing up to department or section editor to managing editor to editor-in-chief. The normal succession to the top editorial post involves stops along the way at the various sublevels. With each increasing level comes more responsibility for managing subordinates. Also, as editors advance through the newspaper hierarchy, a wide breadth of knowledge is imperative. Students hoping to become editors would do well to pursue a double major in college with a focus in political science or economics to complement their journalism training.

Employees who are working in advertising sales offices typically also have a background in journalism and an understanding of how a newspaper works. Again, journalism degrees are common, as are degrees in advertising and marketing. Employees working in upper-level circulation positions also are expected to have journalism training in addition to marketing skills. Just as internships provide practical experience for other staff, those aspiring to a career in newspaper advertising or circulation should acquire a working knowledge of the business before seeking employment.

See also: EDITORS; NEWSPAPER INDUSTRY; WRITERS.

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COY CALLISON

NEWSPAPER INDUSTRY, HISTORY OF

The creation of movable type marked the beginning of mass production of the written word and thus was essential to the newspaper industry's development. In general, this accomplishment is credited to Johannes Gutenberg, who was working in Mainz, Germany, in the mid-1400s. Other printing techniques existed prior to that time, including a form of movable type in Egypt and other areas of the Mediterranean. In 1295, Marco Polo brought Europe word of advanced printing techniques that were being used in Chinese. Furthermore, the Aztecs of South America hung colored banners in their main public squares to spread the "news" without the use of Gutenberg's or anyone else's "modern" technology. Still, when Gutenberg produced his movable type, the process of information dissemination underwent a revolution.

What, specifically, was Gutenberg's revolutionary invention? Gutenberg had used woodcuts to print pictures and came up with the idea of carving letters in wood and moving them around to create words that, when coated with ink, could be used to print. A worker whom Gutenberg hired suggested that wood would produce blurry letters and that using metal letters might work better. The rest, to use a cliche, is history. Using this new process, Gutenberg printed the Mazarin Bible, which is believed to be the first full book to be published. Without the ability to mass produce the written word, the process of disseminating the news would not have been able to become an "industry." Centuries later, the basics of the movable type that Gutenberg had created were still in use in England's North American colonies.

Colonial America

Public Occurrences, published by Benjamin Harris in 1690, is recognized as the first newspaper in what later became the United States. Although Harris intended the newspaper to be a monthly, it was published only one time. Harris failed to submit his newspaper for government censorship, so it was shut down. The first newspaper to be published on a regular basis in the colonies was the *Boston Newsletter*, which appeared from 1704 to 1719. It was a weekly and its editor was also the local postmaster, John Campbell.

The survival of a newspaper in the American colonies was contingent upon the government. The editors almost always were printers first-the concept of journalism as it is known today did not develop until much later. Printers had to import their presses from England or Germany because none were made in the colonies. In addition, the patronage system existed where the printers relied not on money from advertising and circulation but rather on money from the government in order to print messages to the citizenry. Because their principal income was provided by the government, printers had little incentive to print dissenting opinions or to take on political issues. The early newspapers also served the needs of commerce. Goods being shipped from England to the colonies were important, so newspapers would print information about what was going to arrive and when. Boston, New York, and Philadelphia were the areas that served as the centers for commerce, politics, and education during this period, so they were also the primary locations in which printers lived and worked. The paid circulation, even of the largest newspapers, during the colonial period was only in the hundreds-with a large number of people reading a single copy that was from one person to another. About 70 percent of the males in the colonies in the early 1700s were literate, but even the illiterate people could benefit from newspapers if they gathered in public places to hear a literate person read the newspaper aloud. Along with schools and churches, newspapers and books were the main educational tools and entertainment in the colonies.

Some history books emphasize the conflicts between the colonists and the English government—and obviously that conflict eventually led to the independence of the colonies—but the majority of printers during the colonial period were very timid. They were afraid of the potential financial ramifications of losing the work that was involved in printing government announcements,



An undated illustration depicts the public burning of issues of John Peter Zenger's Weekly Journal on November 6, 1734. (Bettmann/Corbis)

and they were afraid, in the worst case scenario, of losing their official licenses to publish. James Franklin's New England Courant (1720) was one of the first newspapers in the colonies to criticize the government while operating without a license. Franklin challenged the government's program of forcing citizens to get inoculated against smallpox. It was not that Franklin was adamantly against inoculation; it was more about Franklin struggling for authority and freedom in an effort to gain power. He was jailed on contempt charges but resumed his activities upon his release from incarceration. He was forbidden from ever printing the Courant again without a license, but when the government pressed its case, a grand jury would not endorse the charges (i.e., indict him). As a result, the law that required printers in the colonies to purchase licenses remained on the books, but it no longer could be enforced. Thus began the principal of no prior restraint by the government.

While the licensing of newspapers became all but ignored, laws that pertained to seditious libel

remained. The most often cited case that led to the concepts of freedom of the press and freedom of speech involved John Peter Zenger, the printer/editor of the *New York Weekly Journal*. Zenger started the *Journal* in 1733, and in 1735, he was charged with seditious libel. Zenger wrote that the colonial governor William Cosby was corrupt, greedy, and tyrannical, among other things. Zenger's attorney, Andrew Hamilton, did not dispute the nature of the charges; instead, he argued for the freedom of the colonies. After only ten minutes of deliberations, the jury found Zenger not guilty. Although the seditious libel law remained on the books, the government shied away from prosecuting such cases.

As the unrest in the colonies increased in the latter part of the 1700s, the colonial press changed. Newspapers emerged as the most important forum for information exchange. There were around thirty-five newspapers in existence prior to the American Revolution, and there were around thirty-five operating after the war-although they were not the same newspapers; some had gone out of business, and others had sprung up to take their place. The debate, between 1765 and 1775, over what direction the colonies should take was carried out in large part through newspapers. Unlike the objectivity ideal that surfaced in the late 1800s and early 1900s, neutrality was not accepted. The so-called Patriots (or Sons of Liberty) tolerated neither neutrality nor pro-English stances by newspapers. With the Tories pledged to continue loyalty to the British Crown and the Whigs upset over British economic sanctions, the Patriots' goal was to win over the Whigs. Therefore, the war had certainly started with words-largely published in newspapers—long before the first shot was fired.

Sam Adams was essentially the Patriots' propaganda minister. Adams published an account of the Boston Massacre, where six colonists were killed in an exchange with the British, in the *Boston Gazette*. His account painted a picture of British thugs and criminals slaughtering innocent citizens. Other publications, which technically cannot be described as newspapers, also helped in creating dissidence in the colonies.

Post-Revolutionary Partisanship and Technological Advancement

Historian James Mott has described the years following the American Revolution, specifically

from 1789 to 1814, as the "Dark Ages of American Journalism." Mostly, Mott abhorred the fact that the partisan press was allowed to exist after the revolution. Others see the period as an extremely exciting time for newspapers and the country. The great debate between the Federalists and the anti-Federalists (or Jeffersonians) about what kind of government would be best for the fledgling country eventually led to the passage of the Bill of Rights, but the debate did not end there. Most historians agree that much of what was printed in the way of political debate during this period was mean spirited and that neutrality still was not tolerated. Editors would often walk the streets with canes, and some were known at times to beat on rival editors because they had alleged printed lies.

Meanwhile, until 1832, no political conventions were held; instead, candidates were nominated through the newspapers and spoke through the newspapers. The newspapers wielded an amount of political power that they had never had before and have never had since. From 1789 to 1850, the newspaper was virtually inseparable from the political system. By 1840, some separation was occurring. For example, William Henry Harrison became the first presidential candidate to make a public address. Still, for the most part, candidates made their statements through newspapers.

Meanwhile, technological advances allowed newspapers to be produced cheaper and more easily. In the 1820s, printers made a discovery that wood pulp could be used to create paper. In the 1850s, some of the larger newspapers adopted a new stereotyping process that allowed multiple copies of the same page to be printed at the same time. By 1861, R. Hoe Company designed a rotary press that took advantage of the stereotyping process and made the printing process even faster. In addition, the company's later "web perfecting press" was able to deliver thirty thousand copies of an eight-page newspaper in one hour. The "web" referred to the continuous roll of paper, and "perfecting" referred to printing on both sides of one sheet of paper at the same time.

The distribution of newspapers also benefited from advanced technology. In the beginning, newspapers could only be delivered over short distances. However, in 1875, the Pennsylvania Railroad started operating, which allowed newspapers from New York and Philadelphia to be distributed as far west as Chicago. Further, the telegraph was introduced in 1841, which allowed quick communication between distant cities, and in 1878, the first telephone exchange was created in New Haven, Connecticut. Because the telegraph had instantly become popular with newspapers, the change to using telephones was not considered to be necessary. Therefore, the telephone did not supplant the telegraph for use in newsgathering activities until several years after it had already become popular with the public.

The Penny Press

In 1833, a dramatic shift began in the newspaper industry caused by new technology and the changing world. Benjamin Day's printing business was on the decline, so he decided to put together a newspaper that concentrated on local happenings and news of violence. He decided that the newspaper would be sold on a per-issue basis and financed with advertising. The result was the New York Sun, which became the first of the so-called Penny Press newspapers. After the first six months of publication, the Sun had a circulation of eight thousand, and by 1837, the circulation had risen to thirty thousand, which was more than the total of all other New York newspapers combined. The Penny Press was quite different from anything that had existed before. Many historians see the Penny Press as the birth of the modern newspaper. They were sold for one penny per issue (giving them their name), directed toward the common person, hawked by street vendors (i.e., newsboys), financed through advertising (many of which made fantastic claims about patent medicines), and written by local reporters who were paid to provide news. Editors were no longer printers who simply published newspapers as a side business; editors were fully dedicated to the newspaper business. In addition, editors became more concerned about delivering the news rather than opinion-a decided shift from earlier years.

While it was not the first Penny Press newspaper, James Gordon Bennett's *New York Herald* (first published in 1835) certainly became the most innovative Penny Press newspaper. Bennett relied on crime stories and sensationalism, and he had no equal in this area. Bennett pushed the envelope more than anyone else did at the time. For example, he arrived at murder scenes and wrote vivid descriptions of the corpses. As a result, he became a kind of social outcast, and in the 1840s, what is described as a "moral war" was waged against him. Bennett did not hesitate to use terms such as "pants," "shirts," "legs"—all of which were socially unacceptable terms to put in print at the time. People boycotted his newspaper and asked hotels to dispose of it, but Bennett won out; people kept buying and reading.

It would be unfair to characterize Bennett strictly as a "tabloid" journalist. He was innovative and created many journalistic practices that continue to be used. He opened a Washington, D.C., bureau for his newspaper in 1841. He created the country's finest financial page for business people. He created a "letters" column, printed comments from readers, carried a review column, and published society news. Bennett eventually offered sports news and religious news in his newspaper. He even hired news correspondents to cover Europe, Mexico, and Canada. As a result of his sensationalist style, Bennett dealt with an increasing number of libel suits, but he was still feared by politicians and businessmen because the newspaper's popularity provided Bennett with a considerable amount of power.

The Penny Press expanded quickly to Philadelphia, Baltimore, and many other cities, but the most significant expansion was to the west. Horace Greeley, who owned the New York Tribune (first published in 1841), rejected sensationalism, and, as a result, his newspaper was always behind the Sun and the Herald in terms of circulation numbers. However, it was his weekly edition of the Tribune that essentially became the first national newspaper-circulated to the western frontier. Greeley considered his newspaper to be an intellectual publication for the non-elite, and he was ahead of his time in believing that all people-white and black-could share in the prosperity of the country. He is often credited with the phrase "Go West, young man, go West." As in the old colonial press days, newspapers in the western frontier needed to publish notices and information about new laws that had been passed by the government. Greeley recognized the growing literacy in the population and took seriously these people's need to know what was going on, as well as their need for entertainment. He became known as the "father" of the editorial, promoting various political or partisan points of view, much as had been done in the years previous to the creation of the Penny Press. Further, Greeley practiced the art of boosterism, singing the praises of the city, town, or state in which the newspaper was going to be circulated.

During the peak of the Penny Press era, Henry J. Raymond started *The New York Times* (first published in 1851), which would become arguably the best newspaper in the United States. This newspaper was more expensive to produce than the Penny Press newspapers, and it served a higher calling. Raymond considered the newspaper to be an outlet for social concerns, a watchdog over business and government, and he focused on specialized coverage of society, arts, religion, and international news. *The Times* highlighted decency in reporting and has continued to maintain that theme.

Photography

Technological advancements in the 1800s allowed for some dramatic changes in the way in which newspapers looked and marketed themselves. Linotypes (typesetting machines) and faster presses, striking typography and layout, color printing, cartoons, and photographs all allowed for editors to make a more vivid, eyecatching newspaper. One of the most important developments occurred in the area of photography. In 1837, Louis Daguerre invented positive photographic plates that allowed, for the first time, the creation of readily usable photography. However, the process required twenty to thirty minutes of exposure time, and no copies could be made. William Henry Talbot and Sir John Herschel, between 1837 and 1840, developed the Collotype Process, which allowed for multiple prints under a positive-negative process. In 1851, Frederick Archer created the Collodion Wet Process, which used glass negatives and required a much shorter exposure time of twelve minutes. In 1871, Richard L. Maddox created the Dry Plate Process, which cut exposure times to seconds. This series of developments, among other refinements in photography, made it easier for photographs to be taken and reproduced.

The U.S. Civil War is recognized as the first war to be thoroughly covered with the use of photographs. Mathew Brady is credited with chronicling the war through pictures. Brady had been a portrait photographer in New York, but in July 1861, he received permission from Union commanders to accompany the troops at his own expense. Brady put together traveling darkrooms that consisted of photographic plates, plate holders, negative boxes, tripods, and cameras. As a result, Brady is credited with bringing the "terrible reality" of the war to the country's "dooryard." Although there was no demand for his photographs after the war and Brady died in poverty, the thirty-five hundred photographs that he and his crew produced are now considered to be a national treasure.

Twentieth-century developments in photography made the use of photographs in newspapers easier and more economical. In 1912, faster film was developed for use in the Speed Graphic camera, which was also smaller. The Speed Graphic, which used 4-inch by 5-inch film, became the standard for newspaper photography for nearly fifty years. The 35-mm camera first appeared in the 1920s, but it was initially less reliable and more difficult to use effectively than the Speed Graphic. On the positive side, the 35-mm camera had a faster lens and used more sensitive film, both of which eliminated the need to have subjects pose and allowed for the creation of informal, realistic, nonintrusive photographs.

Yellow Journalism

Toward the end of the nineteenth century, a form of journalism known as "yellow journalism" (or "new journalism") emerged. This new form of journalism was typified by unethical and unprofessional tactics that were used primarily to boost circulation. The newspapers of Joseph Pulitzer and William Randolph Hearst were the most prominent practitioners of this style. Pulitzer left the St. Louis Post-Dispatch in 1883 to move to New York and take over the New York World. Borrowing from the advances that had been made by Day and Bennett, Pulitzer added the innovations of short news clips, columns, large headlines, and the use of a worldwide news service. Pulitzer managed to reinvent himself before his death (lending his name to the most prestigious journalism award in the country-the Pulitzer Prize), but early on he led the way in sensationalized irresponsible journalism. For example, eleven people were trampled to death on a pedestrian walkway next to the Brooklyn Bridge in May 1883. Keeping in mind the newness of the bridge, the headline on Pulitzer's newspaper read, "Baptized in Blood." In 1895, Hearst took over the New York Journal and raided Pulitzer's staff. One of the most sensational quotes to be attributed to Hearst during this



Mathew Brady's photographs of the Civil War allowed newspaper readers to see for the first time the actual events of war, including this occasion where observation balloons were prepared for use in observing enemy maneuvers on June 1, 1862, near Fair Oaks, Virginia. (Medford Historical Society Collection/Corbis)

period had to do with the Spanish-American War. In 1897, Frederic Remington was serving as a correspondent in Cuba, but he wanted to return home because it did not look like there was going to be a war. Hearst reportedly sent a telegram to Remington saying, "You provide the pictures; I'll provide the war." Unlike Pulitzer, Hearst was never able to reinvent his public image in order to distance himself from his early days of sensationalism. The term "yellow journalism" comes from the Yellow Kid, a comic strip character that was created by Richard Felton Outcault. Pulitzer was the first to publish Outcault's character, but the artist was later lured away to work for Hearst. This event only served to escalate the battle between the two publishers.

While Hearst and Pulitzer squared off, *The New York Times* was rescued from bankruptcy and did not give in to the temptations of the day. In 1896, Adolph Ochs bought the newspaper and rebuilt it. His hiring of top-class editors and reporters set the tone for *The Times* and maintained the original intent of its founder.

Changing Formats and Increasing Objectivity

As the twentieth century began, newspapers reached a saturation point. There were more than

twenty-two hundred daily newspapers in the country; there were twenty-nine dailies in New York City alone. Newspapers were facing a changing world, and never again would they be as dominant a medium as in the late 1800s. As the 1920s began, there was disillusionment with Democrats because of World War I, radio was on its way to becoming the new dominant medium (until television), and business was king. The silent film industry was thriving, magazines were becoming more sophisticated with quality color printing, and cities were getting larger (i.e., the mostly rural country was becoming a more urban country).

Newspapers, at least many of them, adapted to the environment. The reaction was the creation of the tabloid. Compared to newspapers, tabloids were more visually pleasing, smaller, and more compact (in order to be easier to handle when riding on a streetcar or in a subway). Short punchy stories were more common as magazines and films cornered the market on good storytelling. Further, responding to the radio commentators, political columnists became more prevalent in publications. The New York Daily News, first published by Joseph Medill Patterson in 1919, is a good example of the new newspapers of this period. Patterson aimed his newspaper at the lowest literate class of people in New York, and he patterned it after successful New England publications. The New York Evening Graphic, which was first published in 1924, used a tabloid format, but it also used "yellow journalism" tactics. This newspaper pioneered the doctoring of photographs (e.g., taking people from two different photographs and creating a composite photograph to make it look as if they appeared together).

It would be irresponsible to avoid addressing the issue of objectivity when talking about the newspaper industry. Some historians trace the journalistic ideal of objectivity—the idea of reporting information fair and accurately without personal bias leaking into the news—as far back as the Penny Press. Compared to the opinion-laden newspapers that were published before, during, and soon after the American Revolution, the newspapers of the Penny Press were certainly more fact driven. Another group of historians believes that objectivity took root about the time that the Associated Press started disseminating news nationwide in the mid-1800s. Because the news was used in all areas of the country, it had to be reported as fairly as possible in order to guarantee that it did not offend anyone. In addition, the evolution of photography lent itself to the idea of objectivity because photographs were considered to be little pictures of "reality." A final group of historians believes that objectivity as a journalistic ideal did not start until the 1920s and 1930s. The rise in public relations (which was often considered to be "creating" the news) and the failure of big business (with the Great Depression) caused journalists to look for a scientific approach to newsgathering. Things such as identification of news sources, creation of nonpartisan research councils, and the professionalism of journalism all occurred in response to dissatisfaction with the existing system. Several of the most famous journalism schools started during this time, and the Society of Professional Journalists (Sigma Delta Chi) adopted objectivity as part of its code of ethics, declaring, "We honor those who achieve it."

Modern Technological Innovations

In the period between 1945 and 1974, another revolution led by technology hit the newspaper industry. One of the major developments was the Teletypesetter system of the 1950s. Used in conjunction with the old Linotype machines, the Teletypesetter helped to create a trend toward uniformity in the newspaper industry. It was easier for an editor to print a national wire service story than to assign a local reporter to go through the entire process of production. The Teletypesetter had a set type of punctuation, abbreviations and capitalization styles to which the Associated Press, United Press, and International News Service all agreed to adhere. Photocomposition and offset printing were other major technological breakthroughs that occurred in the decades immediately after World War II. The old Gutenberg raised type had been the standard for centuries, but photocomposition produced type by photographic processes. Offset printing, a form of lithography, used a photographic process to produce the plate for printing, which all but eliminated the large and noisy linotype machines by the end of the 1960s. The computer started taking over the newsroom in the 1980s. This new process was aptly called "desktop publishing," and it included the use of laser printers, personal computers, and software that created both text and graphics. By 1987, half of the newspapers in the United States had already converted to desktop publishing.

The number of daily newspapers declined steadily during the twentieth century. Other than the creation of USA Today by the Gannett Company in 1982, virtually no new major newspapers have surfaced since the mid-1970s. Instead, many cities have undergone a joining of two newspapers into one or the loss of one or more newspapers. USA Today, which is second only to the Wall Street Journal in circulation, was the first modernday national newspaper. Initially, USA Today was damned by most of the newspaper establishment, who said that it was television in print. Still, when it became both popular and profitable, local newspapers all over the country suddenly started to copy it.

In the 1990s, newspapers, by and large, joined the new media arena. Most of the daily newspapers in the United States established some kind of Internet presence, even though there was little or no evidence that a website would prove to be profitable. If the estimates that indicate that there are more than eight thousand online newspapers in existence are correct, then the number of online newspapers has already surpassed the number of traditional print newspapers.

See also: Bennett, James Gordon; Bly, Nellie; Greeley, Horace; Gutenberg, Johannes; Hearst, William Randolph; Internet and the World Wide Web; Journalism, History of; Journalism, Professionalization of; News Effects; Newspaper Industry; Newspaper Industry, Careers in; News Production Theories; Printing, History and Methods of; Pulitzer, Joseph.

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NEWS PRODUCTION THEORIES

News carries with it a powerful mythology, leading people to regard news as a mirror that is held up to society, a window on the world that tells "the way it is." Moving beyond this unproblematic view of journalism opens a wide range of important questions to research, predicated on the idea that news, like other forms of knowledge, is socially constructed.

The many attempts to explain the production of news have often taken a sociology of media view, which considers how media power functions within a larger social context. More narrowly, this approach is equated with the newsroom ethnographies that have been carried out by sociologists such as Herbert Gans and Gaye Tuchman. Taken more broadly, it suggests that the structural context of journalism must be tackled, moving beyond the more narrow attempt to psychologize the news process through the attitudes and values of individual practitioners, or "gatekeepers."

In her interpretive sociological approach to news, Tuchman (1978, p. 12) asserts that "making news is the act of constructing reality itself rather than a picture of reality," a view that leads her to think of news as a "frame." Newswork is viewed as the process of transforming occurrences into news events. Her ethnomethodological analyses of journalists in local news organizations examines how people make sense of the everyday world in its "taken for grantedness." Journalists, for example, find the meaning of objectivity in the specific procedures of quoting, sourcing, and balancing that have become synonymous with good work. Thus, reference to these steps, the "strategic ritual," as she terms it, rather than any philosophical recourse, is invoked when their work is challenged. Following the work of Peter Berger and Thomas Luckmann (1967), Tuchman's work shows how meaning becomes objectified in the institutional "newsnet," rendering "historically given" the journalistic reports that are embedded in the time rhythms and geographical news "beat" arrangements of legitimated, official settings.

Framing the News

As a particularly influential concept in news study, the idea of "frame" is defined by Erving Goffman (1974) as the principles of organization that govern people's interpretation of and subjective involvement with social events. Interest in framing responds to the recommendation by Robert Hackett (1984) that studies of news move beyond a narrow concern with bias—deviation from an objective standard—to a more fruitful view of the ideological character of news, thoroughly structured in its content, practices, and relations with society. The notion of bias suggests that a faithful reflection of events is possible, while framing underscores the constructed quality of news. The surge of interest in framing highlights important issues. Precisely how are issues constructed, discourse structured, and meanings developed?

A number of definitions have been proposed to refine the framing concept. According to Robert Entman (1993, p. 52), a frame is determined in large part by its outcome or effect: "To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation." William Gamson and Andre Modigliani (1989, p. 3) define frame as a "central organizing idea . . . for making sense of relevant events, suggesting what is at issue," signified by the media "package" of metaphors and other devices.

Todd Gitlin (1980, pp. 7, 21) views frames as "persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion, by which symbol-handlers routinely organize discourse." His definition lays the emphasis on the routine organization, which transcends any given story and is "persistent" over time (resistant to change). In dealing with information, frames enable journalists to "recognize it as information, to assign it to cognitive categories." This gives frames a power, actively to bring otherwise amorphous reality into a meaningful structure, making them more than the simple inclusion or exclusion of information. In their analysis of social movement coverage, James Hertog and Douglas McLeod (1995) note that if a protest march is framed as a confrontation between police and marchers, the protesters' critique of society may not be part of the story-not because there was not room for it, but because it was not defined as relevant. Thus, it may be said that frames are organizing principles that are socially shared and persistent over time and that are working symbolically to provide a meaningful structure for the social world.

Hierarchy of Influences Model

To help summarize the forces that figure into the construction, or framing, of news, a "hierarchy of influences" model that is based on levels of analysis has been proposed by Pamela Shoemaker and Stephen Reese (1996). In brief, these levels range from the most micro to the most macro: individual, routines, organizational, extramedia, and ideological, with each successive level viewed as subsuming the prior one(s). The hierarchical aspect draws attention to the idea that these forces operate simultaneously at different levels of strength in any shaping of news content.

Individual Level

At the individual level, the attitudes, training, and background of the journalist (or media workers more generally) are viewed as being influential. American journalists have encouraged a certain mythic image of their distinctive role in society and resisted viewing this product as a construction, like those produced in any other complex organization. Leo Rosten (1937) was perhaps the first to try to describe journalists in his study of Washington correspondents, but not until the 1970s did sociologists begin to apply the same occupational and organizational insights to this as to any other professional group. J. W. C. Johnstone, E. J. Slawski, and W. W. Bowman (1972) are frequently cited as making the first major empirical effort to describe U.S. journalists as a whole.

In more partisan-based research, the tendency of journalists to tilt liberal is sufficient to explain what conservatives view as a leftward slant in news content. S. Robert Lichter, Stanley Rothman, and Linda Lichter (1986), for example, concluded that American journalists (those working at "elite" urban, primarily Northeast media) were more likely to vote Democrat, to express left-ofcenter political views, and to be nonreligious than were the American public as a whole. Broader surveys, such as those by David Weaver and G. Cleveland Wilhoit (1991), find that American journalists, across the entire country, are much more like the American public than the Lichter study would suggest. They have provided a valuable counterweight to generalizations about journalists that have been based on a few high-profile but unrepresentative cases.

The study of key news decision makers follows from the "gatekeeper" tradition of analysis that was begun by David Manning White (1950), who attributed great influence to the individual editor's subjective judgment. Later perspectives see the gatekeeper as greatly limited by the routines and organizational constraints within which they work (Becker and Whitney, 1982; Berkowitz, 1990).

Routines Level

The routines level of analysis considers the constraining influences of work practices, which serve to organize how people perceive and function within the social world. Analysis taking this perspective often finds the ethnographic method valuable because it allows the effect of these practices to be observed over time and in their natural setting. It is assumed that journalists are often not aware of how their outlooks are so "routinely" structured and would be unable to selfreport honestly about it. And indeed, it is assumed that much of what journalists provide as reasons for their behavior are actually justifications for what they have already been obliged to do by forces that are outside of their control (e.g., Tuchman, 1972, 1978). Field observation suits the concern here with the ongoing and structured rather than the momentary or sporadic. The routines that have attracted the most interest have been those that have involved the frontline reporters, such as in local television news (Altheide, 1976; Berkowitz, 1990) and newspapers (Fishman, 1980; Sigal, 1973). A classic field study of national networks and newsmagazines, which was conducted by Herbert Gans (1979), showed how little journalists often know of their audiences, how influenced they are by other media-especially The New York Times-and their news sources, and how, while reflecting the enduring values and hierarchies of society, journalists must assume a detached attitude toward the consequences of their work.

Organizational Level

At the organizational level, the goals and policies of a larger social structure and how power is exercised within it may be considered. If the routines are the most immediate environment within which a journalist functions, the organizational level considers the imperatives that give rise to those routines and how individuals are obliged to relate to others within that larger formal structure. Charles Bantz, Suzanne McCorkle, and Roberta Baade (1980) exemplify this view in their depiction of local television as a "news factory," leading workers to take an assembly line view of their interchangeable commodity products rather than a more professional, craft-oriented perspective. The major questions addressed at this level are suggested by an organizational chart, which maps the key roles and their occupants, in addition to how those roles are related to each other in formal lines of authority. The chart additionally suggests that the organization must have ways to enforce and legitimize the authority of its hierarchy and calls attention to the organization's main goals (economic in relation to journalistic), how it is structured to pursue them, and how policy is enforced. The pioneering work of Warren Breed (1955) showed how social control is exercised nonovertly in the newsroom, ultimately by publishers, leading to self-censorship by journalists.

Newsroom studies often contain elements of both the routines and the organizational perspective, which are clearly related. This more macro level, however, is a reminder that news is an organizational product, produced by increasingly complex economic entities, which seek ever more far-reaching relationships in their ownership patterns and connections to nonmedia industries. While journalists have long needed to be concerned with business considerations influencing their work, now these concerns may stretch far beyond their immediate organization. As news companies become part of large, global conglomerates, it is often difficult to anticipate the many conflicts of interest that may arise, and journalists find it difficult to avoid reporting that has a relationship to one or more aspects of the interests of the parent company.

The organizational level brings different challenges for analysis than the previous two levels. Organizational power is often not easily observed and functions in ways not directly indicated by the formal lines of authority described in accessible documents. As Breed (1955) emphasized, power is not often overtly expressed over the news product because it would violate the objectivity notion, that news is something "out there" waiting to be discovered. Enforcing policy about what the news is to be would contradict this principle. At this level, there is curiosity about how decisions are made, and how they get enforced. By definition, the concern is with power that is exercised periodically, implicitly, and not overtly, which makes it not as readily available to direct observation. Indeed, a journalist anticipates organizational boundaries, the power of which is manifested in self-censorship by its members. Thus, journalists may accurately state that no one told them to suppress a story. This self-policing is more effective than direct censorship, however, because outsiders are often not even aware that anything has taken place.

Extramedia Level

At the extramedia level, those influences that originate primarily from outside the media organization are considered. This perspective considers that the power to shape content is not the media's alone; it is shared with a variety of institutions in society, including the government, advertisers, public relations, influential news sources, interest groups, and even other media organizations. This latter factor may be seen in the form of competitive market pressures. From a critical perspective, the extramedia level draws attention to the way media are subordinated to elite interests in the larger system. While individual journalists may scrupulously avoid conflicts of interest that may bias their reporting, maintaining a professional distance from their subject, their employers may be intimately linked to larger corporate interests through interlocking boards of directors and other elite connections. At this level, then, it is assumed that the media operate in structured relationships with other institutions, which function to shape media content. It is further assumed that these relationships can be coercive but more often are voluntary and collusive. Normative concerns at this level are for press autonomy, assuming often that it is not desirable for the media to be so dependent on other social institutions. Conceptually, this level encompasses a wide variety of influences on the media, but those systemic, patterned, and ongoing ways in which media are connected with their host society are of particular concern.

Ideological Level

Each of the preceding levels may be thought to subsume the one before, suggesting that the ultimate level should be an ideological perspective. The diverse approaches and schools of thought in media studies that may be deemed "ideological" make them difficult to summarize. Here, the concern at least is with how the symbolic content of media is connected with larger social interests, how meaning is constructed in the service of power. This necessarily leads to the consideration of how each of the previous levels functions in order to add up to a coherent ideological result. In that respect, a critical view would consider that the recruitment of journalists, their attitudes, the routines they follow, their organizational policy, and the 'positions of those organizations in the larger social structure work to support the status quo, narrow the range of social discourse, and serve to make the media agencies of social control. A critical view is likely to be concerned with how power is exerted by the natural workings of the media system, creating a process of hegemony. Gitlin (1980), in his classic study of media marginalization of the student movement in the 1960s, defined this as the "systematic (but not necessarily or even usually deliberate) engineering of mass consent to the established order." At this level, it must be asked how a system of meanings and commonsense understandings is made to appear natural through the structured relationship of the media to society.

Conclusion

Led by the media sociologists, research into the news production process has grown greatly since the early 1970s. These studies provide great insight into precisely how societal power, organizational processes, and individual characteristics of journalists interact to shape the news. The news produced, or "framed," as this constructed reality in turn frames the ways of thinking about social issues and the participation in public life.

See also: Cultural Studies; Culture Industries, Media AS; Democracy and the Media; First Amendment and the Media; Functions of the Media; Globalization of Media Industries; Journalism, History of; Journalism, Professionalization of; Social Change and the Media; Society and the Media.

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STEPHEN D. REESE

NONVERBAL COMMUNICATION

Nonverbal communication has been referred to as "body language" in popular culture ever since the publication of Julius Fast's book of the same name in 1970. However, researchers Mark Knapp and Judith Hall (1997, p. 5) have defined nonverbal communication as follows: "Nonverbal communication refers to communication effected by means other than words." This definition does not exclude many forms of communication, but it implies that nonverbal communication is more than body language. However, determination of the exact boundaries of the field is a point of contention among scholars.

Nonverbal communication is an area of study that straddles many disciplines—sociology, psychology, anthropology, communication, and even art and criminal justice. Each of these fields tends to focus on a slightly different aspect of nonverbal communication. For example, psychology might focus on the nonverbal expression of emotions; anthropology might focus on the use of interpersonal space in different cultures; and communication might focus on the content of the message. However, there is more overlap among these fields than divergence.

The History

It appears that all cultures have written or oral traditions expressing the importance of nonverbal communication to understanding human beings. Over thousands of years, Chinese culture has developed a set of rules about how to judge the character and personality of an individual by observing the size, shape, and relative positions of the nose, eyes, eyebrows, chin, cheeks, and forehead. Someone with wide-set eyes would be a "broadminded" person, while someone with a high forehead would be a "smart" person. Although there does not seem to be much scientific evidence that facial characteristics predict personality, modern people still believe this to be valid.

Ancient Greek culture has also relied on nonverbal communication to understand people. The playwright Theophrastus created a list of "31 types of men" that he made available to other playwrights to assist them in the creation of characters for their plays. Theophrastus relied on insights gleaned from nonverbal communication to describe these personalities; the penurious man does not wear his sandals until noon, and the sanguine man has slumped shoulders. Humans still rely on nonverbal insights like these to judge the personalities and emotions of other people.

In India, the sacred Hindu texts called the *Veda*, written around 1000 B.C.E., described a liar as someone who, when questioned, rubs his big toe along the ground, looks down, does not make eye contact, and so forth. Late-twentieth-century research based on North Americans shows that people still concur with the *Veda* on this description of a liar.

Research into African history has shown that one of the characteristics of an effective tribal chief was his ability to move his subjects with the power of his speeches, made particularly potent by the heavy use of nonverbal communication. This legacy is apparent in the traditions of the African-American church in America. These same principles of strong body language and voice tone accompanying speeches has now been adopted in various forms by the rest of American society and politics because of its ability to persuade above and beyond well-crafted words.

The Function of Nonverbal Communication

Nonverbal communication serves a number of functions. It can define communication by providing the backdrop for communication—a quiet, dimly lit room suggests to people that the communication that occurs within that environment should also be quiet and hushed (as in a religious venue). Brightly lit rooms, with active colors such as yellow and orange, communicate active, upbeat activities. Nonverbal communication can also be connected to the behavior or dress of others in the room. If others are moving calmly, crying, and wearing formal clothes, that sends a nonverbal message that is quite distinct from a room full of people moving with a bounce in their step, laughing, and wearing Hawaiian-print shirts.

Nonverbal communication can also regulate verbal communication. Much of people's conversations are regulated by nonverbal cues so subtle that the average person does not notice them. People nod and smile at particular moments during a face-to-face conversation. This signals the talker that the listener understands and that the talker should continue talking. When the talker is finished, he or she will drop his or her voice tone and loudness to let the listener know. If the talker wishes to continue talking, he or she will fill the pauses that occur with a louder voice, with many "umms, ahhs," and so on. People have learned these rules so well that they adhere to them almost unconsciously. The use of these subtle clues accounts for why people can have conversations without constantly talking over each other, or having to utter the word "over"-like the astronauts-to let the other person know when one is finished speaking. This rule can be tested by violating it. If a person tries to remain motionless while engaged in a conversation with a friend, that person will find this is not only hard to do, but it will cause the friend great consternation.

Finally, nonverbal communication can be the message itself. A frown indicates unhappiness. A wave of the hand signifies "good-bye." A quiver in the voice signifies distress. Raising the index finger to the lips signifies "shhh," or "be quiet," yet raising the index finger into the air in a thrusting manner may mean "we're number one." No words are needed to send these messages. Note that most of these meanings are culturally determined (which is discussed below in detail).

The Relationship Between Verbal and Nonverbal Communication

Paul Ekman proposed that there are six ways in which verbal and nonverbal communication relate. He suggested that nonverbal communication can substitute for verbal communication, as well as repeat, contradict, complement, accent, and regulate verbal communication.

What Ekman meant by substitution is that nonverbal communication can be substituted for

verbal communication. If asked whether another helping of mother's wonderful pasta is wanted, a person can shake his or her head up and down to signify "yes," rather than attempting to utter the word "yes" through a mouthful of spaghetti.

Nonverbal communication can also repeat verbal communication. People can simultaneously speak the word "no" and shake their heads side to side. Repeating and substitution seem like the same idea, but substitute means someone does not speak the word or phrase represented by the nonverbal gesture, whereas repeat means he or she does speak the word or phrase.

Sometimes these simultaneous verbal and nonverbal signals will contradict each other. Someone might utter the phrase "this will be fun" and yet display a facial expression of disgust as they speak those words. This is sarcasm; the words seem positive, yet the facial expression is negative.

Nonverbal communication can also complement verbal communication. Someone might say the phrase "I've had a tough day" with their shoulders slumped and their feet dragging. Note that slumped shoulders and dragging feet can express a number of things (e.g., sadness, fatigue, injury, daydreaming), but in conjunction with the verbal message "I've had a tough day," they enrich and focus the message.

Sometimes nonverbal communication will simply accent a particular part of a spoken verbal communication. Someone might say, "It is important to punctuate your speech with nonverbal gestures," while rhythmically moving one hand up and down on each syllable in the word "punctuate." In this situation, the moving hand gestures for the word "punctuate" will accent that word, thereby letting the listener know that this concept is important.

Finally, Ekman proposes that nonverbal communication can regulate verbal communication. As discussed above, there are various unspoken rules that regulate conversations. Listeners provide backchannel communication (e.g., nodding, smiling subtly, saying "uh huh") at particular points during the conversations to let their partners know that they understand and that the partners can continue to speak.

The Structures and Properties of Nonverbal Communication

Judee Burgoon and other scholars have suggested that nonverbal messages conform to many



Les Grimaces, an early nineteenth-century lithograph by Louis Leopold Boilly, depicts five basic facial expressions—anger, disgust, happiness, sadness, and surprise. (Corbis)

of the same properties as verbal communication properties such as structured rules, intentionality, awareness, covert and overtness, control, and private/publicness—but in slightly different ways.

In order to communication meaning, nonverbal messages must be rule bound, similar to speech. The sentence "Floats otter the on sea the" does not make much sense because it does not conform to certain rules applying to word order. "The otter floats on the sea" does follow those rules, and thus makes sense. Nonverbal communication has similar properties, and when the rules are violated, they change the meanings. In North America, there are rules that guide how close people stand next to each other when talking-usually between eighteen inches and four feet. When one person stands too close to another when talking, the other feels compelled to move away to reestablish what they feel is a comfortable distance. The violation of this rule causes one person to feel that the other person is too pushy or aggressive, and the other person to feel that the other is too unfriendly or standoffish.

People assume that the vast majority of spoken communication is intentional; they choose the words they speak. Likewise, most nonverbal communication is intentional. People deliberately wave to others or give an insulting finger gesture. However, scholars such as Peter Andersen and Joseph Capella have argued that it appears that a greater proportion of nonverbal communication is unintentional. For example, some people may intend to communicate calmness and maturity about the death of their cat, and yet they often unintentionally communicate sadness through their voice tone and facial expression.

Similarly, people are also less aware of their nonverbal communication compared to their verbal communication. Except for unusual circumstances, people can hear all that they speak. People are usually aware of their nonverbal communication (e.g., the clothes they wear, the gestures they use, and the expressions they show), but not always. For example, when lying, a person may feel afraid and yet feel they were able to hide that fear. As scholar Bella DePaulo has shown, despite their beliefs, liars are often unaware that in fact they are expressing clear signs of fear in their face, posture, or speech.

Verbal communication is more overt, and nonverbal behavior is more covert. People are formally trained in their verbal behavior in the schools. Nonverbal communication is less obvious, as in subtle facial expressions and barely perceptible changes in voice tone, and people are not typically formally trained in their nonverbal communication. Children are not often given lessons on how close to stand to others when talking or how to express anger in a facial expression.

Nonverbal communication is also less controllable than verbal communication. Verbal communication is easy to suppress, or to express, and people choose the words they use. Although much of nonverbal communication follows the same pattern (e.g., people choose to display a hand gesture), nonverbal communication is much more likely to have an unbidden quality to it. This is the smile that creeps onto one's face when one knows he or she should not be laughing.

Finally, verbal communication is more public than nonverbal communication. Speaking typically requires an audible or visible message that is available for others to hear or see, not just the intended target of the communication. Once public, this communication is also fodder for public discussion. In contrast, nonverbal communication tends to be more fodder for private conversation. When political candidates speak, people publicly discuss and debate their policies, and not their shoes or their gestures. This trend is changing, with more focus being placed on how the candidate delivers a message, rather than on the message itself.

The Origins of Nonverbal Communication

Nonverbal communication comes from both culture and biology. Most nonverbal communication is learned the same way as language, one word or gesture at a time. Words have different meanings in different languages or cultures, and likewise, gestures can have different meanings in different cultures. In North America, a raised index and middle finger typically means "peace" or "victory," regardless of whether the palm is turned inward or outward. In Australia or the United Kingdom, this same gesture with the palm turned outward means "victory," but with the palm turned inward, it is an insult ("screw you"). People learn how to cross their legs, fold their arms, how much to gesture with their hands when speaking, how much to express with their faces, how close to stand to others, and so on.

However, what distinguishes nonverbal communication from verbal communication is that some nonverbal communication is not learned; it is innate. Charles Darwin argued that the facial expressions people display for certain emotions, such as anger, disgust, distress (sadness), fear, happiness, and surprise (some scholars argue for contempt, embarrassment, and/or interest as well), are part of human evolutionary heritage. These emotions have helped humans (and other animals) to survive, and thus they get passed from one generation to the next. A person who has a fear emotional response to danger will be more likely to escape that danger and thus will survive and reproduce. A person without that response will not survive and thus will not pass his or her genes on to the next generation.

What Darwin and others, including Carrol Izard and Ekman, have argued is that these emotions cause people or animals to act in some way (e.g., to strike when angry, or to flee when afraid). This behavioral intention must be communicated to others in the group. The facial expression thus becomes a visual signal of this intention, which allows others to avoid this person and his or her anger—which prevents a fight. This communication permits all social animals to maintain harmony and cooperation. Even animals without a spoken language will communicate their emotional intentions (e.g., tail wag, raised fur, attentive ears), but they communicate with their bodies and not so much with their faces. Other animals interpret these signals accurately without receiving any formal training.

Darwin, Ekman, and Izard argue that these facial expressions are as much a part of an emotional response as an increased heart rate or sweating, and they cite five sources of evidence that supports their views. First, scholars such as Irene Eibl-Eibesfeldt have shown that children who are born blind will smile when happy or make a distressed face when sad-similar to children who are born with sight-even though they cannot see how this expression was made. Second, human's biologically closest animal relatives, the chimpanzees, also seem to show facial expressions that are similar to those of humans. Third, when Ekman and his colleagues asked people to pose those facial expressions of emotion described above, and then showed photos of these expressions to people of other cultures, the people in other cultures were not only able to recognize the expressions but agreed strongly which expression was anger, which was disgust, and so on. Likewise, all cultures spontaneously pose these expressions in the same way (i.e., all people show anger with a furrowed eyebrow and tight lips, and happiness with a smile, and so on). Ekman's research included cultures in Papua New Guinea that at the time had no books, no electricity, and almost no contact with Western culture, so they could not have learned the expressions from movies, television, or outsiders. Izard points out that as one travels in Europe, the nonverbal gestures for particular words or concepts change drastically as one goes from village to village-yet the facial expressions for these emotions does not. Fourth, Ekman and his colleagues have shown that by posing and holding these facial expressions of emotion, one will experience the emotion shown in the facial expression. Finally, evidence suggests that there are centers in the human brain that respond specifically to the facial expression of fear, and possibly other facial expressions of emotion, thus arguing for the hard-wired perception of these expressions.

However, Ekman and Izard have argued that these facial expressions are not simple reflexes. People can learn to control these expressions, depending on the rules of a person's particular culture or subculture. Boys in North America

learn not to cry when distressed, whereas girls typically do not learn that rule. In Japan, people learn not to show anger or disgust to high-status people or in public situations, whereas North Americans do not learn such a rule. Research has shown that both Japanese and Americans, when alone, will show facial expressions of disgust when viewing a gory film. However, when in the presence of a high-status person, the Japanese will smile during the gory film, whereas Americans still show an expression of disgust. Ekman found with closer inspection that the Japanese were still showing expressions of disgust, but they were trying to mask them with the smile. Ekman has called these cultural rules that dictate how and when people should show these facial expressions of emotion "display rules."

Sources of Nonverbal Communication

Nonverbal communication is part of the behaviors of people, as well as the results of their behavior. One source of messages is the environment. Different houses send different messages about their occupants. This is accomplished through the use of color, lighting, heat, fabric textures, photos, and so on. Restaurants will capitalize on the messages sent by these environmental factors to influence the behaviors and impressions of diners. Fast-food restaurants use active, bright colors such as orange, yellow, and red in a well-lit environment with hard plastic seating. These messages subtly urge diners to eat more food more quickly and not to lounge around afterward. In this way, the fast-food restaurants get a quick turnover in order to maximize profits. In contrast, elegant restaurants use dimmer lighting, softer and darker colors, and more comfortable chairs to communicate a more intimate impression, subtly urging diners to feel comfortable and stay around for dessert and coffee, and so on. This will cause diners to spend more money per visit, as well as ensure increase business through positive word of mouth. Thus, the nonverbal messages sent by the environment can help guide the behaviors that occur within that environment.

Another source of nonverbal messages is one's physical characteristics and appearance. Physical characteristics are the static physical appearance or smell of a person. This includes one's height and weight, skin color, hair, eyebrows, cheeks, chin, proportion of eye, nose, and chin size, as well as odors. William Sheldon believed that different body types were predictive of personality: endomorphs (heavier, obese, rounder, softer looking) were sociable and pleasant, mesomorphs (angular, muscular, harder looking) were leaders and strong-willed, and ectomorphs (thin, frail, brittle looking) were withdrawn, smart, and nervous. The media capitalizes on this association by casting actors and actresses accordingly; notice how the leading man is almost always a dynamic mesomorph, the comedy relief is almost always the sociable endomorph, and the smart person is almost always the nerdy ectomorph. Although these beliefs persist, there is no strong evidence that body types predict personality.

Moreover, people have historically made the same judgments of personality based on facial appearance. The ancient Chinese were not the only ones to do this; in the late 1800s, Europeans led by Caesar Lombroso felt they could characterize criminal personalities based on the heaviness of one's eyebrows and jaw. As with the body research, there has been no evidence that one can accurately identify criminals by their facial appearance. Research by Diane Berry and Leslie MacArthur in the 1980s found that adult humans with more babyish looking faces-defined by a higher forehead, proportionally larger eyes, and smaller nose-are seen as more naíve, honest, and less likely to be picked as a leader. Research by Paul Secord in the 1950s showed that although people have reliably assigned personalities to particular faces, their assignments were not accurate. This perhaps best sums up the findings in this area.

Odors also send messages, both at a conscious and unconscious level. At a conscious level, perfumes and aftershaves and lack of body odor send messages about hygiene in North America, but such messages are not so clear in other cultures. Humans subconsciously send pheromones, substances that, when placed under the nose of a woman, make her judge a man as more attractive. Infants can also recognize the smell of their mothers and will show strong preferences for items that carry that smell. Many adults will also note how they are comforted by the smell of loved ones.

Physical appearance clues also include what are called artifactual clues, such as jewelry, clothes, glasses, and so on. People wearing glasses are seen as being smarter. Jewelry sends messages about one's socioeconomic or marital status. North Americans signal their married status by wearing a solid gold band on their left-hand "ring" finger, whereas Europeans often wear this signal on the right-hand ring finger. Clothing also sends messages about income, group membership, and even respect for others. People who wear jeans to a formal occasion send a message about what they feel about that occasion, although, as in the previous instances, this message can be inaccurate.

An important source of nonverbal messages involves proxemics, or the study of the use of space during interactions. Edward Hall noted that human beings seem to have a series of four concentric zones that surround them, like a portable territory, in which they allow others to enter depending on the occasion and the degree of familiarity between the people involved. Hall called the zone that ranges from touching the body to 18 inches (45 cm) away the "intimate zone," an area that typically only lovers, children, and other intimates can enter. The next zone outward, ranging from 18 inches (45 cm) to 4 feet (1.22 m), was called the "casual-personal zone," the distance at which most casual conversations take place. The next zone, ranging from 4 feet (1.22 m) to 12 feet (3.67 m), was called the "social-consultative zone," the distance at which most formal conversations, as in business meetings with strangers, take place. The final zone, 12 feet (3.67 m) and beyond, was called the "public zone," where public speeches and other events take place. Note that these distances are typical for North Americans: other cultures may have the same series of concentric territories, but the distances may be different. In some Mediterranean countries, strangers will routinely talk to each other while standing less than 1 foot (30 cm) apart. To a North American, this will violate his or her intimate zone, and the North American will feel extremely uncomfortable and will take steps to reestablish a more comfortable distance by backing away. Of course, the Mediterranean person will feel uncomfortable talking to someone so far away and will move closer. This is another example of how cultural differences in nonverbal communication can cause misunderstanding and discomfort by both individuals. Note that neither distance is "right"; they are just different. Of course, other variables besides culture can affect the distance at which people communicate. These variables include how personal or negative the topic is, the age of the individuals (people stand closer to children and the elderly), and so on.

Humans also use nonverbal signals to mark their territories or possessions. Putting down one's books on a desk in a classroom, or placing one's jacket over a chair, will typically mark that desk or chair as temporarily belonging to that person that is, part of his or her territory.

People send many types of nonverbal messages with their bodies. Ray Birdwhistell referred to the field of inquiry dedicated to the study of body messages as "kinesics." Kinesics includes body postures, such as angle of lean or tightness, and it also includes gestures, touching behavior, facial expressions, eye behavior, and even paralanguage (e.g., voice tones).

Body postures can certainly communicate many things. A person in a job interview who sits slumped in his or her chair will not look attentive and will be judged as uninterested in the job. Another way posture communicates is through the appearance of immediacy; a person who leans toward another, makes eye contact, and modulates his or her voice (i.e., does not speak in a monotone) is seen as very immediate. Research evidence suggests that people who behave in a more immediate fashion are seen as more credible, and teachers who are more immediate are better liked and children seem to learn more from them.

There are many nonverbal gestures that people exhibit to communicate. In the 1940s, David Efron suggested that one type of gesture—called an emblem—takes the place of a word. The "thumbs up" sign means "okay" or "good" in North America. People can say the word or show the gesture. Holding one's nose means something stinks. There are about one hundred emblems in North America. Efron showed that these emblems are learned. He observed that the emblems used by Jewish and Sicilian immigrants were different, and yet the emblems used by their American-born children were identical.

Desmond Morris proposed that these emblems come about through a variety of ways, and he identified mimic, schematic, symbolic, technical, coded, hybrid, relic, and interactive emblems. For example, Morris suggested some emblems mimic in a schematic fashion the object for which the emblem stands; holding both hands to one's head and extending index fingers to resemble the horns of a cow is the emblem for a cow. Others are symbolic, as in crossing the fingers for good luck; the crossed fingers represent a crucifix or "sign of the cross," which early Christians believed would ward off evil or bad luck. Relic emblems derive from ancient practices, such as the Greek "moutza" emblem. This emblem involves throwing a hand up toward another to signify contempt or disdain; it evolved from the ancient practice of citizens throwing garbage onto criminals as they were marched through the streets. The emblem thus mimics the action of throwing garbage onto someone. Morris believes that some emblems represent universal human social experience, such as the emblem for the word "no," being a side-to-side headshake. He suggests that this derived from the side-to-side head action that an infant exhibits to reject his or her mother's breast when not hungry. All people throughout the world experience this, and that is why virtually all cultures use the horizontal headshake to indicate "no."

A second type of gesture is an illustrator. Illustrators do not take the place of words, but they help facilitate speech by being intimately tied to the content and flow of speech. Thus, when people move their hands as they speak, they are illustrating. Sometimes these illustrators are used to help find a word; sometimes they are used to keep the rhythm of the speech; sometimes they paint pictures of what the speaker is referring to; and sometimes they show motion. Illustrators are not confined to the hands; people can illustrate with their eyebrows by raising them as they emphasize an important point.

A third type of gesture is a manipulator, or adaptor (the words are used interchangeably). Manipulators occur when a person manipulates an object or other part of his or her body. Thus, touching one's nose, rubbing one's chin or ear, twirling one's hair, playing with one's glasses, chewing on a pencil, and biting one's lips are all examples of manipulators. There is some evidence that manipulators increase when people are nervous.

Touching behavior is another form of rulebound nonverbal message. In North America, heterosexual males tend not to touch other males. If they do touch, it is typically on the upper arm, in a strong fashion. Heterosexual females touch each other more and in other body spots besides the upper arm. However, in the context of a sporting event, male teammates will pat each other on the rear end—a touch that would not be socially sanctioned in any other time or place. Of course, a pinch or a punch is a form of touch that sends a very different message than a gentle caress.

Facial expressions provide some of the more obvious forms of nonverbal communication. In addition to the six to nine universal facial expressions discussed above, humans have learned expressions as well. A wink may mean different things in different cultures. One raised eyebrow may be an illustrator. People can even pose expressions to communicate that they are thinking (eyebrows pulled down, lower lip pushed up), or are exasperated (raising the eyebrows slightly, and puffing cheeks and then blowing out the air), and so on.

People send nonverbal messages though eye behaviors. Eye behaviors typically involve staring or gazing, but they also include pupil dilation (where the pupil increases in size). When heterosexual couples are attracted to each other, they gaze into each other's eyes longer, and their pupils dilate. Researchers note that women with dilated pupils are seen as more attractive. When people are going to fight, they glare at each other. There are also great cultural differences in eye contact members of some cultures gaze longer at strangers than do members of other cultures. When speaking, members of some cultures show their respect for other people by looking them in the eye; members of other cultures show their respect by not looking other people in the eye.

Finally, nonverbal messages are sent in the paralanguage of others. Paralanguage includes voice tone, pitch, pauses, and so on. This is has led to the adage "it is not what you say, but how you say it." People can say a positive statement and, using their voice tone, make it sound sarcastic, thereby producing two very different meanings from the very same sentence.

Conclusion

Everyday decisions are made based on people's readings of nonverbal communication. Nonverbal communication affects interpersonal encounters ranging from police interviews to first dates, doctor visits, job interviews, and advertising. For the most part, people are good at interpreting these nonverbal communications, although some people are better at it than others, despite the fact that the nonverbal message that is sent often does not equal the message that is received, and vice versa. In addition to relying on nonverbal communication to clarify communication and make day-today interactions flow more smoothly, people also use it as an indicator of the true essence of a person. As Chinese philosopher Confucius stressed thousands of years ago, one can better understand others by looking into their eyes, rather than listening to their words.

See also: Animal Communication; Intercultural Communication, Adaptation and; Interpersonal Communication; Interpersonal Communication, Conversation and; Interpersonal Communication, Listening and; Language Acquisition; Language and Communication; Language Structure; Models of Communication; Symbols.

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MARK G. FRANK

NUTRITION AND MEDIA EFFECTS

An Australian study by the Food Commission (1997) reported that more than one-half of nineto ten-year-old children believe that Ronald McDonald knows best what is good for children to eat. Is television truly this persuasive, and can it shape the eating habits of the children of an entire nation? The answer appears to be yes. Poor diet is related to a number of problems in both health and quality of life. Obesity (the prevalence of which is on the rise among children) is the most obvious, but it is only one consequence of a national diet in which food is abundant, readily available, inexpensive, and promoted very heavily.

Television viewing appears to be an important factor in keeping both children and adults from being physically active. The influence of television is especially powerful in children. Many spend long hours watching television, a setting that promotes eating because children are inactive and are exposed to thousands of persuasive food advertisements. William Dietz (1990) noted that children spend more time watching television than doing any other activity except sleeping. Considering that children spend more time with television than in school, television has the potential for enormous influence.

Obesity results from an imbalance between the amount of energy (calories) consumed and the

amount of energy used (through metabolism and physical activity). Weight gain occurs when a person eats more than the body burns. Television can affect this balance on both sides of the equation, by keeping children away from physical activity and by increasing food consumption. It is clear from research that children consume extra calories while watching television. The great majority of food advertisements aimed at children are for foods that are low in nutritional value.

Research has shown a positive association between television viewing and obesity. Although some studies have found only weak links between television viewing and obesity, many have found significant positive relationships. In 1985, Dietz and Steven L. Gortmaker published a study reporting that the amount of television viewed by children was directly related to measures of their body fat and that the rate of obesity in the children rose 2 percent for every hour of television viewed per day. The results of this research have been supported by numerous other studies that also indicate an increase of obesity associated with television viewing. Even those researchers who report finding weaker associations note that the health risks of obesity are of such magnitude that the topic merits further research. The message appears clear-more television, more obesity.

The content of what children watch is critical. A 1997 report by The Center for Media Education stated that children view one hour of advertising for every five hours of television watched and that the average child sees more than twenty thousand television commercials per year. Most young children do not understand that the purpose of advertising is to sell a product. Therefore, the line between programs and commercials is blurred as advertisers use popular television and movie characters to induce children to buy their products.

The majority of television commercials aimed at children are for food products, most of which are foods high in sugar, fat, and salt. A 1996 report by Consumers International (Dibb, 1996) on television food advertising directed at children indicated that food items represented the majority of products advertised to children in almost all of the thirteen countries studied. Candy, sugared breakfast cereals, and fast-food restaurants accounted for more than one-half of the food advertisements, with salty snacks, prepared foods, soft drinks, desserts, and dairy products also being widely advertised. Many advertising campaigns directly target children through promotional items in children's meals and tie-ins with popular cartoon and movie characters. Advertisers know that children control a large portion of family spending, either directly through purchases or indirectly through purchase requests, so they tailor their campaigns to capitalize on the children's market.

Studies have shown that the food choices of children are closely related to what they see on television. Television viewing in children has been linked to poor eating habits, increased caloric intake, supermarket requests for unhealthy foods, and misunderstanding of nutritional principles. Howard L. Taras and his colleagues (1989) conducted a study of mothers with children between three and eight years of age and found that food requests by children paralleled the frequency with which those foods were advertised on television. Weekly viewing hours correlated significantly with the food requests of children, purchases of advertised foods by parents, and the caloric intake of children.

Gerald Gorn and Marvin Goldberg (1982) showed through an experiment that children who watched candy commercials chose more candy than fruit as snacks, but children who saw either no commercials or public service announcements chose more fruit. Several studies have supported the finding that children who see advertisements for unhealthy foods make less-healthy food choices than children who view healthy-eating announcements. Thus, pronutritional public service announcements may be a largely untapped resource for using television to encourage healthier eating.

The Children's Television Act of 1990 limited the number of advertisements in children's programming on broadcast stations to 10.5 minutes per hour on weekends and 12 minutes per hour on weekdays. In 1996, the Federal Communications Commission (FCC) expanded the Children's Television Act, requiring broadcast stations to air at least three hours of programming designed to educate and inform children between two and sixteen years of age. Although the number of socalled educational and informational programs on broadcast stations appears to have increased, the positive effect of these programs remains to be demonstrated.

Television has a powerful influence on children, and that power can be used responsibly to promote healthy lifestyles. Advocacy groups have called for increased pronutritional public service announcements, which have been shown to have a positive effect on healthy food choices, and for greater restrictions on the quantity and content of advertising directed at children. The U.S. government has shown interest in encouraging children to become more physically active with initiatives such as the inception in the 1990s of an annual National TV Turnoff Week. Research has explored the role that parents can play by discussing the content of programs and advertisements with children and by making careful purchasing decisions.

The prevalence of obesity among adults and children has caused observers to highlight the need for intervention on an environmental level. Television is an appealing target area for this type of intervention because it provides opportunities for change on both sides of the obesity equation.

See also: Advertising Effects; Body Image, Media Effect on; Children and Advertising; Parental Mediation of Media Effects; Television, Educational.

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OPINION POLLING, CAREERS IN

Public opinion research is one of the fasting growing and most diversified career opportunities available. It provides opportunities for work in government agencies, university settings, in political campaigns, and in the business world. Because the work involves a range of possible skills, the field attracts people who are interested in designing studies, managing polls in the field, conducting statistical analyses of data, or working with clients to implement policy or business decisions based on the data analysis.

Public opinion polling takes a number of forms. People who work for news organizations, for example, are interested in measuring opinion about current events or political figures. The most visible form of this work is the preelection polls conducted in conjunction with political campaigns or the exit poll interviews that are collected on the day of an election that are used to estimate the outcomes of elections. People who work for commercial firms are often interested in the attitudes and behavior of consumers with the intent of helping companies understand how to increase their market share or to improve their products. People who work for the government are interested in tracking important demographic trends or the use of government programs and services. Academic pollsters often study such basic research questions as how attitudes are formed and crystallized, how durable they are, and how opinions affect behavior.

Conducting a poll involves a number of steps, and different skills and training are required for

each. Many of the people who rely on polling data for making decisions are not well trained themselves in data collection and analysis, so one of the most important needs is for people who can talk to potential users of public opinion data to determine what their needs are. They can help the potential users think about such questions as what the appropriate population of interest is, what questions should be asked, and what shape the analysis should take in order to provide an answer to the original questions. Most polls involve samples of individuals drawn from the population of interest, and sampling is a special skill that is quite different from the ability to write good questions for a poll. Specialists in writing questionnaires are interested in producing unbiased data that are unaffected by the wording of a particular question or by the order in which the questions are asked. People who analyze polling data have a set of statistical skills that are quite different from samplers or questionnaire designers. Most polling is done by telephone, although the use of the Internet for conducting surveys is increasing.

Learning to manage studies while data collection is underway is another important skill that is in demand. The production of a survey, from the design of the sample to writing a questionnaire to collecting data to analyzing them, involves the coordination of staff and facilities. There have to be enough interviewers available to contact potential respondents on the expected days and nights, for example. Managing data collection and analysis on a timely and cost-effective basis is a very important responsibility.

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The appropriate training for a career in public opinion polling can be obtained through a number of college disciplines that result in a B.A. degree. Public opinion research is necessarily a quantitative profession, so a person should have some training in statistical methods and feel comfortable with data. People who are interested in becoming survey methodologists who specialize in sampling or data analysis should consider a concentration in statistics, although this path can usually be pursued in conjunction with a substantive specialty in a field such as political science, psychology, or sociology. Survey research training can increasingly be found in programs in communication studies or in interdepartmental programs in the social sciences. For individuals interested in market research, undergraduate training in business would be good background. Most of this undergraduate training would expose a student to an introduction to methodology but concentrate on data analysis. A well-trained undergraduate should understand the steps in the survey process and how to analyze the resulting data. They would be well trained to be a consumer of polling data and to write research reports, but they might not know how to produce data.

There are a growing number of graduate programs that offer an M.A. degree in survey research or public opinion research, and this advanced training can lead to starting positions that have more responsibility and higher salaries. In a graduate program, students learn more about the methodological skills necessary to produce public opinion polling data. In an M.A. program in survey research, students typically take courses in sampling, questionnaire design, and data analysis, as well as in survey management. Most programs involve some kind of practicum course in which the students go through all of the steps in the process, including interviewing. By the time the students finish this course, they are familiar with all of the steps involved in the process.

People in the polling business often belong to one of a number of professional organizations that provide them with the opportunity to meet other people in the field and to network about job placements. The American Association for Public Opinion Research is an organization that publishes a career brochure and provides a job placement service at their annual conference. There is a Survey Methods Section of the American Statistical Association that produces a series of brochures titled *What Is a Survey?* that describe how surveys are planned and conducted. Also, the Council for Marketing and Opinion Research maintains an Internet website to inform members of the public about the research process, their role in it, and the various types of misuses and abuses of the research process that they may encounter

See also: Advertising Effects; Audience Researchers; Election Campaigns and Media Effects; Marketing Research, Careers in.

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MICHAEL W. TRAUGOTT

ORGANIZATIONAL COMMUNICATION

Organizational communication is a process through which people construct, manage, and interpret behaviors and symbols (whether verbal or nonverbal), both intentionally and unintentionally, through interaction (mediated or direct), within and across particular organizational contexts.

An October 2000 search for publications that included "organiz-"and "communicat-" yielded more than 2,000 books or journals in the online Library of Congress catalog and more than 630 doctoral dissertations in the Dissertations Abstract database. ABI/Inform, the online business and organizations database, included nearly 1,300 articles that were indexed with either "organizational" and "communication" as subject words and nearly 200 articles with the two words in the article title. Furthermore, many surveys show that managers rank communication among the most valuable skills new, and veteran, employees should have.

Organizational communication can occur at a variety of levels, involving interpersonal and dyadic interaction, small groups or teams, large meetings, and within or across organizational departments or units, entire organizations, industrial sectors, and national borders. This communication may emphasize specific content (such as a memo providing some information) or may emphasize the nature of the relationship, what is called "metacommunication" (such as that same memo emphasizing that the person providing the information is clearly the expert and the reader should follow orders). The focus of the communication may be on task or social aspects, on administrative or operational functions, and on disseminating or receiving.

Organizational Theories and the Role of Communication

Different theories about organizations involve different assumptions about communication. Developed during the beginning of the 1900s, "classical management theory"-including scientific management theory, administrative manageformal ment theory, and bureaucracy theory-arose in response to the growth of large organizations performing standardized procedures to produce manufactured materials, a result of the industrial revolution. Classical management theory generally proposed that organizations could be efficient and successful through hierarchical structures, downward flow of task information from managers to workers, recognition of monetary and security motivations of employees while ignoring social relations and personal goals, avoidance of ambiguity or subjectivity of information especially in rules and procedures, optimal design of the work process, authority and legitimacy located in hierarchical position rather than in personal and political influence, hiring and rewarding employees on the basis of technical competence and task performance, division of labor to increase efficiency and specialization,

facilitation of horizontal communication when necessary but only with approval of the relevant superiors, and a continuing focus on organizational goals. In classical management theory, communication is highly structured and hierarchical, impersonal, and focused only on the goals of the organization.

Human relations theory arose not so much as a rejection of classical management theory but as a means to manage relationships within hierarchical organizations. However, the famous Hawthorne Studies in the 1920s and 1930s found that humans value social interaction and attention. Thus, organizational communication should allow development of group cohesion and cooperation, relationships within and among workers and management, job satisfaction, managerial skills, and awareness of the organization's community.

By the end of World War II, human resource theory expanded the consideration of social aspects, by emphasizing the importance of genuine participation and involvement of members. Other strands emerged, such as the authority-communication theory, which argued that organizational authority is developed, maintained, and accepted through honest and open communication.

In the 1960s, systems theory conceptualized systems as being embedded in larger systems and consisting of smaller subsystems, each interdependent, each creating something greater than the sum of the parts, and each engaging in general processes. Organizational environments consist of other organizations providing inputs to, using outputs from, and creating constraints on, the focal organization. No longer could organizations be managed as fixed, efficient machines; rather, they must be considered organic, adaptive, and constantly challenged processes that require constant communication within and across system boundaries.

Related concepts include organizational communication networks and roles, such as gatekeepers (who filter communication to a specific manager or upward through the organization), liaisons (who mediate interaction between two groups), bridges (a group member who mediates interaction with outside individuals), cosmopolite or boundary spanner (one who monitors the environment and brings new information into the organization), cliques (members who communicate more with each other than with other members), and grapevines and rumor networks (where members communicate through informal and social networks about salient, time-sensitive topics).

Communication structures influence outcomes (e.g., centralized or decentralized networks are differentially appropriate for different kinds of tasks), are affected by other factors (e.g., accuracy of upward communication is moderated by the level of trust between superior and subordinate), moderate other relationships (e.g., the ability of organizations to respond well to crises), and are both positive and negative influences on, and are both positively and negatively affected by, organizational changes such as the implementation of new media (Johnson and Rice, 1987). Evaluation and use of new organizational media may be influenced by the behaviors and attitudes of others in one's communication network (Fulk and Steinfield, 1990).

Related somewhat to systems theory, as well as to more recent notions of the interpretative and interactive nature of organizational communication, is the theory of organizational sense-making (Weick, 1979). The purpose of organizing is to reduce equivocality, or the extent to which multiple interpretations of a situation are possible. The nature of the environment is largely constructed by what people are able to, or choose to, "enact." To the extent that what is selected from this enacted environment is equivocal, people must either refer to interpretations and responses retained from past activities, or make sense of the situation through interactions with others. Jointly, through agreedupon patterns of enactment, interaction, and interpretation, organizational members "make sense" of their world so that they can engage in behaviors. Often, however, people must first take action before they can make sense of the situation, what is known as "retrospective sense-making."

More interpretative and cultural conceptualizations view organizations as constituted and structured not by formal flows of downward or horizontal communication but through and in the form of stories, myths, rituals, artifacts, values, logos, trademarks, taken-for-granted behaviors, dress styles, and office landscapes. That is, these cultural symbols are both results of and influences on meanings and behaviors, both positively and negatively, and emerge organically through the communication of members. A powerful example of an interpretative or cultural perspective is the organizational metaphor. Members may be guided, often implicitly, by the organization's "root" metaphor-such as business as "war." These metaphors shape the values and interpretations of the members and thus their decisions and behaviors as well. Metaphors also communicate the organization's image to its members, publics, researchers, executives, and policymakers-such as machine, organism, brain/computer, culture, political system, prisons, self-producing systems, or instruments of domination (Morgan, 1986). Some theorists, such as Stanley Deetz (1992), Michel Foucault (1995), and Dennis Mumby (1988), argue that all organizational power is embedded in discourse-who controls what is communicable within the organizational context. Thus, communication is not just a tool for exercising power; it is the very form of power.

More recent developments in organizational theory focus on quality management (where communication with current and prospective customers is the crucial source of feedback necessary to guide and improve the organization), chaos theory and learning organizations (where organizations are complex, adaptive, self-organizing systems dependent on rich communication that fosters collaboration, shared knowledge, and constant feedback at various levels), and network organizations (where organizational boundaries are becoming blurred as entities engage in temporary relations for particular products or markets, divest or outsource entire divisions so as to take advantage of marketplace resources, or even create virtual organizations that exist only on the Internet).

Applications of Organizational Communication

Motivation theories argue that people may be influenced to take action by salient needs that are not currently being met (Maslow, 1970), by expectations of the likelihood and value of outcomes (Vroom, 1982), or by general perceptions of expectations, opportunities, fulfillment and performance (Pace and Faules, 1994). Each of these processes is moderated by or manifested in communication; for example, expectations can be changed through communication about abilities and outcomes.

Organizational climate—a macro, organizational-level perception of the environment based on one's experiences with and perceptions of organizational elements (such as work and management practices)—influences a variety of communication outcomes (such as open and accurate downward information, and level of consultation in decision making). Communication satisfaction—a micro, individual-level evaluation—represents the extent to which basic communication processes (such as ability to suggest improvements, media quality, and adequacy of information) are acceptable. Both climate and satisfaction influence the attitudes and behaviors of individuals (Pace and Faules, 1994).

The concept of leadership has changed from a hierarchical role that delivers decisions and monitors workers, to a person who helps construct shared meanings and norms, provides support and motivation, and manages the boundaries of the unit. Various studies of leadership styles emphasize different communication aspects, from the appropriate balance among tasks and personal relations, to the extent to which all members can engage in decision making and self-regulation.

Another shift is from fixed organizational positions and specialized tasks to fluid teams and collaborative projects. Teams are often temporary groups that bring together particular expertise for a specific project, accomplish their task, and then disassemble to form new teams. These teams may even be "virtual," with the team consisting of members from different organizations who may be devoting only a portion of their time to each of several teams, and who may not even meet their team members face-to-face, instead collaborating and communicating through new communication technologies. Group decision support systems and other forms of groupware may be used to improve group communication (e.g., through anonymous brainstorming), allowing participation across time and space constraints, and providing different decision tools such as voting or ranking. Even traditional teams must communicate well to evolve through various group development stages and provide the necessary social support as well as task coordination. The necessary communication skills for dispersed and virtual teams are greater, especially as team members will be increasingly diverse-from different locales, organizations, professions, and cultures-and as members will have to switch between teams and adjust to new teams more frequently.

Conflict management and negotiation are fundamentally communication processes, as they are deeply embedded in the language, information, and interpretations available to, and valued by, each of the participants. There are formal and strategic communication styles that experienced negotiators apply in different contexts, for different goals.

Writing, public and group speaking, thinking critically, using new media, and presenting reports and results are increasing in importance. Working with others, especially in management and leadership roles, requires good listening and nonverbal communication abilities, an understanding of persuasive messages, familiarity with new interactive multimedia, interviewing, preparing and evaluating resumes, reading and assessing research reports, understanding the use and evaluation of online information and databases, and managing mediated interactions, such as through videoconferencing or online discussion groups.

Other areas of organizational communication include public relations, cross-cultural interaction, performance assessment, training, socialization, decision making, innovation, globalization, emotions, clothing design and selection, and office decoration. Nearly all organizational communication has ethical and legal implications concerning things such as harassment, discrimination, equity, cultural diversity, gender roles, racism, hiring and promotion bias, false or misleading advertisement, and even termination and retirement.

See also: Diffusion of Innovations and Communication; Internet and the World Wide Web; Networks and Communication; Organizational Communication, Careers IN; Public Relations.

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RONALD E. RICE

ORGANIZATIONAL COMMUNICATION, CAREERS IN

By the end of the twentieth century, the United States and other developed countries (especially Japan and most of the countries in Europe) had become informationand service-based economies. Due to the need to manage more complex social and institutional activities, and due to the rise of systematic management, communication media, computing systems, and telecommunications networks, more and more organizational activities have become symbolic-the creation, communication, and interpretation of information. Organizational communication and information professionals—"symbolic analysts" "knowledge workers"-will play an increasingly crucial role in society and the economy.

The U.S. Department of Labor (2000c) predicts that there will be growth in the number of communication and information jobs between 1998 and 2008. Within the industrial sector, which will grow by 14.4 percent overall, the services sector will have the largest growth (31%). The largest expected growth will be in professional specialties (27%), technical and related support (22%), service (17.1%), executives, administration, and managerial (16.4%), and marketing and sales (14.9%). The top ten industries with the fastest wage and salary employment growth will include computer and data processing services (117%), management and public relations (45%), and research and testing services (40%). The top six fastest growing occupations will be computer engineers (108%), computer support specialists (102%), systems analysts (94%), database administrators (77%), desktop publishing specialists (73%), and paralegals and legal assistants (62%). Overall, the top ten occupations with the largest job growth include systems analysts, general managers and top executives, office clerks, and computer support specialists. The rise of the Internet, of course, has generated entirely new classes of communication/information workers (see U.S. Department of Labor, 2000b).

Communication Careers

Disciplinary and association career guides, such as those noted in the bibliography section of this entry, provide good descriptions of the kinds of jobs, the educational and skill requirements, related disciplines, salary ranges, and associations related to communication and information professions.

Communication jobs can be categorized in a variety of ways:

- Advertising (marketing, copy writer, sales manager, media planner, media sales representative, opinion researcher, agency manager, account manager, creative/art director, publicity and promotion, etc.)
- Communication disorders (speech-language pathology, audiology, teaching, research)
- Communication education (media librarian, language arts coordinator, drama or debate director, university professor, etc.)
- Corporate communications (investor relations, environmental affairs, government relations, issues management, crisis management, public affairs, strategic planning, media relations, employee relations, community relations, marketing, special events, publicity, advertising, fundraising, media production)
- Electronic media (radio/television station personnel, film/tape librarian, engineer, community relations director, traffic/continuity specialist, media buyer, market researcher, actor, announcer, account executive, writer, news reporter or anchor, director, lighting director, multimedia developer, Internet information management, website developer, interactive materials producer, music librarian, video specialist, announcer, etc.)
- Publishers (print or electronic reporter, editor, copy writer, script writer, trade magazine representative, advertising sales, direct mail researcher, art and design, archivist/librarian, news service researcher, photography, technical writer, media critic/reviewer, media interviewer, printing, columnist, book editor, contract manager, literary agent, feature writer, freelance writer, etc.)



Tom Grimmer—the communications director for the Credit Suisse First Boston group—speaks to reporters outside the Credit Suisse's Tokyo branch office in October 1999 after the Japanese police had raided Credit Suisse Financial Products on suspicion that it obstructed an earlier inspection by Japanese financial regulators. (Reuters NewMedia Inc./Corbis)

- Public relations (publicity manager, marketing specialist, press agent, lobbyist, crisis management, press secretary, sales manager, media analyst, conference organizer, media planner, audience analyst, public opinion researcher, fund raiser, development officer, account executive, etc.)
- Theater/performing arts (performer, script writer, events organizer, producer, director, arts educator, lighting/design, theater librarian/historian, makeup/costume, theater critic, professor of theater and film, etc.).

Almost all other careers involve multiple aspects of communication and information. Some of the most relevant include business, education, government/politics, foreign service, educational institutions, high technology industries, health centers, international relations and negotiations, law, and social and human services.

Organizational Communication and Information Professionals

Some theorists such as Chester Barnard and Karl Weick have argued that organizations exist only through the process of communicating, whereby members attempt to make sense of information by communicating with others. The work that is performed by managers primarily involves providing oral communication with external and internal information sources, making decisions from incomplete and contradictory information, developing formal and informal communication networks, scanning the environment and spanning organizational boundaries, and depending on organizational structures to filter and evaluate information. Communication and information are central aspects of all organizational activities, from managing offices, developing satisfying jobs and worker relations, motivation and commitment, up to corporate redesign, information systems implementation, and marketplace strategy.

The book Managing Information for the Competitive Edge (1996), which was edited by Ethel Auster and Chun Choo and contains good reviews of these topics, argues that "information management" represents the beginning of convergence of the knowledge and skills of a range of professions-as indicated by the rise in executive titles such as chief information officer and by the growth in research and consulting in the fields of information resource management and knowledge management. A United Kingdom report noted in the book listed the following five positions as the most important areas for information management: information strategy, systems development, management of information, training, and liaison among other managers. New university programs and degrees in communication/information include multidisciplinary domains such as information science, information systems, database managers, user-interface and usability evaluator, communication, psychology and sociology, management, health informatics, information management in a variety of institutional settings, and Internet use and evaluation.

The rise of team/project structures, virtual organizations, and groupware or collaborative

technology (such as desktop video, audio, and text conferencing, shared files and documents, and asynchronous task management), and contract and outsourced employment, all require greater knowledge of nonverbal, interpersonal, team, and organizational communication.

Jobs involving information handling, networking, managerial awareness of information technology, and project management will become more frequent and important. Four basic organizational information competencies are monitoring performance, correcting performance, improving systems, and designing new systems.

Many organizational communication textbooks discuss job and career opportunities. Development positions include improving team and organizational effectiveness, training managers, developing and delivering training services, providing sales and customer service training, career development, and offering technical and skills training. Public contact positions include public affairs, community relations, media relations, and employee relations, as well as the more familiar marketing and personal sales. Finally, general management careers pervade for-profit and nonprofit organizations.

A search of an online career placement service, using the search term "organizational communication," found more than two thousand job listings. Examples (with the main category capitalized and the communication-related subcategory in lower case) include Account Management, Administrative Support meetings & marketing, Advertising Management, Art Director of Magazine, Business Process Consultant, Clerical Ad Team coordinator, Consulting senior writer, Creative Services corporate communications, Desktop Publishing online senior editor, Education/Training instructional designer, Entertainment audiovisual, Executive director of communications, General Management media ratings, Graphics, Health Care director of needs assessment, Human Resources personnel management, Internet/Intranet/Extranet editor, Marketing Communications manager, Multimedia information architect, Other catalog marketing strategist, Other collaboration, Other Intra/Inter/Net content specialist, Other conference planner, Other media production team, Other corporate communications, Producer online, Public Relations administrator, Publishing assistant, Secretarial communications coordinator, Technology Development technical

writing, Trade Services internship coordinator, and Training manager.

Additional Sources

Most professional and academic associations have websites that describe their placement services, career opportunities, listings of related disciplines, and summaries of undergraduate and graduate programs. Particularly relevant associations are the American Society for Information Science, the International Communication Association, the National Communication Association, the Association for Education in Journalism and Mass Communication, the Association for Communication Administrators, the International Association of Business Communicators, and the American Speech–Language–Hearing Association. Most all career and occupational books provide resources for local, regional, and national employers, by job type. The Dictionary of Occupational Titles, produced by the U.S. Department of Labor (2000a), provides a comprehensive list of job descriptions.

See also: Internet and the World Wide Web; Organizational Communication; Public Relations, Careers in.

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RONALD E. RICE

ORGANIZATIONAL CULTURE

Organizational culture is defined by Brent Ruben and Lea Stewart (1998) as the sum of an organization's symbols, events, traditions, standardized verbal and nonverbal behavior patterns, folk tales, rules, and rituals that give the organization its character or personality. Ruben and Stewart note that organizational cultures are central aspects of organizations and serve important communication functions for the people who create and participate in them. These functions include providing employees with a sense of individual and collective identity, contributing to the establishment of structure and control within the organization, aiding the socialization of employees through learning about the customs and traditions of the organization, and fostering cohesiveness among employees.

In their classic book on organizational culture, *Corporate Cultures: The Rites and Rituals of Corporate Life* (1982), Terrence Deal and Allen Kennedy provide extensive examples of organizations with strong cultures. Four of the common characteristics that they found are the following:

- 1. a widely shared philosophy (e.g., "people are our greatest resource" or "customer service is our top priority"),
- 2. a belief in the importance of employees (e.g., through flexible jobs and work hours, absence of reserved parking spaces, or opendoor management policies),
- 3. the presence of heroes (i.e., a person or persons who exemplify the philosophy of the organization), and

4. rituals and ceremonies (e.g., pizza parties every Friday afternoon, company sponsored recreational outings, birthday celebrations for all employees, and so on).

Various aspects of an organization can serve as indicators of its organizational culture. For example, modern technology companies often are characterized by their use of open space in which many people work in a large space that is freely accessible to all corporate employees. These companies may also encourage employees to dress casually and to interact in an informal manner. This reflects an organizational belief that hierarchies inhibit creativity and make it difficult for people to do their best work. Contrast this view of organizational culture with a more conservative company in which employees adhere to a generally understood dress code of formal business attire and work in offices that indicate the status of their occupants by the size of the office and the relative quality of its furnishings. These companies believe that formal networks of supervision lead to more productivity by allowing supervisors to monitor employee behavior and provide guidance and sanctions when necessary to keep employees focused on their jobs.

Language is a very important aspect of organizational culture and one that has been studied extensively by scholars of communication. Language both reflects and influences an organizational culture. For example, an organization that describes itself in terms of the family metaphor may provide flextime for employees who want to balance home and work responsibilities, on-site daycare facilities, wellness programs including health club memberships, or organization-wide social activities such as picnics and trips to amusement parks. An organization that uses militaryoriented language, such as "we are fighting this battle together" or "success means climbing to the top," may focus more on maintaining a rigid organizational hierarchy and a clear separation between people at different levels in the company.

Stories are an important means to maintaining an organizational culture. Most people in organizations can tell several stories that are indicative of the organizational culture, such as stories about how past employees either succeeded or failed at their jobs or memorable moments in the history of the organization. These stories may be communicated within the company or may be included in messages the organization communicates to the public. Within a company, an employee may tell a story of how the last person to ask for a new office carpet was moved to a smaller office, clearly communicating the message that the company does not encourage employees to focus on office décor. Communicating to the public, a television commercial for a beer company describes a situation in which a town was coping with the aftermath of a severe flood, and the company stopped bottling beer and bottled water instead to distribute to the flood victims. This type of advertisement is designed to communicate to the general public the caring nature of the organizational culture of the company.

Healthy organizational cultures can adapt to changing business needs and technological developments. For example, as technology enables employees to telecommute (either work at home or on the road and still remain in contact with their offices), many organizations have adapted themselves to this phenomenon. Some organizations have set up large areas in which telecommuters can come to the office and make telephone calls and meet customers or other employees as necessary without having individual offices. Other organizations have invested considerable resources in making sure that employees who work from their homes have ergonomically designed equipment that will enhance their productivity. Many organizations are struggling to balance the benefits offered by telecommuting (such as allowing employees to have flexible work schedules and the ability to respond to customer needs immediately) with the difficulties that arise when employees are separated from their supervisors and the day-today informal communication that is often beneficial to a healthy work environment.

Katherine Miller (1999) moves beyond the prescriptive approach to organizational culture by noting that some researchers view organizational culture not as a thing but as a process that includes emerging and possibly fragmented values, practices, narratives, and artifacts. Miller argues that the approach to organizational culture scholarship taken by contemporary researchers views culture as complicated, emergent, and not unitary. These researchers are more likely to use qualitative data collection methods, such as participant observation, extensive interviews, and ethnography, to develop a rich understanding of the culture of a particular organizational culture. The goal of this research is to gain an understanding of organizational culture that is grounded in what Miller refers to as "local observations." This research may be reported in a formal, scholarly way, but it can also include stories that are impressionistic and that attempt to capture the essence of an organizational culture that is compelling to the reader.

See also: Culture and Communication; Organizational Communication; Organizational Communication, Careers in; Organizational Quality and Performance Excellence.

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LEA P. STEWART

ORGANIZATIONAL QUALITY AND PERFORMANCE EXCELLENCE

Many organizations face common challenges when it comes to achieving quality and high levels of performance. Organizations of all kinds business, governmental, health care, and educational—create products or services to meet particular sets of consumer needs. To the extent that an organization achieves success and stability, the structures, systems, policies, work practices, and leadership styles that are associated with those accomplishments become accepted and standardized over time. In the short run, these patterns are often a prescription for continued success and vitality. However, in the longer term, these same patterns can lead to rigidity, insulation, lack of innovation, and gradual distancing from the needs of the marketplace and the expectations of consumers.

Over time, changes may also occur in the needs, expectations, or confidence of key consumers or sponsors. Competition, technology, economics, regulatory factors, and other marketplace conditions also evolve, sometimes in dramatic ways, and organizations or industries that are unable to anticipate, accommodate, or shape these changes are at risk as they become increasingly closed systems. Unless new ways of thinking and working and new structures and cultures to support these changes are developed, performance and quality may well deteriorate. The dynamics are quite similar whether one considers the rise and fall of an educational institution, a local video store, a community group, U.S. electronics manufacturers, or the Swiss watch industry.

Six Core Concepts

Originally called "TQM" (total quality management), "the quality/performance excellence approach" has achieved remarkable acceptance as a philosophy and method for addressing quality and performance challenges and dynamics and for identifying and reducing the gaps that confront many contemporary organizations.

Though the terminology varies somewhat from setting to setting, author to author, and program to program, there are six key values that transcend the various approaches to organizational quality and performance excellence: (1) service orientation, (2) leadership, (3) information use, (4) collaboration, (5) communication, and (6) continuous improvement.

Service Orientation

A service orientation directs attention to the needs, expectations, and satisfaction levels of the groups that are served by a private- or public-sector organization. Within the quality framework, these groups are variously referred to as "customers," "constituencies," "stakeholders," "consumers," "publics," "clients," "audiences," "beneficiaries," or "users." The focus on service to consumers is based on a recognition that it is ultimately their judgments of the quality of a product, service, or institution—translated into marketplace behaviors that are necessary for the continuing viability of the product or service organization.

The quality/performance excellence perspective suggests that practically speaking—as well as theoretically speaking—the definition of quality and value is dictated by the behaviors of consumers in a competitive marketplace for goods and services. No matter how organizational "insiders" assess the value of a particular product or service, those judgments are made in a vacuum (which makes them limited and inevitably incomplete) if the insiders do not take account of the needs, perceptions, and expectations of the consumers for whom the products and/or services are intended.

The concept of service orientation also applies to services provided by support and operational units within an organization for other groups that are internal to the organization. Most basically, the concept of service orientation suggests that it is essential to (1) identify external constituencies for which the organization provides products or services, (2) determine and anticipate their needs and expectations, and (3) satisfy—ideally exceed those needs and expectations.

Leadership

A fundamental tenet of the quality approach is that leaders are most effective when they are personally involved in creating, communicating, explaining, reinforcing, and exemplifying the organization's mission, vision, values, and service orientation. These directions must be clear, visible, and well integrated into management systems. Leaders should serve as role models through their active involvement and leadership in public and professional activities.

Ideally, the involvement of senior leaders will include a visible commitment to the growth, development, and satisfaction of the employees, and it should encourage productivity, participation, collaboration, and creativity among all personnel. Through ongoing personal involvement in activities such as planning, communication, reviews of performance, and recognition of individual and unit achievements, senior leaders serve as role models, reinforcing the organization's mission, vision, values, and goals and encouraging improved leadership at all levels.

Information Use

The basic concept underlying the value of information use is that organizational well-being and an external focus are possible only with effective systems for information acquisition, analysis, and application. This includes identifying, studying, and comparing an organization's own activities to those of "benchmark" organizations—organizations that represent a standard of excellence and are therefore a focal point for performance comparison and improvement. Specific kinds of information to be collected and used would include the answers to the following questions:

- How do key external consumer groups evaluate products and/or services?
- What criteria do consumers use in assessing products/services?
- What is the relative importance of these criteria?
- Who are the key competitors?
- How do products, services, management approaches, and operational performance compare to those of competitors?
- How do employees evaluate the organization, its performance, management, quality of life, products/services, and processes?
- How do suppliers and gatekeepers evaluate the organization and its products/services?

Depending on what information is needed in order to answer any given question, the data may need to be gathered from external sources (e.g., key constituent groups, other organizations, and suppliers), or it may need to be gathered from internal sources (e.g., from employees and through organizational self-study).

Collaboration

Organizations are considered to be complex systems with numerous internal and external constituencies that interact with and depend on one another. These interactions may take the form of exchanges of goods, services, capital, or information. The viability of organizations as systems and their ability to meet expectations of external constituencies depend largely on whether and how these internal interactions take place. Traditionally, organizations have been structured based on basic functions that need to be carried out. Thus, a typical manufacturing company has divisions or departments of production, sales, operations, marketing, finance, research and development, and so on. Each division is organized hierarchically, with the staff in that area reporting to supervisors, who report to managers, who report to directors, who report to vice-presidents, who ultimately report to a president and/or a chief executive officer. This results in elaborate vertical structures and reporting relationships within each functional area of the organization.

Vertical structures, sometimes termed "silos," facilitate interaction within functional divisions. At the same time, they set up obstacles to interaction and coordination between units. Individuals and departments often become detached from the overall mission of the organization. Work process fragmentation, compartmentalization, and an "it's not my job" mentality tend to evolve. Thus, for example, the research and development division may design a product without the benefit of full collaboration with manufacturing, operations, and marketing, which can potentially lead to any of a number of unfortunate outcomes, such as a wonderful design for a product that the company cannot easily manufacture and for which there is no longer a viable market.

Simpler, better integrated, "flat" organizations, which facilitate cross-functional and cross-divisional collaboration, coordination, and teamwork, are considered to be a means for addressing consumer expectations, aligning individuals and functional units with the organization's mission, and improving the overall organizational quality.

Communication

Communication is the means through which information is gathered and disseminated to and from stakeholders or consumers, and it is the mechanism through which work process collaboration occurs. It is also the process through which relationships are formed and developed—relationships that are essential to the creation of a culture and spirit of teamwork that is necessary to support and maintain an external focus, collaboration, and a good overall organizational quality.

Continuous Improvement

Quality and high levels of performance do not occur naturally. Rather, they require a substantial

commitment of time and resources to a process of continuous improvement and ongoing change what many people writing in the quality area have called a "journey."

Continuous improvement implies a commitment by everyone within the organization to a recursive process, consisting of planning and testing improvements, evaluating outcomes, learning from failures, implementing and sustaining successes, planning and testing improvements, and so on.

Quality Strategies and Processes

What is the process by which the core quality and performance excellence values are implemented within an organization? Broadly speaking, the process has two phases: assessment and improvement.

Assessment

Fundamentally, assessment is a strategy for evaluating the current level of performance of an organization in relationship to the expectations of its constituencies and the organization's mission and vision. It allows for the identification of service quality gaps, which become priorities for improvement.

One of the most widely used assessment tools is the Malcolm Baldrige National Quality Award. The Baldrige Award, signed into federal law on August 2, 1987, was initiated with the intent of improving quality and workmanship in the United States. The National Institute of Standards and Technology (NIST) directs the award program. Organizations that are interested in being considered for the award must complete a comprehensive self-study and application process. Awards are given in five categories: manufacturing, service, small business, education, and health care.

Quality Improvement

The process of quality improvement usually involves two steps: (1) identifying, planning, and implementing improvement and (2) integrating improvements. Basic to the improvement process are groups, or teams. A team simply is a group composed of individuals who represent various facets and levels of a unit or process earmarked for study and improvement. The team includes individuals who have a broad base of knowledge and experience with the processes that are being addressed.

The team members work together to develop an approach for ongoing monitoring, evaluation, and improvement. Team activities typically consist of the following:

- attending meetings,
- planning improvements,
- understanding the process to be improved,
- understanding the problem,
- collecting information,
- using tools and techniques to analyze and interpret the information, identifying solutions, and
- implementing and managing changes.

Other improvement tools besides teams include strategic planning, advisory groups, work process design or redesign groups, quality and service skills training, partnerships with corporations that are experienced with quality programs, and external consultation.

Conclusion

The quality/performance excellence approach is an interdisciplinary approach to organizational behavior and leadership. The approach addresses significant and enduring issues, and it integrates theories, concepts, and methods from various disciplines and traditions of organizational thought.

See also: Culture and Communication; Group Communication; Knowledge Management; Management Information Systems; OrganizaTIONAL COMMUNICATION; ORGANIZATIONAL CULTURE.

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BRENT D. RUBEN



PALEY, WILLIAM S. (1901-1990)

William S. "Bill" Paley was the son of Samuel and Goldie Paley, Jewish immigrants from the Ukraine who founded a cigar manufacturing company in 1896 in Chicago; the company was later incorporated as the Congress Cigar Company and relocated to Philadelphia, where it became a thriving business. At the age of twelve, Paley impulsively added the middle initial "S" to his name. (Some people thought the "S" stood for Samuel.) Paley graduated from the Wharton School of Finance at the University of Pennsylvania in 1922. He had worked for his father's company while in college and joined the company upon graduation. Paley biographer Sally Bedell Smith writes in In All His Glory (1990) that while young Paley was vacationing, his father and uncle agreed to sponsor a radio program to advertise their La Palina cigars. This eventually led the company to become a radio sponsor on a regular basis. Smith writes that Paley only reluctantly agreed to his involvement with radio, although Paley, in his later years, suggested that he had been the radio visionary who recognized the power of radio to promote the family's cigars. In any case, Paley's version had become the official network story by the 1940s.

Radio advertising boosted the sale of the cigars and opened young Paley's eyes to the possibilities of radio. La Palina cigars became one of the first sponsors on the newly founded Columbia Phonograph Broadcasting System, later the Columbia Broadcasting System (CBS). In 1928, with Paley buying 41 percent of the stock, and other family members owning the remainder, Paley purchased CBS. Two days before his twenty-seventh birthday, Paley was elected president of the network. One of his early successes came when the network was negotiating program carriage with the local stations (i.e., affiliates). First, Paley doubled the number of network programming hours to twenty hours per week-time that consisted of a combination of programming with sponsors (i.e., sponsored programming) and without (i.e. sustaining programming). Second, he got the affiliates to agree to run all twenty hours and to guarantee that they would not preempt network programming. Third, he got the affiliates to agree to accept money from the network only for the portion of the twenty hours that consisted of sponsored programming. Finally, he got the affiliates to waive this monetary compensation for the first five hours of sponsored programming. Because the network typically included only five hours of sponsored programming in the twenty hours of full programming each week, the affiliates had to run all of the programming for free. More important in the long run, the twenty hours of programming provided affiliates with higher quality national broadcasts that furthered the development of the network and improved the public's perception of radio.

Paley's network competitor and nemesis was David Sarnoff, president of the National Broadcasting Company (NBC). Sarnoff's NBC Red and Blue networks led Paley in the number of affiliates, the number of popular programs, and the length of operation. One of Paley's early accomplishments for CBS was to sign additional affiliates


Frank Stanton presents William S. Paley with a silver gavel on behalf of "The men and women of CBS in grateful appreciation for his resolute and inspiring leadership" to commemorate the company's fortieth anniversary year. (Bettmann/Corbis)

that had previously been with the NBC networks. The affiliate raids ended a "gentleman's agreement" between CBS and NBC not to poach each other's affiliates, and it signaled to Paley's detractors that he was prepared to compete head-tohead in the competitive radio business. Paley was noted for his ability to identify star performers and recruit them for CBS broadcasts. Part of Paley's effectiveness came from his ability to charm the stars through his personality. Paley conducted a series of talent raids to lure stars away from NBC, a tactic he used successfully several times during his career. The talent raids were a success partly because Paley offered the stars more money but also because Paley personally enjoyed lavishing attention on his stars. Following the talent raids, CBS carried the most popular programs, and NBC had to start over and prepare a new programming schedule. Popular CBS performers included George Burns and Gracie Allen, Jack Benny, Will Rogers, Bing Crosby, Kate Smith, and the Mills Brothers.

During World War II, Paley served in the U.S. Army in the Psychological War Branch of the Office of War Information. Paley's assignments included supervising broadcasts to Germany and Occupied Europe and preparing radio messages to accompany the D-Day invasion. Paley described radio broadcasting as a tool of warfare, just as were guns and bullets.

Under Paley's leadership, CBS introduced a color television system in 1945. Because the system was incompatible with existing black-and-white television sets, NBC's Sarnoff successfully lobbied the government not to approve the CBS system. Eventually, CBS withdrew its color television system. CBS was slow to develop television programming, but with help from Frank Stanton, CBS was soon airing *The Jackie Gleason Show* (1952–1970), *I Love Lucy* (1951–1961), *Gunsmoke* (1955–1975), *Arthur Godfrey's Talent Scouts* (1948–1958) and *The Ed Sullivan Show* (1948–1971).

For Paley, CBS was his very life. He waived the company's mandatory retirement rule in 1966 and continued to serve as company president. He selected an outsider, Tom Wyman from Pillsbury, to run the company in 1983 with disastrous results. Paley resumed the chairman's job in 1986 when Laurence Tisch of Loews Corporation was acquiring stock and eventual control of the company. Tisch, at the time of Paley's death in 1990, had succeeded in wresting control of CBS away from Paley and was putting the company through a series of cost-cutting measures and selling divisions of the company.

Paley and his second wife, Barbara "Babe" Paley, were avid art collectors. Their collection included works by Henri de Toulouse-Lautrec, André Derain, Pablo Picasso, Paul Cezanne, and Jackson Pollock. Paley was a longtime president and trustee of the New York City Museum of Modern Art and founded the Museum of Broadcasting, which was later renamed the Museum of Television and Radio.

See also: Radio Broadcasting, History of; Radio Broadcasting, Station Programming and; Sarnoff, David; Television Broadcasting, History of.

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GREG PITTS

PARADIGM AND COMMUNICATION

Philosopher Thomas Kuhn (1970) is generally credited with having introduced the term "paradigm" to refer to a broad framework that guides the thinking and research of scholars over a long period of time as they conduct research and develop specific theories. Perhaps the most classic illustration of a paradigm was the long-standing view that Earth was the center of the universe, around which center the Sun, moon, and planets revolved. This way of thinking, attributed to Alexandrian geographer and astronomer named Ptolemy (130 C.E.), was widely accepted and used until astronomers encountered discrepancies that were not easily explained by Ptolemy's geocentric paradigm. Inconsistencies of this kind, which Kuhn calls "anomalies," can lead to a scientific revolution and the emergence of a new paradigm. In this case, the new framework, advanced by Nicolaus Copernicus in the fifteenth century, was able to address the anomalies by advancing a new way of thinking, which proposed that Earth rotates on its axis and that the planets (including Earth) revolve in orbits around the Sun. This paradigm replaced the Ptolemaic view and has continued to provide the overarching framework for scholarship and research in the centuries since then.

In communication study, as in astronomy and other fields, the concept of paradigm is quite useful for understanding the evolution of thought. From the earliest formal study of communication by Aristotle and his contemporaries in Ancient Greece, communication was generally viewed as a process through which a speaker conveys messages to influence or persuade one or more receivers. This paradigm emphasizes the importance of a source and his or her intended message. Receivers are typically viewed as being passive recipients of messages, and thus as the endpoint in what is viewed as a straightforward and predictable cause-and-effect process.

This Aristotelian framework remained pervasive in communication study until the middle of the twentieth century. As noted above, paradigms change as a result of anomalies. In the case of communication study, it was observed by a number of scholars that messages sent by a speaker often are not received and/or acted on by receivers in the manner in which the sender or message advocated. These observations were at odds with the traditional paradigm. Gradually, the anomalies led to the erosion of the traditional paradigm and the growing acceptance of a communication paradigm that emphasizes the active and powerful influence of receivers on the process.

Contemporary models of communication assert that receivers play a much more active and discriminating role in the process. They emphasize the variety of ways in which receivers attend to, interpret, and respond to messages. The factors that affect these processes are related to the sender and the message, as well as the channel, the situation, the relationship between sender and receiver, and so on.

Paradigms are important in communication study, as in other fields, because they guide scholarship, research, and sometimes policy and professional practice. For example, based on the earlier communication paradigm, it made sense to think that smoking could be greatly reduced or eliminated if warnings pointing out the health hazards were printed on cigarette packages. Research and observation, however, indicated that the intended message was often ignored or distorted by receivers; it certainly was not reacted to as advocated by the source or message. Anomalies such as these led to a view that suggests the importance of focusing on the intended receiver of messages rather than just on a sender and the intended message.

Paradigms evolve slowly and are sometimes rejected with reluctance even when many anomalies exist. Thus, even though important changes began to take place in the communication paradigm in the middle of the twentieth century, it is still not uncommon to hear the process described in terms that reflect the older view, such as when someone says, "I don't know why he didn't get my message. It was a simple point, and I repeated it two times!" This kind of utterance implies that communication outcomes are primarily influenced by the sender and his or her message; it does not acknowledge the very active role that receivers play and the variety of factors that influence the outcomes of the communication process.

See also: Communication Study; Evolution of Communication; Human Information Processing; Models of Communication.

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BRENT D. RUBEN

PARANORMAL EVENTS AND THE MEDIA

The term "paranormal" refers to a wide range of alleged phenomena that appear to defy explanation using scientific understandings of natural law. The term is commonly used to refer to such diverse things as extrasensory perception (ESP), haunted houses, ghosts, devils, angels, spirits, reincarnation, telekinesis, unidentified flying objects (UFOs), space alien abductions, astrology, palm reading, astral projection, the Loch Ness monster, and communicating with the dead.

Public opinion polls and studies by academic researchers indicate that belief in paranormal phenomena is common. In a 1991 national survey of more than one thousand adults, George Gallup and Frank Newport reported that paranormal beliefs were "widespread," with nearly 50 percent of the respondents reporting belief in ESP and almost 30 percent reporting belief in haunted houses. Of some surprise to scholars, studies reveal that paranormal beliefs are not significantly lower among college students, even at institutions that are noted for science and engineering. For example, in a 1994 study of students from Purdue University, Glenn Sparks, Trish Hansen, and Rani Shah found that a variety of different paranormal beliefs were endorsed by many of the respondents. These beliefs included the existence of ghosts (70%), accurate predictions of the future by reading palms (40%) or by relying on psychics (37%), personal ability to use ESP on occasion (44%), and astral projection (30%). The traditional line of research on paranormal beliefs extends back to the late 1960s and focuses on (1) the extent to which various populations express belief in some paranormal phenomenon, (2) the extent to which belief in one paranormal phenomenon corresponds with belief in other paranormal phenomena (i.e., the structure of paranormal beliefs), and (3) the extent to which belief in the paranormal varies according to individual differences in personality or according to membership in some demographic category.

In the 1970s, a group of scholars (including some who conducted basic research on paranormal beliefs) became increasingly concerned about what appeared to them to be a rising tide of paranormal claims that were, for the most part, not challenged by any systematic line of study. Their concern resulted in the formation of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), an organization that is devoted to rational, scientific inquiry into various paranormal claims. CSICOP began to publish a journal, *The Skeptical Inquirer*, in the mid-1970s.

One issue that has been regularly featured in The Skeptical Inquirer since its inception is the role that mass media play in encouraging people to believe in various paranormal claims. Typical of the rhetoric that is found in the pages of this journal is the following comment made by Paul Kurtz (1985), chairman of CSICOP and a philosophy professor: "We thought it incredible that so many films, TV and radio programs, news stories, and books were presenting these paranormal claims as gospel truth, even maintaining that they had been proven by science, and that there was little or no public awareness of the fact that when these claims were subjected to careful scientific appraisal they were shown to be either unverified or false" (p. 357).

Even though no scientific content analyses exist to document the presence of paranormal themes in the media, Kurtz's observation about the prevalence of paranormal depictions is not controversial among scholars. Such depictions of one form or another have turned up in books, radio programs, movies, and television shows for almost as long as these media have existed. On Halloween night in 1938, Orson Welles triggered a sensational episode of panic among the radio-listening audience with his War of the Worlds broadcast. The radio drama, which aired as part of CBS's Mercury Theatre on the Air, featured realistic, onthe-spot "news" reports that told of an invasion of space aliens from Mars. Follow-up research conducted by Hadley Cantril at Princeton University in 1940 documented the fact that many listeners did experience feelings of helplessness and panic as a result of the broadcast.

Until the late 1970s, few studies other than Cantril's study examined fright responses to media depictions, and almost no research existed on how depictions of paranormal themes might influence audience beliefs. In 1981, Joanne Cantor launched a series of studies on children's fright reactions to mass media (see Cantor, 1998). As a result of these studies that were funded by the National Institute of Mental Health, a number of researchers began to work systematically with frightening movies and television programs. Much of the content in this genre was paranormal. For example, The Exorcist, a 1973 film that triggered several extreme reactions among audience members (including the need for hospitalization), featured the paranormal depiction of demonic possession. Similarly, Poltergeist, a 1982 film that reportedly induced long-term sleep disturbances in many children, featured numerous ghosts and spirits who disrupted the daily routine of a suburban family by haunting their house in frightening ways. Although research on children's mediainduced fears shows that the tendency to be frightened by fantasy creatures declines with age, in her 1998 book summarizing the available fright research, Cantor concluded that alien and supernatural phenomena were among the most potent fear-inducers for adolescents. The early studies examined these films for their emotional effect on viewers, but it was only a matter of time before the potential effect of paranormal themes on the beliefs of viewers would also come under scrutiny.

Several factors converged in the 1980s to increase the prevalence of paranormal themes in



Brig. General Roger M. Ramey and Col. Thomas J. Dubose, from the U.S. Air Force, identify metallic fragments found by a farmer near Roswell, New Mexico, as pieces of a weather balloon. (Bettmann/Corbis)

the media. With the proliferation of cable channels, new networks searched for programming formulas that would compete for a share of viewers that was large enough to make a profit. Industry programmers discovered that so-called reality television was relatively cheap to produce and could attract reasonable audience sizes. Consequently, stories about haunted houses, UFO sightings, police psychics, demonic possessions, angelic visitations, and the like began to proliferate. The success of some of these programs inspired the networks to explore paranormal themes in their prime-time lineups and led Hollywood to invest in more movies that revolved around paranormal plots.

In the 1990s, Sparks and his associates began studying the effect of media depictions of the paranormal on the beliefs of viewers. In a 1994 study, Sparks, Hansen, and Shah randomly assigned college students to view a television program about astral projection with one of four possible introductions: one that emphasized that the depicted events had been real, one in which the events were labeled fictitious, one with a stronger disclaimer that emphasized that the depicted events were impossible from a scientific standpoint, and one with no introduction. The introductory messages significantly affected the subsequent beliefs of the students. Relative to the beliefs that they had expressed several weeks earlier, students assigned to the fiction or impossible conditions reduced their beliefs in astral projection and related paranormal phenomena. Students who heard no introductory message increased their beliefs in paranormal phenomena. Students in the reality condition failed to increase their beliefs in the paranormal. Sparks and his colleagues speculated that introductory messages that emphasize the reality of the depiction may cause viewers to become more suspicious about the veracity of the events that are being depicted. This study demonstrated that the way in which paranormal phenomena are depicted in the media can trigger changes in what people believe about the existence of those phenomena.

In a 1995 study by Sparks, Cheri Sparks, and Kirsten Gray, college students who possessed either high or low ability to experience vivid mental images were randomly assigned to view one of two versions of a television program that featured documentary-style reporting of UFO sightings. One version of the program contained depictions of UFOs and space aliens that were created by special effects as part of the original network broadcast of the program. The second version of the program was edited to remove all of these UFO depictions that were created by the network. Students with a high ability to experience vivid mental images increased their belief in UFOs after viewing the version that contained no UFO or alien images. In contrast, students with a low ability to experience vivid mental images increased their belief in UFOs when they viewed the unedited version of the broadcast that contained the special effects. Sparks and his colleagues concluded that the decision to include various UFO images in a documentary-style report can definitely have an effect on the subsequent beliefs of viewers, but this effect may depend on viewer characteristics.

In a 1997 experiment by Sparks and Marianne Pellechia, college students were randomly

assigned to read one of four versions of a magazine article about alien abductions. Two of the stories affirmed the reality of alien abductions; the remaining two stories tended to disconfirm their reality. For both the affirming and disconfirming stories, one of the versions featured the testimony of a scientist while the other version simply presented the opinions of the magazine writer. After reading the articles, beliefs in UFOs and alien abductions were highest among the students who read the affirming story that featured the testimony of a scientist. Beliefs were lowest among the students who read either the affirming or disconfirming story that presented only the opinions of the magazine writer. Students who read the disconfirming story that featured a scientist did not express the lowest level of belief in UFOs. Sparks and Pellechia speculated that merely mentioning a scientist in the context of a story about UFOs and alien abductions may tend to bring credibility to the phenomenon and make it more believable. Once again, variation in the way paranormal content was depicted produced a difference in postexposure beliefs.

In a 1998 experiment by Sparks, Pellechia, and Chris Irvine, college students were randomly assigned to watch one of two different segments about UFOs. The segments were originally broadcast as part of a network news documentary. One segment featured video experts who testified that a video recording of an alleged UFO showed more than a conventional jet aircraft. The other segment featured unchallenged testimony from an alleged eyewitness to a UFO crash. Students who viewed the unchallenged testimony increased their belief in UFOs; those who viewed the video experts decreased their belief in UFOs.

In addition to these experiments, Sparks, Leigh Nelson, and Rose Campbell conducted in 1997 a random-sample survey from a midwestern city to investigate the relationship between media exposure and paranormal beliefs. Exposure to programs that regularly depict the paranormal was positively correlated with paranormal beliefs. Sparks and his colleagues discussed the possibility that prior beliefs lead to selective exposure to these programs, but they concluded that overall, the pattern of evidence from the survey and the experiments supports the idea that media depictions of the paranormal exert a causal force on the paranormal beliefs of viewers. Given the frequent depictions of paranormal phenomena in the media, there is every reason to believe that researchers will continue to investigate their effect.

See also: FEAR AND THE MEDIA; WELLES, ORSON.

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GLENN G. SPARKS

PARENTAL MEDIATION OF MEDIA EFFECTS

There is much concern over the negative effects of television viewing on children. Children who watch more television are at a greater risk of experiencing a host of negative outcomes compared to children who watch less television. The good news is that parents can modify or even prevent television-related effects by engaging in a variety of practices known as "mediation."

What Is Mediation?

Mediation has not been defined consistently. As a result, many different definitions of this term exist. However, researchers endorsing the various conceptualizations agree that mediation refers to interactions with children about television. Although a number of individuals can provide mediation, such as siblings, peers, and adults, the term is commonly used to signal parent-child interaction. The focus of this entry, therefore, is on parental mediation.

Parental mediation can take several different forms. Amy Nathanson (1999) has distinguished these forms as active mediation, restrictive mediation, and coviewing. Active mediation refers to the conversations that parents can have with their children about television. Sometimes these conversations are generally negative in tone, such as when parents tell their children that what they are seeing on television is not real or that they disapprove of the behaviors of the television characters or the program in general. In this case, the parent-child communication is called "negative active mediation." However, parents can also say positive things about what their children watch on television. For example, parents can communicate their approval of certain programs or depicted behaviors or point out how certain portrayals are realistic. This kind of interaction is called "positive active mediation." Parent-child communication about television that is neither negative nor positive would likely fall into the "neutral active mediation" category. This type of active mediation includes providing the child with additional information or instruction regarding television content. For example, while watching an educational program, parents might extend the lessons that television introduces. Active mediation-whether negative, positive, or neutral-can take place at any time. In other words, parents can discuss television with their children during viewing or after programs have ended and the television is no longer on.

Restrictive mediation includes the rules and regulations that parents institute regarding the television viewing of their children. Parents can create rules about the kinds of programs that their children are allowed to watch, how much they can watch, and when they can watch it. Parents can also vary in how strict they are in enforcing the rules. That is, some parents may have a lot of television-viewing rules, but may not enforce all of them. Others may have just a few rules that they ensure are never violated. The combination of the kinds of rules and how strictly they are adhered to constitutes the level of restrictive mediation.

Coviewing occurs when parents watch television with their children. Although parents may discuss the television content with their children while viewing with them, it is important to note that coviewing occurs regardless of whether active mediation occurs. As a result, coviewing describes a much more passive form of behavior in which the parent simply watches television with the child. The distinction between active mediation and coviewing is an important one to make, as the two concepts reflect unique forms of behavior that are associated with very different kinds of effects.

Who Gives and Receives Mediation?

Unfortunately, Erica Austin reported in her 1993 article that not all parents use mediation. In fact, it may be increasingly difficult for parents to provide mediation given a number of factors, including the limited amount of time that working parents have to mediate and the easy access of children to television (in fact, many children have television sets in their own rooms). Those parents who do mediate appear to fit a particular profile. In other words, there are certain types of parents who use the various forms of mediation with certain types of children. To begin, active mediation is most often used by mothers as opposed to fathers. It is unclear whether users of active mediation are more educated or not-a 1992 survey by Tom van der Voort and his colleagues suggests that this is the case while research conducted by Patti Valkenburg and her colleagues in 1999 indicates that active mediation is used by parents of all educational levels. It is not surprising that parents who generally like and approve of television are more likely to use positive active mediation while parents who dislike television are more inclined to use negative active mediation. Both boys and girls of all ages are equally likely to receive active mediation.

Parents who use restrictive mediation are also usually mothers. These parents are typically well educated and believe that television can have a detrimental effect on their children. Parents are more likely to restrict the viewing of their younger children as opposed to their older children, who are allowed more viewing freedom. For the most part, it appears that parents are equally likely to use restrictive mediation with their sons as with their daughters.

Research suggests that coviewing is used most frequently by mothers and parents with less education (Austin, Bolls, Fujioka, and Engelbertson, 1999; van der Voort, Nikken, and van Lil, 1992). Like positive active mediation, coviewing occurs more frequently among parents who like and approve of television. Although both boys and girls are likely to receive coviewing, there is some disagreement in the literature regarding whether coviewing is mostly used with younger or older children. That is, a 1999 survey by Austin and her colleagues indicates that parents are more likely to coview television programs with their younger children. If parents believe that coviewing will help prevent negative effects from occurring, then it makes sense that they would use it more with younger children who are often perceived to be more susceptible to experiencing negative effects from viewing television. On the other hand, a 1982 survey by Carl Bybee and his colleagues showed that coviewing occurs more frequently with older children. This could be because of the similarities in the viewing preferences of the parents and the viewing preferences of the children that emerge as children mature. Hence, coviewing that occurs between parents and older children may reflect shared interests rather than conscious attempts at mediation.

Overall, then, mothers use all forms of mediation more than fathers. When they use negative active mediation or restrictive mediation, it is likely that they are trying to protect their children (probably their younger children) from perceived harmful effects of television. In the minds of the parents, making negative statements about television or restricting the access of their children to it should reduce the negative effects of television. However, it is possible that the use of positive active mediation and coviewing by parents is simply the outcome of parents enjoying television with their children.

How Successful Is Mediation?

Researchers have tried to determine whether active mediation, restrictive mediation, and

coviewing affect children in a positive way. Given that there is so much concern over the effects of television on children, it certainly would be reassuring to know whether parents can prevent or reduce undesirable effects.

Much of the work on the effects of active mediation has explored whether parents who use it have children who are more sophisticated consumers of television. For example, research has shown that children who receive active parental mediation are better able to understand the plots of television programs, are more skeptical of televised news, and are less likely to believe that what they see on television is real (Austin, 1993; Desmond, Singer, Singer, Calam, and Colimore, 1985; Messaris and Kerr, 1984). However, some forms of active mediation can produce the opposite effects. A 2000 survey by Austin and her colleagues showed that children become less critical of television when their parents make positive comments about it. It certainly seems that what parents say to their children about television is very important in shaping the children's perceptions of the content.

Other research indicates that children whose parents employ active mediation are less likely to be negatively affected by television. Although there exists less research exploring this kind of relationship, the results are promising. A 1997 survey by Nathanson found that children whose parents use negative active mediation are less aggressive than other children. In fact, these children are not only less aggressive in general, but they are also less likely to learn aggression from violent programs they see even when their parents are not present. It could be, then, that negative active mediation "inoculates" children from harmful television-related effects that could occur outside of the home.

Research on the effects of restrictive mediation is less abundant. However, there is some indication that children whose access is restricted to television are less likely to be negatively affected by it, even when they do view it. A 1987 survey by Nancy Rothschild and Michael Morgan found that children whose parents restrict viewing are less likely to be unnecessarily fearful of the outside world (one outcome that is often associated with television viewing). In addition, it has been found that children who receive restrictive mediation are less aggressive—both in general and after viewing violent content on television. It should be noted, however, that there is some evidence that very extreme levels of restrictive mediation will backfire. In other words, children whose parents severely limit access to television may actually become more aggressive, perhaps due to the frustration that results from the deprivation of privileges.

When parents coview television with children, it seems that children are more likely to experience positive feelings and learn from what they see on television. It is possible that the mere presence of parents while viewing makes children feel happy and that this positive emotional state enhances children's learning. Although this appears to be a generally positive effect, negative outcomes may result when parents coview harmful television content. In fact, there is evidence that children whose parents coview are more likely to believe that television is realistic, to uphold gender stereotypes, and to learn aggression from television (Messaris and Kerr, 1984; Nathanson, 1999; Rothschild and Morgan, 1987). The effects of coviewing may depend, then, on what kind of television content the parents and children share.

One reason why the various forms of parental mediation are associated with the outcomes reviewed above could be that mediation teaches children to have a certain attitude toward television that will make effects either more or less likely to occur. In the case of negative active mediation, it is possible that children who consistently hear negative messages about television adopt a disapproving attitude toward it. Armed with this kind of attitude, these children may be less likely to take what they see on television very seriously and, therefore, be less likely to learn from it. This kind of reasoning could also apply to restrictive mediation: When their television is consistently restricted, children may learn that television is undesirable. Once they adopt this perspective, they may be less vulnerable to experiencing television-related effects when they do watch television. However, when children receive positive active mediation, they may learn that television is good and should be taken seriously. This kind of attitude may make effects more likely. And, if children interpret parental coviewing to mean that their parents like the content that is shared, they may develop a very accepting attitude toward television that may enhance effects.

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In fact, a 1999 survey by Nathanson showed that the explanation provided above is accurate. It seems that children who receive negative active mediation or restrictive mediation of violent television have more negative attitudes toward violent television than other children. It also appears that these negative attitudes that children develop make it less likely that children will learn aggression from television. It is unclear, however, whether coviewing effects are also attributable to changes in attitudes toward television.

Mediation, then, provides parents with some options for dealing with the television viewing of their children. Depending on the kind of mediation provided and the kind of programs that are mediated, parents can influence how their children are affected by television. However, parents need to be educated about what options exist and the relative effectiveness of these options so that the most successful strategies will be implemented with more children.

See also: Antiviolence Interventions; Fear and the Media; Ratings for Movies; Ratings for Television Programs; Ratings for Video Games, Software, and the Internet; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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PATIENT-PROVIDER RELATIONSHIP

See: Health Communication; Provider-Patient Relationships

PEIRCE, CHARLES SANDERS (1839-1914)

Born in 1839 in Cambridge, Massachusetts, Charles Sanders Peirce was the second and favorite son of Benjamin Peirce, who was a professor of mathematics and astronomy at Harvard University and was superintendent of the U.S. Coast and Geodetic Survey. Along with Abraham Lincoln in 1863, Benjamin Peirce founded the National Academy of Sciences. Charles graduated with high honors in 1854 from Cambridge High School, where one of his favorite pastimes was the debating society, a source of his reputation as an engaging conversationalist and dynamic lecturer. He then graduated from Harvard with a B.A. in 1859 and an M.A. in 1862. In 1863, he graduated summa cum laude with a B.S. in chemistry from the Lawrence Scientific School at Harvard. He had an erratic and confrontational personality, largely preventing him from permanent employment in the academic world. He was a part-time lecturer in logic at Johns Hopkins University from 1879 to 1884. Despite the persistent efforts of William James, he never obtained a position at Harvard. His more periodic employment with the Coast Survey, and later with the U.S. Assay Commission, fared no better. He suffered seven mental breakdowns between 1876 and 1911 due to a condition now known as trigeminal neuralgia, associated with manic depression. With a small inheritance, he purchased a retirement home at Milford, Pennsylvania, and lived in extreme poverty. During the years between 1903 and 1908, he corresponded on logic and semiotics with Victoria Lady Welby in England. Peirce died of cancer on April 19, 1914.

Peirce comes closest to being America's only systematic philosopher, writing widely and in detail. His principal philosophic system draws from medieval learning focused on the semiotic *trivium* of grammar, logic, and rhetoric—the building blocks of modern communication theory and mathematical (information) exchange theory. But, the behaviorist division of semiotics, proposed by Charles Morris, is better known. For Morris, gram-



Charles Sanders Peirce. (Bettmann/Corbis)

mar is syntactics, or the study of sign structures (codes), whether animal, machine, or human. Logic is semantics, or the study of choices in meaning that govern intention in communication. Last, rhetoric is pragmatics, or the use of discourse to inform and convince. These three elements combine to create the world of human reference (named the "semiosphere" by Juri Lotman).

Peirce uses the covering term "semiotic" to include his major divisions of thought and communication process: (1) speculative grammar, or the study of beliefs independent of the structure of language (i.e., unstable beliefs); (2) exact logic, or the study of assertion in relation to reality (i.e., stable beliefs); and (3) speculative rhetoric, or the study of the general conditions under which a problem presents itself for solution (i.e., beliefs dependent on discourse). This division previews Peirce's famous triadic models of analysis. Peirce goes on to make the distinction between communication (a process) and signification (a system). Communication is the study of messages and the process of meaning, whereas signification is the study of codes and the system of referential signs

used. Messages may contain codes (e.g., linguistics or computer programs) or codes may contain messages (e.g., cryptography or measurement). Messages constituting codes are Peirce's doctrine of "tychism," or the study of probabilities where absolute chance is real. What is probable can be understood as the distinction among type, token, and tone. A typology is a category Peirce called "firstness," the condition under which something exists. A token is an example illustrating the type and is a case of "secondness." The tone is "thirdness," a unique individual (a paradigm or prototype example) known by the connection between the type and token. In short, firstness and secondness are two categories held together, related, by thirdness. Thus, types are more probable than tokens; tokens are more probable than tones. For example, one's actual ability to drive a car is more probable than one's ability to own a car, but one's owning a car is more probable than one's buying a new Ford. The communication process of tychism for Peirce is the existential experience of learning how to learn in a general communication experience. When one learns, an object presents itself to the person's consciousness as a sign or "representamen" that "stands to somebody for something in some respect or capacity." An equivalent sign or "interpretant" is created in the mind and this new sign stands for the object. How this communication process of representation (phenomenology) works is the study of signification.

Signification or the doctrine of "synechism" is the analysis of possibilities where codes contain messages. This doctrine holds that all problems can be solved because there is an absolute continuity among things that can be generalized as such. This basic doctrine is applied in Peirce's classification of signs. He divides signs into three basic types, although there are sixty-four subtypes. First, an icon is a sign that has a similarity to its object. Second, an index is a sign that physically connects to its object. Third, a symbol is a sign that arbitrarily links to its object. For example, a statue of a person is an icon, a photograph taken of that person is an index, and the naming noun "person" is a symbol of that person. As Umberto Eco suggests, keep in mind that in complex communication systems the types of signs are often "overcoded" in one object; for example, a traffic stop sign is an icon (similar to a raised hand), an index (red color of danger, octagon shape of convergence), and a symbol (contains the word "stop" on the sign face). Film and television images have much the same overcoded effect. Undercoding occurs when one or more of the signs are taken away, such as when a stop sign does not have the word "stop" on it or when one suddenly loses the audio while watching a television set.

Peirce is noted for his philosophic realism, or the belief that probability and possibility are linked to the actual existence of things or that which can become actual. Hence, people inherit the association of "pragmatism" with a test of realworld application that Peirce called the doctrine of "fallibilism." This existential and phenomenological orientation made Peirce a polymath, according to his biographer Joseph Brent. Peirce was conversant with chemistry, geodesy, metrology, and astronomy. He was the first experimental psychologist in America, a mathematical economist, a logician and mathematician, a dramatist, an actor, a writer, and a book reviewer. He created the modern discipline of semiotics to include all the arts and sciences of communication, information (informatics), and exchange.

See also: LANGUAGE STRUCTURE; RHETORIC; SEMIOTICS.

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RICHARD L. LANIGAN

PHILOSOPHY

See: Ethics and Information; Technology, Philosophy of

PIRATE MEDIA

Pirate media refers to media outlets that operate without official license. This is different from alternative media-those outlets that provide in their content and operation a challenge to the dominant media and social systems. In the United States, for example, legally authorized and operated radio stations may be alternative in their programmingfor example, Pacifica stations KPFA in Berkeley, California, and WBAI in New York City-but they are not pirate. Likewise, because print media are not licensed in the United States, alternative newspapers abound. Thus, "pirate" typically refers to media otherwise requiring official authority to operate (i.e., radio and television) and to the illegality of their operation rather than to the nature of their content. This does not mean that pirate media are not alternative in their content, because many, if not most, are alternative in content. Despite the fact that they do have illegal operation in common, pirate stations in different countries and different media systems do serve different functions for those countries and systems.

The term "pirate" came into use in Great Britain in the 1960s, when it was applied to illegally operated radio stations broadcasting to English audiences from off-shore facilities. Pirate, then, had a dual connotation—these broadcasters were, like pirates, rogues and law-breakers, and again like pirates, they operated on the high seas.

These pirates, however, were well funded and powerful, richly supported by commercial advertisers and record companies, and operated twentyfour hours a day, every day of the year. Among the most notable were Radio Caroline, broadcasting from the *M. V. Frederika* three and a half miles off the coast of the Isle of Man and drawing a million listeners a day; Radio London, broadcasting from a retired U.S. minesweeper; and Radio Veronica, broadcasting from a ship anchored off the coast of The Netherlands. At the time of their greatest popularity, they offered an alternative to the more controlled and sedate fare of the noncommercial stations of the British Broadcasting Corporation (BBC). Advertisers wanted to reach British consumers, but there were no commercials allowed on the BBC, and record companies wanted to introduce their artists to rock-n-roll hungry kids, a growing audience largely ignored by the government-controlled BBC.

It was the popularity and success of the pirates, in fact, that eventually helped persuade the British government to begin the licensing of commercial radio stations and to create its own popular music service, BBC Radio 1. Nonetheless, pirate stations flourish in England and throughout Europe, but now they are more like pirate stations in the United States—they operate on shoestring budgets, broadcast irregularly, are not-for-profit stations, air content that is politically and community oriented, and like the early British pirates, they are constantly under siege by governmental broadcasting authorities.

Pirate Radio

The early pirate stations in Europe operated in defiance of the continent's noncommercial broadcasting systems, trying to sound as much as possible like American commercial stations—employing witty disc jockeys to play snappy slogans and jingles while spinning contemporary rock and pop music discs. The experience of pirate radio in the United States, however, is just the opposite; it began and continues to operate in opposition to the dominant commercial broadcasting system.

Pirate radio in the United States goes by several names: microbroadcasting, free radio, low-power broadcasting, rebel radio, and, of course, pirate radio. Yet many people involved in this unlicensed broadcasting reject the term "pirate," arguing that it is the government, through the Federal Communications Commission (FCC), and giant, moneyed corporations that are the real thieves, having "stolen" the people's airwaves. For example, as recently as the 1980s, the most radio stations one entity could own in the United States was seven nationally and two in any one city (one AM and one FM). The FCC imposed these limits in an effort to ensure a diversity of sound and opinion on the air. However, through deregulation and the Telecommunications Act of 1996, virtually all ownership limits have been removed. A single company, Clear Channel, for example, owned 830 stations in 1999, and it and a score of others own as many as eight in a single city. It is this "corporatization" of the radio dial that has breathed new vigor into pirate radio.

The philosophy of the movement is encapsulated in the manifesto of pirate station Radio4All:

Radio for *whom*? The airwaves nominally belong to the people, but the reality is most of the media outlets worldwide are owned by a steadily smaller number of large corporations who use them to expand their wealth and power. Even so-called "public stations" increasingly take corporate money or emulate corporate paradigms. This means communities and individuals are increasingly shut out of the process of determining what information they receive. A right of "Free Speech" that only the rich can exercise is no right at all!

This belief is embodied in the type of programming found on the low-power pirates. Beginning operation in Springfield, Illinois, in 1986 as Black Liberation Radio, Human Rights Radio broadcasts African-American music and literature, political and social commentary, and addresses by local community residents. WTBS (The Pirate Station) in Milwaukee, Wisconsin, began operation in 1983 as an outlet for music that local commercial and college stations would not play. Free Radio Gainesville in Florida plays an eclectic mix of music emphasizing local artists, community news, and poets and writers reading their works. Radio Clandestino in Los Angeles programs bilingual, leftist Latin American fare. There are pirate stations serving the Hasidic Jewish community in Miami, Florida; family farmers in North Dakota; and small merchants who are unable to afford the cost of advertising in the major media in Cincinnati, Ohio.

Pirates typically transmit at a power of from 1 to 100 watts (as compared to the 50,000 to 100,000 watts of licensed stations) and reach an area from 2 to 15 miles. The necessary audio and

transmitting hardware is inexpensive (often less than a few hundred dollars), can fit comfortably in a backpack, and can be legally purchased from scores of outlets. Websites such as Pirate Radio Central and Radio4All provide instructions on how to get started, operate, avoid detection, and deal with the authorities if caught.

There are more than 1,000 unlicensed lowpower radio stations operating in the United States at any given time, despite the efforts of government officials to stifle their growth and operation. In 1998, for example, the FCC shut down 270 pirates nationwide, 19 in a single December day in Miami, Florida. These closures are frequently accomplished with the aid of armed SWAT teams, but just as the early British pirates forced change in the BBC's radio landscape, the pirates in the United States have been successful in moving the FCC to consider altering that of the United States. Citing "the most dramatic increase in consolidation in the broadcast industry in our history" and the hundreds of microbroadcasters willing to face fines and even jail to meet the needs of their listeners, FCC chairman William Kennard announced in 1999 that the commission intended to create a new type of radio: legal microbroadcasting. The aim, according to Kennard as reported by Bill McConnell (1999, p. 100), is to "maximize the use of the spectrum for the American public" and to "give voice to the voiceless," goals so close to the hearts of the pirates that the FCC received 13,000 inquiries for low-power licenses in the first few months after Kennard's announcement.

Still, some pirates either will not wait for (or simply reject) legal microbroadcasting, arguing that because U.S. law requires that all new frequencies be auctioned off to the highest bidder, the same corporate commercial giants who dominate high-power radio will inevitably dominate low-power radio. There have been several challenges, therefore, mounted against the FCC's rules that limit unlicensed microbroadcasting. These efforts have two similar themes: (1) the FCC ban on licensing stations of under 100 watts is a violation of the First Amendment's protection of free speech and press, and (2) the federal government should have no say in the regulation of low-power radio stations whose signals do not cross state lines.



Abie Nathan operated a pirate radio station from The Peace Ship, which sailed in the international waters of the Mediterranean Sea from 1972 until 1993. (Moshe Shai/Corbis)

Clandestine Broadcasting

There is another type of pirate broadcaster, the ones whose primary intention is the overthrow of an entrenched political power; these are clandestine broadcasters. According to Lawrence C. Soley and John S. Nichols (1987, p. vii), "Clandestine stations generally emerge from the darkest shadows of political conflict. They frequently are operated by revolutionary groups or intelligence agencies." There have been antigovernment or antiregime clandestine broadcasters as long as there has been officially authorized broadcasting. In the 1930s, radio pirates aired the grievances of communist sympathizers in Czechoslovakia, Germany, and Hungary, while the Irish Republican Army broadcast in Belfast and anti-Nazi dissidents broadcast in Germany and Austria. During World War II, clandestine stations encouraged German submarine sailors to sabotage their U-boats in harbor to avoid near-certain death at sea at the hands of the Allies. False reports were intentionally broadcast for a variety of reasons. For example,

Atlantic Station and Soldiers' Radio Calais, posing as two of the many official stations run by the German military for the enjoyment of its personnel, broadcast false reports of the invasion of Normandy. In addition, by making false reports of such verifiable facts as the death of Field Marshall Erwin Rommel, the clandestine broadcasters forced the official German media to counter with accurate reports, thereby providing the Allies with just the information they wished to know.

It was during the Cold War, however, that clandestine broadcasting truly flowered. In the years between the end of World War II and the fall of European Communism in 1989, thousands of radio, and sometimes television, pirates took up the cause of either revolutionary (pro-Communist) or counterrevolutionary (anti-Communist) movements. In addition, other movements tangentially related to this global struggle—especially the anti-Colonial movements in South America, Central America, and Africa—made use of clandestine broadcasting.

The Cold War pirates typically operated outside the nations or regions to which they broadcast, because to have operated within those borders guaranteed discovery, capture, and imprisonment or death. Those relatively few pirates who operate inside the areas to which they transmit are indigenous stations, and those pirates who broadcast from outside the areas to which they transmit are exogenous stations. Indigenous Radio Solidarity, the underground voice of the successful Polish anti-Communist, antigovernment movement, began operating a network of transmitters inside the borders of Poland in 1982, four months after embattled pro-Soviet dictator General Wojciech Jaruzelski declared martial law. Leipzig-based Kanal X transmitted pirate television from inside East Germany, in opposition to that regime's adherence to Soviet-style Communism until the Berlin Wall-and the Communist regime-fell. Exogenous Voice of Free Africa, the pirate station of the Mozambique National Resistance Movement, broadcast its antigovernment message into Mozambique from South Africa during the late 1970s and early 1980s.

These illegal operations can be further classified as "black stations" (i.e., those that disguise both their purpose and source of support) and "gray stations" (i.e., those that are open in their aim to subvert the existing government while disguising the source of their support). During the war in Vietnam, for example, the U.S. military operated a black station, Liberation Radio, which was a duplicate of a North Vietnamese gray station by the same name. This black station broadcast false reports of South Vietnamese military victories in an effort to demoralize North Vietnamese soldiers and to boost morale among the South Vietnamese army. The gray Liberation Radio, broadcasting into South Vietnam from and with the support of the government of North Vietnam, had just the opposite goals. Implicit in this example is another characteristic of the large majority of clandestine stations that operated during the Cold War-they drew their support from foreign powers who were also hostile to the targeted nation.

Regardless of their specific nature—black or gray, indigenous or exogenous—there is not a major Cold War or anti-Colonial conflict that has not seen the involvement, if not the success, of broadcast pirates. Unauthorized, illegal broadcasts have been enlisted to further the cause of all sides of the conflict in Northern Ireland, both sides in the push for and against Apartheid in South Africa, both the pro- and anti-Castro Cuban partisans, and the leaders of the ill-fated Hungarian Revolution against Communist rule in 1956.

Modern Pirates

Modern pirate broadcasters, rather than being truly politically motivated clandestine stations, are more likely to be free-broadcasting advocates; that is, they object to either excessive corporate or government control of radio and television. Political clandestine stations do exist, however. Inside Israel, for example, ultra-Orthodox Jewish pirate stations broadcast from Jerusalem in opposition to what their operators believe is the secular drift of the elected government. Exogenous, black Radio Caiman, transmitting from Guatemala and rumored to be funded by the U.S. Central Intelligence Agency, has been broadcasting rock-n-roll, Latin music, and anti-Castro matter into Cuba since 1994. Indigenous Radio Patria Libra, urging the overthrow of the Colombian government, transmits from that country's Medellin region. In the United States, neo-Nazi Voice of Tomorrow illegally broadcasts from Virginia its racist propaganda designed to "raise the consciousness" of supposedly "threatened White Americans."

Still, the large majority of pirates operating in the United States and around the world has the somewhat less overtly political goal of subverting or at least challenging what it sees as officially sanctioned information monopolies. In the United States, as discussed above, this activity exists in the form of low-power radio pirates broadcasting to local audiences the music and commentary that is otherwise ignored by the commercial media. In Europe, also discussed above, these low-power stations exist to challenge the noncommercial as well as commercial media. Another difference between the U.S. and European pirates is that the European pirates are more likely than U.S. pirates to employ television. Radio is the medium of choice for most pirates, regardless of location, because of its low cost, the portability of the necessary equipment, and the ease with which pirates can avoid detection and seizure. The technology for pirate television, while not as cheap and not as small as that for radio, is becoming increasingly so. Still, in the United States, there has been no

significant pirate television movement, in large part because local commercial television, licensed low-power independent stations, and the public access channels of cable television provide numerous outlets for independent video producers and activists.

This has not been the case in Europe. Beginning with the 1977 free-broadcasting movement in France, illegal television stations went on the air with the stated intent of breaking the government broadcasting monopoly. They did so by flagrantly and openly defying the law, going so far as to announce the date, time, and place of broadcast, and televising live the inevitable police raids. Television pirates have forced the French and Italian governments to open their television systems to large numbers of independent stations, resulting in greater diversity and citizen involvement. As the number of these stations has grown, pirate television has become as rare in these countries as it is in the United States. This is the reason that most discussions of pirate broadcasting have come to deal almost exclusively with pirate radio.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Federal Communications Commission; First Amendment and the Media; Radio Broadcasting; Telecommunications Act of 1996; Television Broadcasting.

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POLITICAL ECONOMY

In the field of communication and information studies, "political economy" is a term generally used to describe scholarship concerned with the relationships among economic, political, and communications systems within the structure of global capitalism. The tradition is rooted in the classical political economy of Adam Smith, David Ricardo, and John Stuart Mill, among others, and the radical political economy of Karl Marx. Their works, spanning the late eighteenth to late nineteenth centuries, sought to understand the nature of the emerging industrial phase of capitalism. Though the original political economists had relatively little to say about communications systems, they established a holistic and normative approach upon which contemporary political economists of communication and information have built.

Beginning in the late nineteenth century, classical political economy gave way to neoclassical approaches that displaced political and moral considerations from the study of economics for the purposes of establishing a discipline in the tradition of normal science. This pattern was replicated in almost every branch of the social sciences, including communications studies. By the late 1950s, the quest to make communications studies a science had relegated critical analysis of media institutions and organizations to the margins. Increasingly, however, communications scholars raised questions about the control of communication and information systems, as social and political changes in the late 1950s and 1960s brought them to the fore. In the 1970s, the search for answers led to a renewed interest in the work of the Frankfurt School on the culture industries and inspired the emergence of critical political economy of communications as a distinct approach within mass communications theory.

Communication and Class Struggle (1979, 1983), a two-volume collection of original and republished essays edited by Armand Mattelart and Seth Sieglaub, and *The Political Economy of the Media* (1997), a two-volume compilation of reprinted articles and book chapters edited by Peter Golding and Graham Murdock, document the origins and continuing evolution of this perspective. In *The Political Economy of Communication* (1996), Vincent Mosco categorizes the various approaches within critical political economy by the regional contexts in which the work was produced. Dallas Smythe, Herbert Schiller, and Thomas Guback pioneered a North American approach. Nicholas Garnham, Golding, Murdock, and Mattelart developed a distinct European approach. These scholars influenced, and were influenced by, political economists working in third-world countries. By the late 1990s, a fifth generation of critical political economists began entering teaching and research positions in the academy.

Most political economists take Marx's critique of capitalism as their starting point. Marx showed how the logic of capital shapes the reproduction of human existence in particular ways. Political economy studies have extended this analysis to the communications system, examining the ways in which the logic of capital affects the structure and output of the information and culture industries. For example, Marx argued that capitalism has an inherent tendency toward concentration as capitalists logically seek to control their markets through horizontal and vertical integration in hopes of maximizing their profits. The political economic history of the media and telecommunications industries, as well as the accelerated concentration occurring in these sectors of the economy in the late 1990s, reflect this tendency.

For political economists, concentrated and centralized control of the communications system has ramifications that extend beyond the high prices, artificial scarcity, and poor quality usually associated with monopolistic control of basic goods. In addition to the ability to influence markets and reap excess profits, those who have ultimate control of the culture and information industries can use their power and wealth to influence public opinion and policy. Schiller's groundbreaking The Mind Managers (1973) serves as a touchstone for understanding how the capitalist class extends its power through both the media and the state. Ben Bagdikian's influential text Media Monopoly (1983) falls outside the neo-Marxist tradition, yet it provides ample evidence of ways in which institutional networks link the capitalist class, the government, and the culture industries. Such networks operate to affect media content, from the censorship of news deemed harmful to specific and general corporate interests to the promotion of causes that are regarded as beneficial. In Manufacturing Consent (1988), Edward Herman and Noam Chomsky develop a

propaganda model to study systematically how these institutional networks shape media coverage of U.S. foreign policy in similar ways.

Political economists who study the media as culture industries also focus on how the pursuit of profits affects the form and substance of the output of mass media. The culture industries, following common oligopolistic practices, seek to manipulate consumer demand through heavy investments in marketing and promotion. However, the demand for informational and cultural products is inherently harder to influence than in markets for basic consumer goods. Accordingly, in order to minimize economic risks, culture industries tend to rely on imitation, formula, sequels, series, spin-offs, stars, and other sorts of strategies to attract already existing audiences. Additionally, culture industries dependent on advertising revenues must produce content to attract audiences within the demographic range desired by advertisers (i.e., those with the ability to consume). The result is increasingly homogeneous informational and cultural output distributed globally.

The primary challenge to the critical political economy tradition has come from cultural studies. Cultural studies theorists have criticized the tradition for reducing the analysis of communications systems to economic determinants at the site of production and distribution while ignoring the polysemic nature of texts and the interpretive capacities of audiences. Another challenge comes from information policy studies that emphasize the dynamic processes at work in information and communications markets largely generated by continuing development and deployment of new technologies.

Political economists have responded to these challenges by returning to their roots, such as the retrieval of Raymond William's concept of determination, defined in Marxism and Literature (1977, p. 87), as a process involving the "setting of limits" and the "exertion of pressures" rather than a strict one-to-one causal relationship. The response also involves the recovery of Marx's dialectic relationship between social structures and human agency. To paraphrase Marx, while human beings are born into specific social conditions they have the capacity to change them, which leaves plenty of theoretical space for polysemic texts and readings. Similar to information policy studies, political economists recognize the central role of communications in processes of social change. However, political

economists reject the notion that technology alone can bring it about.

See also: Cultural Studies; Culture and Commu-Nication; Culture Industries, Media As; Williams, Raymond.

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PORNOGRAPHY

Major sources of information about sex include media such as magazines, videos, television, and movies. Some, but by no means all, of these sources are what most people think of as "pornography." The most common public perceptions of pornography include the "dirty magazine" that an adolescent has hidden under the mattress and the "X-rated" film that a group of men enjoy at a bachelor party. Although these examples may appear relatively harmless, almost an accepted part of societal curiosity about sex and images of beauty, this entry will demonstrate that not all types of pornography are harmless. In fact, some may have seriously adverse influences on attitudes and behaviors.

What Is Pornography?

When people speak of sexually oriented materials, they can be referring to a wide variety of sources. There are classes of materials, at least in the United States, that are explicitly labeled "erotic," "pornographic," or "sexually explicit." These come in the form of magazines, videos, films, and some notorious Internet websites. Such materials are marketed separately from nonsexual media, and their access is at least somewhat restricted with regard to distribution to children, although just how restricted it is, or should be, remains controversial. These materials are generally recognized as being for sexual purposes only and lacking recognized literary or artistic merit. One of the few exceptions is the comparatively tame magazine Playboy, which, practically alone

among sex magazines, also has some recognized literary respectability. It is also an exception because it refrains from explicit depictions of sexual acts and instead features nudity alone, which is often but not necessarily sexual in theme. Pornography is big business; about ten thousand pornographic videos were released in 1999. In the San Fernando Valley of Los Angeles alone, production of pornographic films provides ten thousand to twenty thousand jobs in a \$4 billion industry (Gettleman, 1999).

Some sources (e.g., Final Report, 1986) distinguish between sexually violent material, which portrays rape and other instances of physical harm to persons in a sexual context, and nonviolent sexual material, which may or may not depict degradation, domination, subordination, or humiliation. Nonviolent and nondegrading materials typically depict a couple having vaginal or oral intercourse with no indication of violence or coercion. Research (reviewed below) has consistently shown more negative effects from viewing sexual violence than from the nonviolent, nondegrading material. Some materials include child pornography, which portrays minors and, although illegal to produce in the United States and many other places, still circulates widely through foreign magazines and personal distribution. For obvious ethical reasons, there has been little scientific research on its effects.

Sex also occurs in many other media outlets besides these explicitly sexual materials. For example, sex is rampant in advertising, particularly for products such as perfume, cologne, and aftershave, but also for tires, automobiles, and kitchen sinks. Sex in media is not limited to explicit portrayals of intercourse or nudity, but rather may include any representation that portrays or implies sexual behavior, interest, or motivation. However, the major focus of this entry is on the more explicit materials, most commonly what is generally called "pornographic." The term "pornographic" is highly value laden, however, and as such is rather scientifically imprecise. Although it is in many ways preferable to refer to such materials as "sexually explicit," the term "pornography" will also be used because it has some wide degree of common usage.

History of Sexual Art and Communication

Sexual themes in fiction have been around as long as fiction itself. Ancient Greek comedies were often highly sexual in content, for example, Aristophanes' Lysistrata, an antiwar comedy about women who withhold sex from their husbands to coerce them to stop fighting wars. Literary classics such as Geoffrey Chaucer's Canterbury Tales and William Shakespeare's The Taming of the Shrew are filled with sexual double entendres and overtly sexual themes, some of which are missed today due to the archaic language and the "classic" aura surrounding such works. Throughout history, the pendulum has swung back and forth in terms of how much sexual expression should be permitted in literature and how explicit that depiction should be. In contrast to what is normally thought of as pornography, sex in literature usually has some accepted literary purpose or merit, which makes it much more socially acceptable. This issue of "prevailing tone" is discussed in more detail below.

Since the advent of broadcast media, standards have usually been more conservative for radio and television than for print media because it is easier to keep sexually oriented print media from children than it is to keep radio or television from them. With the advent of widespread cable television and videocassette technology, a sort of double standard has arisen, with greater acceptance of more sexual materials on videocassettes and premium cable channels than on network television. The logic appears to be that premium cable and rented movies are "invited" into the home, whereas network programming is an uninvited presence wherever there is a television set. Even more controversial is the problem of the availability of pornography on the Internet, which has virtually no restrictions. The major issue is how to restrict legally the access by minors to sexually explicit materials, although there is disagreement about just how much sex is actually available on the World Wide Web (Glassner, 1999).

Sex is one area where some limits on the freedom of speech and press are clearly accepted. The difficulties arise, however, in deciding just where those limits should be. One important issue in the discussion of where the limits should be drawn is the age of the viewer or reader. There is far more concern about the effects of sexual materials on children than on adults. Even strongly libertarian people probably would not want their six-year-old children reading *Hustler*.

The Gender Bias

Explicit sexual materials have traditionally been designed by men for men. As such, they have a distinctly macho and hypermasculinized orientation. Although magazines and videos show all varieties of intercourse, they place little emphasis on associated foreplay, afterplay, cuddling, or general tenderness. Women are seen eagerly desiring and participating in sex, often with hysterical euphoria. There is little concern with the consequences of sex or the relational matrix within which most people experience it. Although there has been some increase in sexual materials developed primarily to be marketed to women (materials that show more emphasis on relationships, pre- and post-coital behaviors, and the woman's point of view overall), these comprise only a minuscule part of the \$5 billion market worldwide (Day and Bloom, 1988; Hebditch and Anning, 1988; Weaver, 1991). Although men are much more active seekers and users of sexual material than are women, this cannot be assumed to be due to greater intrinsic male interest in sex; it may merely reflect the extreme slant of the pornography industry to the traditional male perspective.

Effects of Viewing Pornography

Although many people might wish it otherwise, sex apparently does sell, even very explicit sex. Sexually oriented print, video, and broadcast materials are highly profitable commercially, a condition that assures their continued presence. Although there is some increase in the production of "couple-friendly pornography," an estimated 71 percent of sex videos are watched by men by themselves (Gettleman, 1999). In examining the use of these materials, several specific effects have been identified.

Arousal

A fairly straightforward effect of consuming sexual materials is sexual arousal, the drive that energizes or intensifies sexual behavior. Sexually oriented magazines and videos do tend to arouse people sexually, both in terms of self-rating of arousal level and physiological measures such as penile tumescence (Eccles, Marshall, and Barbaree, 1988; Malamuth and Check, 1980; Schaefer and Colgan, 1977), vaginal changes (Sintchak and Geer, 1975), and thermography (Abramson, Perry, Seeley, Seeley, and Rothblatt, 1981). Sexual violence is particularly arousing to sex offenders and much less so to normal men, unless the victim is portrayed as being aroused by the assault. (These findings are discussed in more detail helow)

Sexual arousal in response to stimuli that would not naturally be arousing may be learned through classical conditioning. This process could account for the vast individual differences in which specific stimuli arouse people sexually. Through different experiences, individuals have all been conditioned to different stimuli as they relate to specific loved ones. For example, because of its association with a particular person, someone may be aroused by a certain perfume or cologne, type of clothing, or specific behaviors.

Contrary to what one might expect, the degree of arousal is not necessarily highly correlated with the degree of explicitness of the media. Sometimes people are actually more aroused by a less sexually explicit story than a more explicit one. A scene that cuts from the night before in a bedroom to the next morning may sometimes be more arousing than a more pornographic version with the intervening night uncut. Censoring out a sex scene may make a film more arousing because viewers can fill in their own images. Sexual arousal is highly individual. When people are allowed to use their own imaginations to construct the ending of a romantic scene, they are more likely to construct a reality that is more arousing to them personally than if they view someone else's idea of what is arousing. There is some validity to the old truism that the most important sex organ is the brain.

Attitudes and Values

Beyond arousal, sexual media may affect people's attitudes and values. In fact, sex is one of the most value-laden areas of people's lives.

Many concerns about pornography have to do with communicating attitudes and values. For example, pornography may encourage people not to take sexual issues as seriously as they should. When a sex magazine has a regular cartoon called "Chester the Molester" that features a child molester, many argue that this is an inappropriately light treatment of an extremely serious subject. Although few would probably argue that sex should never be comedic, there are for most people some sexual subjects that do not seem appropriate for light treatment.

One of the major social criticisms of pornography is that it is antiwoman in an ideological sense. It is usually women, not men, who are the playthings or victims of the opposite sex. Although this concern spans the gamut of sexual content in media, it is particularly leveled at violent pornography. When *Hustler* magazine runs a photo spread of a gang rape turning into an orgy (showing the women appearing to be aroused by the assault), what is being taught about women and their reactions to forcible sex?

Finally, with regard to values and attitudes, people sometimes complain that pornography, especially the more explicit varieties, removes some of the mystique, some of the aura, from what is a very mysterious, almost sacred, activity. This argument holds that sex is inherently very private and becomes less meaningful, perhaps even less enjoyable, if it becomes more public. This is a difficult concern to test or even to articulate clearly, but it is one that is often expressed.

A large body of research has shown effects on a variety of sexual attitudes and values after exposure to nonviolent sexually explicit materials. After seeing slides and movies of beautiful female nudes engaged in sexual activity, men in one study rated their own partners as being less physically endowed, although they reported undiminished sexual satisfaction with their partners (Weaver, Masland, and Zillmann, 1984). In another study, men reported that they loved their own partners less after seeing sexually explicit videos of highly attractive models (Kenrick, Gutierres, and Goldberg, 1989). Men who saw a pornographic video responded more sexually to a subsequent female



With the increasing prominence of the feminist movement in the 1970s, many women began to speak out and demonstrate against the pornography industry, claiming it exploited women and women's bodies and encouraged violence against women. (Bettmann/Corbis)

interviewer than those seeing a control video, although this result was true only for men who held traditional gender schemas (McKenzie-Mohr and Zanna, 1990). All of these studies show significant attitude changes in men after a very limited exposure to sexual media.

Such effects are not limited to men. Relative to control groups, both men and women who watched pornographic films on a weekly basis later reported less satisfaction with the affection, physical appearance, sexual curiosity, and sexual performance of their real-life partners (Zillmann and Bryant, 1988a, 1988b). They also saw sex without emotional involvement as being relatively more important than the control group did. They showed greater acceptance of premarital and extramarital sex and a lower evaluation of marriage and monogamy. They also reported less desire to have children and greater acceptance of male dominance and female submission. Also showing weekly films and then questioning the participants one to three weeks later, Dolf Zillmann and Jennings Bryant (1982, 1984) found that participants who watched sexually explicit films overestimated the frequency of sexual practices such as fellatio, cunnilingus, anal intercourse, sadomasochism, and bestiality in the general population, relative to perceptions of a control group that saw nonsexual films. This may reflect the cognitive heuristic of "availability," whereby one judges the frequency of occurrence of various activities by the ease with

which one can think of examples (Taylor, 1982; Tversky and Kahneman, 1973, 1974). Recent exposure to vivid media instances thus leads to an overestimation of such occurrences in the real world and a perceived reality that is substantially at odds with actual reality.

Some such effects may depend in part on the medium. Participants in a study by Marshall Dermer and Tom Pyszczynski (1978) were told to think about their partners before reading some explicit passages about a woman's sexual fantasies. They later rated their own partner as more sexually attractive. This inconsistency with the Zillmann and Bryant results may be due to specific procedural aspects of the research, the particular materials used, or psychological differences in responses to print versus video material. It is possible that all-language descriptions of sex in print media (e.g., the advice column in *Penthouse*) may actually be more conducive to fantasizing about one's own partner, whereas photographic sex may encourage an unfavorable comparison to that person.

Behavioral Effects

The third major class of effects of sexual media is their effect on behavior. This area can be divided into the three areas dealing with the teaching of new behaviors, the disinhibition of known behaviors, and the relationship between pornography and sex crimes.

On the one hand, sexual media may actually teach new behaviors. One issue of *Penthouse*

contained a series of photographs of Asian women bound with heavy ropes and hung from trees. Two months later an eight-year-old Chinese girl in Chapel Hill, North Carolina, was kidnapped, raped, murdered, and left hanging from a tree (cited in *Final Report*, 1986, p. 208). Of course, such examples are not commonplace, and definitively demonstrating a causal relationship in such cases is difficult, but the juxtaposition is nonetheless disturbing.

Some of the most extreme sexual violence includes very violent and offensive images, such as movies of women apparently being killed while engaging in sexual activity ("snuff" films). For obvious ethical reasons, it is difficult to study scientifically the effects of such extreme materials.

Besides teaching new behaviors, erotic material may also disinhibit previously learned behavior. For example, watching a pornographic video with oral sex or bondage may weaken the prior inhibitions of the viewer against engaging in such behavior. Watching a rape scene where a woman is portrayed as enjoying the assault may disinhibit the constraint against the secret urge of some men to commit such a crime. This is of particular concern given some evidence suggesting that large numbers of college men reported that they might rape if they were sure they would not be caught (Check, 1985; Malamuth, Haber, and Feshbach, 1980).

One of the main concerns about the behavioral effect of viewing pornography is that it may have a relationship with sex crimes. There have been many studies looking at rates of crimes such as rape, exhibitionism, and child molestation, relative to changes in the availability of pornography. In a careful review of such studies, John Court (1984) argued that there is in fact a correlation of availability of pornography and certain sex crimes. Most Western nations have experienced a large increase both in the availability of pornography and the rise in reported rapes since the 1960s. The relationship between the two, however, has been difficult to clarify. Court presented some data from two Australian states that showed a sharp increase in rape reports in South Australia, but not Queensland, after state pornography laws were liberalized in South Australia in the early 1970s. A comparable downturn in reported rapes occurred temporarily in Hawaii between 1974 and 1976 during a temporary imposition of restraints on sexually explicit media.

However, an interesting apparent counterexample occurs with Japan, where there is wide availability of pornography but very low rape rates (Abramson and Hayashi, 1984). Sexual themes in Japanese art and society go back centuries, although some restriction and censorship occurred after the Meiji Restoration in 1868 and even more occurred under the U.S. occupation that followed the end of World War II in 1945. Still, however, sexuality continues to be a strong theme of Japanese society-one not associated with shame or guilt. Although there are specific restrictions on showing pictorial representations of pubic hair or adult genitalia, sex is not restricted to sexual media in certain types of magazines, bookstores, or theaters, as occurs in the United States. Thus, depictions of nudity, bondage, and rape occur regularly on commercial television and in popular movies and magazines, even in advertising. Films often portray very vivid scenes of rape and bondage. Toward the end of the 1990s, a market surged for magazines that featured pictures of naked schoolgirls. It is legal in Japan for men to have sex with children as long as the girls are more than twelve years of age, and some schoolgirls earn extra money from prostitution or catering to the sexual fantasies of men in Tokyo's "image clubs." Some observers have concluded that the rising interest of Japanese men in child sexuality is a reflection of the men's feeling increasingly threatened by women's growing sophistication and demands for equality ("Lolita in Japan," 1997).

Why, then, is the incidence of reported rapes so much lower in Japan (which has an annual rate of 2.4 per 100,000) than in countries such as the United States (34.5), England (10.1), and Germany (10.7)? Paul Abramson and Haruo Hayashi (1984) argued that the answer might lie in cultural differences. Japanese society emphasizes order, obligation, cooperation, and virtue; one who violates social norms is the object of shame. Others have suggested that rape in Japan is more likely to be group instigated, perpetrated by juveniles, and greatly underreported by victims (Goldstein and Ibaraki, 1983).

Firmly establishing a causal relationship between the availability of pornography and the frequency of rape is extremely difficult, due to the many other relevant factors, including the different varieties of sexual material, changes in social consciousness about reporting sexual assaults, and changing norms sanctioning such behavior. Some evidence suggests a correlation of rape and the circulation of sex magazines, particularly those containing sexual violence. For example, Larry Baron and Murray Straus (cited in *Final Report*, 1986) found a high correlation (+0.64) between rape rates and the circulation rates of eight sex magazines in fifty states.

One sometimes hears the argument that sexually explicit material allows open expression of sexual urges and thus decreases the rate of sex crimes. This invokes the construct of "catharsis," the emotional release that follows the expression of an impulse. This popular idea comes from psychodynamic models of personality, notably that of Sigmund Freud. Applied to sex, the catharsis argument says that consuming pornography relieves sexual urges, with the magazine or video acting (perhaps in conjunction with masturbation) as a sort of imperfect substitute for the real behavior. Although this argument is sometimes used by libertarians to support appeals for loosening restrictions on pornography (e.g., Kutchinsky, 1973), the research support for catharsis is meager to totally nonexistent (Comstock, 1985; Final Report, 1986; Harris, 1999). Viewing pornography increases-rather than decreases-sexual arousal, and, after viewing, one is more motivated to engage in sexual behavior. Also, it is now understood that some violent sex crimes, most notably rape, are energized by a power motive, not a lack of sexual fulfillment (Prentky and Knight, 1991).

The Problem of Prevailing Tone

Responses to sexual materials are not entirely due to the nature of the material. They also depend on the perceived purpose and setting of the work, what is called the prevailing tone (Eysenck and Nias, 1978). The nature of this prevailing tone can make an enormous difference in the experience of using pornography. In fact, the nature of the prevailing tone often determines whether sexual materials are labeled "pornographic" or not. Typically, materials that lack some serious social, artistic, or didactic intent are labeled "pornographic," while those that have such merit are not. The surest way to disparage and devalue some piece of work is to label it "pornographic," as social critics frequently do with overtly sexual art, literature, or film.

Just because a piece of work is sexual in nature

does not necessarily earn it the label of "pornography." For example, a documentary on rape or a "tasteful" drama on incest may be considered perfectly acceptable, whereas a comedy with the same theme, but which is far less sexually explicit, may be considered highly offensive and even pornographic. Although highly explicit videos, books, and magazines are used routinely in sex therapy to treat sexual dysfunctions (Quinsey and Marshall, 1983), few would consider such materials "pornographic." People react very differently to a sexually explicit drawing by Pablo Picasso than they do to one in Hustler magazine. Shakespeare, Chaucer, "The Song of Solomon" in the Bible, and serious sex manuals such as The Joy of Sex are seen to have serious literary or respectable didactic intentions, and thus the sex therein is considered more acceptable and even healthy.

The cultural context is also a factor in the prevailing tone. Some cultures do not consider female breasts to be particularly erotic or inappropriate for public display. Thus, most readers, at least those who are more than thirteen years of age or so, do not consider topless women from some exotic culture in National Geographic photographs to be erotic, sexual, or pornographic. Even within Western culture, standards have changed. In much of the nineteenth century, women's knees and calves were thought to be erotic, and the sight of a bare-kneed woman would be considered scandalous, even pornographic, as would a topless woman in the twenty-first century. As societies go, North America overall is moderate in what it considers to be allowable sexual expression in dress, media, and behavior. Many Western European and Latin American cultures are far more permissive, while many Islamic and East Asian cultures are far more restrictive.

The Special Case of Violent Pornography

Although neither sexual nor violent materials are anything new, the integral combination of the two has been increasing in prevalence. Cable, video, and computer-mediated communications technology have greatly expanded the capability of much of the public to view sexually explicit material privately and conveniently. Although many people are not willing to seek out and visit theaters that show pornographic films, the chance to view such material safely and privately in one's own home makes it much more accessible. While sex magazines are not new, some particularly violent publications are relatively new, and even more "established" publications such as *Penthouse* and *Playboy* have long shown evidence of increasing themes of sexual violence (Dietz and Evans, 1982; Malamuth and Spinner, 1980). Even the old genre of horror films has evolved into showing frequent and extensive scenes of violence against women in a sexual context (Weaver and Tamborini, 1996). Not generally labeled pornographic, these films can thus be heavily marketed to teenagers, in spite of their "R" ratings. With all of these materials, the major concern is not with the sex or violence in and of itself, but with the way the two appear together.

Effect Depends on How the Woman Is Portrayed

To understand the effects of sexual violence, the nature of the content must be examined carefully. For example, Neil Malamuth (1984) reported several studies in which men viewed scenes of violent pornography and afterward rated their attitudes on several topics. Men who saw those films showed a more callous attitude toward rape and toward women in general, especially if the women victims were portrayed as being aroused by the assault. In terms of sexual arousal, men were aroused by the violent pornography only if the victim was shown to be aroused. They were not aroused if the victim was shown to be terrorized.

Other studies have examined convicted rapists and found them to be aroused by scenes of both rape and consensual sex, whereas men who were not convicted rapists were aroused only by the consensual sex (Abel, Barlow, Blanchard, and Guild, 1977; Barbaree, Marshall, and Lanthier, 1979). An important exception to this occurred if the victim was portrayed as enjoying the rape and coming to orgasm; in this case, the men who were not convicted rapists were equally or more aroused by the rape than by the consensual sex (Malamuth, Heim, and Feshbach, 1980). The same did not hold true for women.

In further examining this question in regard to individual differences in men, Malamuth and James Check (1983) had men listen to a tape of a sexual encounter with (1) consensual sex, (2) nonconsensual sex where the woman showed arousal, or (3) nonconsensual sex where the woman showed disgust. Both force-oriented and nonforce-oriented men were more aroused, in terms of both self-report and penile tumescence, by the consensual than by the nonconsensual rape scene where the woman showed disgust. However, the nonforce-oriented men were equally aroused by the consensual and nonconsensual version in which the woman was aroused, whereas the force-oriented men actually showed more arousal to the nonconsensual (rape) version. Similar results were obtained by Malamuth (1981) using video stimuli.

Can such effects carry over to new settings? The answer appears to be yes. Edward Donnerstein and Leonard Berkowitz (1981) showed men a sexually violent film where a woman is attacked, stripped, tied up, and raped. In one version of the film, the woman was portrayed as enjoying the rape. Afterward, participants were given a chance to administer electric shocks to a confederate of the experimenter, the same confederate who had earlier angered them in an ostensibly unrelated study. Men who had seen the film where the woman enjoyed being raped administered more shocks to a female confederate but not to a male. This suggests that the association of sex and violence in the film allows violent behavior to be transferred to the target confederate in a new situation.

Although most of the research has been conducted on men, some studies testing women who view pornography have also found an increase in the female subjects' violent behavior toward other women (Baron, 1979) and a tendency to take rape less seriously and accept rape myths (Malamuth, Check, and Briere, 1986; Zillmann and Bryant, 1982).

In a meta-analysis of studies examining the relationship of exposure to pornography and the acceptance of rape myths, Mike Allen, Tara Emmers, Lisa Gebhardt, and Mary Giery (1995) conclude that experimental studies show a consistent positive effect between pornography exposure and rape-myth acceptance, while nonexperimental studies show only a very small positive or nonexistent effect. The relationship was consistently stronger when the pornography was violent than when it was nonviolent, although some experimental studies obtained effects in both cases.

Conclusions from the Research

Several conclusions emerge from the violent pornography research. One is that a critical factor

is whether the woman is presented as enjoying and being aroused by the assault. Far more undesirable effects occur in men if the woman is seen to be aroused than if she is seen to be terrorized. This portrayal of women as being "turned on" by rape is not only a distasteful deviation from reality but also a potentially dangerous one. A second important conclusion is that violent pornography often affects individual men very differently, depending on their own propensity to use force in their own lives. Convicted rapists and other forceoriented men are more likely to become aroused or even incited to violence by sexually violent media, especially if the woman is portrayed as being aroused by the assault.

Some researchers have questioned the conclusion of sharply different effects of viewing violent versus nonviolent pornography (Weaver, 1991; Zillmann and Bryant, 1988c). Check and Ted Guloien (1989) found that men exposed to a steady diet of rape-myth sexual violence reported a higher likelihood of committing rape themselves, compared to a control group that experienced no exposure, but the same result was found for a group exposed to nonviolent pornography.

The Political Wild Card

What happens when political agendas to restrict or liberalize pornography start interacting with the scientific evidence? Politics has a tendency to undermine objective scientific analysis. For example, the U.S. Commission on Obscenity and Pornography was established in 1967 by President Lyndon Johnson to analyze (1) pornography control laws, (2) the distribution of sexually explicit materials, and (3) the effects of consuming such materials, and to recommend appropriate legislative or administrative action. It funded more than eighty research studies on the topic, providing important impetus to the scientific study of pornography. The final report in 1970 recommended stronger controls on distribution to minors but an abolition of all limits on access by adults. The latter recommendation was based on the majority conclusion that there was "no evidence that exposure to or use of explicit sexual materials play a significant role in the causation of social or individual harms such as crime, delinquency, sexual or nonsexual deviancy or severe emotional disturbance" (U.S. Commission on Obscenity and Pornography, 1970, p. 58). However, the composition of the commission was criticized for being overloaded with anticensorship civil libertarians. When the political winds had changed, it turned out not to matter anyhow in terms of policy. The conclusions were rejected by the new administration of the more conservative President Richard Nixon, who declared, "so long as I am in the White House there will be no relaxation of the national effort to control and eliminate smut from our national life" (Eysenck and Nias, 1978, p. 94).

Some years later, in the far more conservative political climate of the 1980s, a second commission was formed by President Ronald Reagan. U.S. Attorney General Edwin Meese charged this commission (the Attorney General's Commission on Pornography) in 1985 to assess the nature, extent, and effect of pornography on U.S. society and to "recommend more effective ways to contain the spread of pornography," thus clearly stating a political agenda. One of the major conclusions of the commission dealt with the effect of sexual violence: "the available evidence strongly supports the hypothesis that substantial exposure to sexually violent materials . . . bears a causal relationship to antisocial acts of sexual violence, and for some subgroups, possibly the unlawful acts of sexual violence" (Final Report, 1986, p. 40).

Groups such as these commissions typically have both a scientific and a political agenda (Einsiedel, 1988; Paletz, 1988; Wilcox, 1987). Sometimes, even if there is relative consensus on the scientific conclusions, there is often strong disagreement about the policy ramifications. For example, scientists Daniel Linz, Edward Donnerstein, and Stephen Penrod (1987) took exception to the way that their own work was interpreted by the Meese commission to support censorship. Linz and his colleagues argued that the call of the commission for strengthening pornography laws was not an appropriate policy change based on their research, because that call ignored the strong presence of sexually violent themes in other media not covered by such laws, for example, Rrated movies and soap operas.

Sometimes political agendas can guide pornography research in more subtle ways. Two of the most prominent pornography researchers, Linz and Malamuth (1993), have talked about how various normative theories have guided research and may be lurking behind the scientific evidence. The conservative–moralist position, very prominent in Anglo-American history and culture, sees public portrayals of sex as disgusting, offensive, and especially threatening if occurring outside of monogamous heterosexual relationships. However, pornography is at the same time clearly arousing. There is an implicit belief that a heavy emphasis on sexual gratification and permissiveness encourages behavior that undermines other moral beliefs about women and sexuality and, ultimately, leads to the decay of family and other traditional societal structures. This position would tend to encourage research on sexual arousal, the materials that produce it, and how exposure to sexual materials undermines traditional beliefs and can affect later reactions.

A second normative theory is the liberal theory, which believes that sexual depictions trigger fantasies but that these fantasies are not acted out and thus no one is hurt. They may even be socially beneficial through liberating a person's excessive prudishness. Liberals believe that, if viewing of pornography is kept private, then the government should not restrict or regulate what is best left to the marketplace of ideas, which will naturally adjust to changing social standards. The liberal theory would tend to place a higher value on research that examined the physical and behavioral effects of sexual media in the real world rather than the laboratory, with a prediction of positive effects or a lack of negative ones.

The third normative theory, the most recent one, is feminist theory, which views pornography as a powerful socializing agent that promotes the sexual abuse of women and the social subordination of women as a group. Feminist-inspired research tends to focus on the arousal, or lack of it, in a woman in a rape scene. It also tends to look more at attitudes than behaviors, including differences between men with or without a propensity to rape.

Each normative theory has inspired some useful research, but it may be helpful to identify the ideological positions of researchers when evaluating their conclusions and the place of that research in the matrix of the overall research related to the effects of pornography.

Conclusion

What can be concluded from the research that examines the effects of consuming pornography? First, it is useful to reiterate the importance of the distinction between violent and nonviolent sexual media. While there are some negative effects of nonviolent pornography, especially on attitudes toward women, the research is much more compelling in the case of violent pornography. Sexual violence is arousing to sex offenders, force-oriented men, and sometimes even to "normal" young men if the woman is portrayed as being aroused by the assault.

Repeated exposure to violent pornography may lead to desensitization toward violence against women in general and greater acceptance of rape myths. Not only does this suggest that the combination of sex and violence together is considerably worse than either one by itself, but the nature of the portrayal also matters. If the woman being assaulted is portrayed as being terrorized and brutalized, desensitizing effects on "normal" men are less than if she is portrayed as being aroused and/or achieving orgasm through being attacked. There is nothing arousing or exciting about being raped in real life, and messages to the contrary do not help teenage boys understand the reality of how to relate to girls and women.

Finally, most individuals believe that "other people" are more influenced by advertising and news coverage than they are themselves; this is the "third-person effect" (Davison, 1983; Gunther, 1991). The same is true about the perceived effects of pornography (Gunther, 1995); individuals believe it affects others more than it affects themselves. However, as society accepts increasingly explicit sexual materials, no one is immune to the influences of pornography. These influences are much more far-reaching than the transient titillation of the adolescent boy who views a *Playboy* centerfold.

See also: Catharsis Theory and Media Effects; Gender and the Media; Internet and the World Wide Web; Pornography, Legal Aspects of; Sex and the Media; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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PORNOGRAPHY, LEGAL ASPECTS OF

Sexually explicit expression has been subject to legal regulation in the United States since the earliest days of the republic. Until the last half of the twentieth century, legal sanctions imposed on sexually explicit expression were not thought to conflict with the free speech protections of the First Amendment. Beginning in the 1950s, however, the U.S. Supreme Court began recognizing that a large amount of speech containing sexually explicit content also had significant First Amendment value. The Supreme Court therefore began limiting the government's power to regulate or ban certain types of sexually explicit speech.

Under the Supreme Court's modern cases, what is popularly called "pornography" actually covers several different categories of speech. One category is "obscenity." Obscenity is defined very narrowly and is not protected by the First Amendment. The government may ban the distribution of obscene materials, but it may not criminalize the mere possession of obscene materials that do not include the depiction of children. Another category is "indecency." This term refers to sexually explicit expression that falls short of the narrow legal definition of obscenity. Indecent speech is constitutionally protected (and therefore may not be legally banned altogether), but it may be regulated in some manner to prevent both children and adults from coming into contact with it involuntarily.

The legal regulation of all forms of pornography is complicated by the growth of new communication media. The Supreme Court has traditionally been willing to permit greater legal regulation of all sexual expression in contexts such as radio and television. The Court has been less willing to apply similarly restrictive standards to cable television, and it is far less willing to uphold regulation of speech over the Internet. It remains to be seen whether the ease with which images and ideas can be transmitted over the Internet will eventually lead to a liberalization of free speech protection of pornographic materials in more traditional communications contexts.

History

The first reported case in the United States to involve the censorship of a pornographic drawing occurred in 1815. The first prosecution of a book on obscenity grounds occurred in 1821. The book that was deemed obscene in that case was John Cleland's novel *Memoirs of a Woman of Pleasure*, which is usually known by its alternative title, *Fanny Hill*. This book has been prosecuted repeatedly since its publication, and one prosecution made it all the way to the U.S. Supreme Court in 1965.

Despite the long history of regulating pornography in the United States, the legal doctrine related to prosecution with regard to sexually explicit material developed slowly. The early prosecutions related to sexually explicit texts and drawings were based largely on blasphemy and profanity statutes, which were not specifically addressed to sexually explicit expression. In addition, no First Amendment doctrine covered obscenity until well into the twentieth century. Prior to that time, most pornography prosecutions in the United States were guided by the standard set by the British House of Lords in the 1868 case Regina v. Hicklin. This case involved the prosecution of a sexually suggestive anti-Catholic tract. In one of the opinions for the court in Hicklin, Lord Cockburn asserted that expressive material was obscene if it tended to "deprave and corrupt those whose minds are open to such immoral influences."

The American legal system embraced the *Hick-lin* immorality standard quickly, and soon after the Civil War, the states and the federal government began enacting the first statutes specifically directed toward the regulation of obscene materials. Many of these early statutes were attributable to the efforts of a dry-goods clerk and moral crusader named Anthony Comstock. Comstock started militating against the dissemination of pornography in New York in the early 1870s and later joined with the Young Men's Christian Association (YMCA) to form the Committee for the Suppression of Vice.

Comstock and the committee were instrumental in the enactment of a major federal anti-obscenity act in 1873, and the act soon became known informally as the Comstock Law. This law prohibited not only the distribution of obscene materials but also the distribution of materials related to contraception and abortion. Soon after the law's passage, Comstock was made a special agent of the U.S. Post Office Department, a post from which he would lead the anti-pornography efforts in the United States well into the twentieth century.

Although Comstock's personal influence waned in the years preceding his death in 1915, the zealous moralism that he embodied continued to define efforts to regulate pornography throughout the first half of the twentieth century. During this period, a range of now-classic literary works were subjected to obscenity prosecutions or other forms of legal regulation. These prominent cases involved the works of writers such as George Bernard Shaw, Theodore Dreiser, Erskine Caldwell, Edmund Wilson, and D. H. Lawrence. A 1933 obscenity case against James Joyce's novel Ulysses resulted in the first systematic attack on the Hicklin analysis by an American court. The case involved the seizure of the book by U.S. Customs officials. In his opinion holding that the book was not obscene, U.S. District Judge John Woolsey held that the artistic value of the book insulated it from a charge of obscenity. Obscenity, the judge ruled, was defined by the tendency of sexually explicit materials to excite sexual passions among those with normal sexual tendencies. This was a significant departure from the Hicklin analysis, which focused on the effects that obscenity had on those who were most susceptible to messages of sexual immorality.

The Ulysses decision was not appealed to the U.S. Supreme Court, and it took the Supreme Court another twenty years before it finally attempted to set forth a constitutional standard for regulating obscenity. In its 1954 decision in *Roth v. United States*, the Court announced the first of what would be several constitutional standards for obscenity regulation. In several ways, the Court moved beyond the restrictive *Hicklin* standard that had defined American obscenity prosecutions for almost one hundred years. The Supreme Court held in *Roth* that sexually explicit speech contained within otherwise intellectually valuable expression could not be deemed obscene. In addition, the Court rejected the notion that obscenity



Anthony Comstock. (Bettmann/Corbis)

should be defined by the sexual tendencies of the most susceptible portion of the population. Unfortunately, although the Court's opinion contained a broad statement of general principles pertaining to art and literature, the Court was unsuccessful in defining precisely where the realm of art ended and the realm of the legally obscene began. The *Roth* decision therefore resulted in almost twenty years of litigation in the Supreme Court over the factors that contribute to a finding of obscenity. This dispute over the general constitutional standard was finally resolved in 1973 in *Miller v. California*, a case that continues to frame discussions of the legal regulation of obscenity.

The Obscenity Standard

In *Miller*, the Supreme Court provided a threepart standard that governs both criminal and civil regulations of obscenity. Under the so-called *Miller* test, the government must prove that the sexually explicit material that it seeks to regulate (1) appeals primarily to the prurient interest as judged by contemporary community standards, (2) depicts sexual conduct that is patently offensive under contemporary community standards, and (3) lacks serious literary, artistic, political, or scientific value.

This standard is more protective of expression than earlier standards in several respects. First, when judging allegedly obscene expression, a judge or jury must consider the work as a whole. This diverges from earlier standards, which permitted judges and juries to consider obscene passages in isolation and out of the expression's larger literary or artistic context. Second, the reference point for the "prurient interest" and "patent offensiveness" components of the standard is the average person, rather than the person who is the most susceptible to influence by pornographic materials. Third, the inclusion of an intellectual-value component in the obscenity standard ensures that artistic, literary, and scientific works are no longer subject to the whims of local censors or customs officials-as has frequently been the case in the past. Moreover, unlike the first two elements of the Miller test, the intellectual-value element of the test is measured by a national standard rather than a local community standard. Thus, a local community can no longer deny its residents access to a respected literary work such as Ulysses simply because the work contains some graphic sexual passages that transgress local sexual mores.

Despite the more protective elements of the Miller test, several elements of that standard continue to create confusion in the regulation of allegedly pornographic materials. The first problem stems from the vagueness of the terminology used in the standard. The terms "prurience" and "patently offensive" are neither precise nor clear. The Supreme Court has subsequently suggested that these terms refer only to "hard-core" pornography, but the scope of that term is also subject to vigorous dispute. The fact that prurience and patent offensiveness is measured by contemporary community standards is another source of uncertainty in the Miller test. The Supreme Court has never defined the exact parameters of the relevant community; it has chosen instead to leave to local courts the exact scope of the geographic area covered by the term. At the very least, this localized standard produces significant variation in the application of obscenity laws throughout the country. What is obscene in Utah or Alabama will not necessarily be obscene in New York or California. This inconsistency can cause serious problems as the nation's communications industry becomes increasingly national and even international in scope, because tailoring content for the more restrictive communities will be difficult and expensive if not technologically impossible.

Despite the flaws in the Miller test, it has generally provided, in most communities, a broad protection for expressive materials that contain sexual content. The generally protective Miller test does not apply, however, to sexually explicit materials that include visual depictions of underage children engaged in sexual activity. The Supreme Court has held that materials of this sort may be regulated much more easily than materials that depict adults. Government authorities may regulate these materials without proving that they are prurient or patently offensive. The Supreme Court has clearly held, however, that the government cannot ban all depictions of nudity involving minors; thus, the lenient standard for prosecuting child pornography seems limited to relatively rare situations that involve visual depictions of live sexual activity by minors. The Supreme Court has also held that a work using a person over the statutory age who appears underage is not subject to the lowered standard for child pornography. Furthermore, it is unclear whether the Supreme Court would permit prosecutions over sexual depictions of minors in expressive materials that have serious literary, artistic, political, or scientific value.

One final aspect of the modern free speech standard involves the private possession of pornography, including material that may be deemed obscene under the Miller test. The Supreme Court ruled in Stanley v. Georgia (1969) that the possession of pornographic materials for personal use at home is protected by the U.S. Constitution even if the commercial distribution of the same materials could be prosecuted under the Miller test. The Court relied on a combination of privacy and free speech principles to justify this exception to the general rule that obscene materials are not protected by the Constitution. The Court noted that these principles could not be reconciled with the act of government officials sifting through an individual's library to identify contraband books or movies. Therefore, except in cases of child pornography, mere possession of pornographic materials is protected by the Constitution.
"Indecent" Speech

In the modern legal vocabulary, "indecent" speech refers to speech that contains sexual content but is not sufficiently explicit to fall within the definition of obscenity as defined by the *Miller* test. Except in the context of radio and television broadcasts, where special rules apply, indecent speech may not be banned, criminalized, or otherwise sanctioned by the government. However, the courts have permitted local governments to apply special zoning restrictions on bookstores and movie theaters that specialize in "indecent" adult entertainment.

These restrictions generally take the form of zoning laws that isolate such establishments in a few areas of a town—away from schools, churches, and residential areas. The theory behind upholding these restrictions is that although indecent (but not obscene) expressive materials are constitutionally protected, cities and towns may regulate establishments in order to protect against the "secondary effects"—such as prostitution and other crimes—that the distribution of indecent expressive materials can attract.

Regulating Sexual Expression on Radio, Television, and Cable

Another context in which regulation may occur is when materials are transmitted on radio or television. The Supreme Court has permitted the federal government to regulate both indecent speech (i.e., profanity) and other indecent sexual expression in both media. The theory behind permitting the stricter regulation of constitutionally protected speech in the broadcast context is that broadcasting intrudes into the sensibilities of unwilling listeners to a far greater extent than do other forms of communication. In a case involving a comedy routine that contained numerous expletives, the Supreme Court upheld a Federal Communications Commission sanction against a radio station that broadcast a tape of this routine at a time when children might be listening. Based on this theory, the government continues to require that speech containing indecent material must be broadcast at a time that is later than the time that is allocated to family-oriented programming.

The constitutionality of government regulation of indecent speech that is transmitted over cable television is less clear-cut. On one hand, the Supreme Court has permitted cable companies to ban indecent speech from leased-access channels that are controlled by the cable companies. On the other hand, the Court has invalidated federal regulations that require cable companies that agree to carry channels containing indecent speech to block, scramble, and segregate those channels in a way that permits subscribers to receive such channels only upon written request. The Court held that a simpler, less-intrusive blocking requirement was sufficient to protect unwilling viewers while still protecting the free speech interests of speakers and willing viewers. Although the decisions involving cable regulation are somewhat unclear, the standard seems to protect speech from government regulation more vigorously in the cable context than in the context of radio and "regular" television broadcasts.

Obscenity and the Internet

The Internet is the newest medium in which issues of pornography regulation have arisen. The Supreme Court invalidated the Communications Decency Act of 1996, which was a major congressional attempt to regulate pornography on the Internet. The statute prohibited the transmission of indecent material to anyone who was under the age of eighteen. The statute was premised on the theory that the Internet was intrusive into private homes to the same extent as radio and television broadcasts, and therefore, Congress could regulate speech over the Internet to the same degree. The Supreme Court rejected this theory on the ground that the regulation would severely limit access for adults who wanted to view sexually explicit materials. More broadly, the Court described the Internet as a vast democratic forum in which speech should be allowed to flourish in much the same way as it does in traditional public forums such as public parks. Although the Court did not foreclose the possibility of some regulation in the future, it did suggest that the First Amendment was incompatible with any regulation that significantly inhibited a willing adult from accessing sexually explicit material.

The Internet regulation case may indicate the future direction of law regarding the regulation of pornography. The Internet provides easy and quick access to materials from all over the world, and some of the materials contain sexual expression. This globalization of speech undermines the decentralized enforcement of the *Miller* obscenity standard, which relies on local community



As an example of the growing international concern over the influence of Internet pornography, Charles Winwood, Acting Commissioner of the U.S. Customs Service, held a press conference on March 26, 2001, and announced that the U.S. Customs service and the Russian police had teamed up to identify a group of Russian child pornographers, which led to five arrests in Russia and four in the United States in "Operation Blue Orchid." (Reuters NewMedia Inc./Corbis)

standards for two of its three basic components. The Supreme Court's Internet opinion may portend a shift by the Court to a standard that is defined by individual viewer interest rather than collective community standards. In other words, the world defined increasingly by the easy availability of speech over the Internet shifts to individuals the authority to decide for themselves the moral acceptability of pornographic speech. Under this analysis the government would have an interest only in ensuring that pornographic speech is not foisted on unwilling viewers. Under these circumstances, the government would no longer have the paternalistic responsibility of defining and enforcing a standard defined by the parochial perceptions of an isolated and morally homogeneous local community that no longer exists in the new world of global information.

See also: Broadcasting, Government Regulation of; Cable Television, Regulation of; Communications Decency Act of 1996; First Amendment and the Media; Internet and the World Wide Web; Pornography.

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PREFERENCES FOR MEDIA CONTENT

See: Attachment to Media Characters; Children's Preferences for Media Content; Parental Mediation of Media Effects

PRESERVATION AND CONSERVATION OF INFORMATION

Information has been recorded throughout time in a wide variety of formats as human knowledge, ability, and skills developed. Cave paintings, papyrus scrolls, handwritten manuscripts, and visual or sound recordings in various languages and formats provide information to people and allow knowledge acquired by one generation to be passed to the following generation. Along with the oral tradition, images, sound, and text have assisted in the transfer of personal, educational, political, social, or cultural information. These materials comprise our collective memory and are valuable and necessary to a society or group of people.

It has been impossible to save all information created throughout the history of humankind. The beginning of the twenty-first century represents an era of unprecedented growth in the creation of recorded materials. Consequently, institutions that serve as custodians of cultural and historical information must make decisions regarding its collection, preservation, and conservation. Candidates for preservation encompass a variety of formats, such as paper, books, photographs, and sound recordings. The decision to save information is based on criteria that considers the uniqueness of the information, its intellectual content, its historical or cultural significance, and its value to future research and education. In addition, valuable items that are in danger of being destroyed are also candidates for preservation and conservation.

Items that comprise visual or artifactual information, rather than written information, may also be considered valuable. Materials such as books, archaeological artifacts, paintings, and other artistic works may not provide direct information in the traditional sense, but still have value due to the knowledge that can be derived from studying them. It is not uncommon that an object may have informational value in the traditional sense, through words, images, or sounds, and as an artifact. For example, a book generally contains information in the text, but it may also be an important artifact in that its structure and format provide information on the process of its creation.

Objects that show value for the information they contain or for the information they can provide are collected and preserved by institutions such as libraries, archives, and museums. These institutions make every effort to preserve objects in their original form. In addition, objects that are in bad physical condition, and therefore at great risk, become immediate candidates for preservation and conservation.

Conservation and Preservation

Preservation involves maintaining an object or information in a format that ensures the continued use and accessibility of the information provided. It includes developing criteria for selecting materials that have cultural or historical importance and assessing their preservation needs; halting the deterioration of materials by providing a stable environment and proper supplies and equipment for storage; developing and implementing policies for the safe use of materials; and providing the resources necessary to engage in an on-going preservation program committed to the continued existence of valued materials. Preservation also includes preparing for potential disasters such as floods, fires, tornadoes, and earthquakes. Conservation is a vital aspect of preservation. The goal of conservation is to stabilize and restore an object in its original form through various treatment methods. Professional conservators are trained to apply conservation treatment methods and make recommendations for long-term preservation of materials in suitable environments.

Preservation and conservation decisions are dependent on a variety of factors, the most important of which is the value of the information or intellectual content an object provides. Other factors that are considered include the uniqueness or rarity of an object; its connection with significant events, individuals, or places; its significance in relation to an institution and the mission of that institution; whether the information provided by the object is available elsewhere; and the consequences of the loss of the item or the information it contains. The current condition of an object, including its fragility and level of deterioration or wear that has occurred during its use serves as an important factor in preservation and conservation.

Conservators and preservation administrators often work with individuals who manage collections held in institutions such as libraries, museums, and archival repositories. Collections managers strive to meet the recommendations from professional conservators and preservation administrators and provide the ideal conditions for the media and artifacts housed in various institutions. Private collectors and individuals may seek similar advice and follow guidelines developed by professional conservators and preservation administrators to protect and preserve items they consider to be of value and to safeguard the information they contain.

While various materials and formats have special preservation needs, there are a few recommendations that are common to the long-term preservation of nearly every type of item. These recommendations deal with temperature, relative humidity, light, and air quality. High temperatures, high humidity, or large fluctuations or changes in temperature and humidity can damage most materials. High humidity encourages the growth of mold and mildew and affects the chemical makeup of items such as film, photographic prints, and audiotape or videotape. High temperatures often speed up the deterioration of materials. Although individual items have specific requirements for temperature and humidity, generally, a stable temperature of 70° Fahrenheit and a humidity range between 30 percent to 50 percent is recommended for proper storage. Light can fade ink and paper, and alter the appearance of photographs, paintings, and other types of artifacts. Air quality is also a consideration because dust, dirt, and other airborne pollutants can contribute to the deterioration of objects and artifacts.

Paper and Books

Since the development of paper-making techniques, paper has been used to record and transfer information, and thus has influenced the cultural and social history of the world. Paper assisted in spreading ideas and information in a form that became increasingly prevalent as people became literate. The availability of paper led to the creation of books, which enhanced the spread of ideas and information. Books are considered one of the greatest achievements of humankind. The information in books assisted in the education of people and the dissemination of knowledge and ideas. Initially, books were handwritten, rare, and available only to the wealthy. However, with the development of movable type, books became available to all people who could read or sought higher levels of education.

Throughout time, as the demand for books and the information they contain increased, efforts were made to find cheaper components with which to create books. In the mid-1800s, in an attempt to lower production costs, paper manufacturers turned to the use of wood pulp (from trees) in the paper-making process instead of linen and cotton rags. The acids in wood pulp, however, cause paper fibers to lose strength, become brittle, and slowly disintegrate. A familiar example of acidic paper is newsprint, the paper used to print newspapers, which is highly acidic.

An awareness of the loss of vast amounts of printed information due to the acid content of paper resulted in an increased use of alkaline or acid-free paper by book publishers. The use of paper that is acid-free serves as a long-term solution for preserving information.

Institutions that hold valuable artifacts and maintain collections of rare and unique books or collections of primary source materials in the form of manuscripts and written records strive to maintain the ideal environmental conditions for longterm preservation of these materials. In addition to environmental controls, papers containing valuable information should not be subjected to direct sunlight, ultraviolet rays, or fluorescent light, all of which can weaken paper and fade writing. Also, paper should not be handled while eating or drinking, as food and drink near books can attract insects and rodents that may damage the paper. As with all types of media that contain valuable information, paper should not be stored in attics, basements, or places where mold and mildew may develop or already be present. Books should be stored on metal shelves or sealed wooden shelves and should be shelved upright. Retrieve books with care and use a bookmark, and avoid writing in books or using tape that can cause damage.

Photographs

Photographs record and store information regarding events, history, and people and provide through study a basis for the development of new

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A restorer uses a sixteenth-century technique to rebind by hand an early Elizabethan book in the book restoration laboratory at the Folger Shakespeare Library in Washington, D.C. (Nathan Benn/Corbis)

information. Photographs are also an art form, comprising images created with a variety of techniques, such as the daguerreotype, tintype, and black-and-white and color prints. The process used to create each format is unique, however, the basis for producing photographs remains constant: exposing a mixture of chemicals on paper, film, or glass to light. The outcome of photography is both an image negative and a positive print image. Photographs and photographic paper are chemically complex structures and as such are more fragile and susceptible to adverse conditions than paper. Many steps can be taken to assist in the preservation of the information provided in photographs.

Photographs are susceptible to destruction caused by excessive exposure to light and physical and environmental fluctuations and hazards. They should be stored in an environment that does not have high temperature and high humidity or excessive fluctuations in temperature and humidity. An ideal temperature is 68° Fahrenheit with a relative humidity range from 35 percent to 40 percent. Direct handling of photographs or touching the surface of a photograph should be avoided because oils and chemicals on human skin can permanently damage a photograph. Photographs should be protected from airborne pollutants, improper handling, as well as fingerprints, abrasions, dirt, pencil or pen marks, paper clips, and cracked surfaces. Photographs should be stored individually in paper that is acid-free or in plastic enclosures that are chemically inert. Paper enclosures protect images from light and avoid potential moisture buildup. Plastic or polypropylene or polyethylene enclosures allow an image to be seen without removing the image from the enclosure. Photographs are best stored in a dark closet on the first or second floor of a house, never in a basement or attic.

Slides consist of a transparent base, made from glass or film, that allows an image to be projected onto a screen. Both black-and-white and color slides are affected by the same environmental factors as photographs on paper. When slides are projected, the image is exposed to a great amount of both heat and light that adds to the deterioration of the slide. Slides are also affected by the acid content of cardboard sleeves or by the type of plastics used in the sleeves for the transparent image. Slides, as well as negatives, need to be treated with the same care and environmental considerations as print photographs.

Motion Picture Film, Audiotape, and Videotape

Films provide information in visual and audio form and are also considered to be artistic works. Motion picture film, both black-and-white and color, is composed of multiple layers that, due to their chemical components, can react to bad environmental and physical factors. Motion picture film is plastic that is made of nitrate, acetate, or polyester. Each of these types of film is coated with a chemical emulsion that holds the actual images.

Nitrate-based film, used prior to the 1950s on 35-mm format, is particularly unstable and can deteriorate rapidly in most storage conditions. It is highly flammable and the gasses emitted from the nitrate can invade and affect surrounding films. Because of these factors, nitrate film should be stored separately from all other materials in a collection. It should never be stored in an area that also serves as a living, working, or archival storage space for other materials. The deterioration of nitrate film can be slowed through stable cold storage at a temperature of less than 25° Fahrenheit. However, the best preservation option is to transfer nitrate film to modern, chemically inert polyester-based film.

Acetate has been used for 8-mm, 16-mm, and 70-mm film formats. Acetates are known as "safety" film because, unlike nitrate, they are not combustible. The plastic of the film can react with the atmosphere and create an acidic byproduct that gives off a vinegary odor, a form of deterioration known as "vinegar syndrome." This cannot be reversed and can spread to other films. Again, the best preservation method for nitrate-based film is transfer to polyester film.

Polyester is chemically inert and does not exhibit the same problems as nitrate-based and acetate-based films. All films are best stored horizontally, in chemically inert canisters, and in a controlled environment. High or fluctuating temperature and relative humidity can damage film by attracting mold, separating the emulsion layer of a film from its base, and accelerating chemical deterioration. Motion picture film should always be protected from light, dust, dirt, and fingerprints. All motion picture film is fragile and its base and emulsion layers can be easily damaged with improper handling or use in either a viewer or projector. For this reason, alternative copies may be produced for greater access to the information or content of the film.

Videotape, another common format for moving images and sound, may contain information that is considered highly popular, such as a copy of a popular movie, or may contain personal information, such as home videos. Videotape is an electromagnetic medium and as such is also highly affected by fluctuations in temperature and humidity, dust and dirt, use in poorly maintained playback machines, and magnetic fields. Videotape is not considered an appropriate medium for long-term preservation. Each time a videotape is played it loses some of the picture quality or signal. One way to ensure that the content of a videotape is not lost is to transfer it to polyester motion picture film and store it accordingly.

Audiotape, commonly found in cassette and reel-to-reel format, is subject to the same environmental and handling concerns as videotape. Analog reel-to-reel tape offers high-quality sound reproduction and is still considered the best preservation format for recordings on magnetic media. Audiocassettes, which also consist of a magnetized plastic ribbon, are more accessible and less easily mishandled that reel-to-reel tapes, but their sound quality is significantly inferior. The temperature and humidity should not fluctuate and a temperature range from 60° to 70° Fahrenheit and a range of 20 percent to 30 percent relative humidity is best for storage. As with any audiovisual format, the equipment used to play tapes should be maintained in proper condition, kept free of dust and dirt, and the tape ribbon should be aligned properly on the reels to avoid distortion. It is also best to create copies of original tapes for access and use.

Preservation of moving images on film and videotape and of sound recordings on audiotape is important due to the unique information these formats contain. Yet their chemical and magnetic components, and their dependence on machinery that may become difficult to maintain or become obsolete, makes the preservation of the original format a challenge. For these reasons, audiovisual materials become candidates for transfer to a new format.

Phonograph Records

Sound recordings or phonograph records preserve information through music and recorded voice and allow such material to remain accessible over time. Recordings have been made on wax and metal cylinders, and on disks made of aluminum, glass, and vinyl. The sound signal is stored within the grooves of recording and is released through a stylus or needle when it is played. It is particularly important to protect these grooves from dirt, dust, and oil, which act as abrasives. In order to protect the grooves of a record and to decrease abrasions, phonographs should be housed in inner sleeves made of either an inert plastic, such as polyethylene, or acid-free paper. They should be stored vertically to avoid warping. Phonograph recordings should be stored in an environment that has a temperature of 68° Fahrenheit (plus or minus 5° Fahrenheit), and a relative humidity that ranges from 40 percent to 55 percent. In addition, a record should be handled by supporting the edge of the record and the paper cover in the center. Phonograph records can be cleaned with a soft lint-free cloth or brush.

Computer Disks, Compact Discs, and DVDs

Computer disks and compact discs have superseded other types of recording formats for information and data. For example, compact discs (also knows as CDs) have essentially replaced phonograph records for recording and distributing music. DVDs (digital video discs or digital versatile discs) have been introduced as a replacement for videotapes and as a way to store large amounts of information. Computer disks, compact discs, and DVDs store information in a digital format. Compact discs and DVDs are created using lasers that burn a sequence of binary code (composed of 0s and 1s) onto the bottom of a disc. Lasers both record and read information from the compact disc or the DVD without direct contact with the surface of the disc.

Computer disks and compact discs are composed of a variety of materials that affect the permanence of the information they hold. They can be affected by high fluctuations in temperature and humidity, as well as dirt and dust. These types of environmental hazards can cause the loss of part of the digital code. Both should be stored away from high temperatures or direct sunlight, and should be housed in dust-free containers. For compact discs, a soft, clean, dry cloth can be used to remove dirt, dust, or fingerprints from the surface of the compact disc. Water, solvents, or sprays are not necessary in order to clean a compact disc. Care must be taken to not scratch or damage the surface of a compact disc or the surface of a computer disk. Compact discs, DVDs, and computer disks should be kept away from magnetic field sources that may corrupt or destroy the information that they contain.

As with video and audio media, computer disks, compact discs, and DVDs are dependent on machines to read or access the information they contain. There is also information or computer data that is dependent on a specific type of software for retrieval and access. This means that it is essential to preserve the media as well as the computer equipment and software necessary to access the information. Computer equipment is susceptible to an adverse environment. High temperatures, dampness, and humidity, as well as dust and dirt, can damage computer equipment and destroy the information or data it contains.

Computer technology is constantly changing and many storage formats are no longer in use or available; for example, punch cards and 8-inch and 5-inch floppy disks. An option to ensure survival of the information stored on a computer disk, compact disc, or other type of media dependent on a computer is to convert or migrate the information to a new format every three to five years without the loss of intellectual content or the integrity of the information. Creation of digital media mandates a commitment to the maintenance of the format over time.

Facsimiles and Reformatting

The artifactual value of an object, or its value in its original form, may make it a candidate for conservation and preservation through the creation of a surrogate or facsimile. The use of surrogates prevents further damage to the original item, in whatever form, by allowing the surrogate to be used in place of the original. An object presenting information often has historic or intrinsic value and must be preserved in its original form. Other issues that contribute to the preservation of an artifact in its original form are its age and rarity. Sometimes, and for many reasons, objects or materials cannot be maintained in their original format and in such cases it may be acceptable to copy the content onto an alternative format that preserves the information but not the original format.

Reformatting original materials onto a new media ideally provides an accurate and quality reproduction of the original and allows the information it provides to be accessible over time. This also assures that deteriorating materials are no longer required for use, and those materials that are of significant value but also have the potential to experience further damage will be protected.

Microfilm

If a source of information, such as a book or a paper document, cannot be maintained in its original format, conversion to another medium is considered an option. Microform technology is an alternative format that preserves information and the intellectual content of materials. Microforms are considered to be one of the most stable preservation mediums for long-term access to information and materials that are not intrinsically tied to their original form. These types of materials most often consist of serials or periodicals, newspapers, and books that are valued for research and scholarship.

Microforms include microfilm, microfiche, and microprint, which are composed of microimages that are magnified through a lens provided in a microform reader. Due to the size of the images on microforms, a large amount of information can be preserved on microforms, which require a limited amount of storage space. Microfilm used for preservation is composed of a photosensitive emulsion made of silver halides. Microfilm made with silver halide and kept in stable, environmentally controlled storage can last for several hundred years. The proper temperature for the storage of microforms is 65° Fahrenheit, with a relative humidity of 35 percent (plus or minus 5 percent). Preservation of microforms also includes the creation of several copies. Silver halide 35-mm microfilm, usually the master copy or first generation of microfilm created, is considered the archival or permanent copy. A printing copy of microfilm is also produced and this copy is used to provide additional service copies that can be distributed for use and access to the information it contains. Service copies of microfilm are made of diazo or vesicular microfilm, which allows the materials to be used at a greater rate, while the master copy is preserved under proper environmental conditions. Microfilm is also considered a relatively inexpensive preservation option.

Digitization

Almost every format and medium mentioned above, from books, sound recordings, videos, and microfilm, can be digitized. Digitization is recognized as a viable option for access to information and for the conversion of information into new formats. Transferring information from its original format to a binary code allows for greater manipulation of materials and the information they contain. Digitization provides greater access to information than any other type of format.

Reformatting and converting materials to a digital format assists in providing access to materials that are fragile, deteriorating, and still valuable based on the information or intellectual content they contain. Digitization provides a highquality facsimile or surrogate of an original object or artifact. Transferring information to digital formats can assist in preservation because the original item, which is retained, is protected from additional handling that will further damage it. Digitization, however, does not constitute a longterm preservation method of information that is not preserved in its original form and it does not guarantee long-term access and authenticity of the information. It does not replace microfilming or other methods of preservation that can ensure long-term access and preservation. Digitization is preferred for improved access to materials rather than as a replacement of an original object or format that is best preserved in its original form.

Digital media, like magnetic media, requires machinery and software to read the binary code and present it to a user. Hardware and software components and human assistance is necessary to access digital information. Digital information must be migrated from outdated storage formats and software formats to current technology in order to ensure access to information considered to have long-term value.

Conclusion

Preservation assists in keeping information accessible and useful over time. Conservation treatments help to ensure the longevity of objects that have value for their content, so information can be learned from them as artifacts. Preservation and conservation efforts assist in research and scholarly activity but also affect daily life. Access to architectural records provides safety information for building and construction details that may prove useful during a natural disaster. State or municipal records that outline information on the storage of waste can ensure that housing developments are not placed in areas that once held waste materials. Photographs, maps, and other visual documents can help with the revitalization of neighborhoods and business districts. The records of organizations may help them plan community programs for the future.

The existence of information in its myriad forms, maintained or preserved over time, has benefits for all generations. It continues to provide the foundation for development of new information, knowledge, and skills. Societies and groups of people throughout history have sought to document their experience. It is from recorded information that we have learned about past cultures and peoples, how they lived, what they thought, what they placed value on, be it ideas or objects, and even what may have led to their demise. Information stored on paper, in books, through still and moving images, on sound recordings and electronic media, and in works of art, in original or surrogate form, help to define our culture and society, drives economic and political decisions, and should remain essential to our global heritage and cultures. Libraries, archives, local and state historical societies, conservation labs, museums, and related institutions serve as the custodians of these resources and as such make the effort to preserve information for generations to come.

See also: Archives, Public Records, and Records Management; Archivists; Conservators; Museums.

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M. E. DUCEY

PRICE, DEREK JOHN DE SOLLA (1922-1983)

Derek John Price was born on January 22, 1922, in Leyton, a suburb of London, England, to Fanny Marie de Solla, a singer, and Philip Price, a tailor. Both of his parents were descended from Jewish immigrant families. Price added de Solla as a middle name in 1950. His early interest in science was derived in part from reading science-fiction pulp magazines. In 1938, he became a physics laboratory assistant at South West Essex Technical College and received a bachelor's degree in physics and mathematics in 1942 and a doctorate in physics in 1946 from the University of London. During World War II, he did research in the optics of hot and molten metals and taught various adult education evening courses and armed forces training programs while completing his doctoral studies. He spent the 1946-1947 academic year at Princeton University as a Commonwealth Fund Fellow in mathematical physics and married Ellen Hjorth of Copenhagen, Denmark, in 1947. They had two sons and a daughter.

The period from 1947 to 1950 marked a shift for Price from work in physics to work in the history of science while he served as a lecturer in applied mathematics at Raffles College in Singapore. During that period, he read through the volumes (beginning with 1665) of the *Philosophical* Transactions of the Royal Society and not only became aware of the evolutionary nature and the historical aspects of science and technology but also developed his theory of the exponential growth of the scientific literature. He first presented a paper on this theory at a history of science congress in 1950 in Amsterdam. His second doctorate (awarded in 1954) was in the area of the history of science, and it was completed at Cambridge University, where his earlier experience with laboratory apparatus led to an interest in the history of scientific instruments. In the 1955-1956 period, he received a Nuffield Foundation award for research in the history of scientific instruments and prepared a catalog of the instrument collection of the British Museum, as well as a catalog of all astrolabes known to him. In 1957, he moved to the United States as a consultant on the history of physics and astronomy for the Smithsonian Institution. He then served as a Donaldson Fellow at the Institute for Advanced Study at Princeton, studying ancient astronomy, and finally went to Yale University in 1959. At Yale, Price held the Avalon Chair for History of Science until his death on September 3, 1983. He was the recipient of the Leonardo da Vinci Medal from the Society for the History of Technology (1976), the John Desmond Bernal Award from the Society for Social Studies of Science (1981), and was elected a foreign member of the Royal Swedish Academy of Sciences (1983). He worked with the United Nations Educational, Scientific, and Cultural Organization (UNESCO) as a science policy advisor and was interested in exploring the social and policy dimensions of science and technology.

Price's background in mathematics led him to focus on the quantitative analysis of science and scientific development and laid the foundation for a new field of inquiry: the science of science (i.e., scientometrics). Two books of lectures, *Science Since Babylon* (1961) and *Little Science*, *Big Science* (1963), explored themes such as the growth and development of the publishing scientific community and caught the attention of a wide audience, including those interested in scientific information and communication. Through these and subsequent publications, he sought to turn the tools of science on science itself, measuring scientific personnel, literature, expenditure, and other indicators on a national and international scale. His research included establishing and interpreting the magnitudes of growth in the size of science, such as noting that of all the scientists throughout history, 80 percent to 90 percent were active in the twentieth century. He was an early user of the Science Citation Index, which records the links created when authors cite earlier works, as a source of data for investigating networks of scientific papers. He clearly demonstrated the broad patterns that scientists follow in referring to previously published documents and, by inference, something about the way in which new science builds on recorded knowledge. He suggested that relationships within and among disciplinary literatures could be identified and measured via their mode and degree of citation to one another.

In the realm of scientific communication, he explored the concept of the "invisible college" as a channel for informal communication among scientists. He observed that small groups of scientists at the forefront of a research area, but working at different institutions and possibly in different countries, stay in close touch through such mechanisms as conferences, summer schools, and distribution of preprints of papers. Price approached science as a social activity that can be modeled mathematically, and he sought to understand changes over time. His contributions included mapping the structure of science and measuring the size of science. His pioneering role-connecting the history of science, scientometrics, and information science-made a significant effect on the study of scientific communication.

See also: Research Methods in Information Studies.

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LINDA C. SMITH

PRINTING, HISTORY AND METHODS OF

Printing consists of processes for preparing identical copies of a written or pictorial text. Writing, which dates from the beginnings of civilization, records messages and enables them to survive over the course of chronological time; printing enables the duplicated messages to move through geographical space as literary and political statements. The first printing dates from East Asia, just after the birth of Christ. Processes for duplicating written texts were invented anew in Europe around 1450, where it both reflected and profoundly stimulated an emerging Western culture.

The history of printing is a history of artifacts and events but also of crafts. Four objects are involved: (1) printing surfaces, determined by what is to be copied, (2) ink, which consists of a chemical vehicle into which are mixed other substances for pigment and drying, (3) presses to transfer the ink from the printing surface to a reading surface, and (4) reading surfaces (usually paper) to receive the printing in order to produce the objects that are distributed through the activities of publishing.

Based primarily on the printing surfaces, one of four prototypical methods may be involved for the presswork: printing from raised surfaces, printing from incised surfaces, printing from flat surfaces, or printing from perforated surfaces. Printing from raised surfaces (i.e., letterpress, using either movable type or blocks of wood, metal, or later often linoleum) is essentially what Johannes Gutenberg invented around the 1440s. It subsequently dominated the printing world for more than four centuries. Printing from incised surfaces (i.e., intaglio engraving, often known as copperplate) was also developed during the 1400s but under circumstances that are less well known. Because it is not tied down to the linear text sequences prescribed by movable type, engraving came to be particularly well suited for maps, music, and works of arts. Its history was soon expanded to include not only direct incision with a stylus (or drypoint) but also chemical incisions of the printing surface (e.g.,



This simple hand press is typical of the type of press that Johannes Gutenberg would have used. (Underwood & Underwood/Corbis)

etching, aquatint). Capable of fine detail, intaglio engraving has become the appropriate medium for modern "security printing" (i.e., money and stock certificates). Printing based on flat surfaces (stones at first, from which came the name "lithography") was developed around 1800. Slow to be appreciated at first, the method has become the most widely used for commercial work, thanks to transfer processes that copy the printing surface on a different medium for inking and printing. Printing from surfaces that are perforated (e.g., silk-screening) allows ink to pass through the perforations. This is the least common of the four methods. All four have been developed and refined to fill particular niches in a decentralized world that has endless special demands, deadlines, and resources.

The Hand Press Era

Gutenberg, as elusive as he is celebrated, worked obsessively over several decades to produce the first printed books. His monumental achievement is represented in two different printings of the Bible (both completed probably soon after 1450) and in other short texts. Behind his work lay the physical invention and visual conception of the movable type that is reproduced on the printed page. His invention also entailed the improvement of presses capable of exact pressure across a large surface and the preparation of ink of the right consistency and color. Gutenberg understood that only if his works were visually convincing would they be commercially successful; their appearance needed to rival handwritten copies in both elegance and detail. The movable type involved complex activities in its own right. First, the fonts needed to be conceived in models that would reflect local tastes (in a time when there were many local manuscript styles), and they needed to be impressive and readable wherever copies were sent. Over time, punch cutters became part of the picture, as they filed and shaped the conception of the letters on the hard metal surfaces of punches and then impressed them into matrices by striking the punches into soft, heat-resistant metal. The matrices were next fitted into molds, into which molten lead was poured to create the individual sorts of type. Gutenberg not only worked out such complex procedures, but having done this, he went further and prepared separate fonts for each of his two Bibles, with several different shapes for a number of the letters.

In the surplus labor market of the day, workmen and apprentices who had been trained in the Gutenberg shop soon moved out of Mainz and took their skills to other nearby German cities, including Strasbourg, Bamberg, Augsburg, and Nuremberg. The printing press was soon seen in Switzerland (in Basel in 1467), Italy (in Subiaco outside of Rome in 1465 and in Venice in 1470, and France (in Paris in 1470). Before long, printing presses could be found across most of Europe. William Caxton, who was active in Bruges around 1475, set up his press in England in 1477. His imprints include several major English texts that survive in no earlier manuscript copy. Each of these printers needed to do exactly what Gutenberg had done. They needed to construct the press, design, punch, cast, and set the type, and prepare the ink. They then needed to locate sources for paper (or often vellum) and work the press efficiently to produce copies that were impressive in appearance. All of this could only be done after they had secured the necessary patronage or working capital. They also needed authors, texts, and editors, along with visions of market demands in the form of readers who were likely to want the books and be able to pay for them. Under such circumstances, the perfection and elegance of their books are especially astonishing.

In hindsight, the historical effect of their efforts seems obvious; printing clearly became a driving force in the course of Western civilization. The trends were also subtle and tied in to other historical events, however, so that the effect is hard to describe. The first texts were mostly religious works, as well as the Greek and Roman classics; political and practical writings, and original texts in general, came later. The first letters naturally reflected countless local preferences, but a standardization of the alphabet soon emerged, following national and religious predilections. Blackletter forms were to survive in Germany until as late as the 1940s, and elsewhere in conservative areas into the seventeenth century. Roman-letter forms, as first revived by the Italian humanists, were adopted in the Calvinist world. They soon came to dominate the rest of Europe, except in those Slavic areas where Cyrillic forms were to reflect the importance of the Eastern Orthodox Church. Printing obviously played a major role in the events through which Latin came to be supplanted by the vernacular languages. It helped to codify the orthography of the vernacular languages and, more subtly, their grammar. Serious readers-including legal scholars and scientistscould compare variant texts more easily when printed copies could be seen side by side. Thus, the bibliographical study of physical evidence itself was enriched, and with it, the causes of standardization and of scholarship thrived. Thanks to printed copies, political tracts were distributed more widely in the sixteenth century; in the relatively literate environment of Germany, Martin Luther was quick to call on printed sermons to foster his theological agenda.

Well established throughout Europe by the beginning of the sixteenth century, the press found its first major commercial center in Venice, where beginning in 1501, Aldus Manutius issued small, portable editions of the Greek and Roman classics, the latter in handsome italic type. Around 1520, Paris emerged as a home of scholarly printing, thanks to the Estienne family, which was also venerated for lexicography. By the 1530s, printers, particularly in Germany and France, found themselves caught up in the religious battles of the Reformation. London printers, torn by the religious instability of the early Tudor era, worked together through the Company of Stationers to negotiate an exclusive patent in 1557. In exchange for their promise of loyalty to the crown, they received ownership rights to the works they printed, in an arrangement that amounted to one of the earliest forms of copyright protection. In Antwerp, Christopher Plantin produced important scholarly books; he also served as the major distributor of movable type. The Plantin-Moretus Museum, which preserves the shop, is preeminent as a historical showcase for the equipment and activities of the early printer. It was during the sixteenth century, and significantly in connection with Plantin, that many of the classic type faces that are still in use today were introduced and promoted, including fonts designed by the Franco-Flemish type designers Claude Garamond, Robert Granjon, Hendrik van den Keere, Guillaume LeBé, and Pierre Haultin.

During the seventeenth century, the quality of printing declined because of the political censorship and shortage of materials that accompanied the acceleration of religious warfare in Europe. Pamphlets and broadsides, often with political overtones, are well represented in this period, and it was out of these that the modern newspaper began to emerge. Intaglio engraving came to be used for maps during the great era of exploration, as well as for other pictorial printing and, around 1700, for music. During this period, printers became increasingly separated from publishers, and eventually from booksellers as well. Printing remained a craft, learned through apprenticeship, although its secrets slowly began to be publicly known. For example, Joseph Moxon's Mechanick Exercises (1683) provided an invaluable description of the workings of the early printing shop.

Printing was introduced outside of Europe by the church (as part of Protestant or Jesuit missionary efforts and in order to provide service books) and by colonial governments (in order to publicize laws and official notices). The first Icelandic printing, in 1534, was sponsored by Jon Arneson, the last Catholic bishop prior to the Reformation. In the New World, liturgies and other books for use with the native populations were printed in Mexico as early as 1540. In the



A 1592 type-founder's specimen provides examples of the typefaces created by the French publisher and designer Claude Garamond. (Bettmann/Corbis)

British colonies, Stephen Daye's press in Cambridge, Massachusetts (the first printing press in America), issued its *Bay Psalm Book* in 1640. The first books from India were printed by Portuguese Jesuits in 1675, while a British government press dates from 1675 and a Danish missionary press dates from 1712. A Dutch press in Indonesia dates from 1668, and one in Ceylon dates from 1719. Native presses were occasionally seen, one of the most provocative being the later Maori press and its readership in New Zealand.

Printing commerce stabilized in the eighteenth century. In England, modern copyright, vested primarily in the author, dates from the Queen Anne statute of 1710. The newspaper expanded in size, reflecting larger and more literate readerships, and there was a burgeoning output of pamphlets, many of them political. Because these publications challenged the national governments, they played a major role in the events that led up to the American and French revolutions. Other forms of books were first finding their markets and their readers. Printers were crucial to the advent of the earliest novels and to the specialty of children's books. Slowly, and most particularly in the Protestant nations, the printing press came to foster those elusive events through which nations with strong newspaper traditions also have strong library traditions.

In the United States, the press moved with the first settlers, across the Appalachians, prairies, and plains, following the rivers where there were no roads. Quickly, the new nation was blanketed with printing presses. The major publishing centers for books and popular reading materials were located initially on the East Coast, notably in Boston (where Isaiah Thomas first set up his shop), Philadelphia (where the firm of Matthew Carey was located), and New York (with the firm of Harper & Bro.). Local printers, in contrast, provided newspapers and pamphlets, along with state and regional notices and ephemera. From the ranks of the printers and their apprentices came such notable American writers as Benjamin Franklin, Walt Whitman, Mark Twain, and William Dean Howells.

What is known of the production of the early presses around the world consists mainly of books, mostly because books were thought of as items that should be preserved. The extent and importance of printed ephemera can only be guessed at, based on surviving copies (which are scarce) and secondary evidence (which is often ambiguous). Gutenberg is known to have printed indulgences, calendars, announcements, and other odd fragments. His immediate successors prepared a broadside listing the books they had for sale. Playing cards are known to have been printed even earlier. There are also surviving pamphlets and broadsides, which were sold by hawkers on the street. The literature was different from that of the established publishers who came to define the modern book trade and who worked mostly through the booksellers whose premises had slowly emerged out of the shops of stationers. Political tracts are known through the unrest they fostered. These include sermons that were widely printed and reprinted during the early phase of the Protestant Reformation in Germany, the news sheets printed during the time of the English

Commonwealth and Restoration, and the pamphlets that stoked the controversy that led up to the American and French revolutions. Other printed ephemera that were probably published in considerable quantity include horn books and tutors for children, announcements, riddle books, songbooks, prayerbooks, almanacs and prognostications, trade cards, ledgers, and posters.

The Era of Mass Production

There is little reason to believe that the flat-bed platen printing press created by Gutenberg changed much between the time of its invention and the beginning of the nineteenth century. Around 1800, however, a growing demand for books, stimulated by a more literate populace, led to innovations that would transform the worlds of printing and publishing. The wooden press came to be made of iron, with its early forms named in honor of its patron, the third Earl of Stanhope. Its successors, among them the Washington, the Albion, and the Columbian presses, tell of a competition that reached across the ocean. Steam power was quick to be used in driving the press, and soon came the larger presses, among them the flat-bed cylinder presses that served the needs of nineteenth-century newspapers and other large editions that required timely delivery.

Other innovations affected the printing processes. Stereotype plates (i.e., castings of whole pages of type) had been conceived by William Ged in the eighteenth century but were fiercely opposed by the workmen who composed the type and distributed it after printing. By the nineteenth century, stereotyping had become a common option for printers, thanks in large measure to the support of the Earl of Stanhope. Meanwhile, the brothers Fourdrinier, working in London in the 1790s, invented the machinery for producing paper in continuous rolls to replace the cumbersomely produced handmade sheets. By the end of the century, stereotyped printing surfaces could be curved around a cylinder so they could be used on large rotary presses, which rolled the plates against a continuous roll of paper to produce modern newspapers and other large press runs. Also near the end of the century, the Linotype and Monotype further simplified the work of setting type by hand. Other machinery was developed at this time to distribute type and to justify the right margins on the printed page.

These inventions all served to provide more reading matter more quickly in order to meet and in turn to create growing public demands. Printed matter from outside the established world of the book trade was promoted, often by enterprising publishers. These materials included children's literature, gift books, sheet music, popular and local periodicals and newspapers, and organizational pamphlets. Books, previously sold in sheets for purchasers either to bind, lavishly or simply, or to leave unbound, were now sold as bound copies, with covers of boards often covered in cloth and. in time, with book jackets. Publisher's bindings quickly became so pervasive as to lead some publishers of the day to tout their work as cheaper for being in paper.

Lithography had been invented by Alois Senefelder at the end of the eighteenth century, but his wide ambition was not matched by capital and the process was slow to come into favor. Its ascendancy dates from the middle years of the nineteenth century, when chromolithography (i.e., color printing) was developed. This process was first accomplished by using different stones for each color, which was obviously very cumbersome. It was used primarily for maps and music, ill-suited as they were to movable type, and pictorial material, such as the famous prints of Currier and Ives. Still later the camera, another invention of the nineteenth century, was used to create lithographic printing surfaces, which led to the heralding of texts that had been reproduced by photolithography. Processes that shifted one printing surface to another one (i.e., lithographic transfer), helped make the process particularly appropriate to reprinting.

Paper, basic to the demand for reading matter, came to be produced more cheaply as grasses were introduced into the pulp and stronger acids were used to break down the fibers. The result was to make more printed matter available in an era of high commercial demand, although the cheaper paper has deteriorated more rapidly than has that of earlier periods, which has created major problems in preserving historical evidence in archives and research libraries.

As a device for attracting readers, printed pictures and decorative effects were also fostered in the nineteenth century. Illustrations, common in Renaissance books but seen less often in the wordbound writings of the seventeenth and eighteenth



Ottmar Mergenthaler's creation and refining of the Linotype machine in the 1880s revolutionized the typesetting process. (Bettmann/Corbis)

centuries, returned to literary texts. Artists enjoyed a range of mediums for the creation of book illustrations. In addition to woodcuts and engravings, lithographs were now an option, and new processes were developed for metal cuts. For display work, the classic alphabetic forms were distorted with dramatic blackness and fine Victorian decoration, or they were reshaped to fit the fashions for gothic tastes.

Reacting against the "commonness" that resulted from mass production (and with a social agenda in mind), a group of passionate idealists at the turn of the twentieth century exerted a powerful influence on the design of printed matter. Working in London and for the most part socialist in their politics, William Morris, working at his Kelmscott Press (with the guidance of Walter Crane and Emery Walker), preached a return to Renaissance tastes and English folk art. Personal presses, including those of T. J. Cobden-Sanderson (Doves Press), Charles Ricketts (Vale Press), St. John Hornby (Ashendene Press), Lucien Pissarro

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(Eragny Press), and Gwendoline and Margaret Davies (Gregynog Press) further helped to revitalize the design of printed books. The cause of public tastes was fostered through the political efforts of Sidney Cockerell and Stanley Morison and with publishing programs such as those of the Nonesuch Press and the Golden Cockerell Press in England and the Limited Editions Club in the United States. New type designs were fostered, based on classical models. Some of the best known of these new faces were created by Stanley Morison (Times New Roman), Bruce Rogers (Centaur), and Hermann Zapf (Palatino). Continental predilections of the futurist, dada, and Bauhaus movements strongly influenced the graphic design of nonbook materials, particularly advertising presentations.

During the twentieth century the printing industries flourished, widening their production of large newspapers and mass-media magazines, of bestsellers and bulk advertising, of an everexpanding profusion of scholarly books, educational texts, and manuals, and of cards, forms, announcements, and other small job printings. As a surface for printing, paper came to share the press with a wide range of metals, cloths, glasses, and plastics, mostly for the needs of commercial presentation and packaging. New kinds of paper were developed, ranging from the coated stocks used for color illustrations to the alkali forms that promise to survive for library materials. These new and expanding applications have called for a wider range of specialty presses, commercial firms, and trained workers. Photography expanded from basic camera work in the nineteenth century into microforms and other kinds of image copying. Printing has also been obviously affected by computer innovations. For personal use, typewriters have been largely supplanted by dot-matrix and laser printers, while for formal publication, "hot type" (in which the metal itself is inked directly on the printing surface) has largely been replaced by, first, the Photon, and later, by other forms of phototypesetting machinery. The design of type itself has also been enhanced through the digitization of fonts, suggesting that the printing processes will continue to be redefined in order to continue to provide multiple physical copies of written material.

See also: Bibliography; Cataloging and Knowl-Edge Organization; Conservators; Gutenberg,

Johannes; Journalism, History of; Newspaper Industry, History of; Publishing Industry.

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D. W. KRUMMEL

PRIVACY AND COMMUNICATION

Privacy, as defined by Judge Thomas Cooley (1888, p. 29), is "the right to be let alone." As the electronic media expands its reach to all parts of the globe, and twenty-four-hour news services are increasing their desire for time-filling material, federal and state courts are seeing more and more lawsuits that deal with the violation of privacy. In their rush to beat the deadline, reporters may find themselves on the wrong side of a privacy tort. While libel cases make the news, and make newsrooms shudder, it is the tort of privacy that the journalist is more likely to be charged with in civil court.

Privacy entered the legal arena in 1903, when the state of New York passed a statute that made it a misdemeanor and a tort to use someone's name or picture for trade purposes without prior consent. The legislature was reacting to the case of a woman who had no legal recourse after her portrait was used in a flour advertisement that was tacked up in saloons, stores, and warehouses.

When media professionals talk about privacy, they generally mean the five tort actions of unreasonable disclosure of embarrassing private facts, intrusion upon seclusion, portrayal in a false light, appropriation for commercial purposes, and the right of publicity. These actions are referred to as the common-law invasion of privacy, although the courts are still refining the status of the right of publicity.

In the latter part of the twentieth century, plaintiffs seldom prevailed in their invasion of privacy lawsuits. However, that does not prevent someone from attempting to recover something of value from the reporter if that person perceives that the published stories have done harm to his or her reputation. Therefore, it is imperative that the reporter become familiar with the five torts of invasion of privacy. This will go a long way to ensure an adequate defense if the reporter winds up in court.

Unreasonable Public Disclosure of Embarrassing Private Facts

Unreasonable public disclosure of embarrassing private facts is the tort that is most often cited in cases that are brought before the courts. It is also the branch of invasion of privacy to which most definitions of privacy apply. Yet, even though the odds against winning are great, plaintiffs file embarrassing private facts lawsuits frequently; only false light actions appear to outnumber embarrassing facts among all privacy cases.

Why do plaintiffs almost always lose? The major reason is that the defense of newsworthiness, adopted early in the development of the cause of action, has almost completely negated the tort. Newsworthiness means different things to different people, but the majority of cases that have applied an analysis of the newsworthiness defense have relied on the definitions of the news media themselves in reaching conclusions. An editor or news director will likely consider any story newsworthy. Why else would the story have been published in the first place? At times, courts may apply a narrower definition-holding that issues that directly affect the audience members are newsworthy, but that facts that are merely interesting is outside the scope of the newsworthy defense.

The problem with this interpretation is that it focuses on the news *value* of the story, especially its political or social value, rather than the personal or intimate character of the information. Such narrow definitions of the newsworthiness of a story also fail to take into account the significance of entertaining or novel information. One of the ironies of the embarrassing disclosure of private facts lawsuit is the increased publicity that accompanies the filing of such a lawsuit. Not only is the case brought out in the media, but also the original facts are brought forth again and again. Because the facts are now newsworthy, the lawsuit can only pertain to the original publication or broadcast. Once the lawsuit is public, the tort no longer applies.

In most cases, privacy rights terminate when a person dies or when their name appears in a court document or records of proceedings. Therefore, in these cases, the privacy tort cannot be used.

Two additional lines of private facts cases concern whether occurrences of the past that were then a matter of public record or public interest would be public if they were brought out again at a later date by the media. In *Roshto v. Hebert* (1983), it was determined that controlling weight on the decision should be given to the fact that the stories were true and a matter of previous public record. Past allegations, so long as they were made by law enforcement or government officials, are also protected from liability when published.

Newsworthiness by proximity to an event or to another person has been less of a concern. *Campbell v. Seabury Press* (1980) extended the public interest or newsworthiness defense to entirely private persons because of a "logical nexus between the complaining individual and the matter of legitimate public interest." *Campbell* dealt with the publication of remarks from a former sister-inlaw in the biography of a civil rights leader.

Where can one draw the line between news and intrusion of someone's privacy? Taking into account what the public finds acceptable in its news and entertainment media, should there be a line at all? The courts are trying to decide the answer. Until they do so, one can see that there are fewer disclosure of embarrassing private facts lawsuits being filed, and of those that are filed, the plaintiffs are losing almost every time.

Intrusion

The tort of intrusion upon seclusion deals with newsgathering techniques rather than what is ultimately published. This tort seeks to protect the right of individuals to be left alone in places where there is a reasonable expectation of privacy—in other words, where someone would normally not expect to be observed by others. An act of intrusion occurs when someone intentionally enters a location where another has a privacy interest. In order



Carol Burnett testified on March 17, 1981, in connection with a libel suit that she brought against the National Enquirer as a result of a 1976 story that alleged she had been drunk and rowdy in a Washington, D.C., restaurant. Burnett donated a portion of the awarded settlement to the Department of Journalism at the University of Hawaii in order to promote ethical reporting. (Bettmann/Corbis)

for the tort to be applied, the intrusion must "be offensive to a reasonable person." Content of the news story or the permission of the owner or privacy interest holder is the complete defense for the tort of intrusion. By giving consent to enter, a person has waived their privacy interest, at least temporarily. Moreover, when newsgathering occurs in a public place, or a place where anyone could have gathered the same facts, a plaintiff has no reasonable expectation of privacy—similar to the "in plain view" defense in Fourth Amendment cases.

In reality, intrusion upon seclusion cases present little danger to the news media. Few suits are filed, and plaintiffs win still fewer. The only time that the media is in danger of violating the tort of intrusion is when the media also violates the common law of trespass—in other words, by entering onto private property without the consent of the owner or somehow interfering with the owner's right of exclusive possession. The property in question must be a place wherein the plaintiff has the right to exclude others (i.e., nonpublic, "private" property). As with intrusion, consent or permission serves as a complete defense.

Intrusion can also be closely related to nuisance laws, especially when surveillance reporting through electronic or photographic means is involved. How a journalist obtains information may be just as offensive to a reasonable person as outright trespass. By using extraordinary means of newsgathering, reporters might find themselves on the wrong side of an intrusion complaint. Extraordinary means include persistent following of a potential news source, in addition to electronic or mechanical means.

The common element in all of these actions is control of one's own property or information about oneself. It is the interference with solitude or space, not the information that is gathered, that justifies the action. However, if the plaintiff cannot lay the claim of intrusion at first, then whatever harm may have come from the publication of facts gleaned during the intrusion is irrelevant.

Routine newsgathering in or from public places is almost always protected from a claim of intrusion. However, if newsgathering behaviors approach harassment, stalking, or public nuisance, the courts have occasionally been persuaded that intrusion or "tortuous newsgathering" has occurred. Tortuous newsgathering includes intrusion, trespass, fraud, harassment, and other related legal issues.

The proliferation of electronic communication devices, including cordless telephones, pagers, e-mail, computer software, and satellite telephones have caused privacy concerns to grow. Statutes at the federal level and in many states are designed to safeguard the privacy of private communications. However, some courts have held that there is no privacy interest in messages that are distributed over unsecured channels. Federal law has been interpreted as creating an interest in the security of communications, not of its confidentiality. In several cases that concerned privacy in the workplace, the federal courts have held that the owner of the communications system can tap into the network and monitor employee communications at any time, without the consent or knowledge of the employee. However, when a third party views the internal communications of a company without the consent of the company, then a tort of intrusion or trespass has occurred.

Is a reporter liable to charges of illegal wiretapping if telephone interviews are recorded without the source's consent? That depends on local state laws. Ten states bar one-party consent recording of telephone calls or of individuals in person. Broadcast news professionals are further barred from airing a recorded telephone call without the other party's consent. That consent must either be in writing or stated clearly by the source at the beginning of the conversation. However, the Federal Communications Commission (FCC), the agency that regulates the airwaves, has allowed exceptions to this regulation for reporters who were investigating crime. The FCC also prohibits the transcription or use of nonpublic radio broadcasts, such as broadcasts that are heard over police scanners, but the commission has not enforced that rule. It has, however, admonished broadcasters to respect that rule, reminding them of their public-interest obligation of not attracting crowds to dangerous situations.

If a reporter interviews someone from another state, is there a risk? Again, that depends on the courts. One might think that the state laws that are in effect in the state where the call originates would be applicable. However, *Krauss v. Globe International, Inc.* (1995) has indicated otherwise—at least where tort claims are involved.

Federal court decisions have interpreted the Omnibus Crime Control Act of 1968 to mean that if one side of a communication knows that the conversation is being taped, then no illegal wiretapping has occurred.

While wiretapping and bugging of private places by the media are illegal, eavesdropping or recording conversation that is taking place in a public or quasi-public location is legal for both print and broadcast media.

Portrayal in a False Light

Invasion of privacy by portrayal in a false light is the one tort that has fared the worst of all torts in the courts. In fact, false light is a legal hybrid. False light accusations concern either false assertions of fact or false implications of fact, just as in libel. The difference is that in false light, the errors need not be defamatory, only embarrassing. Because of that, false light is a privacy tort rather than a part of libel law in that the harm is considered to be against one's dignity rather than to one's reputation. Another way to look at the difference is that libel harms one in ways that can be quantified, whereas false light, while damaging, cannot be easily calculated. Where one lives could determine whether or not false light is even actionable. Ohio, Texas, and Massachusetts have all refused to acknowledge the existence of false light. These actions are libelous in those states.

The federal courts define false light in specific terms. According to the Restatement (Second) of Torts (section 652), false light is said to have occurred if "(a) The false light in which the other was placed would be highly offensive to a reasonable person and (b) the actor had knowledge of or acted in reckless disregard as to the falsity of the publicized matter and the false light in which the other would be placed." Part (b) reflects the "federalization" of both libel and false light under the First Amendment by the U.S. Supreme Court.

Filings of false light lawsuits are numerous enough to be a concern for the press. However, as with libel cases, false light cases are hard for plaintiffs to win. Plaintiffs might resort to false light claims rather than libel because the action, as defined in the Restatement of Torts, does not require the proof of defamatory meaning. Thus, this means that a plaintiff only has to prove that the defendant negligently (rather that with malice) overlooked an unfortunate meaning, resulting in embarrassment for the plaintiff. This makes false light cases easier to win for the plaintiffs, and it also invites criticism from legal and media experts.

The most typical instances of false light claims deal with coincidental uses of names, fictionalization, distortion, embellishment, and misuse or misidentification in pictures through unfortunate (not intentional) juxtapositions in otherwise legitimate news stories. If there is anything like a general rule to spotting a potential false light privacy invasion, it would be that some inappropriate interpretation or implication could be drawn from the news story.

Appropriation and the Right of Publicity

Using someone's name, picture, or distinctive personal characteristics without securing the permission of the individual was the first type of invasion of privacy tort to be recognized by the states. It is committed more frequently in promotions, advertising, and merchandising publications than by news personnel. Nevertheless, the tort is still of concern for the mass media.

To prove appropriation, a person must prove that they were used in an identifiable fashion for a commercial purpose without prior consent. In fact, the first appropriation case, *Pavesich v. New England Life Insurance Co.* (1905), involved an insurance company that used the plaintiff's picture and name and a phony endorsement. The two elements—identification and commercial use—remain the defining characteristics. The tort is designed to protect an individual's "persona" from noncompensated use for commercial purposes.

Starting in the 1950s, more and more appropriation cases have involved taking the name, likeness, or characteristics of famous people rather than unknown persons. From this line of cases has sprung a new tort, the right of publicity, which seeks to protect the monetary interests of those whose names, faces, or characteristics are marketable.

The obvious defense against a lawsuit that alleges appropriation would be a signed consent or release form from the person whose identity is used. Actually, consent forms are a defense against all invasion of privacy torts. However, the forms are rarely used in instances that are likely to provoke private facts, intrusion, or false light cases. Release forms are important tools where the famous or unknown are to be the subject of news or promotional events. If minors or the mentally incompetent are to be used, the parent or guardian must sign the form prior to the release of the materials. If the signed form accurately reflects the use of the name and picture, then it becomes the complete defense. In the case of celebrities, there is usually some form of payment that accompanies the signing of the form. Oral releases can be argued in court; however, the plaintiff usually wins.

Any major alteration of a photograph or substantial changes in treatment of the subject will void almost all release forms and may open the door to additional false light charges as well. Because the passage of time may nullify the reasons for consent, the media should seek an additional release form before using older images, or if the image is to be used for a different purpose than the originally agreed upon purpose.

The use of images of deceased celebrities will be entering the courts soon, as new digital technology can make long-dead movie stars interact with living actors. The appropriation tort states that the immediate family of the deceased owns the right of appropriation for fifty years beyond the date of death. If necessary, the rights can be renewed once through the copyright office.

While invasion of privacy torts should never be far from the mind of the media professional, common sense should dictate their actions. The public's right to know is almost always inviolate. However, when those rights interfere with an individual's right "to be let alone," the journalist should be ready with the consent forms or be ready to prove that the story was newsworthy and that the facts were gathered in a public or quasi-public place. The journalist should also be ready to show that he or she did not stalk the source or use some other illegal means of obtaining the information. This might not keep the journalist out of court, but will definitely increase the chances of winning the case.

See also: Federal Communication Commission; First Amendment and the Media; News Production Theories; Privacy and Encryption.

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PRIVACY AND ENCRYPTION

Although privacy and its protection are hotly debated in the beginning of the twenty-first century, what is being debated is poorly defined. According to definitions of "privacy" and "private" in *Webster's Third New International Dictionary*, "privacy" denotes an element of being withheld from public view, of "belonging to oneself," of "freedom from unauthorized oversight or observation of others." Louis Brandeis and Samuel Warren, in a seminal 1890 article, called privacy "the right to be let alone." But whether privacy is a civil right, a property right, a market commodity, or all of these at one time or another is unsettled.

Concerns about privacy at the time of the Brandeis and Warren article focused on intrusive photographers and gossip columns, not the records of business or government. In the late twentieth century, the issue of informational privacy came to the forefront with the rapid development of electronic communication through distributed networks. Companies transacting business on the World Wide Web (WWW) must ask for at least minimal amounts of personally identifiable information in order to receive payment for orders and deliver them. Governments collect data about individuals in order to carry out functions such as collecting taxes, paying social security, and conducting the census. Information collected in the course of doing business or government is organized and stored; it can be readily accessed and used again to carry out additional transactions or for purposes beyond those for which it was gathered. This secondary use and the possibility of misuse of personally identifiable information have many people concerned about the protection of privacy with respect to electronic records. Encryption, or using a code to prevent unauthorized access to information transferred or stored electronically, is seen as one solution to the privacy protection problem.

Privacy

Privacy would not need protecting if people did not value it. The Universal Declaration of Human Rights, adopted by the United Nations General Assembly in 1948, declared, "Everyone has the right to the protection of the law against" any "arbitrary interference with his privacy, family, home or correspondence" as well as "attacks upon his honour and reputation." The coupling of privacy with home, correspondence, and reputation suggests that it is central to personal relations, some kinds of communication, and even identity. Although the Constitution of the United States does not explicitly claim privacy as a right, the Fourth Amendment addresses the "right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches

and seizures." There is also a "penumbra" of privacy in the First and Third Amendments. Therefore, many people find a civil right to privacy articulated in the Constitution as well.

Scholars theorize that privacy is necessary for the construction and maintenance of autonomy and integrity and a sense of identity. Within relationships people reveal themselves incrementally to others. They withhold information if they feel their freedom of conscience or of action or their safety would be compromised by self-revelation. The private, or Australian, ballot was instituted to protect voters from threats and pressures from vote seekers. Privacy is necessary to prevent people from becoming vulnerable to coercion or manipulation. For example, the rights of citizens to have free inquiry, association, and communication would be seriously chilled if their inquiries, associations, and conversations could not enjoy a certain degree of privacy.

The right to privacy, however, is not an absolute right. People give up a degree of privacy in exchange for intimacy or friendship. They give up information about themselves in order to achieve something they want or to be responsible citizens. For example, a college applicant divulges a scholastic record for the opportunity to get an education, and a patient releases medical records to an insurance company in order to receive needed care. Citizens reveal income and expenditures to pay taxes. They give up informational privacy.

Informational privacy, or privacy with regard to personally identifiable information, is, as the example of health care illustrates, inextricably bound with other types of privacy, such as privacy of the person. So closely bound are information about individuals and individuals themselves, that the theft and use of another's personally identifiable information is referred to as "identity theft." At least in the marketplace, personally identifiable information in sufficient amounts may equal personal identity.

Computers and Privacy

Widespread concern about privacy in both the United States and in Europe began with governmental development of large-scale computer databases to replace paper files in the 1960s and 1970s. Citizens became concerned that easy access to so much private information left them vulnerable to infringement of their civil liberties. The result of this concern in the United States was the Privacy Act of 1974, which applied to "systems of records" held in government databases. The Privacy Act articulated what has become a widely accepted set of fair information practices, which have also been implemented by the European Data Privacy Directive of 1995. Subsequent legislation has attempted to address such concerns as data matching—the capability of computer systems to locate information about an individual across a number of databases using a common identifier such as a Social Security number.

In the 1990s, as electronic commerce flourished, concerns about privacy focused on the corgovernment, porate, rather than sector. Distributed computing allowed personally identifiable information to be transmitted across networks and stored in hundreds of databases around the country or even the world. That information, easily sorted by any variable, becomes a valuable commodity, not only used internally by the company for tailoring services to its customers or improving its marketing, but also sold to others. Thus, informational privacy itself becomes a commodity, raising the issue of who owns information about an individual. In the electronic marketplace, for example, when information about which parts of a website a person visits is gathered without his or her knowledge or consent, the individual loses the ability to bargain over use of personal data. The market is asymmetric, with the individual at a disadvantage. These secondary uses of information have increased individual concerns about privacy. Because information can be shared without being destroyed, even one transmission of personally identifiable information across data networks means a person loses control over that information.

A growing concern is the vulnerability of networked computer systems to infiltration or "hacking." Technically skilled thieves can break into computer systems and steal passwords or by other means gain access to private information such as credit card or Social Security numbers, addresses, information about purchases, or health data.

The combination of distributed computing and the ease of searching electronic records makes discovery of personal information easier. A skilled Internet searcher can learn a great deal about an individual by aggregating information discovered legitimately. It is not difficult to find WWW sites that sell access to public records that would ordinarily be difficult to find. More than one company sells software to allow any individual to track another's use of the Internet without the other's knowledge, including seeing every message typed in a chat room.

Either authorized or unauthorized use of personally identifiable data can have deleterious results. For example, according to Paul Clayton and Jerry Sheehan (1997), medical records that have historically been poorly protected and widely spread could be used without an individual's knowledge to deny that person employment or access to health insurance.

If business and government are to be conducted on a large scale over the Internet, ways must be found to protect the privacy of records, especially those pertaining to personally identifiable information. In a poll, 80 percent of those who buy products on the Internet said they were concerned about privacy online, and 96 percent of Internet purchasers said that websites should explain how they use information (Maurici, 1998). In order for electronic commerce and government to succeed, privacy concerns must be addressed.

The European Union (EU) has chosen to address concerns over informational privacy, or data protection, with the Data Protection Directive of 1995. The directive incorporates and strengthens the fair information practices found in earlier U.S. legislation but directs its injunctions toward the private sector, whereas U.S. law deals only with data collection by the government. Organizations must state their policies on data collection, use, and transfer, which must conform to the following principles:

- 1. Collection limitation: Data collected must be limited to that which is relevant for its stated purpose.
- 2. Clear and conspicuous notice: Organizations must state clearly in a prominent place who is collecting data, for what purpose, and any third party to whom it might be transferred. Notice must include limits on disclosure of information and the appropriate party to contact to rectify data.
- 3. Informed consent: Before using data, an organization must get the consent of the data subject. Whether the consent takes the form of opting in (positive assent to sharing data)

or opting out (assent to sharing data by not acting to withhold it) depends on the sensitivity of the data.

- 4. Disclosure/onward transfer: Organizations must secure informed consent (opt in) before transferring data to a third party.
- 5. Records integrity: Information must be up-todate, complete, and accurate; data not meeting these standards should be eliminated.
- 6. Security: Organizations must protect data from unauthorized use, manipulation, or modification.
- Access: An individual has the right to review and correct personal data in a timely and affordable manner. The EU Directive also established a Data Protection Commissioner. A number of other countries have a similar official.

The United States, on the other hand, relies on self-regulation by private industry and commerce to protect data privacy, which concerns many privacy advocates. Many companies, however, understand that privacy policies and practices trusted by consumers are prerequisite to thriving electronic commerce. A good many participate in self-regulatory consortia such as Trust-e, which attempts to verify that the companies observe fair information practices. To ensure secure transactions such as the transmission of credit card numbers and other personally identifiable information over the WWW, companies use secure transmission capabilities, including encryption, one way to protect data from unauthorized use.

Encryption

Encryption is the use of a mathematical algorithm to encode any data transmitted or stored digitally, such as an e-mail message, a contract, or medical records. The code is a string of numbers or bits; the longer the string, the more complex the code, and thus the more computational power and time required to break it. Typical key lengths for strong encryption range from 56 bits to 128 bits. In order to receive and decode an encrypted message, a recipient must possess the right key.

There are two types of encryption: private key encryption and public key encryption. In private key encryption, the sender and the receiver must hold identical keys. Because the key is shared, it is less secure than is the key used in public key encryption. In that case, the sender uses the public key of the recipient to encrypt a message; the recipient uses a personal private key to decode the message. The private key is never shared. This type of encryption can ensure the security of a communication. Public key cryptography such as PGP (Pretty Good Protection) is freely available on the Internet.

The U.S. government has developed its own very powerful encryption system, the Escrowed Encryption System, or "Clipper Chip," which is an algorithm etched into a silicon chip. Because the government is concerned that encryption makes it easier for criminals or terrorists to use the Internet for criminal purposes, with the Clipper Chip the government holds a copy of the key in escrow, splitting it into two parts for security. This escrowed key would allow law enforcement, with proper warrants, to decode encrypted messages if they have evidence that a crime is being planned. Privacy advocates oppose such a system. They also oppose the Carnivore e-mail monitoring system, which was promoted in 2000 for law enforcement's use against organized crime and terrorist groups. Privacy advocates fear the misuse of such invasive technologies. It should be possible, they say, to encode data prior to its encryption by the Clipper Chip, thereby ensuring data privacy and decreasing the power of the government to monitor its citizens closely. Seldom addressed is the possible role of encryption in protecting against commercial misuse of personal data. Law enforcement, commerce, and personal freedom contend as the debate continues over encryption as an important tool to ensure informational privacy.

See also: Computer Literacy; Databases, Electronic; Economics Of Information; Electronic Commerce; Internet and the World Wide Web.

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LOUISE S. ROBBINS

PRODUCTION PROCESSES

See: Film Industry, Production Process of; Magazine Industry, Production Process of; News Production Theories; Recording Industry, Production Process of; Television Broadcasting, Production of

PROGRAMMING

See: Cable Television, Programming of; Radio Broadcasting, Station Programming and; Television Broadcasting, Programming and

PROPAGANDA

"Propaganda" has been and continues to be a troublesome term. Many social scientists believe that the term is not particularly useful, since arriving at a workable definition of propaganda remains difficult. Other scholars are convinced that propaganda can and must be studied as a separate subject in its own right. No consensus on the definition of propaganda seems likely in the near future, but, after several decades in which almost no studies of propaganda were published, propaganda enjoyed a modest comeback in the 1980s and 1990s. Several important books and academic journal articles devoted to the subject appeared during those decades.

While labeling something as "propaganda" was widely perceived as pejorative through most of the twentieth century, the term did not always have an unpleasant connotation. While Garth S. Jowett and Victoria O'Donnell (1999) traced the systematic study and application of propaganda techniques to ancient Greece and Rome in the Western world, the earliest use of propaganda in a way resembling the word's contemporary meaning occurred on June 22, 1622, when Pope Gregory XV established what was commonly called the Sacra Congregatio de Propaganda Fide ("Congregation for the Propagation of the Faith"). This group was charged with evangelization in the "New World" of the Americas and with countering the Protestant Reformation by promoting orthodox Roman Catholicism. However, widespread references to propaganda did not become common until the twentieth century, when propaganda was increasingly associated with the trickery and deceptive mass communication that was employed by the governments involved in the two world wars and in the Cold War. Few people in the contemporary Western world would publicly describe their work as propaganda, since less controversial terms such as "information," "persuasion," and "communication" are available.

The Problem of Definition

The central problem of propaganda studies is one of definition. If propaganda cannot be distinguished practically and theoretically from other kinds of communication, then propaganda becomes nothing more than a disparaging label for a message that someone dislikes. The term is not very useful if it simply becomes an insult or epithet. Several possibilities for defining propaganda have been explored.

Source

One way to define propaganda is to suggest that it is a specific kind of persuasion that comes from a government or corporate source. From this perspective, a lone individual could not engage in propagandizing, but individuals working under the direction of the U.S. government or General Motors could be part of an organized propaganda effort. In the orthodox Marxism-Leninism of the Soviet Union, for example, propaganda was produced by well-trained professionals who worked for the state. This definition suggests that propaganda is ethically neutral, since government or corporate sources are not always or necessarily evil.

Critics of this source-based approach to defining propaganda would argue that this perspective creates another word for official persuasion and/or corporate advocacy and that an additional label is not particularly helpful. Also, some critics of this definition complain that describing propaganda in this way suggests a coordinated, secret, persuasive campaign that involves government and corporate actors, when no such plan exists in fact.

Technology

Another way to define propaganda is to emphasize technology and a variety of modern techniques that are used to reach large audiences. For some scholars, propaganda is in all important respects a synonym for "mass persuasion," whether in government messages or commercial advertising. From this perspective, studies of propaganda only became necessary in the twentieth century when new media technologies (e.g., radio, film, television) began to be used regularly by ordinary citizens. As with the source-based definition, a definition of propaganda that relies on technology is ethically neutral, since mass persuasion could be used for good or ill.

Critics of the technology-centered definition of propaganda would complain that mass persuasion is not inherently different from other kinds of persuasion and should not be given its own, unique label. This complaint is especially compelling when one recognizes that "propaganda" is a term with much negative baggage and that avoiding the term when possible has some intuitive advantages.

Intent and Purpose

A final way to define propaganda is to focus on the intent and purpose of the source that created the message and delivered that message to an audience. Propaganda from this perspective is ethically defective or troublesome because it puts the interests of the propagandist ahead of the interests of the propagandist's audience. Furthermore, propaganda relies on deception to secure agreement on the part of audience members. Even if the propagandist tells the truth, she or he does so as a strategy for facilitating attitude change, rather than because telling the truth is a moral obligation that is normally owed to all other human beings. While propaganda might happen to come from a government source and use mass persuasion techniques, the ethical problems that are inherent in propaganda separate it from more ethical forms of persuasion.

Concentrating on the intent or purpose of the propagandist distinguishes this definitional approach from the others described above. Specifically, while some scholars beginning in the 1930s sought to make propaganda an ethically neutral concept that was amenable to social-scientific analysis, others consistently maintained that propaganda was morally objectionable and, thus, could be distinguished from other kinds of persuasion. If a person who designs a message places her or his interests above those of the audience in the creation of that message, then, by definition, propaganda has occurred. While some versions of this definition compare (inherently unethical) propaganda with (ethical) persuasion, other variations make propaganda an unethical subcategory of persuasion.

Critics of attempts to ascertain intent and purpose in defining propaganda would complain that intent and purpose are hard to pin down since a speaker or writer may not be entirely forthcoming or honest when asked about her or his intent. Also, as was the case above, the justification for a separate label to be used for unethical persuasion is not necessarily compelling.

These three different approaches to defining propaganda illustrate the difficulty of finding a workable definition. Each of these approaches could be constructed as a subcategory of persuasion (organizational, mass, unethical) that does not require the existence of the propaganda label. While Jowett and O'Donnell (1999, p. 4) are right that a "definition sets forth propaganda's characteristics and aids our recognition of it," the need for the term "propaganda" itself is less clear, especially given the long, complex, and largely unhappy history of the term. Nevertheless, scholars who have studied propaganda, not surprisingly, have generally accepted that the references to and research on propaganda make sense given one or more of the definitional approaches described above.

Propaganda During and Between the World Wars

In the United States, the greatest degree of anxiety over the dangers posed by propaganda have involved the U.S. role in military conflicts, beginning with World War I and continuing after the end of the Cold War. During the world wars, preparation for and support of war efforts included extensive government attempts to create pro-war messages and promote attitudes and behaviors that would make victory in these wars more likely. The systematic efforts of governments to influence public opinion were widely characterized as propaganda.

During World War I, the Allied governments produced a variety of propaganda materials that denounced German motives and emphasized the atrocities that were committed by German soldiers. U.S. President Woodrow Wilson facilitated the creation of the Committee on Public Information, which among other activities offered assistance to the film industry and worked to see that pro-war films were created for U.S. audiences. The German government did not make effective or extensive use of propaganda during World War I, but the Nazis learned from the mistakes of their German predecessors and made frequent use of propaganda



A 1918 World War I poster uses democratic propaganda to tell civilians that they can help with the war effort by conserving food. (Corbis)

during the 1930s and 1940s. Adolf Hitler's infamous 1926 book *Mein Kampf* would later be read as a "how-to" manual for propaganda.

In the years between the two world wars, propaganda was widely studied in the United States, despite the fact that references to propaganda had only been common in the United States since 1918. As the events of World War I were assessed, many scholars and public intellectuals described concerns about the public being misled by unethical communication practices. Driven by their belief that mass communication had a powerful potential to distribute messages that would alter audience attitudes and behaviors, these progressive propaganda critics, as J. Michael Sproule called them in his book Propaganda and Democracy (1997), wanted to educate the public about propaganda and to help people detect deceptive claims and faulty reasoning. The Institute for Propaganda Analysis (1939) identified several techniques of propaganda that are still widely taught. For example, "card stacking" by a propagandist provides evidence that favors one side of an argument while withholding the best evidence that supports the other side of an argument. Furthermore, "name calling" by a propagandist attempts to discredit a person or group by describing the relevant parties in highly negative terms, as when Vietnamese nationals were called "gooks" by some U.S. soldiers during the Vietnam conflict.

In the late 1930s, those people who favored U.S. neutrality during the early days of World War II recalled efforts by British propagandists to encourage U.S. involvement in World War I. In addition, pro-war messages during this time were often denounced as propaganda. However, once the United States entered World War II, propaganda efforts coordinated by the Office of War Information were again defended as a vital part of the total war effort. As explained in a War Department pamphlet, What Is Propaganda? (1944), which was prepared by the American Historical Association, there was a difference between democratic propaganda, which was truthful and provided the information that people need to make up their own minds, and enemy propaganda, which relied on lies in an attempt to fool ordinary citizens into following misguided, dictatorial policies. This pamphlet explained that democratic propaganda was a weapon of modern warfare and that it was vital for spreading accurate information

about the war and for inspiring people to sacrifice in order to make victory possible.

Despite the insistence on a distinction between democratic and enemy propaganda, the practice of propaganda during World War II made this distinction difficult to sustain. For example, as described by Douglas Walton (1997), one 1939 newspaper article in London's Sunday Times recounted the bombing of a British fishing trawler in an exceedingly unbalanced and one-sided way. According to the story, a German submarine deliberately, rather than accidentally, bombed a civilian vessel and sank it, thus proving that Germany was an evil nation. Later, when the German submarine returned to the area to pick up survivors and give them water and shelter, this only proved that Germany was trying to deceive other nations, who would wrongly conclude that the Germans were not so bad after all. German behavior, whether in sinking the vessel or in tending to the survivors, was always interpreted in the most unfavorable manner. This democratic propaganda, even though published by an independent news source, did not provide for multiple interpretations of the same facts.

Additionally, enemy propaganda was not always deceitful during World War II. For example, some Japanese short-wave radio broadcasts during the war were designed for African-American consumption and argued that U.S. involvement in the war was designed to ensure white world supremacy at the expense of both the Japanese and African Americans. Japanese propagandists in this case were often truthful, since they had only to make reference to conditions in the Jim Crow South to support their claims about racial inequality in the United States. In short, conventional distinctions between democratic and nondemocratic propaganda did not seem entirely consistent with the actual propaganda messages of the period.

The Cold War and Its Aftermath

In the transition from World War II to the Cold War between the United States and the Soviet Union—the two great postwar military powers both countries made extensive use of print and electronic media to disseminate messages that portrayed their economic and political systems on favorable terms. International short-wave radio broadcasts became a popular means of promoting



In 1949, U.S.-born Mildred "Axis Sally" Gillars was convicted of treason (and served twelve years in prison) because she made Nazi propaganda broadcasts on the German radio during World War II. (Corbis)

governmental causes. For example, U.S. broadcast services included Voice of America and a variety of other radio and television services.

The United States Information Agency published magazines and bulletins in several countries and, since the 1990s, it has maintained an Internet website. During the Cold War, attempts were periodically made to distinguish between totalitarian propaganda, which relied on central control of the content of messages and was intolerant of dissent, and democratic propaganda, which was truthful and allowed for expression of some differing perspectives. However, not surprisingly, democratic propaganda still sought to portray the experience of democratic political systems as being generally positive.

Despite the end of the Cold War at the conclusion of the 1980s, interest in propaganda was renewed by the sophisticated public relations operation of the U.S. military and the constraints on media coverage of military operations during the Persian Gulf War, as well as by the comparison of the independent news media in purportedly democratic nations with the state-controlled news media of Iraq. The Internet and international television broadcasts via satellite also were examined during the 1990s as new technologies that presumably would provide new capabilities both for the distribution of propaganda and for the challenging of propaganda.

Computer-Based Media and the Future

The future of propaganda and propaganda studies is not at all clear. With the creation of the Internet, access to mass media outlets is no longer limited to the wealthy. While nightly news television programming and commercial print, radio, and television advertising continues to have larger audiences than individual Internet websites, relatively inexpensive desktop publishing, electronic mail, and websites will provide convenient and cost-effective means for distributing information and challenging official sources of news. Unless a national government is willing to ban computers, facsimile machines, and other advanced communication technologies, that government will not be able to restrict the flow of ideas and information among its citizens.

When confronted with charges that some message is a kind of propaganda, perhaps the best response is to remember that those who create such messages are not the only individuals who have important duties to perform. Many communication scholars have argued over the years that, unless misled or intellectually incapable of making tough choices between two or more competing arguments, audience members-receivers of propaganda messages-also have an ethical obligation to think through and critically analyze those messages. In other words, if an audience member thinks that something she or he has heard might be propaganda, it is the job of the audience member to reflect on that message, to do research on it if necessary, and to act accordingly. Propaganda is only effective if audience members allow it to be.

See also: Democracy and the Media; Globalization of Culture through the Media; Internet and the World Wide Web; Social Change and the Media; Social Goals and the Media; Society and the Media.

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PROVIDER-PATIENT RELATIONSHIPS

Provider-patient relations is the study of interpersonal communication patterns and the resultant development of interpersonal relations between providers and consumers within a health-care delivery system. Both health-care providers and consumers depend on effective communication to seek and provide relevant health information in receiving and providing competent health care, and the relationships established between healthcare providers and consumers have major influences on the quality of communication between these individuals.

Interpersonal Communication and Health Care

Interpersonal communication is a primary channel for information exchange for both consumers and health-care providers. For example, to diagnose health-care problems, doctors and other health-care providers depend on communication to gather relevant information from their clients about the specific symptoms these clients are experiencing. Without accurate diagnostic information, it is a hit or miss proposition to develop viable treatment strategies. Health-care treatments that are based on inaccurate or incomplete diagnostic information are unlikely to be effective. Healthcare providers depend on communication to furnish consumers with information about how to carry out treatment strategies, such as the correct use of prescription drugs or therapeutic regimens.

Health-care consumers also depend on their abilities to communicate in describing their symptoms to health-care providers and in interpreting the recommendations of the health-care providers. Consumers use interpersonal communication with their health-care providers to gather relevant information about the diagnosis of their ailments, their prognosis for recuperating, the specific health-care treatment strategies that are recommended for them, and the costs and benefits of these treatments. Typically, patients have a lot of questions about health care that can only be answered if they can establish effective channels of communication with their providers.

Communication and Relationship Development

People develop interpersonal relationships to establish and maintain social agreements related

to interacting with one another in cooperative and coordinated ways. The interpersonal relationship is the basic building block of social organization. People develop numerous interpersonal relationships in their personal and professional lives. These relationships range in their development from incipient (just beginning) to intimate.

All relationships are based on the development and maintenance of implicit contracts, mutually understood agreements to meet one another's (often unspoken) expectations for each other. In incipient relationships, these implicit contracts are few and are generally quite rudimentary, but as relationships develop, so do the agreed upon mutual expectations (i.e., the implicit contracts).

It takes a good deal more time and effort to develop intimate interpersonal relationships because of the many implicit contracts that govern how relational partners are expected to interact and cooperate. In intimate relationships, people learn over time to fulfill the many, often subtle, expectations they have for each other. Through the norm of reciprocity, which encourages individuals to respond in kind to one another, relational partners are encouraged to reciprocate with one another when their expectations are met. As more expectations are met and implicit contracts are established, the intimacy of the interpersonal relationship grows. This is known as the process of relationship development. When individuals fail to meet relational expectations, the norm of reciprocity encourages reciprocal violations of expectations, leading to a process of relationship deterioration.

Furthermore, individual expectations and cultural norms for role performances are continually changing, necessitating periodic updates in implicit contracts. To maintain effective interpersonal relationships, then, people must use interpersonal communication to continually identify their relational partners' different and emergent expectations, to let relational partners know that they intend to meet those expectations, and to share their expectations with the relational partners.

Relationship Development and Health-Care Delivery

Interpersonal relationships are central to providing health care. Consumers and providers must establish clear implicit contracts for coordinating activities in the health-care enterprise. Interdependent health-care provides, as well as support staff within the health-care system, also depend on the development of cooperative relationships.

It is critically important to develop and maintain effective health-care relationships between the many interrelated participants in the modern health-care system. However, relational development depends largely on the levels of communication competence that are engendered by health-care participants. Competence in relational health communication requires the ability to listen empathically, be sensitive to verbal and nonverbal cues, encode and decode messages, and manage interactions.

Complex health-care situations demand high levels of relational communication competence between providers and consumers if they are going to accomplish the goals of health communication, such as increased interpersonal satisfaction, therapeutic communication outcomes, cooperation between providers and consumers, social support, and health education. Insufficient competence at relational communication will surely limit fulfillment of these important health-care goals.

One of the most important competencies related to relational communication in the modern healthcare setting is the ability to be sensitive to the two basic types of interpersonal communication. Personal communication (i.e., communication that demonstrates respect for others) is a humanizing form of interaction that encourages relationship development and cooperation, while object communication (i.e., communication that demonstrates disrespect for others) is dehumanizing, leads to relationship deterioration, and undermines interpersonal cooperation. There is far too much object communication in modern health care, and participants in the health-care system should work toward treating one another with respect to promote cooperation and relationship development.

For example, object communication can occur when a health-care provider conveys object-oriented messages to a client by spending more time looking at a patient's chart than providing direct eye contact during interviews. Providers can also express object communication by dominating the conversation during an interview. Lack of eye contact and failure to encourage participation are likely to suggest that the provider does not think highly of the client and believes the patient is not as important as his or her chart. Such behavior can discourage the client from speaking up during the interview and providing full and accurate information to the provider about relevant symptoms and health history. Failure to provide such information can limit the accuracy of diagnosis and the effectiveness of suggested treatments. By using a more personal interpersonal communication style that includes providing direct eye contact, engaging the client in conversation, and treating the client with warmth and respect, the provider can begin to establish an effective interpersonal relationship with the client, encourage the client to disclose relevant information, and gather pertinent data for making effective diagnostic and treatment decisions.

Patients should also be aware of the potential influences of their use of personal and object communication messages when communicating with health-care providers. It is not uncommon for patients who are in discomfort to be very demanding of their providers' time and attention, sometimes forgetting to use common courtesies (e.g., waiting their turn, speaking calmly, and using polite terms such as "please" and "thank you"). Demanding and tactless behaviors (i.e., object communication) can suggest a lack of respect for providers and may discourage providers' development of empathy and concern for patients. Expressions of courtesy and respect are more likely to encourage cooperation and concern from providers than are less civil discourse. It is a very good idea for patients to communicate in ways that will encourage cooperation and concern from their providers in order to promote the best possible health care.

Content and Relationship Messages in Health Care

Relational communication has both content and relationship dimensions; that is, every time people communicate with one another, they provide each other with both content information about conversational topics and relationship information about the nature of their relationship with one another. The relationship between the participants in the communication process affects how the message is interpreted. In a similar manner, the messages influence the development and interpretation of relationships.

Often people are so concerned about crafting the content of their messages that they neglect the monitoring and controlling of the relational aspects of their communication, especially since relational messages define the relationship being developed between the people. In fact, every time people say something to someone else they have a potential positive or negative influence on the development of the relationship with that other person. Messages that violate the cultural expectations of the recipient provide relational information that will inevitably lead to relational deterioration because these messages demonstrate a lack of respect for the relational partner. However, messages that validate the cultural expectations of the recipient enhance relationship development. Therefore, it is important for healthcare participants to be aware of both the content and relationship implications of the messages they send and to monitor how these messages influence the development of cooperative healthcare relationships.

See also: Health Communication; Interpersonal Communication.

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GARY L. KREPS

PSYCHOLOGICAL MEDIA RESEARCH, ETHICS OF

Research ethics are the moral principles and rules of conduct that guide research. In general, researchers must balance two major obligations: (1) contribute to knowledge through research, which ultimately should benefit society, and (2) protect the rights and welfare of research participants. Federally funded research must conform to the ethical guidelines of the U.S. Department of Health and Human Services. Many professional associations, such as the American Psychological Association, have ethical guidelines for research with human participants. Most academic institutions require that research proposals be reviewed for ethical standards by institutional review boards (IRBs). Applying ethical principles to research situations is a complex process that requires the consideration of many factors.

Assessing Risks and Benefits

Researchers must assess risks (e.g., costs, harms) and benefits when deciding whether and how to conduct a research study. Any risks to research participants must be carefully weighed in relation to the potential benefits of the research to the participants and to society. Risks of participating in research include the possibility of physical harm or discomfort, as well as psychological harms such as anxiety, embarrassment, reduced self-esteem, and invasion of privacy. The possibility of psychological harm is a serious concern in psychological media research, because studies often examine the harmful effects of media messages. Researchers are obligated to inform participants beforehand about any risks associated with the study and to remove any harms that may have been induced (e.g., fear) during the study. Researchers can reduce the possibility of harm by studying people who have already experienced an aversive state (e.g., interview people about past reactions to horror films) or by inducing minimal levels of stress (e.g., show children a mildly scary film rather than a graphic horror film).

Informed Consent

In general, individuals must be free to choose whether or not to participate in research, and must agree to accept any risks voluntarily. Researchers must avoid coercion, which may occur if someone in authority recruits participants or when large incentives are offered. According to the American Psychological Association (1992), before participating in research, individuals must be informed about the nature of the research, be told that participation is voluntary and that they may withdraw at any time, and be informed about any aspects of the study that might reasonably be expected to influence their willingness to participate (e.g., risks). Often, research participants are not fully informed beforehand about the purposes and procedures of a study, because this would compromise the validity of the research. For example, the responses that participants have to a public-service announcement about safe sex may be affected if the participants know that the source of the message (expert versus peer) was being manipulated. The key issue to consider is whether any concealed information would be likely to affect the decision of an individual to participate.

Occasionally, researchers actively deceive research participants about aspects of a study. Common forms of deception include providing a "cover story," or misinformation about the purpose of the study, using an experimental confederate who acts out a planned role, or providing false feedback during the study. For example, to create a more natural viewing situation, a study of memory for commercials may be described as a study of responses to the comedy program in which the commercials appear. Not all researchers agree on the ethics of using deception. Some feel deception is never justified, because it denies individuals the freedom to make an informed decision about research participation. Others feel deception is justified when the research is meaningful and cannot be conducted any other way, when there is no deception about possible risks, and when participants are debriefed afterward.

Informed consent may not be required in certain field settings. These would include naturalistic observation in a public place and field experiments in which the treatment is within the range of normal experience and poses no risk. For example, a researcher who observed travelers watching television on airport monitors probably would not need informed consent.

Debriefing

At the conclusion of a research study, debriefing is used to inform participants about the full nature and purpose of the study, to explain the necessity for any concealment or deception, and to remove any harm created by the research. For example, research on the effects of violent sexual content in the media typically uses extensive debriefings, including researcher-led discussions. These procedures are designed not only to inform participants about the study, but also to ensure that any adverse effects of participating (e.g., increased acceptance of rape myths) are removed.

Privacy

All individuals have a right to control access to themselves and to information about themselves. Privacy may be protected, in part, through anonymity or confidentiality. Anonymity means that the researcher does not obtain any identifying information about participants. Confidentiality means that the researcher agrees not to reveal to others any information obtained from participants and that the researcher will disguise identifying characteristics when reporting the results of the research. Privacy issues are of particular concern whenever a researcher plans to film or record participants, gain access to personal records, or ask sensitive personal questions. These procedures can be used responsibly if the researcher is sensitive to the concerns of participants, obtains informed consent, and maintains anonymity or confidentiality.

Research with Special Populations

Special precautions must be taken when conducting research with any population that might be especially vulnerable to research risk or have a reduced capacity to consent to participate, such as individuals who are mentally disabled, ill, or victimized. Another special group is children (under eighteen years of age), who are the focus of much psychological media research. Research with children requires both documented permission from a parent or guardian and the child's agreement to participate. Children are more susceptible to coercion than adults and must be made fully aware that they are under no obligation to participate. Special care must be taken to limit the risks associated with the research. Developmental factors must be considered when judging how children of different ages will respond to research protocols. Debriefing, which must be age-appropriate may be unnecessary with young children who have a limited ability to understand the purpose of the research or the procedures that are involved. In any case, it is important that children leave the research setting in a positive state.

Reporting of Research

Researchers must also make ethical decisions about interpreting and communicating research results. The data must be analyzed appropriately, the procedures and results described fully and accurately, and those who contributed to the research must be given proper acknowledgment. Research reports typically undergo peer review to ensure the quality and significance of the research before being shared with the scientific community (e.g., through publications). Research findings should also be communicated to the general public (e.g., through the news media) when it is likely that the public may benefit from the knowledge. For example, research on children's responses to media messages can aid parents in helping their children become responsible media consumers. Psychological media research should contribute to scientific understanding, but ultimately it should also benefit society.

See also: Audience Researchers; Childrens' Comprehension of Television; Marketing Research, Careers in; Researchers For Educational Television Programs; Research Methods in Information Studies; Violence in the Media, History of Research on.

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CYNTHIA A. HOFFNER

PUBLIC BROADCASTING

Public broadcasting in the United States is widely seen as an important component of the media culture of the nation (Carnegie Commission, 1979; Twentieth Century Fund, 1993). Its programming and the terms of public support for it are not without criticism; it has its detractors from both the right and the left, and it regularly is a subject of debate. On the whole, however, public broadcasting tends to be endorsed as a social good; American society is seen as being better off for having it because of its role in broadening the base of information, education, cultural experience, and political discourse.

However, U.S. public broadcasting is much different from its counterparts abroad. By comparison with other major systems of public-service broadcasting (e.g., in Great Britain, Canada, Germany, Italy, Japan, and most other advanced "information societies"), the U.S. enterprise is not seen to be as central and as important to the overall national media culture. It is largely an afterthought, heavily rooted in a formal educational rationale and in some eyes serving principally as a palliative to the perceived shortcomings of the dominant commercial broadcasting system upon which it has been grafted.

Overview

Broadcasting began in the 1920s, and by the middle of the century, it had developed its various basic institutional structures and social roles throughout the world. In other industrialized, democratic nations, broadcasting typically began and grew around a model of itself as a cultural institution, as an extension of language, arts, and national identity. In contrast, U.S. broadcasting was considered at the outset to be principally a business enterprise, as a creature and promoter of commerce, and this has continued to be the prevailing view.

As in other countries, U.S. broadcasting has been subject to regulatory oversight. It is licensed under the assumptions of spectrum scarcity and related expectations about its public trustee obligations as a government sanctioned quasi-monopoly. In the United States, the fiduciary responsibilities of commercial broadcasting (to serve "the public interest, convenience, and necessity") were initially considered to be adequate to guarantee a broad range of services, such that no other major institutional alternative was seriously or widely contemplated. As a result, there was no commitment to a general model of a public-service broadcasting institution in the United States. The small, decentralized educational, noncommercial alternative that did emerge was considered to be only marginally necessary and was forced to begin life swimming upstream against the materialist currents of the dominant media structures and purposes.

Simultaneously, the modest educational broadcasting enterprise developed around a doctrine of localism and a resistance to the establishment of strong, national producing and programming entities. As such, it reflected the general public-policy structure for education in the United States, as well as the deeper constitutional debates about the structure of American government and politics.

During the latter third of the twentieth century, U.S. public broadcasting was given a new, seemingly firmer, public-policy mandate, plus public and private resources that were sufficient for it to build a system of local and national entities (i.e., stations, networks, and support agencies). That system was markedly larger and more stable than what had been imagined at the outset for noncommercial broadcasting. Nonetheless, at the beginning of the twenty-first century, it still remains a relatively small part of the overall broadcasting, media, and telecommunications nexus in the United States. Additionally, even as its existence seems more secure, it also is facing the substantial challenges of a new era of digital communications technology, marked by a widespread process of convergence and reconfiguration in media forms. Those developments are associated with increasingly rapid, broadband, multimedia and interactive forms of production and distribution, new business models, and changing regulatory assumptions.

History of Educational and Public Broadcasting

U.S. public broadcasting began in the 1920s and 1930s as a small collection of noncommercial radio stations that were licensed principally to educational institutions such as colleges, universities, and local schools. These stations were largely independent of one another, and they operated without any federal or even significant state or local funding. At the outset, public broadcasting had no special status under the relevant pieces of federal legislation (i.e., the Radio Act of 1927 and the Communications Act of 1934). Consequently, for its first twenty years, it also had no special regulatory protection through either the Federal Radio Commission (FRC) or the Federal Communications Commission (FCC), and for most of its first forty years, public broadcasting had relatively modest production capacities, little national programming, and no permanent interconnection (i.e., network) facilities. By the mid-1940s, noncommercial radio had been granted some reserved space in the emerging new FM (i.e., frequency modulation) band, though that status was never built back into the prior and then still dominant AM (i.e., amplitude modulation) band.

With the arrival of television in the early 1950s, interest in noncommercial broadcasting began to spread beyond school boards and colleges to national and community organizations that were seeking to develop broader-ranging social and cultural programming services that would be of interest to general audiences. The FCC also, in 1952, extended its spectrum reserva-

tion policy into the table of allocations for the very high frequency (VHF) and ultra high frequency (UHF) ranges. However, for most of its first decade or so and for most of its stations, the primary purposes of noncommercial television remained those of formal instruction (ITV) and education (ETV), and it had no major forms of national support and encouragement.

As with radio before it, certain dissatisfactions with the performance of commercial television began to emerge, and with them came increasing pressures for a more general-audience, publicservice institution. This combination led to the activation of more stations and program exchanges in the noncommercial realm. The growth of the number of stations was stimulated by the direct aid of the Ford Foundation, which made capital facility grants to community and educational organizations throughout the country, and by the increasing interest of many universities and state agencies in building ETV capacities. By the mid-1960s, more than one hundred ETV and nearly four hundred noncommercial radio stations were on the air.

As their numbers, resources, and common needs had grown, the stations had formed a few of their own collective trade and service organizations at the state, regional, and national levels. The foremost of these, the National Association of Educational Broadcasters (NAEB), had roots dating back to the prewar educational radio days, and it had developed radio and television divisions that provided programming and other professional services. The Ford Foundation had helped create a rudimentary national production service and network, the National Educational Television and Radio Center (NETRC, later known as NET), which came to focus exclusively on television. It produced and distributed a regular but modest (and only videotape delivered) schedule of cultural and public-affairs programming. Meanwhile, as the number of stations grew, they formed new regional organizations, such as the Eastern Educational Network (EEN), the Central Educational Network (CEN), the Southern Educational Communications Association (SECA), and the Pacific Mountain Network (PMN), principally to provide more programming for exchange among the stations. Comparable regional associations also were created for radio.

The growing number of noncommercial entities and audiences created a critical mass of awareness, interest, and public support that led to more coordinated and explicit planning for the development of stronger national program production and networking capacities and for larger amounts of funding. Those interests began to focus particularly on the question of federal funding, and they culminated in the work of the Carnegie Commission and the passage of the Public Broadcasting Act of 1967. This act laid out the basic plan for completing the transformation from a relatively narrowly defined and unique U.S. educational broadcasting model to one that encompassed more of the general-audience purposes of publicservice broadcasting, as reflected in similar institutions abroad.

Building on the tradition and imperatives of the largely decentralized, locally focused U.S. system of noncommercial radio and television, the 1967 act led to a series of actions that established the national structure and core dynamics that would define U.S. public broadcasting for the remainder of the twentieth century. The Public Broadcasting Act of 1967 chartered a new national, but theoretically nongovernmental, agency-the Corporation for Public Broadcasting (CPB). The act established a CPB governing board to be appointed by the president of the United States and confirmed by the U.S. Senate. It also authorized the corporation to receive federal funds and, in turn, to use those resources to create national systems of interconnection, to provide larger amounts of national programming, and to channel support directly to the noncommercial radio and television stations around the country.

Shortly after its own incorporation in 1969, working with the existing base of stations and other parties, CPB created two new organizations to manage the national interconnection systemsthe Public Broadcasting Service (PBS) for television and National Public Radio (NPR) for radio. As a result of compromises with the stations, particularly with the larger producing stations in several major cities, national public television programming was to be produced by the stations themselves and other independent entities. PBS was to be the coordinator of the national schedule for public television, but it was not authorized to produce programs, and the stations were to retain considerable autonomy in decisions about when to carry the national programs. In radio, the stations had the same scheduling autonomy, but NPR



On July 30, 1970, Joan Ganz Cooney, president of the Children's Television Workshop, testified in relation to the benefits of educational television before a Senate subcommittee on Equal Educational Opportunities. (Bettmann/Corbis)

was given both authority and CPB resources for producing national programming.

Throughout the 1970s, the initial structure of U.S. public broadcasting solidified, though it also continued to change on the margins. In other countries, one or two organizations tended to lie at the heart of the public-service broadcasting enterprise. In the United Kingdom, for example, the British Broadcasting Corporation (BBC), founded in 1922, received the bulk of the funding designated for public radio and television; it operated several national networks and many local stations, and it produced nearly all of the programming that was carried on its networks. In the United States, such singular dominance never existed, even after the development of the new national structure. CPB was a sort of primus inter pares among the national organizations, but it had no direct operational responsibilities for production, programming, or distribution. It could only facilitate those functions through other organizations. Also, while its national funding mandate gave it certain responsibilities for speaking to the White House, the U.S. Congress, and the press on behalf of public broadcasting, that authority was never total, with many of the representation functions remaining with the stations themselves and with their membership organizations.

The multiplicity and divided responsibilities of those agencies, as reflected in PBS, NPR, the regional networks, and the vast diversity and sheer growing numbers of stations, meant that programming and policy authority in the United States was highly diffuse. Nonetheless, the funding, programming, and board appointment experiences during the early years of CPB led to concerns that its influence, and that of the president and the Congress through it, were too great. As a result, by the early 1980s, both PBS and NPR had been through major organizational and governance crises that had led to greater independence from CPB and more explicit station ownership and control. Those reorganizations also differentially affected the national representation functions in public radio and television. Whereas NPR had not had such responsibilities for the public radio system at the outset, it did by 1977. Alternatively, a new organization in public television-America's Public Television Stations (APTS)-was formed in 1980 to provide regulatory and legislative services independently from PBS.

This pattern of churning reorganization and constant, often inconsistent, debate about the roles and authority of the national organizations reflected the persistence of a strong local-station base in U.S. public broadcasting and the continuing debates over the appropriate extent of its federalist character. The newer national organizations had been welcomed as practical necessities if public broadcasting was to become anything more significant than a relatively small, dry, narrowly focused set of pedagogically oriented stations. However, there was little willingness within the system or in Congress and successive presidential administrations to permit the national organizations to coalesce and have the resources that would allow them to become strong centers along the models of commercial American broadcasters or public broadcasting abroad.

Meanwhile, although many licensees, particularly in radio, continued to be educational institutions, the newer stations and the growing number of state networks were increasingly licensed to nonprofit community groups. Unable to justify the costs in relationship to the value of their instructional services, and responding to the emerging emphasis on a more general-audience orientation, some school board and higher education licensees actually transferred station owner-
ship to community organizations. In statewide systems, there also was a growing emphasis on governance by independent boards of directors made up of state and community leaders.

This public-service, corporate governance structure was similar to the pattern for other public U.S. cultural institutions such as museums, arts centers, and hospitals, and it had several consequences. It tended to draw to public broadcasting a powerful cross-section of professional, business, and cultural leadership well beyond the education sphere, thereby broadening its base of legitimization in the eyes of the public and state and federal political leaders. It opened the stations to a wider range of funding support, particularly in the private sector, and it also strengthened the authority of the local and state licensees relative to the newer and ever-growing national entities.

Meanwhile, other aspects of the public broadcasting system were continuing to change. In the mid-1970s, with congressional and CPB help, the interconnection systems had abandoned the conventional network structure of terrestrial land lines and microwave telephony for a new distribution system via geostationary orbiting satellites. As the newer national organizations developed, others waned. NET had been absorbed into one of the New York City public stations (WNDT, which became WNET) as a national program division. With the rise of CPB, PBS, and NPR, the role of NAEB became less clear. NAEB lost the financial and institutional support of the stations, which were now paying dues to the newer national programming and interconnection services. Increasingly defined as a professional association and therefore more dependent on the smaller revenues of individual memberships, NAEB finally went out of business in 1981.

Similarly, the regional television networks, now bypassed by the satellite system, began to abandon or substantially redefine their original roles as programming entities, with concomitant name changes and new charters. By the late-1990s, EEN had emerged as a general national programmer (i.e., American Public Television). CEN and SECA had added many aspects of the professional association work that had been lost with the demise of NAEB and changed their names to the American Telecommunications Group (ATG) and the National Educational Television Association (NETA), respectively. PMN had ceased to exist as an operating organization altogether.

Although certain large-city public television stations, such as WNET in New York, WGBH in Boston, and WETA in Washington, D.C., continued to provide the majority of the programs on the PBS schedule, and did so in partnership with nonstation organizations such as the Children's Television Workshop (CTW), more stations and state networks across the country were offering programs for national distribution and competing for scarce national program dollars. Meanwhile, pressures for diversity of voice and access led in 1991 to the statutory creation of the Independent Television Service (ITVS) to promote program production and distribution outside of the normal process that had been developed by CPB, PBS, and the major producing stations. In radio, NPR remained the dominant producer and distributor, but over time, American Public Radio, later Public Radio International (PRI), grew up from within Minnesota Public Radio (MPR) and became a substantial competitor to NPR. In time, even MPR itself became a competitor to both NPR and PRI.

These changes were facilitated by the widening, more flexible distribution capacities of satellite and cable technologies and the steady, if small, growth of revenues in the public system. With an increasing demand for more diversity of service and the proliferation of program sources, the growth in the number of stations tended to shift away from the few remaining under-served areas in remote, rural portions of the country toward urban centers, providing an increasing number of communities with access to multiple public broadcasting signals. By the mid-1990s, well over one-half of the U.S. population was capable of receiving three or more public radio stations and two or more public television stations. To some people, this phenomenon became known as the "multiple services problem," which implied an unwarranted duplication of services and waste of scarce resources. To others, it was the "overlap opportunity" that provided capacity for a wider range of program streams and community services similar to the stronger public-service broadcasting institutions abroad and parallel to the differentiated, audience-niche program channels that were being developed in commercial radio, cable, satellite, and Internet telecommunications.

The institutional structure of public broadcasting by the end of the twentieth century reflected an uneasy amalgam of both its deep-set Jeffersonian, decentralized educational heritage and its post-1967 efforts to create a more coherent quasifederalist model and a powerful, general-audience, national public-service media presence. The agencies that had been put in place by the early 1980s remained largely intact. Newer associations of stations and other interests, such as the Station Resource Group (SRG) in radio and the National Forum for Public Television Executives (Forum), the Program Resources Group (PRG), and the Hartford Gunn Institute (HGI) in television, had come into being to address issues and provide services that the existing agencies appeared to be unable to render.

However, the overall structure and the fundamental issues that faced public broadcasting remained. The substantial funding, technological, and overall policy problems that faced public broadcasting persisted. Individually and collectively, these matters had significant implications for the system, raising all the traditional questions about public broadcasting's own sense of itself and the public expectations for it. Additional national studies and task forces had tried to address them (Carnegie Commission, 1979; Twentieth Century Fund, 1993), but significant resolutions remained elusive. The continuing limits of public-policy commitment to public broadcasting were perhaps most clearly apparent when there was no mention of public broadcasting in the Telecommunications Act of 1996, the most sweeping piece of U.S. communications legislation since 1934.

Public Policy and Funding Patterns

The strengths and weaknesses of U.S. public broadcasting are reflected in the structure and amounts of its funding and in the associated legislative and regulatory environment.

The principal strength of the system's funding pattern is its diversity. Public broadcasting abroad tends to be supported by a combination of annual taxes for the right to own and use television sets (i.e., license fees) and limited amounts of commercial advertising. By comparison, the U.S. system has a much wider variety of revenue sources. This pattern of multiple public and private funding tends to protect it from direct control by any single social institution, such as government or business. The financial situation of U.S. public broadcasting improved considerably after the Public Broadcasting Act of 1967. By the year 2000, that growth had led to the establishment of nearly eleven hundred CPB-qualified radio and television stations, a sophisticated satellite distribution system, two full-time national networks, various other national and regional services, thousands of hours of original programming every year (with much of it having exceptionally high quality), and a professional cadre of more than sixteen thousand employees. The infusion of federal funds also helped strengthen the other public and private sources of support.

However, a major weakness of the funding system was the relatively small amount of actual funding that it provided. Total funding for public broadcasting had reached \$2.0 billion by 1998, but that amount was only 2 percent of the total revenues for U.S. commercial broadcasting and cable, which were about \$95.8 billion in 1998 (*Broadcasting & Cable Yearbook*, 2000). In addition, the diversity of funding sources reflected ambivalence about responsibility for the institution. No single sector, public or private, had emerged to sponsor public broadcasting.

By the end of the twentieth century, the principal funding sources for public broadcasting could be divided into tax-based funding (which includes federal, state, and local funding) and private support (which includes sponsorship, underwriting, memberships, subscriptions, auctions, and special events).

Tax-Based Funding

Tax revenues for public television are provided at federal, state, and local levels, though the latter is small and insignificant. In virtually all instances, federal and state funding is appropriated from general treasury revenues.

Throughout the educational radio period and the early ETV years, there was no federal funding for public broadcasting. In the late 1950s and early 1960s, some federal support (e.g., the National Defense Education Act of 1958 and the Educational Television Facilities Act of 1962) began to emerge for instructional programming and the construction of noncommercial television facilities. However, such funding was modest and did not become significant and include support for programming and operations until after the Public Broadcasting Act of 1967 and the creation of CPB.

The total amount of federal support (for CPB, facilities, and special educational initiatives) grew from approximately \$7 million in 1966 to approximately \$400 million for 2001. The latter amount is still small when compared with funding for public broadcasting abroad. By the late 1990s, public broadcasting's per capita rate of federal support-the annual amount of national, taxbased public broadcasting revenue per citizen of the country-remained well below that of national government expenditures in all other advanced industrial, first-world nations (e.g., less than \$1.20 in the United States versus \$30 to \$60 in Canada, Japan, and the United Kingdom) (Corporation for Public Broadcasting, 1999a). As a result, the U.S. public broadcasting program production rate, particularly in television, was far smaller than most other public-service broadcasting institutions around the world.

Additionally, federal funding has been consistently tenuous. The receiving-set license fees are widely employed in other countries and are relatively stable pools of funds, but in the United States, there are no special national funding mechanisms dedicated to public broadcasting. National task forces, study commissions, and leading political figures have at various times recommended the establishment of taxes on such things as the sales of receivers, the profits of commercial broadcasting and telecommunications, and the use or purchase of the spectrum. None of these ideas was ever implemented, and federal funding continued to come principally through appropriations from the general treasury.

There also have been serious limits on what is possible with regard to appropriations. Federal funding for public media has always been contentious in the United States. It lies at the heart of American ideological debates over the state of the arts, education, and communication (i.e., the "culture wars") and First Amendment issues about the role of government in such matters. As a result, even as federal funding for public broadcasting tended to increase, it was periodically reduced and regularly subjected to serious threats of elimination altogether. Such episodes occurred in the early 1970s, the early 1980s, and again in the mid-1990s. Those crises also undermined efforts to maintain a firm policy of multiyear advanced authorizations and appropriations.

The costs of overcoming such problems have

been significant. To generate the appropriations and to recover from the reduction episodes, public broadcasters and their supporters have had to engage in constant, intensive lobbying, thereby exposing themselves to regular political oversight, similar to the process that is required of any federal agency or program. Those efforts also have required public broadcasters to divert considerable energy and resources from other essential tasks, such as the core mission of program planning and production and the longer-term strategic planning needs for service development in a rapidly changing technological world.

Taken altogether, state and local government support for educational or public broadcasting has always been a larger source of capital and recurring revenue than has federal income. That support has been channeled primarily through university licensees and state educational and telecommunications authority station boards. Increased numbers of stations licensed to such institutions, as well as support for various state and local instructional programs, accounted for a considerable portion of the system growth in the 1960s and 1970s.

Steady increases in such support during the late 1970s and early 1980s, when state government budgets were otherwise widely leveling off or dropping, did much to offset the reductions in federal support. That growth has remained remarkably solid, even through the fluctuations in congressional support during the mid-1990s. However, while state and local support was significant and even increasing, its growth remained slow and modest enough to guarantee only minor continued increases in public broadcasting facilities and program services.

State government funding also varied widely in type and amount across the country; many states did not make public broadcasting a high priority. Even where such support was substantial, it was typically annual or, at most, biennial, its overall levels showed no dramatic increases, and its actual proportion of overall public broadcasting funding was still shrinking. Proportionately, it declined from about 50 percent of overall public broadcasting revenues in the early 1970s to about 30 percent in the late 1980s and through the 1990s. By the end of the twentieth century, state support remained a substantial pillar of U.S. public broadcasting, predicated largely on the traditional belief in its instructional and educational potential, enhanced by its more contemporary Internet, distance-learning, and web-based instructional efforts. A large majority of the states had even committed to special funding initiatives to help public broadcasting make the conversion to digital technology. Overall, however, it was unclear whether state support could become the basis for anything more significant, such as providing operating support for the large increase in the numbers of noncommercial public-service channels and program efforts implied in digital conversion.

Private Support

In the absence of large amounts of federal and state funding, U.S. public broadcasting turned increasingly to private sources of support. In keeping with the pattern associated with other nonprofit institutions in the arts, culture, education, and health, public broadcasting came to rely increasingly on membership subscriptions, foundation grants, commercial underwriting, and special fundraising events. Altogether, these various forms of private funding grew at substantial rates after the early 1970s. Accounting for only about one-fifth of all public broadcasting revenues in 1970, they amounted to more than one-third by 1980. They more than trebled during the 1980s, and they accounted for well over one-half throughout the 1990s.

Up through the late 1950s, memberships and subscriptions were little used outside of a few listener-supported radio stations and the new community corporation ETV licensees. In time, particularly with the emergence of the stronger Carnegie Commission notion of public broadcasting, stations of all sorts began soliciting membership subscriptions; eventually, even school and university licensees began to seek subscriptions. Such patronage practices were already common in the arts and other cultural and social activities, such as symphony orchestras, opera companies, museums, and hospitals. The adoption of patronage practices for noncommercial broadcasting reflected expectations that public radio and television might play comparable roles in communities around the country. By the late 1980s, membership solicitation came to provide more than 20 percent of the total income for public broadcasting. That statistic rose to nearly 25 percent in the late 1990s.

The membership phenomenon was an encouraging sign of public loyalty and commitment to public broadcasting, and it reflected the institution's increasing acceptance in U.S. culture. It also was a source of largely unrestricted support that provided an important margin of extra capacity and independence for the stations individually and for the system collectively.

On the other hand, only about 10 percent of the audience contributed in this way, and generating such revenues had certain material and opportunity costs. The regular, frequent practice of soliciting subscriptions in special membership drives (derogatorily referred to as "begathons") required a large investment of staff and board time, and it disrupted program schedules, diverting stations and the national services from their core production goals and threatening to alienate viewers and listeners. Also, memberships turned over a great deal (a process referred to as "churning"), and their retention and replacement came to depend to a large extent on the value of the premiums that were offered, which themselves represented a considerable cost to stations. There also were questions about the frequently commercialized forms of pledge programming that stations were using. Those developments reflected an increasingly "transactional," goods-for-support character to the membership and subscription process that in some respects seemed to be at odds with the normal nature and purposes of public broadcasting.

Public stations also became creative in developing special fundraising projects such as auctions and the sponsorship of performances and other events in the community. These devices were similar to the ancillary revenue efforts of other cultural and educational institutions. Many of them became the responsibility of volunteer ("friends") groups, and they provided additional revenues, publicity, new audiences, and community grounding for the stations. As with memberships, however, these alternate devices also required considerable investment of staff time and energy, as well as an investment in inventories of material goods-all of which raised questions about cost-benefit ratios and their relationship to mission.

As with government funding, industrial and corporate support for public broadcast programming and operations is highly sensitive. The practice of underwriting was never explicitly defined and authorized in early legislation, and in many quarters, it was initially looked down on as antithetical to the educational mission. Nonetheless, the practice of soliciting underwriting developed early in the history of community ETV licensees, where appeals to foundations and various other private interests had become, like individual membership subscriptions, a material necessity and a symbol of public broadcasting's legitimacy as a particular kind of cultural institution. In time, as public broadcasting's popularity grew and its evening and weekend audiences took on a somewhat disproportionately upper-level, educational, professional, and politically significant demographic character, many national and local corporate interests began to recognize that there could be important public relations and political benefits in reaching such audiences. At first, identification of underwriters was possible only in brief, strictly regulated credits, but those practices became increasingly liberalized as program costs rose, federal funding proved to be continuously problematic, and corporate interests in reaching public broadcasting audiences grew.

Over time, federal policy actually began to encourage expansion of private, commercial support and even explicit sponsorship, particularly after the advertising experiments conducted under the auspices of the Temporary Commission on Alternative Financing in 1983. While that project did not lead all the way into the sort of limited spotadvertising provisions that exist for public broadcasting abroad, it did permit substantial movement in that direction by authorizing more liberalized sponsorship in the form of "enhanced underwriting." During the 1980s and 1990s, such support grew from less than 10 percent to approximately 15 percent of all public broadcasting revenues.

Public broadcasters, their friends, and their critics have remained sharply divided over this issue. There were strong concerns that any increasing commercialization of public broadcasting was unhealthy—that it was driving the institution ever closer to the programming and audience considerations that guide commercial broadcasting and against which it is assumed that public broadcasting must stand. At the very least, questions were asked about what programming efforts and voices went unheard when underwriting resources were unavailable. Another practical concern was that increased commercialization would seem to threaten all the other significant forms of revenue generation and raise costs for such things as copyright and talent without any guarantee that it would offer sufficient replacement funds.

Other observers, however, felt that none of the other forms of financial support would ever provide the extent of revenue necessary for public broadcasting to survive, let alone to grow and substantially increase its range of services and appeal. From this perspective, there were no realistic alternatives to increased commercial revenues, and, although there were dangers associated with them, it was thought that they could be managed well enough to ensure that the better, unique characteristics of public-service programming would persist and even prosper.

A related issue was that of attempting to recover some of the profits on the public investment in programs that developed aftermarkets and ancillary commercial products (e.g., toys, books). There were mutually incompatible criticisms of public broadcasting for, on the one hand, allegedly not adequately exploiting such opportunities and, on the other hand, for being precisely that commercial and exploitative, particularly of children. In the end, such "deals" were never as potentially large as frequently represented, but they reflected the continuing pressure on public broadcasting to develop external forms of revenue and the confusions of public policy in that regard.

New Media and Digital Technology

As with all other media, the dramatic changes in telecommunications technology in the last quarter of the twentieth century had a substantial effect on the character and prospects for public broadcasting. Broadcasting had been built as an analog system of production and transmission, using open, "over-the-air" spectrum frequencies and serving generally as a mass medium. Beginning in the 1970s, the quickly spreading uses of and interactions among coaxial cable, fiber optics, satellite distribution, and computerization inaugurated a series of challenges to the conventional model and began to take broadcasting more explicitly into the complex welter of telecommunications. Those challenges became more significant with the rapid increase in the pace of digital technology development in the 1980s and 1990s, leading to a process of convergence and reconfiguration among media forms generally. By the end of the twentieth century, the very structure and associated industrial and service forms of traditional broadcasting were breaking down in the face of the much higher carrying and multimedia capacities of digital transmission, the Internet, and the World Wide Web. Public broadcasting was being challenged in similar ways.

Public broadcasting had been able to take creative advantage of the early phases of those changes, such as in its adoption of geostationary orbiting satellite services for distributing its national signals. In keeping with its ownership and fiscal base in the stations, it had been more open to the flexibility of that technology than had commercial broadcasting initially, where centralized network controls militated longer against such distribution options. It also had taken a leading role in the development of closed captioning for use by the hearing impaired.

In other respects, however, public broadcasting's reactions were more muted and uncertain. It had difficulty thinking through and effectively using all the multichannel capacity that was available to it in both conventional broadcast channels and the broader spectrum pipelines represented by coaxial and fiber-optic cable. In contrast, the commercial television responses of the broadcasting and cable industries to the newer program service opportunities seemed initially stronger, and by the mid-1980s, those industries were cooperating to develop new services that to many eyes resembled much of traditional public broadcasting.

Apart from certain limited efforts in its early days-the so-called golden years of radio (in the 1930s and 1940s) and television (in the 1950s)-commercial broadcasting had not demonstrated much of its educational and cultural service potential. The commercial marketplace seemed incapable of providing such programming on a continuing basis, and public broadcasting had come into existence largely in an effort to fill that need. However, the newer cable channels, such as Nickelodeon, the Discovery Channel, Arts & Entertainment, the History Channel, CNN, and C-SPAN, had much deeper funding resources than did public broadcasting, and they seemed to be providing much of the special educational, public affairs, and children's services that had been public broadcasting's traditional mandate. The true extent of the new

channels' replication of the programming of public broadcasting remained debatable, and public broadcasters were quick to note that such services were available only on cable and direct broadcast satellite television, both of which involved a fee. These new channels were not free, over-the-air stations, and many of them were more commercialized than public-service models would permit. Nonetheless, their presence and persistence vexed the question of public broadcasting's special status as an institution deserving of continuing public funding by federal and state governments.

There also was the persistent problem of public broadcasting's small minority position in the overall structure of telecommunications and its concomitantly small audiences. Throughout the 1960s and 1970s, educational and public broadcasting stations constituted a minor but nonetheless noticeable share of the channel capacity of conventional broadcast radio and television (e.g., in television, the local ETV or public station was typically one of five or six locally receivable broadcast signals or of ten to twenty cable channels). By the 1990s, with the steady expansion of cable and direct broadcast satellite capacities, public broadcasting had not kept pace. The number of its stations continued to grow but at a much slower rate than had been the case during the late 1960s and early 1970s, and its relative share of the broadcast, cable, and satellite channel offerings had declined. In television, even with the development of new local stations, its presence amounted to no more than two or three signals in a sixty to one hundred cable-channel environment. Public broadcasting's audiences were likewise small, typically accounting for less than 5 percent of the viewers and listeners at any one time.

Despite proposals that it do so, public broadcasting had developed no master plan nor any clear, longer-term goal for maintaining and building a larger share of the nation's telecommunications carrying capacity. Throughout the growth of the cable and satellite era, public broadcasting therefore tended to be restricted in its thinking about the alternative service models that were available to it with increased numbers of signals and channels. Federal policy throughout much of the 1980s and 1990s, as reflected in the programs of CPB, the National Telecommunications and Information Administration (NTIA, which is a division of the U.S. Department of Commerce), and the Public Telecommunications Facilities Program (PTFP, which is a program within NTIA), actually contributed to that restrictive thinking, bowing to pressures within Congress and even among public broadcasters themselves that "overlap" stations and more diversity of signal and voice should not be encouraged. For many years, public broadcasting had the technical capacity to provide multiple streams of complimentary programming nationally and in every community, but with its continuing fiscal uncertainties, perhaps most dramatically exposed in the congressional calls for "zeroing out" of federal funding in the mid-1990s, public broadcasting tended not to press forward in the multiple-channel arena.

By the late 1990s, that issue began to be put into a new perspective, due in part to the decision by the FCC to convert all broadcasting to digital technology and by the steady growth and public acceptance of Internet, web-based online and interactive communications. Together, those changes provided a whole new set of opportunities for public broadcasting to supplement and even compete with its traditional video services. It was becoming increasingly apparent that, if public broadcasting did not position itself to take advantage of those opportunities by expanding the range, volume, and even forms of its services, it risked remaining trapped in the straitjacket of an obsolete mass-media model.

At the same time, it was uncertain if national, state, and local public policy would support all the implications of these new opportunities. The digital conversion process was an "unfunded mandate," something the federal government was requiring of public broadcasting but for which adequate federal and state funding was in doubt. Likewise, it was unclear whether the federal government was willing to continue supporting the traditional reservations, set-aside and must-carry policies that had done so much to help public broadcasting find and keep a toehold in the U.S. telecommunications system. The cable television industry had always resisted the FCC's must-carry requirements. As it was beginning to implement digital cable services in the late 1990s, much of that resistance was continuing, and FCC support for must-carry appeared questionable. Similarly, the direct broadcast satellite industry was resisting implementation of a "local-into-local" station carriage requirement, an equivalent of must-carry. Although that policy had been written into law in 1999 as the Intellectual Property and Communications Omnibus Reform Act, it had been vigorously opposed by the direct broadcast satellite industry.

Summary and Conclusion

By the turn into the twenty-first century, the institutional structure of U.S. public broadcasting that had been built on the original educational broadcasting model and put into place in the late 1960s and early 1970s remained largely intact. Public radio and television were much larger and more secure entities than they had been twentyfive years earlier, with solid, measurable, albeit, by commercial standards, still small sets of audiences.

However, public broadcasting also continued to be laden with an organizational complexity that was difficult to explain and understand. Without a clear national consensus on its appropriate goals, size, and structure, that complexity had increased throughout the 1980s and 1990s, making it difficult to describe the institution and the various roles of its many organizations. For similar reasons, it also was struggling with a continuing base of funding that was small by comparison with public broadcasting elsewhere in the world, and it was facing the challenges and opportunities of new interactive, Internet, and web technologies, as well as the federally mandated conversion to digital broadcasting, all without clear sources of adequate capital and operating funding.

The old debates about how much public broadcasting should focus on being an institution of formal education versus a high-quality generalaudience service remained, as did the tensions over the relative balance of control between and among the stations and the national entities. Likewise, there was an even more intense phase of the debate over the extent to which the commercial telecommunications marketplace, in its new broad-spectrum environment, could provide the diversity and quality of alternative programming services reflected in public broadcasting.

By the beginning of the twenty-first century, there were signs that the stations and national services were making significant plans for creative uses of their impending new digital and multimedia capacities, and it appeared that many of them would be notably different from those that the commercial industries were proposing to use. However, the costs of digital conversion and the development of sophisticated Internet provider (IP) services were substantial, and it appeared they could not be met by existing funding sources. Additionally, it was unclear whether federal policy would continue to support the reservation of educational, noncommercial channels and require their carriage on the newer digital cable and direct broadcast satellite environments.

During the late twentieth century, U.S. public broadcasting had worked its way up to a relatively stable plateau upon which it had built a diverse funding system, a large local station infrastructure, and an active set of programming services and support agencies. It had a large corps of dedicated and effective personnel and a strong, if small, base of membership and public support. It continued to be seen as a public and social good and as more necessary than not. It therefore did not appear to be in danger of disintegrating and fading away. However, without adequate publicpolicy support and resources to fulfill its basic mission, public broadcasting was going to have difficulty moving up to the next plateau. Public broadcasting remained an important, some would say indispensable, element of U.S. telecommunications and culture, but it was still far from being central to those institutions. Public broadcasting was still swimming upstream against a swift, dangerous set of commercial and political currents.

See also: Broadcasting, Government Regulation of; Communications Act of 1934; Digital Communication; Digital Media Systems; Federal Communications Commission; Internet and the World Wide Web; Opinion Polling, Careers in; Pirate Media; Propaganda; Public Service Media; Radio Broadcasting; Sesame Street; Social Change And The Media; Telecommunications, Wireless; Telecommunications Act of 1996; Television Broadcasting; Television, Educational.

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PUBLIC HEALTH CAMPAIGNS

Promoting public health and preventing the spread of dangerous health risks is an integral communication function in modern society. Whether the focus is on the prevention and control of acquired immunodeficiency syndrome (AIDS), cancer, heart disease, or community violence, a fusion of theory and practice in communication is urgently needed to guide effective promotion efforts. Public health campaigns involve a broad set of communication strategies and activities that specialists in health promotion engage in to disseminate relevant and persuasive health information to groups of people who need such information to help them lead healthy lives.

Public health campaigns involve the strategic dissemination of information to the public in order to help groups of people resist imminent health threats and adopt behaviors that promote good health. Typically, these campaigns are designed to raise public consciousness about important health issues by educating specific groups (i.e., target audiences) about imminent health threats and risky behaviors that might harm them. Health campaigns are generally designed both to increase awareness of health threats and to move target audiences to action in support of public health. For example, public health campaigns often encourage target audience members to engage in healthy behaviors that provide resistance to serious health threats. These behaviors can include adopting healthy lifestyles that include exercise, nutrition, and stress-reduction; avoiding dangerous substances such as poisons, carcinogens, or other toxic materials; seeking opportunities for early screening and diagnosis for serious health problems; and availing themselves of the best available health-care services, when appropriate, to minimize harm.

Frailty of Messages that Promote Health

Campaigns are designed to influence public knowledge, attitudes, and behaviors, yet achieving these goals and influencing the public is no simple matter. There is not a direct relationship between the messages that are sent to people and the reactions these people have to the messages. In addition to interpreting messages in very unique ways, people respond differently to the messages that they receive. For example, having drivers use their seatbelts when they drive might seem like a very straightforward public health goal. A very simple campaign might develop the message, "Wear your seatbelt when you drive!" For this message to influence the beliefs, attitudes, and values of all drivers, the campaign planner must take many different communication variables into account. Is this message clear and compelling for its intended audience? How are audience members likely to respond to this message? Will they pay attention to it? Will they adjust their behaviors in response to it? Campaign planners must do quite a bit of background research and planning to answer these questions. Effective communication campaigns must be strategically designed and implemented. In other words, they must use carefully designed messages that match the interests and abilities of the audience for which they are designed, and they must convey the messages via the communication channels that the target audience trusts and can easily access.

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A refugee looks at an HIV/AIDS prevention campaign poster at a temporary refugee camp in Mae Hong Sorn province in northern Thailand, near the border with Myanmar. Thailand and Myanmar have agreed to cooperate on HIV and malaria prevention to help check the spread of the diseases, which increased substantially along their common borders during the late 1990s. (AFP/Corbis)

A primary goal of the campaign is to influence the way the audience thinks about the health threat. If the target audience already believes this issue is very serious and of great relevance to their lives, this will lead the campaign planner to craft messages that will support these preconceptions. If, on the other hand, members of the target audience barely recognize the health threat and are not at all concerned about it, the campaign planner must design communication strategies that will raise the audience's consciousness and concern about the topic.

Generally, campaign planners want to convince target audiences to recognize and take the identified health threat seriously. They want to influence the audience's beliefs, values, and attitudes about the issue to support the goals of the campaign. Only after a communication campaign raises audience consciousness and concern about the threat can it begin to influence (or persuade) the target audience to adopt specific recommendations for resisting and treating the identified health threat. The communication strategies used to raise consciousness and the strategies used to motivate action may be quite different.

Message Strategies and Communication Channels

Effective public health campaigns often employ a wide range of message strategies and communication channels to target high-risk populations with information designed to educate, motivate, and empower risk reduction behaviors. For this reason, modern campaigns have become increasingly dependent on integrating interpersonal, group, organizational, and mediated communication to disseminate the relevant health information effectively to specific high-risk populations.

Most campaigns use mass media (i.e., newspapers, radio, television, etc.) to convey their messages to large, and sometimes diverse, audiences. These channels for communication often have the

ability to reach many people over vast geographic distances. In recognition of the multidimensional nature of health communication, the most effective public health campaigns develop information dissemination strategies that incorporate multiple levels and channels of human communication. To have the greatest potential influence on the health behaviors of the target audience, public health campaigns often employ a wide range of communication channels (e.g., interpersonal counseling, support groups, lectures, workshops, newspaper and magazine articles, pamphlets, self-help programs, computer-based information systems, formal educational programs, billboards, posters, radio and television programs, and public service announcements). The use of these different media is most effective when the campaign is designed so that the different communication channels complement one another in presenting the same public health messages to different targeted audiences.

Because effective use of communication channels is so important to the success of public health campaigns, research related to health communication can perform a central role in the development of an effective campaign. Such research helps campaign planners to identify consumer needs and orientations; target specific audiences; evaluate audience message behaviors; field test messages; guide message conceptualization and development; identify communication channels that have high audience reach, specificity, and influence; monitor the progress of campaign messages; and evaluate the overall effects of the campaign on target audiences and public health.

Strategic Public Health Campaign Model

Developing and implementing effective public health campaigns is a complex enterprise. Campaign planners must recognize that mere exposure to relevant health information will rarely lead directly to desired changes in health-related behavior. Edward Maibach, Gary Kreps, and Ellen Bonaguro (1993) address the complex relationship between communication efforts and campaign outcomes in their strategic health communication campaign model. This model identifies five major stages and twelve key issues that planners of public health campaigns should consider in developing and implementing their strategic campaigns. The major elements of the model are (1) campaign planning, (2) theories for guiding efforts at health promotion, (3) communication analysis, (4) campaign implementation, and (5) campaign evaluation and reorientation.

Campaign Planning

Campaign planning addresses two major issues, setting clear and realistic campaign objectives and establishing a clear consumer orientation to make sure that the campaign reflects the specific concerns and cultural perspectives of the target audiences. Realistic campaign objectives refer to the purposes of the campaign. Identifying an important public health threat or issue that can be effectively addressed by a campaign is a crucial first step. There must be an important health issue to address, and it must be a problem that poses significant risks for groups of people.

Is the identified health threat likely to be reduced through the implementation of a public health campaign? Are there clearly identified and proven strategies for addressing the threat that can be promoted by the campaign? Are members of the campaign audience likely to adopt the health strategies that will be promoted in the campaign? These questions must be answered before a public health campaign is started, or the planners risk wasting time and money on a campaign that will have a minimal effect on public health.

Adopting a consumer orientation means that the whole campaign is designed from the unique cultural perspective of the target audience and that members of the audience are involved as much as possible in the planning and implementation of the campaign. It is imperative that the campaign planners clearly understand the orientation and predisposition of the target audience in order to craft the most appropriate and effective campaign for that audience. Campaign planners must identify specific (well-segmented) target populations who are most at-risk for the identified health threats that will be addressed in the campaign. These populations of individuals become the primary audiences to receive strategic campaign messages.

Research related to public health campaigns focuses on the effective dissemination of relevant health information to promote public health. To develop and design persuasive campaign messages that will be influential with the specific target audiences, campaign planners must conduct audience analysis research to gather relevant information about the health behaviors and orientations of the target audiences. Audience analysis also helps campaign planners learn about the communication characteristics and predisposition of target audiences.

Theories for Guiding Efforts at Health Promotion

Once the basic campaign planning has been completed, it must be determined which established behavioral and social science theories will be used as guides for developing overall campaign strategies and materials. The best theories have been tested in many different contexts (with different populations) and provide the campaign planners with good advice in directing campaign efforts. Too often campaign planners are in such a rush to provide people with health-related messages that they do not carefully design their communication strategies.

Theory provides campaign planners with strategies for designing, implementing, and evaluating communication campaigns. There are a wide range of behavioral theories of communication, persuasion, and social influence that can be effectively used to guide public health campaigns. The theories that are adopted will direct the campaign planners' use of message strategies to influence key public audiences. For example, Albert Bandura (1989) developed an insightful theory concerning self-efficacy as a key variable in behavior change, which would lead campaign planners to develop message strategies that build the confidence of members of the target audience to implement and institutionalize campaign recommendations into their lives. Campaign planners who apply exchange theories to their efforts are likely to craft messages that identify the personal detriments of health risks and the benefits of adopting proposed behavioral changes. These theories direct the persuasive communication strategies used in public health campaigns.

Communication Analysis

Communication analysis identifies three critical issues in designing public health campaigns: (1) audience analysis and segmentation, (2) formative research, and (3) channel analysis and selection. Audience segmentation involves breaking down large culturally diverse populations into smaller more manageable and more homogenous target audiences for health promotion campaigns. The greater the cultural homogeneity (i.e., the more they share cultural attributes and backgrounds) of a target audience, the better able campaign planners are to design messages specifically for them. With a diverse target audience, the campaign planner is hard pressed to develop message strategies that will appeal to all parts of the population. It is far more effective to target an audience that shares important cultural traits and is likely to respond similarly to campaign message strategies.

After segmenting the target audience into the most culturally homogenous group possible, the campaign planners should, in order to guide the design of the campaign, gather as much information about the group's relevant cultural norms, beliefs, values, and attitudes. The more complete the audience analysis process, the more prepared the campaign planners are to tailor the messages to the specific needs and predilections of the target audience. Audience analysis can take the form of surveys, focus group discussions, or consultation of existing research results that are available and describe key aspects of the population of interest.

Formative research is the process used to guide the design and development of the campaign by gathering relevant information about the ways in which representatives of the target audience react to campaign messages. In essence, it is an early method of testing the effect of the developing campaign when changes, updates, and other refinements can still be made to reflect audience responses. Formative research can also help campaign planners make knowledgeable choices about which communication channels to use in the campaign because those channels are most likely to reach and influence the specific target audiences.

Campaign Implementation

Implementation involves the long-term administration and operation of the campaign. Campaign planners must carefully establish an effective marketing mix, which originates from the field of marketing and is indicative of the growth of social applications of marketing principles (i.e., social marketing) in public health campaigns. The marketing mix is based on product, price, placement, and promotion. In other words, campaign planners try to establish clear sets of campaign activities (products) to promote objectives that audience members can adopt with minimal economic or psychological costs (price). These objectives need to be presented in an attractive manner that is very likely to reach the target audience (placement), and the message must provide the members of the audience with information about how, when, and where they can access campaign information and programs (promotion).

Campaign planners should carefully evaluate the campaign process, which involves identifying macrosocial conditions that may influence accomplishment of the campaign goals and designing strategies for promoting long-term involvement and institutionalization of campaign activities with the target audience. Process evaluation is used to keep track and evaluate campaign activities in order to identify areas for fine-tuning campaign efforts. Since target audiences reside within and are interdependent with the larger society, campaign planners must attempt to involve these larger social systems, such as business organizations and government agencies, in the campaign activities. For example, planners for a campaign related to tobacco control used macrosocial factors to provide strong support for their efforts. They accomplished this by lobbying in support of government and corporate regulations that restricted smoking behaviors in public places and that corresponded nicely with their message strategies that encouraged people to not smoke. In this way, the macrosocial regulations on smoking supported the campaign goals of reducing smoking behaviors.

Furthermore, the campaign planner should design strategies for the long-term involvement of the audience with the goals and activities of the campaign in order to ensure that the audience members institutionalize the messages and make them a regular part of their daily lives. An excellent strategy for such institutionalization is to empower members of the target audience to get personally involved with implementing and managing campaign programs so they have a greater stake in achieving campaign goals and so the campaign activities become part of their normative cultural activities. For example, campaigns that support increased physical activity and fitness have benefited from efforts to establish annual activities, festivals, and sporting events to institutionalize their campaign goals.

Campaign Evaluation and Reorientation

The final process involved in the strategic communication campaign model is evaluation and reorientation. At this point, a summative evaluation (i.e., and evaluation of campaign outcomes) is conducted to determine the relative success of the campaign in achieving its goals at an acceptable cost, as well as to identify areas for future public health interventions. The information gathered through such outcome evaluations reorients campaign planners to the unmet health needs of the target audience. Such feedback is essential in leading campaign planners back to the first stage of the model (planning), where they identify new goals for health promotion. Through this evaluative feedback loop, the strategic communication campaign model illustrates the ongoing cyclical nature of efforts at health promotion.

Campaigns and Communication Research

As seen in the strategic communication campaign model, communication research performs a central role in strategic public health campaigns. Data are gathered (1) in the planning stage to identify consumer needs and orientations, (2) in the communication analysis stage to target specific audiences, evaluate audience message behaviors, field test messages to guide message conceptualization and development, and to identify communication channels with high audience reach, specificity, and influence, (3) in the implementation stage to monitor the progress of campaign messages and products and to determine the extent to which campaign objectives are being achieved, and (4) in the evaluation and reorientation stage to determine the overall effects of the campaign on target audiences and public health. The strategic communication campaign model suggests that to maximize the effectiveness of efforts at health promotion, research in the area of health communication must be used to guide the development, implementation, and evaluation of strategic public health campaigns.

See also: HEALTH COMMUNICATION.

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PUBLIC RECORDS

See: Archives, Public Records, and Records Management

PUBLIC RELATIONS

Varying in scope and duration, and differing in the methods used, all of the following examples have one thing in common—they were managed by practitioners of public relations and they would be recognized by any professional as public relations in practice:

- Fifty years after Thomas A. Edison invented the electric lightbulb, Edward L. Bernays convinces industrial leaders to finance and support "Light's Golden Jubilee," a year-long nationwide celebration involving school children writing essays, inventors contributing their machines to an industrial museum, and an event in Dearborn, Michigan, attended by Edison, Henry Ford, President Herbert Hoover, John D. Rockefeller, Jr., and a host of American inventors and presidents of corporations—a major "photo-op" if ever there was one.
- A coalition of environmental groups, concerned about pollution of drinking water,

pushes a state legislature to call a public referendum on a bond issue to mandate stronger control of pollutants. A grassroots campaign—costing little but involving hundreds of volunteers and a speaker's bureau succeeds in passing the law and funding cleanups.

- On the day of the initial public offering of its stock, the president of a software company rings the opening bell on the New York Stock Exchange while his employees toss T-shirts and baseball caps to those on the trading floor—an event that is seen by hundreds of thousands on the cable business channel CNBC.
- To raise money for a new pediatric wing of the local hospital, the mayor, city council members, president of the hospital, and other dignitaries agree to spend a day in mock "jail." They buy their way out of incarceration by phoning citizens and asking them to pledge contributions of money.
- The manufacturer of a spray that eliminates shoe odors stages the "America's Dirtiest Sneaker" contest for kids, with regional winners flown to New York City and the grand prize winner appearing on the *Tonight Show* with Jay Leno.
- Alarmed at the migration of manufacturing and service jobs from a decaying city center to suburbs and small towns, the city's Chamber of Commerce develops a partnership with labor unions, city government agencies, and the business school at a local university to implement an "It Pays to Stay" campaign, which includes a job fair, open houses at businesses, and a series of paid advertisements in the local news media.

In Lesly's Handbook of Public Relations and Communications (1998), Philip Lesly defines public relations by listing the following activities under the heading of public relations: publicity, communication, public affairs, issues management, government relations, investor public relations, employee relations, community relations, industry relations, minority relations, advertising, press agentry, promotion, media relations, and propaganda. Scott M. Cutlip and Allen H. Center, in their public relations textbook *Effective Public Relations* (1978, p. 37), provided a cogent definition of public relations: "Public relations is the planned effort to influence opinion through good character and responsible performance, based upon mutually satisfactory two-way communication." James E. Grunig and Todd Hunt, in their textbook Managing Public Relations (1984, p.6), further refined the definition: "Public relations is the management of communication between an organization and its publics [i.e., groups that can have consequences on the organization]." Public Relations News, an industry newsletter, defines public relations as "the management function which evaluates public attitudes, identifies the policies and procedures of an individual or an organization with the public interest, and plans and executes a program of action to earn public understanding and acceptance." The International Public Relations Association provides a slightly different perspective: "Public relations practice is the art and science of analyzing trends, predicting their consequences, counseling organization leaders, and implementing planned programs of action which will serve both the organization's and the public's interest."

The pejorative words "hype" and "spin"-often favored by detractors of the public relations profession-are not even hinted at in these definitions. None of them even mentions "persuasion" or "selling," although the concept of "influence" is suggested. Among academics and professionals, the emphasis is on management and on two-way communication that benefits both the organization and its publics-a concept referred to as "mutually beneficial outcomes." That may be an idealistic view, especially when one considers that sports promotion, show-business campaigns, product marketing, and even the packaging of celebrities and political leaders are activities that fit in the tent of public relations. But every profession should aspire to an idealistic mission, so when the members of professional public relations associations renew their membership annually, their signature on the renewal form signifies that they agree to abide by a code of ethics that grows out of these definitions.

Development of Public Relations

Academics who study the history of public relations are fond of pointing to examples throughout American history: the Revolution against England (with that foremost of pseudoevents, the Boston Tea Party); the campaign for the drafting of a *Constitution of the United States* (with the eighty-five Federalist Papers written by Alexander Hamilton, James Madison, and John Jay); newspaper editor Amos Kendall's efforts to turn the image of Andrew Jackson from that of an unschooled bumpkin to a man of presidential stature; the suffrage movement to give women voting rights; and prohibition campaigns with angry teetotalers storming saloons with axes. Indeed, public relations-like activities were part of all these movements-the making of slogans, the distribution of leaflets and pamphlets, rallies and parades, speeches, and letters to editors of newspapers. And, of course, one always can point to the legendary ballyhoo and excesses of press agentry used by showman P. T. Barnum to lure audiences to his freakish circus attractions. Some push farther back in history to argue that edicts published and publicized in ancient Egypt and Rome to gain the compliance of those living outside the cities were public relations campaigns, as were the successful efforts to marshal support for the Crusades aimed at reclaiming the Holy Land between the eleventh and fourteenth centuries.

It makes sense, however, to chronicle the history of modern public relations from the time when the actual phrase "public relations" was coined and came into sufficient usage that people knew what it meant. The clearest example of the movement of the term into the mainstream language was in 1908 when Theodore Vail, president of the American Telephone & Telegraph Co. (AT&T), titled the annual report of the firm *Public Relations*. Edward L. Bernays, in his book *Public Relations* (1952), said Vail was concerned that the company engage honestly and competently in practices that would pay a fair return to investors, thus assuring that there would be no basis for conflict between the company and its most important public.

Bernays, for his part, coined the term "public relations counsel" in the 1920s to describe a person such as himself who was more than a "press agent" disseminating press releases to the news media. The term "press agent" better described Ivy Lee, who in the early 1900s set up a "press bureau" to supply news that would provide publicity on the positions of coal mine owners during a series of bitter strikes against them by miners. In his Declaration of Principles, Lee laid the foundation for modern public relations by declaring certain principles. Among them was the concept that queries should be responded to promptly, that the



Edward Bernays, photographed in his Cambridge, Massachusetts, office in 1981, is known as the father of public relations. He was a strong supporter of licensing practitioners in the profession. (Bettmann/Corbis)

information provided be complete and accurate, that business leaders should be open and honest with the press and the public, and that the press bureau was not to perform any of the functions of an advertising agency. Lee is probably most famous for his ability to rehabilitate the public reputation of John D. Rockefeller, Sr., following the bloody suppression of a coal mine strike in Colorado, blamed on Rockefeller. Lee convinced the reclusive Rockefeller to be more visible as a family man and encouraged him to allow more publicity about the millions he was donating to charity, particularly to medical research that would benefit all citizens.

Bernays is referred to as the father of public relations. Born in Vienna in 1891, a nephew of psychologist Sigmund Freud, Bernays served during World War I on the Committee on Public Information—also known as the Creel Committee after chairman George Creel—which developed the notion that mass persuasion could be based on the principles of social science. In 1919, Bernays established a public relations agency, along with Doris E. Fleischman, whom he married in 1922.

Bernays wrote *Crystallizing Public Opinion*, the first treatise on public relations, in 1923, followed by *Propaganda* in 1928. His textbook *Public Relations* was published in 1952. In his books, Bernays

argued that publics were not sheep to be herded; they could be persuaded to do only what was in their best interest. He counseled management to let him find out what the public liked about an organization, and then he shaped messages that reinforced these beliefs. "Engineering of consent" was the Bernays approach, meaning that the gradual application of psychological theory would lead from identification with a cause to intensified interest and eventually to the action desired by the client organization.

Bernays lived past the age of one hundred, and he could list more than two hundred clients he had served in virtually every field of endeavor, including retailers, trade associations, big business, hotels, government, public-interest groups, and trade unions. Keenly interested in social welfare, he helped the National Association for the Advancement of Colored People (NAACP) and similar organizations. On the other hand, those who consider him a master of "spin" point to gimmicks—like his promotion of cigarette smoking by women, accomplished by placing cigarettesmoking debutantes in New York's Easter Parade.

Colleges and universities began adding public relations to the curricula of journalism schools during the 1950s because corporations were hiring experienced newspaper and magazine reporters and editors to be in-house journalists, writing articles and placing them in the news media. In the 1960s, the growing focus on social responsibility and the consumer movement compelled businesses to switch from one-way message delivery to two-way communication, which meant listening to publics, responding to crises, resolving disputes, and maintaining relationships with key publics. By the 1970s, communication departments at many universities were taking on the role of training public relations professionals, using the tools of social science and preparing graduates to handle much more complicated tasks than publicity and public information.

The role of college preparation was examined in *Public Relations Education for the 21st Century: A Port of Entry*, the report of the Commission on Public Relations Education (1999). The group which was comprised of forty-eight of the leading public relations practitioners and educators in the United States—summarized the status of public relations at the dawn of the millennium: In recent years, public relations professionals have moved toward an emphasis on building and maintaining relationships and on becoming skilled active counselors at management's decision-making table. Driving the latest evolutionary movement are influential social trends: global business operations; mergers, acquisitions and consolidations; the empowerment of public opinion within the global village; segmented, fragmented audiences; the information explosion that has led to uncontrolled, gateless dissemination of messages; increased government regulation and oversight; issues of diversity and multiculturalism in the workplace, marketplace and town hall, and the introduction of technology, including automation and computerization [pp. 9–10].

Increasingly, the professional recognizes the need for education beyond the baccalaureate to handle this complexity. At the beginning of the twenty-first century, approximately seventy schools offer master's degrees or graduate emphasis in public relations. A handful of universities offer the doctorate in public relations for those seeking careers in academic research.

Who are the people who shaped the public relations profession? The trade publication PR Week assembled a panel of experts to select "The 100 most influential PR people of the 20th century" (1999) The top ten, in order, were judged to be Harold Burson, founder of Burson & Marsteller, the largest public relations agency in the world; Edward L. Bernays; Arthur W. Page of AT&T, considered the first vice-president for public relations in a large corporation; Larry Foster of Johnson & Johnson, a former newspaperman who built that firm's public relations operation and gained fame for steering it through the Tylenol tampering crisis in 1982; Ivy Lee; Daniel Yankelovich, the researcher who developed polling to determine public opinion; John Hill, founder of Hill & Knowlton, a vigorous proponent of research and the first to seek clients overseas; David Drobis, CEO of Ketchum, who has led or served on the boards of most of the influential professional organizations in the industry; Larry Moskowitz of Medialink, who developed the video news release; and Scott Cutlip, the foremost architect of university public relations education,

chronicler of the history of the field, and coauthor of a leading public relations textbook. The list indicates the variety of people who constitute the modern profession.

Settings, Structures, and Strategies

The four general settings in the field of public relations are (1) private and public corporations, (2) agencies and freelancers, (3) nonprofits, and (4) educational institutions.

Corporate public relations sometimes goes by the name corporate public affairs or corporate communications. In businesses, the chief public relations officer typically is a vice-president who sits on the management council and who has access to the chief executive officer in order to provide counsel and to receive information about any situation that may necessitate a communication program. As a senior officer of the corporation, he or she participates in planning and policymaking. The corporate public relations staff of anywhere from 5 to 250 people includes media relations specialists, investor relations people, speechwriters, publication directors, and videoconferencing specialists. Larger corporate operations have researchers, librarians, and special events coordinators.

This is not to say that all corporate communication is handled "in-house." Most businesses also use public relations agencies or freelancers to handle special tasks, such as running focus-group interviews, designing corporate brochures, making videos, or running a special community event on behalf of the corporation.

Public relations agencies may be worldwide in scope, with offices in half a dozen or more U.S. cities and as many places abroad. Those agencies often are allied with advertising and marketing groups so that they can provide complete communication services. There also are thousands of oneperson agencies-often called John Doe and Associates or Jane Doe and Associates to indicate that the sole practitioner has support from freelance writers, artists, and photographers. Mediumsize agencies of five to twenty-five persons may specialize in health care, product public relations, sports promotion, retail promotion, entertainment, travel and tourism, or fundraising, to name but a few areas of focus. Often, the principal person in a public relations agency has had prior corporate experience and left the corporate world to set up



Industries that fall on hard times sometimes resort to heavy public relations work, as the French beef industry did when in November 2000 they worked with the French government to launch a public relations campaign to sway consumers to start eating beef again after the threat of Mad Cow disease had dominated headlines. (AFP/Corbis)

the agency. And corporations, which prefer and can pay for people with several years of experience, often hire away agency employees who have worked on the accounts of the corporation and are familiar with the company.

Nonprofit organizations have a different culture and usually need professionals with a somewhat different mindset. Most nonprofit organizations—arts organizations, health groups such as the American Cancer Society and Project Hope, environmental groups, consumer organizations, and community improvement associations—have two primary tasks: fundraising to enable the organization to survive, and public information to accomplish the goals of the organization. Public relations specialists working for nonprofit organizations must work constantly on ways to attract financial support and volunteers, as well as on ways to get their stories into the news media at little or no cost.

Educational relations is a burgeoning field, as universities and colleges become more and more competitive for students, for research money, and for public appreciation of the complex roles educational institutions play in society. Whereas universities once satisfied their needs with a small news bureau and perhaps a speechwriter for the president, the top research universities now employ well over one hundred people in marketing, community relations, legislative relations, business relations, fundraising, and sports promotion. Little wonder that on those campuses public relations also is among the fastest-growing undergraduate majors.

Whatever the setting, public relations is now so vital to an organization and so complex in its application that creativity and inspiration—which might have carried the day in another era—are not the hallmarks of the field. Strategic planning is the key. Because public relations is a management function and because practitioners must be able to demonstrate how they support the mission and goals of an organization, practitioners must be able to explain how their tactics support strategic goals and objectives.

Any organization has a broad mission, out of which grow general goals—and goals are achieved by setting specific and measurable objectives. Heads of public relations departments must set communication goals and objectives. A goal might be to increase information-seeking behaviors among mothers concerning the need to have children vaccinated for certain diseases. Out of that goal might grow specific objectives, such as increase by threefold the number of mothers calling an information hotline or requesting a brochure or, in one year, double the number of mothers bringing children to a clinic.

By its nature, then, the public relations function in an organization is one of coordinating the many parts and programs of an organization to assure that internal publics (employees) and external publics (community, consumers, governments, suppliers) receive the needed information.

At a conference sponsored by a public relations professional organization, there are generally one or two large sessions that are attended by everyone and feature a major speaker on a general topic. The rest of the time, attendees meet in their specialized divisions to talk about their special interests: financial public relations, health communication, travel and tourism, or environmental communication and technology. There are generalists in the field, but as in many professions, practitioners tend to gravitate toward specialties.

The tools and techniques used by public relations practitioners to achieve communication objectives are limitless. The list that followsonly a sampling—indicates many of the standard techniques:

- Prepare a press kit introducing a new product and explaining its uses.
- Disseminate a statement explaining the position of the organization on a public issue.
- Prepare the president of the organization to appear on televised public affairs programs.
- Design a program to encourage employees to volunteer for community organizations.
- Select a celebrity spokesperson to represent the organization at public events.
- Write a letter to the editor opposing the views expressed in an editorial of a newspaper.
- Attend a public hearing to support or oppose a referendum affecting the organization.
- Design a booth for the county fair to disseminate information about the organization.
- Participate in a career program at a local high school.
- Donate products or services to a local homeless shelter.
- Publicize a program designed by the human resources department to help employees quit smoking.
- Plan a one hundredth anniversary celebration for the organization.
- Help raise funds for a new state or regional museum of arts and crafts.
- Plan a campaign to introduce a new semiprofessional sports franchise in the area.
- Write a crisis communication plan for the organization.
- Design a "letter to our consumers" advertisement on a controversial issue.
- Form a coalition with another organization to leverage the public relations power of that group.

Whatever the tools and techniques, it is crucial that public relations practitioners be able to demonstrate they had a reason for selecting the tactics, and that those tactics were able to deliver on the stated objectives. It no longer is sufficient to agree that everyone "felt good" after a public relations program was put in place.

Thus, as in the allied fields of advertising and marketing, research now is of increased impor-

tance in public relations. Management wants numbers to prove that programs and departments are performing their functions. One has no hope of winning a Silver Anvil award from the Public Relations Society of America if research was not performed. Judges are instructed to look for evidence that there was formative research before a program was put in place and evaluative research afterward to assess results. And counting the number of "media hits" or news clippings is not enough in the evaluative stage. If a survey of a target public was conducted as part of the initial research, a followup survey asking the same questions of the same public is necessary to demonstrate the effect of a communication campaign.

In the past, practitioners had few tools for real research and/or little preparation in performing research. At the beginning of the twenty-first century, public relations textbooks provide guidance on sampling techniques, conducting focus group interviews, and content analysis of messages. To some extent at the undergraduate level, and definitely at the graduate level of education, professionals are trained to do research. Publications such as Guidelines for Setting Measurable Public Relations Objectives (Anderson and Hadley, 1999) enable professionals to track objectives and results so they can be reported to management in a meaningful way. In practice, much research is performed by outside agencies that are hired for that specific purpose.

Maintaining Professional Standards

Professions related to areas such as medicine, accounting, engineering, and law have requirements that include higher education at an accredited institution, passage of an entry exam, certification by a board, and maintenance of credentials through continuing education. Most mass communication professions, including public relations, do not have these requirements. A simple explanation is that many in the field do not believe that rigorous special preparation and absorption of a specific body of knowledge are necessary for most public relations positions, and the public has never demanded the same accountability it desires for doctors and lawyers. Another reason cited by some practitioners is that licensing or credentialing could interfere with the First Amendment rights of freedom of speech that mass communicators hold dear.

Bernays advocated licensing, pleading with professional groups to embrace it. He argued it was necessary in order to bring respect to the field and to prevent charlatans from passing themselves off as public relations counselors. He never got far with his campaign, and some said he was not the best proponent for licensing, given some of the dubious promotions with which he was associated.

While the public and the profession may not see a need for licensing, many feel that public relations may not be a universally trusted profession, and thus some form of credentialing is necessary to help clients and publics recognize which practitioners have education and experience in the field.

Some employers favor hiring practitioners who have a college degree in journalism, communication, or business and have taken courses teaching public relations skills. And some employers also favor hiring practitioners who have joined one or more of the several professional organizations in the field. However, considering that as many as half a million Americans work in public relations—or in public relations—like activities—and the combined membership of the major professional organizations is about fifty thousand, many in the field do not feel association is necessary.

The two largest groups based in the United States are the Public Relations Association of America (PRSA), which has nearly twenty thousand members, and the International Association of Business Communicators (IABC), with nearly fourteen thousand members. There is some overlap in membership. In the 1980s, the two groups came close to merging, but the effort to create one dominant professional association foundered over issues of focus and identity.

Both organizations offer accreditation to professionals who take a day-long examination of their skills and knowledge. PRSA confers the distinction of APR (i.e., Accredited in Public Relations), and IABC awards the distinction of ABC (i.e., Accredited Business Communicator). Recipients of the designation usually identify themselves as John Doe, APR, or Jane Doe, ABC. Accreditation is not required of PRSA or IABC members, and it is most popular with counselors in small agencies who want the designation for their business cards. Some corporations automatically grant a raise to a public relations employee who achieves accreditation. Examples of other organizations include the International Public Relations Association (IPRA), the Canadian Public Relations Society (CPRS), the Council of Communication Management (CCM), which caters to managers and consultants, and the Arthur W. Page Society, serving the needs of top public relations practitioners such as large agency heads and corporate vice-presidents of public affairs. There are organizations for many specialized fields, such as agricultural public relations and investor relations. All such groups enable practitioners to network, to benchmark with other organizations, and to enhance their skills and abilities. They accomplish this through publications, conferences, workshops, and award programs.

The field of public relations also benefits from a growing body of knowledge coming out of academia, and scholars are visible in the leading professional organizations. Foundations sponsored by both PRSA and IABC, along with the independent Institute for Public Relations (IPR), provide grants for campus-based research on public relations topics.

A study by three public relations scholars, titled "Influential Authors and Works of the Public Relations Scholarly Literature" (Pasadeos, Renfro, and Hanily, 1999), revealed that, unlike other disciplines, public relations is typified by a concentration of scholars, institutions, and topics. During the five-year period studied, James E. Grunig of the University of Maryland was by far the most cited scholar, and his coauthored textbook *Managing Public Relations* (Grunig and Hunt, 1984) was the most cited work in the field. The book *Excellence in Public Relations and Communication Management* (1992), edited by Grunig, has been heavily cited in the field, as has his theory-building work with Larissa S. Grunig.

The most heavily cited serial publications in the public relations literature, according to the study by Yorgo Pasadeos and colleagues (1999), are *Public Relations Review*, followed by *Journalism Quarterly*, *Journal of Public Relations Research*, *Public Relations Journal*, and *Public Relations Quarterly*. All continue to be leading journals in the field, except *Public Relations Journal*, which has been supplanted by other PRSA publications. Grunig was founding editor of the *Journal of Public Relations Research*, which is published in cooperation with the Public Relations Division of the Association for Education in Journalism and Mass Communication (AEJMC). The scholars whose work is often cited-and who also are active in academic and professional organizations-include Glenn Broom, David Dozier, and Martha Lauzen of San Diego State University, whose work on public relations roles has been heavily cited and is the center of a major cluster of research. Robert Heath of the University of Houston had the largest number of published articles during the period of the 1999 study. He is the author of Strategic Issues Management (1997) and coauthor (with Richard Alan Nelson of Louisiana State University) of Issues Management: Corporate Public Policy Making in an Information Society (1986). Larissa Grunig, in addition to her theorybuilding work, is a leading authority on gender issues and research methods. Elizabeth Lance Toth of Syracuse University and Carolyn Garrett Cline of the University of Southern California are the editors of Beyond the Velvet Ghetto, an examination of women in the field of public relations. Judy VanSlyke Turk is the author of diverse articles and has examined the "information subsidy" provided to the news media by public relations practitioners in the form of news releases and videotape. Kathleen Fearn-Banks of the University of Washington is an expert on crisis communication, and Kathleen S. Kelly of the University of Southwestern Louisiana has been honored for her articles and books showing the relationship between public relations and fundraising. Douglass Ann Newsom of Texas Christian University was the first female academic to serve as president of PRSA. Debra Ann Miller of the University of Portland was the first woman of color to serve as PRSA president.

The Centrality of Public Relations

Say "television" or "radio" or "newspaper" or "magazine" or "book," and everyone knows exactly what is being talked about. People watch television, listen to the radio, and read the print media. It is very clear what these items are and what they do. Say advertising, and everyone has a clear idea of what that is: the paid messages encountered in the mass media—the main reason the media are free or cheap, because advertising is paying the bill.

Say public relations, however, and perhaps people are not so sure. It cannot be touched or felt. Most people cannot explain its role and purpose readily. So, does that mean it is a marginal form of mass communication? Hardly. Public relations plays a central role in much that occurs in the arena of mass communication. It is just that public relations often works best when its role is not apparent. Like a giant iceberg, seven-eighths of what goes on in public relations is below the surface in the sea of information we encounter every day.

Just as advertising provides important revenue to the media of mass communication, public relations provides a stream of information from which the media can select. Why did the local newspaper cover the grand opening of a new supermarket? Because a public relations agency hired a celebrity to cut the ribbon, and it informed the media that the celebrity would be available for interviews afterward. Why is a university professor appearing on a televised public affairs broadcast? Because the news service of the university included a profile of her and her area of expertise on a website where broadcast producers can find expert sources. Why is a town meeting on preventing crime being held at the high school auditorium? Because the mayor's public information department, aided by funds from the public relations departments of area businesses, has put the evening together and promoted it in the news media.

Professionals in allied fields often misunderstand the function of public relations and how it relates to their jobs. Certainly, publishers and broadcast executives understand the benefits of the "information subsidy" their enterprises receive when someone else foots the bill for pictures, text, and access to interview subjects. But reporters and editors may not appreciate the role of public relations in providing the raw material with which they work. That means public relations practitioners must be able to "pitch" their stories so the journalist sees the value of the information and feels aided in informing the public rather than pressured or annoyed into using material.

Similarly, advertising and marketing people are often not clear about what public relations people are doing. In an age when "integrated communication" is seen as necessary so that organizations speak with one voice and so that every message we see about a product or idea is consistent with other messages, public relations people need to work closely with the allied fields. One controversy that exists in the persuasive professions is whether advertising, marketing, or public relations people have the overarching perspective that makes them most central to a communication enterprise. Large public relations agencies either represent themselves as being "full service" or can tell clients they are associated with an advertising agency that handles creative work and media placement.

More and more public relations practitioners must take a global perspective because so many activities and enterprises have become international in scope. Most corporations do business abroad, so most large public relations agencies either have offices in major world capitals or they partner with local agencies in other countries. Even educational and nonprofit practitioners find themselves spanning national boundaries. Rescue and relief agencies in the United States regularly help other nations, and their fundraising is international. Educational institutions have exchange programs and distance education arrangements with universities in other countries.

The number one global priority for public relations practitioners in the twenty-first century is maintaining and strengthening support for the profession in the face of questions about the methods and the ethics of "PR"—the belief that if something is "just PR" it is not truthful communication. Counselor Chester Burger (1998) told professionals:

Perhaps too many of our corporate messages are being framed in exactly the same way they were presented a quarter-century ago. We seem to pretend that the cynicism and changed values of a new generation don't exist. . . . If public relations advocacy is to be effective and persuasive, our messages should be quiet and civil, not angry and adversarial. And, in the age of the Internet, we must be ready to respond instantly.

Similar to lawyers, public relations practitioners are counselors and advocates. And, similar to lawyers, they must work hard to earn respect for their profession.

See also: Advertising Effects; Organizational Communication; Organizational Communication, Careers IN; Public Relations, Careers IN.

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TODD HUNT

PUBLIC RELATIONS, CAREERS IN

The wide range of career opportunities for people working in public relations include such jobs as media relations specialist for an insurance company, newsletter editor for an urban renewal agency, special events coordinator for a hotel, sports information director for a university, writer–editor for a public relations agency, community relations coordinator for a hospital, fundraiser for the American Red Cross, speechwriter for a U.S. senator, and freelancer specializing in the preparation of video news releases.

In few other fields of mass communication would one find the range of job positions one finds in the area of public relations. As the above examples show, the array of possibilities available to a recent college graduate is vast. First, there is the varied choice of setting: public relations agency, government, industry, educational institutions, or nonprofit organizations. Then there is the range of endeavors: writing, editing, meeting the public, arranging events, replying to inquiries for information, distributing material to the news media, or coordinating campaigns with advertising and marketing people. Some public relations positions involve many or all of these skills.

Many public relations people begin their careers in other fields. Journalism has long been a starting place for careers in public relations because reporting, writing, and editing skills can be used not only by an employee of the news media, but also by a public relations person who prepares stories for a client and distributes them to the news media. The line between public relations and allied fields such as advertising and marketing gets blurred within the communications departments of many large organizations and in "fullservice" agencies that offer advertising, marketing, and public relations services to their clients. The line does not exist at all in nonprofit groups.

The Public Relations Society of America has identified four levels of professional competence:

- 1. "Beginning professional" refers to a junior staff member who is using basic skills and is undergoing training. In an agency, the official title might be "writer," "researcher," or "assistant."
- 2. "Staff professional" refers to someone who, after amassing eighteen to twenty-four months of experience at the craft, takes on an initial supervisory role. In an agency, the title might be "assistant account executive."
- 3. "Professional manager" refers to someone with at least five years of experience whose activities include direction of staff and department operations, research, planning, budgeting, evaluation, and personal communication. In an agency, the title might be "account executive."

4. "Senior professional" refers to a top management position where the responsibilities would include running an operation, serving as adviser and policymaker, dealing with public affairs and issues management, and consulting with top management on communication policies. In an agency, the title might be "vice-president."

Alternatively, one can aspire to run one's own agency or become chief public relations officer (CPRO) at a corporation or chief information officer (CIO) in a government agency.

Unlike the field of medicine, where one attends medical school and then endures a long residency, the aspiring public relations practitioner can take many routes. If the career decision is made upon entering college, then majoring in journalism or communication makes sense. One or the other of those departments at most universities offers a sequence of public relations courses, and some offer full majors in public relations. Courses in organizational communication also provide a helpful background.

More than two hundred universities in the United States have chapters of the Public Relations Student Society of America (PRSSA). This means that each of the respective universities offers at least five courses in public relations, has a faculty member who belongs to the Public Relations Society of America (PRSA), and is affiliated with a local or state chapter of PRSA. PRSSA membership is an advantage because, in addition to sponsoring speakers and field trips, most student chapters run agencies that take on "realworld" clients from the campus and the community, which helps students build their resumes while in college.

Internships also are an invaluable way of getting experience while in college. If one is able to do more than a single internship, this provides the opportunity to try out different settings—perhaps working for a nonprofit organization and then moving to an agency or corporate position.

Lack of either a major in public relations or experience in multiple internships will not disqualify the late-bloomer who discovers public relations as a senior, after graduation, or even after sampling another career or serving in the military. For example, one can serve as a public information officer in the military and, upon discharge, present worthy credentials for employment by a civilian public relations employer. Majors in business, English, psychology, and political science can also lead to successful careers for those who belatedly discover the field of public relations.

The key to success in public relations is a skills-set that includes good writing and research abilities, strong interpersonal skills, imagination, and the ability to work in team settings. When the trade publication *PR Week* (1999) asked practitioners whether they would advise their children to pursue careers in public relations, the responses focused on such diverse issues as the pressures to perform, the ethics of disseminating information, the motivation needed, and the opportunity to shape the world of the future.

More and more practitioners are finding that they need to broaden their skills and learn new techniques and technologies as the field becomes more complicated and the pace of communication quickens. Membership in PRSA or the International Association of Business Communicators (IABC) provides the opportunity to hear professional speakers, attend workshops, and participate in conferences where new ideas and fresh approaches are discussed. Most universities offer continuing education courses (such as those focusing on the latest computer skills) that are of value to public relations practitioners. With all of this in mind, the consensus among those working in the area is that public relations demands a high level of professionalism from its practitioners.

See also: Chief Information Officers; Public Relations.

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TODD HUNT

PUBLIC SERVICE MEDIA

The term "public service media" is generally used to refer to a particular form of radio and television broadcasting that emerged in Western Europe in the 1920s, of which the British Broadcasting Corporation (BBC) is the best-known example and most common reference point. Public service broadcasting is still a mainstay in most of Western Europe, as well as in an array of countries as diverse as Canada, Australia, South Africa, and Japan. In various local adaptations, it is also an important model in the emerging media systems of Africa, Asia, and the former Soviet bloc. However, challenged by the pressures of diminishing public funds, the growth of commercial media, new technologies, and globalization, public service broadcasting no longer enjoys the dominant even, in some countries, monopolistic—position that it once held. It is still nonetheless the most important existing mainstream alternative to commercial broadcasting.

Historically, the public service model dates from the early days of broadcast radio. Initial radio "stations" were established in many parts of the world as early as 1919 (Montreal's XWA and Pittsburgh's KDKA are generally considered to have been the first) by set manufacturers and other commercial organizations, as well as educational, labor, and public interest groups. The future shape of broadcasting was at first unclear. By the mid-1920s, however, sparked by the entrepreneurial initiative of networked programming pioneers such as David Sarnoff (later head of NBC), an advertising-supported commercial model was well established in the United States, Canada, and parts of Europe. Fearful that commercial broadcasting would soon dominate to the exclusion of all other models, educators and public interest associations began lobbying governments to recapture at least part of the new medium for public service purposes. In the United States, noncommercial broadcasting was quickly marginalized, but in Britain, the government created a national public service monopoly, the BBC, and put it in charge of all radio broadcasting.

The justification for this British move was spelled out by a 1923 committee chaired by Sir Frederick Sykes, which stated in its report to Parliament "that the control of such a potential power over public opinion and the life of the nation ought to remain with the State, and that the operation of so important a national service ought not to be allowed to become an unrestricted commercial monopoly." The BBC was created in 1926, and most European countries soon followed the British example, while Canada and Australia, among others, adopted "mixed" systems with both public and private-sector components. By the early 1930s, public service broadcasting was well established and began to be typified by distinctive program formats as well as its characteristic institutional structure. When television was introduced in the 1950s, most countries basically incorporated the new medium into the systems that they had put in place for radio, with some important variants, however. In Canada, for example, public radio is commercial-free, while public television depends to an important extent on advertising.

The notion of public service, at least in the Anglo-Saxon world, was strongly shaped by the BBC's founding director, Sir John Reith. Reith saw the public as an audience that was capable of growth and development, and he declared famously that the BBC would give the public what it needs, not what it wants. This kind of elitism would later return to haunt the proponents of public service broadcasting when audiences began migrating to private commercial outlets, especially after the introduction of private television. Be that as it may, the mandate of public service broadcasters inspired by the British example was to provide programming that informed and enlightened, as well as entertained. In many countries, this proviso was enshrined in broadcasting legislation. Depending on local circumstances, public service broadcasting was also typically mandated to provide service that would be accessible to all residents of a given national territory, to provide a range of programs that would be of interest to all social and demographic groups, and to contribute to building national cultural identity. Later, more specific objectives such as reflecting regional and linguistic diversity would be added to many official public service broadcasting mandates.

Public service broadcasting is typically organized in a national corporation, with varying degrees of autonomy from the state. In Britain and its former dominions, the public service broadcaster is deemed to operate at "arm's length" from the government, and this proviso at least nominally guarantees the independence of public service broadcasting. Public service broadcasting executives are named by governments but cannot be removed without cause. In France, however, political tradition called for the heads of public service broadcasting institutions to be replaced with every change of government. Generally, while public service broadcasters and the governments that created them have at times been at

TABLE 1.

Country	Public Funding (%)	Subscription (%)	Advertisinų (%)
Canada	16	47	37
France	25	34	41
Germany	32	25	43
Italy	34	7	59
Japan	23	12	65
United Kingdom	21	30	49
United States	3	46	51

odds over programming choices over the years, the main area of friction surrounds financing.

Public service broadcasting, following the British model, is funded by an annual "license fee," a charge akin to an automobile registration that must be paid by every household that owns a radio or television set. While this funding formula is designed to bypass government interference by providing a direct relationship between the broadcaster and its audience, the fee rates are inevitably set by the government, giving it obvious power over the broadcasting institutions. In some cases, such as Canada and Australia, public service broadcasters are funded by direct annual grants from their respective Parliaments, tainting the process with the potential for political interference even more. Many public service broadcasters also increasingly depend on commercial revenue for at least part of their income, making them reliant on the general regulatory framework in their countries as well. In just about every country with public service broadcasting, there is a lively and more or less permanent debate surrounding the appropriate level of public funding. In Germany, for example, the Constitutional Court ruled in 1994 that funding public service broadcasting appropriately was a government obligation. The figures in Table 1 show the comparative sources of revenue for overall broadcasting activities in seven countries for 1997.

National peculiarities apart, questions concerning the structures of broadcasting are increasingly global ones. In the new broadcasting environment, the issue of public service broadcasting can be reduced to the following question: What social and cultural goals that are attributed to broadcasting require a specially mandated, noncommercially driven organization that is publicly owned, publicly funded, and publicly accountable?

Broadcasters, politicians, media professionals, creative people, community activists, and scholars worldwide are wrestling with this question. While the diagnosis is global, the prescriptions are necessarily specific to context. When they are put together, however, the range of models, examples, and ways of framing the issues include the basis for a global portrait and a sketch of a solution.

There is no easy answer to the question "What is public service broadcasting?" However, a reasonably thorough one can be found in a 1994 document from the Council of Europe, which included a nine-point mission statement that reiterated, in a particularly European perspective, the traditional objectives of public service broadcasting. According to this body, public service broadcasting should provide

- 1. a common reference point for all members of the public,
- 2. a forum for broad public discussion,
- 3. impartial news coverage,
- 4. pluralistic, innovative, and varied programming,
- 5. programming that is both of wide public interest and attentive to the needs of minorities,
- 6. reflection of the different ideas and beliefs in pluriethnic and multicultural societies,
- 7. a diversity of national and European cultural heritage,
- 8. original productions by independent producers, and
- 9. extended viewer and listener choice by offering programs not provided by the commercial sector.

These goals led the Council of Europe to declare that the safeguarding of independent, appropriately funded public service broadcasting institutions is essential to the functioning of the media in a democratic society.

In 1997, the addition of a Protocol on Public Service Broadcasting to the Treaty governing the European Union (EU) highlighted the fact that what was originally a strictly "national" service, although similar in many countries, has become increasingly transnational in the context of globalization. In light of the growing commercialization of all media, public service broadcasting continues to designate a strong value of social worth, the "last best hope" for socially purposeful media acting in the public interest.

The EU protocol considers "that the system of public broadcasting in the Member States [of the European Union] is directly related to the democratic, social and cultural needs of each society and to the need to preserve media pluralism." This in itself is important in terms of legitimating public service broadcasting at a time when its basis is under attack on both ideological and economic grounds. It links public service broadcasting to the question of democracy, emphasizes its sociocultural nature as a public service, and underscores the distinctive role of public service broadcasting in an otherwise uniformly commercial system.

The context of technological convergence and the accompanying policy debates can help to further clarify the concept of public service with respect to media generally and, hence, to develop a more appropriate conception of public service broadcasting. In telecommunication, for example, the concept of universal public service has been much more clear and straightforward than in broadcasting. The principle of universality has been tied to the operational provision of affordable access (not an issue in broadcasting as long as the main means of transmission was over-the-air, but increasingly so with the addition of various tiers of chargeable services).

The displacement of universal service by subscriber-based and pay-per-view services is the strongest factor favoring a shift toward the consumer model in broadcasting, and proponents of public service broadcasting feel that this needs to be countered by policy measures and institutional mechanisms that are designed to promote the democratic function of broadcasting. This can only come about through a rethinking of what is meant by public service broadcasting.

Traditionally, public service broadcasting has been expected to represent the national as opposed to the foreign. It may be time to refocus these conceptual categories in terms of the local and the global. Global cultural industries recognize this by developing products that are targeted to "niche markets." Public service broadcasting has a different role, which it seeks to fulfill principally by conceiving its audience as a public rather than a market. Some programs may speak to a particular national public, but on any given national territory there will be less-than-national broadcasting needs to be fulfilled. National networks can no longer be expected to be forces of cohesion; they can, however, be highly effective distribution systems for programs that are of importance to the communities they serve. For this to occur, public service broadcasting needs to be redefined in terms that are suitable to a new public culture, global in scope and experienced locally.

Nothing in the idea of public service broadcasting ties it intrinsically to that of nationhood; it is, however, necessarily linked to notions of community. In order to flourish in the future, public service broadcasting will need to be reconceptualized in the context of a changing role for the still-present, still-formidable (for lack of a structure to replace it) nation-state. As the alternative to the state becomes the market, the alternative to national public service broadcasting has been constructed as private sector broadcasting; this parallel is logically flawed as well as politically shortsighted. The globalization of markets is both global and local, in that global products are usually produced in a single place, distributed worldwide, and consumed locally, everywhere. As the nationstate struggles to find its way in this new environment, so does public service broadcasting. It is false to assume, however, that there is no longer a need for public service broadcasting, for this is the only established mainstream medium that can be said to place social and cultural concerns before the imperatives of the marketplace. Furthermore, as public authorities begin looking toward the capacity of national broadcasting systems as a whole to meet public interest goals and objectives, more attention may be paid to the overall ecology of broadcasting as a public service environment.

See also: Culture And Communication; Culture Industries, Media AS; Democracy and the Media; Public Broadcasting; Social Change and the Media; Social Goals and the Media; Society and the Media.

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MARC RABOY

PUBLIC SPEAKING

The art of public speaking can trace its roots back to ancient Greece and the orators who proclaimed governmental achievements, entertained audiences, and debated political issues in public forums. In the *Rhetoric*, written in 330 B.C.E., Aristotle discussed the process by which a speaker prepares and delivers a speech. Much of this material is still applicable. For example, Aristotle wrote about three types of persuasive appeals: *ethos* (i.e., credibility of the source of the message), *pathos* (i.e., appealing to the emotions of the audience), and *logos* (i.e., the nature of the message). A contemporary advertisement in which a notable sports figure (*ethos*) telling a personal story about learning the negative consequences of driving while intoxicated (*logos*) to teenage athletes who have just learned to drive (*pathos*) illustrates the principles that Aristotle described.

History

Historically, public speaking was known as rhetoric and has a long history, both in terms of training people to become good rhetors (i.e., public speakers) and in analyzing what factors made a speech effective (i.e., rhetorical criticism or analysis). James McCroskey (2000) notes that the oldest essay ever discovered was written around 3000 B.C.E., and it consists of advice on how to speak effectively. McCroskey argues that the first theory of public speaking was developed by the Greeks and consisted of a theory about courtroom speaking. In the fifth century B.C.E., the Greek Sophists developed small schools to teach the concepts that are now included in the modern idea of debate. Good speakers were taught how to argue both sides of a proposition and were encouraged to write short, general messages that could be used whenever they were asked to speak in public. Isocrates, the most influential of the Greek Sophists, was recognized as an excellent teacher who also wrote orations for other people to deliver, much like a modern speech writer does. Isocrates emphasized rhetorical style (i.e., how to present a speech effectively) and how to train people to become effective public speakers. In 389 B.C.E., Plato wrote the Phaedrus, in which he discussed his theory of rhetoric. According to McCroskey, some scholars consider Aristotle's Rhetoric to be in response to the criticisms that were raised by Plato. Whether this is true or not, both theorists helped lay the foundation for the contemporary study of public speaking.

As discussed by McCroskey, the next major period for the development of the art and study of public speaking is the Roman period, during which the *Rhetorica ad Herennium* appeared around 82 B.C.E. This work includes information about style, delivery, and the six parts to a rhetorical message: introduction, statement of facts (i.e., narration), division, proof, refutation, and conclusion. Cicero also wrote several works about rhetoric during this period, as did Quintilian. As McCroskey notes, the most often quoted phrase from Quintilian is his observation that a public speaker is a "good man speaking well." Of course, this quotation would now be extended to include all people, not just men.

In the contemporary world, one of the most important areas of study for scholars of public speaking is analyzing and critiquing the rhetoric of significant public speakers. Sonja Foss and Karen Foss (1994) extend the traditional examination of famous public speakers by their contention that presentational speaking is an "invitation to transformation." Public speaking allows speakers to grow and change as individuals, and it helps others to do the same thing as well. Both the speaker and the audience have the potential to leave the interaction with new ideas and insights. Foss and Foss, among others, provide a reminder that the public presentations of Adrienne Rich, Audre Lord, Alice Walker, and Ursula Le Guin, for example, are as significant as the speeches of Abraham Lincoln and Thomas Jefferson in terms of scholarly study.

Basic Principles

The four principles of effective public speaking are both simple and complex at the same time. Effective public speeches are audience centered, organized appropriately, written clearly, and presented compellingly. Within each of these aspects of an effective speech, however, there are various ways to accomplish the task well.

Audience-Centered Speeches

The first principle, being audience centered, means that effective public speaking relies on understanding who the audience is and, once this is known, developing a speech that is appropriate to that particular audience. The most basic information that needs to be known about any potential audience is the demographic information (i.e., factors such as age, ethnicity, gender, education level) that may influence the audience's perception of the speaker's message. A young speaker who is talking about a historical topic such as the assassination of President John F. Kennedy, for example, needs to know how many people in the audience were alive when the event occurred. If most of the people remember the event, the speaker needs only to briefly mention historical details and then get to the main point of the speech, such as describing how contemporary teenagers view the event. If most of the audience consists of teenagers who were not alive when the even occurred, more time should be spent during the speech in describing the event and its aftermath. In fact, a speech on the Kennedy assassination for a young audience might have a very different purpose (e.g., convincing them that historical events are relevant to their lives) than it would have for an older audience (e.g., convincing them that modern teenagers are influenced by historical events). Thus, knowing the audience helps the speaker both to choose a topic and to develop it in a manner that is appropriate to the audience.

Appropriate Organization

Effective public speeches need to be organized appropriately both for the topic and for the potential audience. Traditional views of public speaking call for speeches to contain an introduction, body, and conclusion. In fact, some people have commented in jest that a good public speech consists of telling an audience what the speaker plans to tell them, telling it to them, and then telling them what it was that speaker just told them. While this is a bit of an exaggeration, an effective public speech may indeed contain more repetition than other forms of communication in order to assist the audience in remembering the main points that the speaker wishes to make. Stephen E. Lucas (1998) argues that the process of organizing a speech begins when the speaker determines a specific purpose (e.g., to inform an audience about a particular topic), identifies the central idea (i.e., what major issues are involved in the topic), and settles on the main points (e.g., three things the audience should know about the topic). Once this is accomplished, the speaker can then choose from a variety of traditional organizational patterns. These patterns include chronological (i.e., following a time pattern), spatial (i.e., following a directional pattern), causal (i.e., organizing points to show a cause-and-effect relationship), problem-solution (i.e., showing the existence of a problem and then providing a solution to it), and topical (i.e., dividing the speech into subtopics). Clella Jaffe (2001) points out



With the increased influence of media in the democratic process, it is crucial that candidates, such as Hillary Clinton and Rick Lazio in their 2000 battle over the Senate seat for New York, master the principles of public speaking for debates and other public appearances if they are going to be seen as valid contenders in the election process. (Reuters NewMedia Inc./Corbis)

three additional organizational patterns that she notes were explicated by Cheryl Jorgensen-Earp, who contends that they are less linear than the traditional organizational patterns. The patterns that Jaffe discusses include the wave pattern (i.e., a pattern where the crests of the waves are the major points that are developed through a series of examples; repetition and variation are key components), the spiral pattern (i.e., a repetitive pattern that has a series of points that increase in drama or intensity), and the star pattern (i.e., a theme that ties together a series of relatively equally weighted points).

One of the most famous organizational patterns for public speeches was developed by Alan H. Monroe and is called the "motivated sequence" (see German et al., 2001). It is particularly well suited to persuasive speeches. The motivated sequence consists of five steps: attention, need, satisfaction, visualization, and action. The attention step consists of the introduction to the speech, in which the speaker must gain the attention of the audience in an appropriate manner. A speaker may gain the attention of the audience by yelling loudly, for example, but this tactic may only alienate the listeners, not motivate them to pay attention to the speech. Introductions and attention steps must be tailored to a particular audience and fit within the purpose of the speech. For example, a startling statement, such as the number of teenagers who die each year as the result of drunken driving, would be appropriate for introducing a speech that is designed to persuade the listeners not to drink and drive. Many speakers feel that a joke is a good way to begin a public speech, but this tactic often fails because the joke is not well told, does not fit the purpose of the speech, or is inappropriate for a particular audience. The second step of the motivated sequence, the need step, consists of establishing the need for the audience to listen to the speaker's message by describing the problem to be discussed. Monroe proposed four parts to this step: statement (i.e., describe the nature of the problem or situation), illustration (i.e., give examples), ramifications (i.e., give support such as statistics that show the extent of the problem), and pointing (i.e., demonstrate a connection between the problem and the audience). In the satisfaction step, the speaker proposes a solution that will satisfy the need that has been established in the need step. This satisfaction step may include statement, explanation, theoretical demonstration, practicality (i.e., using facts and statistics), and meeting objections. The next step consists of visualization, in which the speaker describes the consequences of either adopting or rejecting the proposed course of action. In positive visualization, the speaker describes the favorable consequences that will results from following the proposed plan (e.g., how one's life may be saved by wearing a seatbelt in a car). In negative visualization, the speaker describes the potential negative consequences that will result from not following the proposed plan (e.g., asking the audience members to imagine what it would feel like, as a result of not wearing a seatbelt, to strike the windshield of a car during a collision). Contrast visualization can be used to compare the negative results of not adopting the proposed action with the positive results of adopting it. Finally, the action step consists of asking the listeners for specific action, which may include changing their beliefs about something, changing their behaviors, or changing their attitudes.

Knowing the audience will help the speaker to determine which organizational pattern is appro-

priate. Audiences who already basically agree with the speaker's message (e.g., voters who support a particular political candidate) will not be as critical of a speech as will audiences who are either unfamiliar with the speaker (e.g., undecided voters) or opposed to the speaker's message (e.g., voters who support an alternative candidate).

Clear Writing

Effective speeches must also be clearly written. A well-organized speech is useless unless the audience understands the message that is being communicated to them. One of the most important ways to ensure clear writing is to make sure that the vocabulary used in the speech is appropriate for the particular audience. For example, it is possible to use highly technical medical jargon when speaking to physicians, but that would not be effective for an audience of college students. In the same way, sports terminology is useful for communicating a message and establishing credibility with a group of sports fans, but it would be ineffective with people who are unfamiliar with the nuances of a particular sport.

Compelling Presentation

A speech does not have to be overly dramatic or theatrical to be effectively compelling. Instead, an effective delivery should be sincere, honest, straightforward, and dynamic. Varying vocal pitch, speech, and volume are effective devices for keeping the attention of an audience. However, an overemphasis on these aspects can be disastrous and can make the speaker seem phony or insincere. It is a good rule of thumb for a speaker to remember to talk to the audience as if he or she were talking to one person at a time. A speaker should try to convince the listeners that he or she is competent to speak on the topic and that he or she is sincere in wanting the listeners to understand the message.

Much research has been conducted on ways in which public speeches can be presented effectively. The first step in effective presentation is rehearsal. In formal situations (e.g., important political speeches or theatrical presentations), dress rehearsals are held. This situation simulates the actual presentational situation as closely as possible. A mock audience may even be included to ask the speaker typical questions and test the answers to them. For less formal situations, the speaker may still want to simulate the situation (at least in his or her imagination) and check for things such as timing, familiarity with the setting (e.g., where the controls to audiovisual equipment are located), and knowing how the audience will be seated. It is extremely important for speakers to prepare a presentation that does not extend past the allotted time, and they must not be confounded by any technical difficulties, such as not knowing how the overhead projector works. Good public speakers make sure that they know how any audiovisual aids work and have alternative strategies prepared in case the expected technological aids do not function properly.

Presentational strategies should also be developed that can be used to respond to feedback from the audience. If the audience seems restless or confused, the speaker should be able to change the message to include more examples or to shorten parts of the planned presentation that seem to be repetitive. More interesting graphics or the use of more vocal variety may help get the audience more involved with the message. Again, audience analysis before the public presentation can aid the speaker in developing strategies to cope with various reactions from the "real" audience.

Good public speakers also often attend to other presentational elements before they enter a situation where they will be presenting a public speech. For example, dress can be a unifying strategy that links the speaker with the audience. Politicians are seen wearing caps that build a bridge between them and their audiences. Jackets with sports insignias are used to help the audience see a speaker as "one of them." Not all speakers endeavor to identify closely with their audiences, however. For example, religious leaders often wear special clothing that signifies their official capacity to conduct a religious service and to reinforce their role as spiritual adviser.

Ethics of Public Speaking

Given their potential to influence so many people, public speakers should have a heightened sense of ethical responsibility as they prepare and present their messages. Jaffe has identified three ethical guidelines that are important for all public speakers: courtesy, tolerance, and civility.

Courteous public speakers demonstrate their respect for the audience by responding politely to them and being considerate of their beliefs and feelings. Demonstrating courtesy does not mean that a speaker must agree with the audience. In fact, the speaker's job may be to persuade the audience that they are mistaken about a particular issue. However, disagreement should be expressed in well-presented ideas and in statements that are backed with supporting evidence, not in namecalling and making insulting statements to the audience.

Effective public speakers exhibit tolerance by understanding that neither they nor their audience may possess the total truth and that each party should be tolerant of the other's views. This does not mean that a speaker should refrain from vigorously arguing his or her viewpoint, but the argument should be framed within a recognition of the potential for legitimate disagreement from the audience.

Speakers who demonstrate civility rely on persuasion, compromise, and coalition building instead of coercion, deceit, or manipulation. A willingness to listen is a necessary prerequisite for civility.

Conclusion

Public speaking and the study of public speakers and their messages continue to evolve as technology changes the means of communicating to larger audiences. A modern speaker can deliver a speech on television and reach a vastly larger audience than could a speaker at any time in previous history. In this way, it is particularly crucial for public speakers to deliver ethical and responsible messages that further the dialogue between themselves and their potential audiences. Technology has given public speakers the ability to influence hundreds of thousands of people at one time, and these speakers must recognize their responsibility to use this power wisely.

In addition, the Internet has given speakers even greater access to a multitude of individuals who are able to gain access to documents, such as speeches, that are posted on the World Wide Web in text, audio, or video formats. The possibilities and potential dangers of this new access to information have not yet been fully explored, but they provide a rich source of data for new scholarly study in the future.

See also: Apprehension and Communication; Interpersonal Communication; Models of Communication; Public Speaking, Careers in; Rhetoric.

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LEA P. STEWART

PUBLIC SPEAKING, CAREERS IN

Effective public speaking is a basic skill that is needed for a variety of careers in contemporary society. People who have completed undergraduate communication programs can be found working in occupations ranging from account managers and actresses to web administration directors. Typical careers for individuals skilled in public speaking include advertising executive, attorney, corporate communications officer, corporate trainer, customer service representative, human resources manager, organizational development specialist, public relations professional, sales representative, and television reporter.

Training in speech and communication is also important for individuals who desire employment as administrators, audience coordinators for television programs, business analysts, computer consultants, digital media specialists, entertainers, financial consultants, hospitality managers, insurance agents, librarians, marketing professionals, mediators, nonprofit development officers, project development specialists, retail buyers, social workers, telecommunications consultants, travel agents, and television producers.

From the above lists, it may seem that any professional career could benefit from training in speech and public speaking, and, in fact, that is probably true. Training in public speaking helps individuals develop organizational skills, the ability to be comfortable when talking in front of both large and small groups, and effective means to persuade others. These skills contribute to effectiveness in almost any career situation.

Basic Career Characteristics

In general, jobs that are pursued by people skilled in speech and public speaking involve three things: (1) dealing with the public, (2) organizing information, and (3) exhibiting individual responsibility.

Most people who seek training in speech and public speaking have a desire to work with the public in some fashion. For example, a talent coordinator on a television show is responsible for interviewing potential guests, persuading individuals to appear on the show, making sure guests are comfortable when they arrive at the show, and often writing questions for the host to ask the guests. A hospitality manager serves as the liaison between employees and customers to ensure a pleasant experience for customers. Much of the time of a hospitality manager may be spent listening to customer complaints and resolving them. Strong listening and negotiation skills, as well as patience, are particularly essential in this profession. Individuals trained in speech and public speaking are effective in dealing with the public due to their experience with presenting information to a variety of audiences and their ability to "think on their feet." Being at ease in public speaking situations easily translates into effective interpersonal communication skills.

Individuals who can organize information find these skills useful in a variety of careers. As part of the training process for public speaking, people find information through various research methods, analyze the credibility of the information, decide which information is most effective in a particular situation, organize the information into a pattern that will communicate the information in the best way, and use effective delivery skills to present the information to a particular audience. These skills have a direct benefit for people working as attorneys, librarians, small business managers, or sales representatives.

Finally, people trained in public speaking are able to be effective in jobs that require individual responsibility because they have been trained to use their self-motivation to formulate messages that can both inform and influence others. For example, a television reporter must first develop a story idea before researching, editing, and presenting the information to the public. The idea must be checked with editors and other decisionmakers before it is approved for dissemination to the public. A software project manager must coordinate the efforts of a variety of individuals in order to develop a product and get it to market. Each step of this process may entail presenting the product to diverse audiences to gain their approval before the next step can be taken.

Important Career Skills

There are many important skills that can contribute to success in the careers discussed above, but three of the most important are (1) the ability to adapt to various audiences, (2) the ability to do research, and (3) the ability to exhibit a sense of personal integrity.

Training in speech and public speaking includes an emphasis on audience analysis and adaptation. This means that in order to deliver an effective public speech, the speaker must first know the audience in terms of who they are and what their needs are. It would be inappropriate and ineffective to address an audience of third graders in the same manner as one would address an audience of senior citizens. In the same way, individuals who have been trained in speech and public speaking know that they must adapt their message to the needs, understanding, and desires of their customers. A sales representative who uses the same message to describe a product to physicians, to government regulators, and to the general public will probably not be successful.

Public speaking training also includes the development of research skills, which are a necessary component of any public speech. In the broadest sense, research skills are essential in any career dealing with effective communication skills. Social workers need to gather information about their clients, marketing executives need to gather research about the products they are selling, documentary filmmakers need to gather research about the topics of their films, and book sellers need to gather information about the latest books that might appeal to their customers.

Finally, effective public speakers need a sense of personal integrity. This may not seem like a skill that is equivalent to audience adaptation and research skills, but personal integrity can be developed just like these other skills and is essential to effectiveness in any of the careers discussed so far. Professional communicators are constantly judged by the credibility of their messages and their personal integrity. For example, a client service representative who has a reputation of assuming responsibility for solving problems and taking into account individual customer needs will be more effective than a person who fails to honor promises or effectively resolve conflicts with clients.

A prominent source of information regarding careers in the public speaking field is the National Communication Association. This is the largest professional organization devoted to serving the needs of both scholars and practitioners in the fields of speech and public speaking.

See also: Interpersonal Communication, Listening and; Public Relations; Public Relations, Careers in; Public Speaking.

LEA P. STEWART

PUBLISHING INDUSTRY

In the broadest sense, the publishing industry would include newspaper publishing, magazine publishing, music publishing, map publishing, government information publishing, comic book publishing, and book publishing. This entry, however, will be restricted to the modern book publishing industry.

Publishing may be defined as the commercial dissemination of literature or information in multiple copies and with the probability of multiple formats (e.g., paper, electronic, CD-ROM, microfilm, microfiche). Publishing is a business, and as such, it embraces the values of competition, sales, and profit. Publishers are as concerned with accounting, marketing and advertising, shipping and distribution, and inventory control as they are with their products—the intellectual, artistic, and cultural creations of the authors. The publishing business often operates under the tension of highly divergent interests. An author's creative works or specialized knowledge may not meet the market values of profit, popularity, and standardization.

Publishing requires authors to create content. Editors work with authors to improve the writing. Scouts look for authors who have stories that may be profitable for the publisher. Literary agents work with authors to represent and protect the interests of the authors. Lawyers work with both the author and the publisher to finalize contracts. A publishing house usually divides its operation into editorial, design, production, publicity, sales, distribution, contracts, rights (e.g., translation, foreign republishing, licensing), and administration. Publishers must also work with printers who create the multiple copies or printings of a work, information processors who make works available electronically, distributors who pack and ship the finished product, and consumers (e.g., booksellers, libraries, school systems) who buy the content to resell at a profit or lend as a service.

While publishing is a complex combination of commerce and culture, it is much more multifaceted than that. It involves controversy (such as censorship, whether for political or propriety reasons), ethical considerations (related to authenticity, libel, plagiarism, and copyright), value considerations (with regard to taste, propriety, and aesthetics), international issues (including translations, politics, diplomacy, and markets), social conditions (related to literacy and education), and philosophical concerns (over authorship, commodification, and commercialization). All of these are key factors in the publishing industry.

As for the physical product of the publishing industry, all books can be divided into the following categories: (1) trade books, which include both hardback and paperback publications that are available in easily accessible retail outlets, (2) religious works such as devotionals, scriptures, and prayers, (3) textbooks for students ranging from kindergarten through graduate or professional school, and (4) scientific, technical, and medical books. Trade books, which can obviously be divided into paperback publications and hardback publications, can be further divided according to the age of the intended reader and the specific content. Adult books are generally intended for readers who are nineteen years of age or older. Juvenile books, which are intended for those individuals who are younger than nineteen years of age, can be further divided into books for young adults and books for children. The broad content genres for trade books are non-fiction, fiction, drama, and poetry, but these can each be divided into more specific sub-genres. For example, fiction can be divided into romance, mystery, westerns, science fiction, fantasy, adventure, military, historical, horror, and thriller, as well as the emerging areas of splatterpunk, cyberpunk, and prehistoric epics. Within each of these sub-genres, there are also niches that satisfy specific audiences and interests, such as African-American romance. urban fantasy, glitz and glamour romance, and technothrillers.

Literacy, Education, and Libraries

Publishing depends on both writers and readers. People read books for many different purposes. Those readers who purchase or borrow a book for voluntarily reading may be looking for recreation or inspiration. Those readers who purchase or borrow a book because it is required reading are looking for specific information. Publishing is intricately tied to literacy, education, cultural institutions such as libraries and museums, and societal respect and support for education and an educated populace. Authors need safe environments for free expression; they need time to think, write, read, and revise. The social conditions of peace, stability, and security are helpful for a healthy publishing environment, but war, instability, and insecurity can sometimes create an environment that encourages an active authorship and readership. Access to literature through a free public library system can create a large reading public and a guaranteed outlet for selling certain publications. Although public libraries are often thought of as a triumph of democracy, communist countries have also been supportive of libraries. Vladimir Lenin and his wife were strong supporters of libraries, and Cuba, with its high literacy rate, has an official government library system as well as, since 1998, a system of "independent" libraries (which are not part of the official government system).

Literacy, education, and the right to opinion and expression are essential for human dignity. In fact, the United Nations, in its *Universal Declara-* tion of Human Rights (1948) states: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers" (Article 19). "Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit"(Article 26). "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits. Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author" (Article 27). Many nations have their own statements on the freedom to read, write, and disseminate information and knowledge. These political and social structures are important to the publishing industry.

Authors, Writers, and the Publishing Process

The term "author" can refer to many different situations in the publishing industry. An author can be a commodity, a name brand that sells titles to an eager readership, an individual or a succession of creators who contribute to a series. An author may be a ghostwriter-someone who writes for another person. In many cases, a pseudonym is an assigned name under which many different authors may write-for example, the Stratemeyer Syndicate, which was created by Edward Stratemeyer, chose a pseudonym for each of its series, including the Hardy Boys and Nancy Drew series, but multiple authors contributed to each series. An author may be a professional who makes his or her living by writing and may be under contract to one publishing house. An author may be an amateur who is defined by some other circumstance or occupation, such as a prisoner, student, teacher, policeman, doctor, lawyer, or housewife.

The relationship between a publisher and an author is defined by a contract, which generally stipulates what the content of the manuscript will be, how and when it will be submitted, who is responsible for proofreading, and what amount the author will be paid—in initial payments and in royalties. (Royalties are additional payments that are made to an author for each copy of the work that is sold.)

The publication process follows a standard sequence that is often modified according to the type of book that is being produced. The basic stages are as follows:

- 1. An author writes, revises (as many times as necessary), and then submits a manuscript to a publisher. This submission can be unsolicited (i.e., submitted directly to the publisher by the author) or solicited (i.e., submitted through a literary agent), but it should be noted that many publishers do not accept unsolicited manuscripts.
- 2. If a publisher agrees to consider a manuscript, it is then assigned to an editor for review.
- 3. The editor reads the manuscript and makes a recommendation to the publisher about publishing or not publishing the work. If the manuscript is essentially publishable, the editor and author work together to develop a contract and to polish the manuscript before sending it to the compositor.
- 4. The book is copyrighted and assigned an International Standard Book Number (ISBN).
- 5. While the manuscript is being polished, a designer develops specifications for an interior design and creates a cover that is appropriate to the manuscript and will attract the attention of potential readers.
- 6. A compositor typesets the polished manuscript according to the specifications that have been created by the designer and provides pages for proofreading, correction, and approval.
- 7. While the manuscript is being typeset by the compositor, the marketing department develops strategies to create interest in the book. Prepublication information is sent to bookstores and libraries to entice them to order the book. Advance copies are sent to reviewers so that information about the book—what it is about and how good it is—can appear in newspapers, magazines, and over the Internet around the time the book is actually published.
- 8. While the marketing department is busy creating interest in the book, the approved type-

set materials created by the compositor are sent to the printer/binder, who produces multiple copies of the work and prepares them for shipment.

- 9. An author tour is arranged where the author participates in radio and television interviews and reads portions of the book at bookstores, libraries, and cultural centers.
- 10. Sales representatives attend book fairs and trade shows and visit bookstores and other retail outlets to sell the book.

Publishing Houses

Historically, publishing houses were relatively small family-owned businesses, but they have evolved into multinational corporations, many of which are publicly traded on the various stock exchanges (e.g., Elsevier is listed on the Amsterdam, London, and New York Stock Exchanges). Some houses are subsidiaries of corporations that are centered on the entertainment industry. Other houses are minor subsidiaries of corporations that have little else to do with literature and publishing. The effects of corporate mergers and acquisitions are shaping the modern book industry in ways that are yet to be determined.

Some of the major houses in the history of publishing include Elsevier, Macmillan, Longman, Charles Scribner's Sons, and Harry N. Abrams. Elsevier, which was founded in 1583 by the Dutch family Elzevir (or Elsevier), is a publisher of scientific literature. It is often cited as the first important European publishing house. The Elzevirs were businessmen, and their business of printing and selling books grew as literacy increased across Europe. Macmillan was founded in 1843 by Daniel and Alexander Macmillan. These Scottish booksellers and publishers created one of the largest and most influential publishing houses of textbooks and works of literature and science. Longman was founded in 1724 by Thomas Longman when he bought a British bookshop and publisher. It is an imprint known for its textbooks and important monographs in the social sciences and humanities. Charles Scribner's Sons, one of the first important American publishing houses, was founded in 1846. It is notable for its legendary editor Maxwell Perkins, who assisted F. Scott Fitzgerald, Ernest Hemingway, Thomas Wolfe, and many other giants of twentieth-century U.S. literature.

Harry N. Abrams, an American publisher of art books, was founded in 1950.

These historic publishing houses, which represent just a small portion of the publishing houses worldwide, have not been immune to the corporate practices of buying, selling, and merging of companies and imprints. Longman is now a subsidiary of the publishing house Addison-Wesley, Longman. The Macmillan company operating in the United Kingdom has no connection to the Macmillan companies in the United States, and even the Macmillan companies operating in the United States are not all owned by the same corporation. In addition, Scribner reference books are no longer published by the same corporation that publishes Scribner trade books. New names that have grown in importance in the publishing world are Bertelsmann, Viacom, Time Warner, and Disney. Bertelsmann is a German publisher that has purchased American publishers such as Doubleday, Dell, and Random House. Viacom, a global megacorporation with entertainment interests in film, video, television, amusement parks, and sports teams, purchased American publisher Simon & Schuster in 1994 and subsequently sold off several of its imprints. Time Warner is a corporation that publishes books, operates book clubs, and owns large segments of the communication and entertainment industry. With the announcement of its merger with America Online, the synergy of publishing (production and distribution of cultural content) with electronic multimedia points to the future of the dissemination of information, ideas, knowledge, and art. Critics are concerned that these types of mergers and acquisitions will lead to the "corporatization" of culture. The prominence of the Disney Corporation, which owns movie studios, operates theme parks, and licenses characters that were not created originally by Disney (e.g., Winnie-the-Pooh, Pinocchio), has critics asking the question "Can companies own culture and thus control it?" With the foreign acquisition of publishing houses, those who study the publishing industry also ask if there are dangers in having foreign ownership of a nation's information outlets. For example, does it matter if Germany publishes American textbooks? Will content and editorial changes occur that may not be in the national interest of those people who are purchasing the books? Or will it make no difference to have foreign ownership of publishing houses?
University presses were initially created to publish the specialized works written by the faculty members of the respective universities. The presses later developed into publishers of scholarly works that were not restricted to those written by an institution's own faculty and students. Traditionally, university presses have not been expected to make a profit, but rising costs, diminishing resources, and shifting values regarding education and profitability are pressuring university presses to print books that have a wider popular appeal. For example, in 1999, Northeastern University Press published a new edition of Peyton Place, a popular 1956 novel about New England life. In other cases, university presses have been sold to commercial publishers. In July 2000, Iowa State University agreed to merge Iowa State University Press (founded in 1934) with Blackwell Science, an international scientific and technical publishing company. Some important university presses include Oxford University Press (founded in England in 1478), Harvard University Press (officially created in 1913, but Harvard has published faculty materials since the seventeenth century), and University of Chicago Press (established in 1891). The last press is also the home of the definitive work in manuscript preparation: The Chicago Manual of Style.

Vanity Presses are publishing houses that publish books at the authors' expense. Often considered unscrupulous, vanity presses rely on the authors wanting so strongly to see their works in print that they will pay all of the expenses of having the books published. However, book distributors, bookstores, and libraries generally do not purchase books printed by vanity presses, and reviewers do not accept them to review for journals, newspapers, and magazines. Therefore, although it is published, there is very little recognition of the work. Electronic self-publishing on the Internet is modifying how some authors get into print. Similar to the vanity presses, websites that allow for self-publishing are changing the avenues for new voices to be heard and read, but unlike vanity presses, websites are somehow not yet tainted with the association of narcissism. Other forms of electronic publishing mimic the traditional format of the publishing process with the exception that the author publishes the work online first and then has it picked up by a major publishing house. Websites that allow for authors



Charles Scribner. (Corbis)

and publishers to negotiate rights in an auction format are part of electronic publishing.

Publisher Associations

Publishers have organized international, national, and regional associations to protect their interests. They also collect statistics and follow trends in the field regarding technology, commerce, trade, taste, and new markets.

The International Publishers Association (IPA) was established in Paris in 1896 to serve as a worldwide organization of the individual national associations, which are recognized as representative of the book and music publishers in each country. The office of the secretariat is located in Geneva, Switzerland. The IPA has a statement on the "Freedom to Publish," collects and maintains statistics on publishing as reported by member nations, and celebrates "World Book and Copyright Day" every year on April 23.

The national book publishers associations include the Association of American Publishers, the Bulgarian Bookpublishers Association, the Canadian Publishers Council, the Den Danske Forläggerforening (Denmark), the Cámara Ecuatoriana del Libro (Ecuador), the Egyptian Publishers' Association, the Syndicat National de l'Edition (France), the Ghana Book Publishers Association, the Icelandic Publishers Association, the Federation of Indian Publishers (India), the Ikatan Penerbit (Indonesia), the Book Publishers Association of Israel, the Japan Book Publishers, the Fédération Luxembourgeoise (Luxembourg), the Malaysian Book Publishers' Association, the Cámara Nacional de la Industria Editorial (Mexico), the Nigerian Publishers Association, and the Philippine Educational Publishers' Association.

Book Fairs

Publishers, authors, agents, and scouts attend international, national, and regional book fairs. They show their wares, attract new clients (e.g., authors, translators, booksellers, book buyers), discuss trends, buy rights to works (e.g., foreign rights to publish or distribute a book in a country other than the original country of publication), make licensing agreements, and attend meetings, seminars, and training programs. Regional book fairs, such as those held in Frankfurt, Guadalajara, and Zimbabwe, are important for highlighting the works published in various countries. Given the large number of countries in the world, international and regional book fairs are important to the publishing industry. Some the most important fairs include the Frankfurt Book Fair, BookExpo America, the Bologna Children's Book Fair, the Guadalajara International Book Fair, the Zimbabwe International Book Fair, the New Delhi World Book Fair, the Asia International Book Fair, the London Book Fair, and the Havana International Book Fair.

The Frankfurt Book Fair was established in 1949 in Frankfurt, Germany. This annual six-day event, organized by Ausstellungs und Messe GmbH (a subsidiary company of the German Publishers' and Booksellers' Association), is the world's biggest international trade fair for publishing. This is an important event for publishers to attend if they wish to obtain information about the international publishing industry.

BookExpo America, formerly known as the American Booksellers Association Convention & Trade Exhibit, is another one of the largest fairs in the world. Usually held in Chicago, this event showcases books in all formats (e.g., paper, audio, comic books), presents new technology and services for publishers, and shows sideline merchandise such as greeting cards, calendars, stickers, and other non-book products for bookstores. It is an education forum that looks at the business of books from many viewpoints.

The Bologna Children's Book Fair, which has been held in Italy since 1963, is uniquely devoted to children's publishing. Organized by the Bologna Fiere Group, this fair includes textbooks and reference works as well as picture books and works that feature licensed characters. Exhibited works exist in a variety of formats, including paper, electronic, and multimedia.

The Guadalajara International Book Fair was founded in 1987. Organized by the University of Guadalajara, it is one of the most important book fairs for Latin American and Spanish-language materials. Its goals are to promote and consolidate the Mexican and Latin American publishing industry and to contribute toward encouraging reading among children and young adults.

The Zimbabwe International Book Fair is the most important annual book event in Africa. Administered by an independent trust (comprising a broad cross-section of Zimbabwe's book industry) and attended by some of the major writers of the continent, this fair provides the opportunity for the free interchange of ideas and expression between those people living in North Africa and those living in sub-Saharan Africa—as well as between Africa and the rest of the world.

Organized by the National Book Trust at Pragati Maidan, New Delhi, the New Delhi World Book Fair occurs every other year. The fair highlights India's eleven thousand publishers, the multilingual publishing industry of India, and its world presence as the third largest publisher of English-language books.

Held in Singapore and organized by the Reed Exhibition Companies, the Asia International Book Fair is a trade event that serves the growing intellectual property rights market in Asia. It is a unique marketplace for the buying and selling of rights for publishing, reprinting, distribution, translation, and co-edition of books in print or electronic format.

The London Book Fair was established in 1970 and targets a wide variety of publishers, booksellers, and printing services. It also features a variety of non-book products that are of interest to readers and book buyers.

Since 1990, the Havana International Book Fair has highlighted the literary achievements and



A worker puts finishing touches on the Polish pavilion at the 52nd international Frankfurt Book Fair, which took place in October 2000. (AFP/Corbis)

strengths of Cuba. Although the United States has a trade embargo with Cuba, some of the larger U.S. publishers participate in the event regularly.

Book Festivals and Awards

Many cities celebrate books and reading by organizing festivals. Often these festivals account for a high percentage of a book's overall sales. For example, in the United Kingdom, it is estimated that 50 percent of all children's book sales are made through book festivals or school book clubs. Some festivals concentrate on local or regional authors or on authors who have a connection to the state, province, or city. Cities may hold many book festivals in the course of a year. Some examples of book festivals held in the United States include the Harlem Book Fair (New York City), the San Francisco Bay Area Book Festival, the Great Basin Book Festival (Nevada), Bumbershoot (Seattle), the Texas Book Festival, the Virginia Festival of the Book, and the New York is Book Country Festival (New York City).

Book fairs and festivals are not the only ways to recognize outstanding works. Publishers, professional associations, and governments honor authors by presenting awards for books of unusual merit. Often, awards are presented for works that are published in specific categories. For example, the National Book Awards given in the United States bestow honors in the areas of fiction; poetry; arts and letters; history and biography; and science, philosophy, and religion. These awards are important to both publisher and author because the honor raises their profile, attracts attention, and generates interest in reading and the exchange of ideas. Some of the other important book prizes and awards include the Nobel Prize for Literature, the Pulitzer Prize in Letters, the Caldecott Medal, the Newbery Medal, the Booker Prize, the Prix de Goncourt, and the Black Caucus of the American Library Association Literary Awards.

Censorship, Banning, and Embargo

Because publishing is the human communication of ideas, desires, information, and knowledge, publishers often face attempts to stop their dissemination of literature. The reasons may be political (e.g., if a ruling government wants to suppress publication of specific ideas), or the reasons may involve personal tastes (e.g., if a person or group believes that a publication contains obscene material).

Publishers vehemently protect the right to free expression and often provide support when a specific publisher's rights are being infringed. For example, in the United States, a joint legal defense fund was launched by what some may consider to be unlikely allies: the American Booksellers Association, the Association of American Publishers, Playboy Enterprises, and Penthouse International. These four entities came together in response to the 1985 Meese Commission, which sent letters to convenience stores saying that if they sold the *Playboy* and *Penthouse* magazines, then the commission would identify them as stores that sold "pornography." In this case, a Federal District Court ruled that the commission had overstepped its authority.

Sometimes publishers come up against national laws and international access. Adolf Hilter's Mein Kampf cannot be sold in Germany, but it can be (and is) published and sold in the United States. When Amazon.com, a U.S.-based online bookstore, was filling orders that German customers had placed for Mein Kampf, German officials objected and cited German laws for banning sales of hate literature. As a result, in 1999, Amazon.com stopped selling Mein Kampf to German customers. In 1989, the American Association of Publishers published The Starvation of Young Black Minds: The Effects of Book Boycotts in South Africa in an attempt to have books excluded from the economic embargo against South Africa under apartheid. The publication did not have the desired effect, and books remained part of the sanctions while they were in effect.

The notions of taste and what is acceptable are not universal. What may be acceptable in one culture may not be acceptable in another. In 1978, a Swedish sex education book for children was deemed obscene in the United States because of graphic nudity. Some governments, such as the Canadian government, subsidize cultural production, which is a practice that is praised by some and criticized by others as a form of government interference. All countries have unique characteristics, customs, and philosophies that shape their respective publishing industries. In spite of those unique elements that are related to specific countries, it is clear that all publishers still struggle with the concepts of free expression, social responsibility, cultural taste and propriety, and intellectual freedom.

International Publishing

While figures for new titles published in the United States generally fall between 55,000 and 75,000 books per year and the Publishers Association of the United Kingdom indicates that British publishers produced more than 100,000 new titles in 1997, these are not the only two countries in the world that have a publishing industry. In fact, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) has reported that, for example, Egypt produced 2,215 new titles in 1996, while Iran produced 15,073 new titles, Israel produced 30,487 new titles, Japan produced 56,221 new titles, Argentina produced 9,850 new titles, and Peru produced 612 new titles. Specific international cities that are known for their strong publishing houses and communication industry include-in addition to the American cities of New York, Boston, Philadelphia, and Chicago-the cities of Buenos Aires, Toronto, London, Paris, Vienna, Florence, Milan, Zurich, Edinburgh, Frankfurt, Leipzig, Singapore, and Tokyo.

The global exchange of ideas and literature, however, is complicated by inequalities between developed and developing nations. Access to raw materials (e.g., paper, ink, glue) and technology, opportunities for authors to write, currency exchanges, diplomacy, politics, war, tariffs, taxes, and distribution systems (e.g., postal services, roads, shipping) are all key factors that can vary from country to country. Consider the variations that exist in Africa, Central Europe, Latin America, Asia, and North America.

The publishing of African authors by African publishers has continually grown since the 1960s. With the emergence of independent African nations after World War II, national pride and postcolonial scholarship fueled the publishing industry. However, challenges such as economic recessions, chronic foreign exchange constraints, war, famine, drought, and political unrest have impeded the development of a robust publishing industry for the African continent. In 1989, a group of African publishers organized to found the African Books Collective, a self-help initiative that was established to promote, sell, and distribute African books in European and North American markets and to promote an intra-African book trade. The African Books Collective is registered in the United Kingdom, and books are shipped from its United Kingdom warehouse. The Swedish International Development Authority supports the African Books Collective website, which helps librarians, educators, and general readers find African books to buy. African publishing still reflects colonial influences, so the industry may generally be divided into Francophone (Frenchspeaking), Lusophone (Portuguese-speaking), and English-speaking markets, in addition to the markets for the native languages and dialects of the many African nations.

With the break up of the former Soviet Union, Central European nations (e.g., Bulgaria, Czech Republic, Hungary, Poland, Romania) moved from communism and state-owned publishing companies to free market economies and a new horizon for publishing. Challenges in Central Europe include foreign exchange rates, political changes, attempts to nurture local authors and increase interest in a nation's classic literature, and the need to balance the new influx of Western European and North American literature with indigenous literature so the culture is not homogenized. Still, there is a concerted effort to build the infrastructure of technology, expertise, and distribution and to re-create the publishing industry in the Central European nations.

Latin American nations are producers and consumers of Spanish-language and Portuguese-language works. Many of the region's nations have strong educational systems with fine universities that produce high-quality scholarship. Recognition of the importance of the translation process has allowed many Latin America authors and poets to reach readers in other countries around the world. More similar to Africa, or perhaps Central Europe, than to North America in terms of robustness of the Latin American publishing industry, the main Latin American book producers and exporters are Cuba, Mexico, Argentina, Colombia, Chile, Venezuela, and Brazil.

Asia, the world's largest continent, also features a large diversity in its publishing industries. Japan, with its high literacy rate and excellent educational system, has a strong publishing industry that is characterized by quality content and some of the highest standards for the physical aspects of publishing (e.g., paper, ink, binding, and color quality). China, on the other hand, has a long and strong book tradition, but a climate of suppression and government control stifles publishing and the import and export of cultural materials. Singapore, with its cosmopolitan population and British ties, has poised itself to be part of progressive Eastern–Western publishing activities. Western publishers and Australia look to Asia as a profitable marketplace. India, the third largest publisher of English-language works is a major player in Asian publishing and in worldwide publishing.

In North America, there is a shared popular culture, there is a shared language (i.e., English, although French and Spanish each have a strong presence as well), and there is a free trade agreement among Canada, the United States, and Mexico (although Mexico is culturally and linguistically more aligned with Latin American publishing). The face of publishing in the United States is changing. Entertainment industries (e.g., film, television, music, radio) are merging with the publishing industry. Many U.S. publishing interests are being purchased by European or Australian interests. Small publishing houses are becoming minor parts of large corporations. The context of publishing in the United States is one of free expression, regionalism, and corporate synergy. Also influencing publishing in the United States is an increase in the Spanish-speaking population and the need to create and provide materials in Spanish. Canada publishes in two languages (English and French) and supports the idea of multilingualism. Canadian publishing exists in an expansive country with a sparse population. There too is strong regionalism, which affects taste, content, and distribution. Canada's proximity to the United States and strong ties to the United Kingdom also affect what is imported, sold, and read. The Canadian marketplace is dominated by foreign products, but these connections also allow Canadian artists and scholars to have their works distributed throughout the world.

The Future in Publishing

In developed nations, time for reading books as a source for information, education, and recreation competes with television, the Internet, computer games, videos, music, and radio. In response, publishing has broadened its base and views the book as just one component of the cultural and educational whole. Multimedia productions of computer software, CD-ROMs, and maps are changing the definitions of publications, as is the development of e-books. The publishing industry is embracing the change.

Developing nations, however, continue to struggle to acquire the raw materials and technology that they need to produce works. They also face obstacles from developed nations that may resist purchasing the published works because they consider the printing to be inferior or because they question the intellectual value of the work.

Despite the inherent complications involved in the publishing industry around the world, as long as the fundamental human urge to communicate remains, publication of the expressions and findings of human endeavor will continue.

See also: Editors; Intellectual Freedom and Censorship; Libraries, Functions and Types of; Magazine Industry; Newspaper Industry; Pornography; Pornography, Legal Aspects of; Printing, History and Methods of; Publishing Industry, Careers in; Storytelling; Writers.

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LORNA PETERSON

PUBLISHING INDUSTRY, CAREERS IN

Publishing is the activity of commercially producing, distributing, and selling literature or information. It is both a business and cultural-intellectual enterprise that makes the work challenging, exciting, and rewarding. Associated with and crucial to the intellectual, cultural, and educational roles of society, the products of publishing (books, magazines, newspapers, online resources, and so on) inspire different feelings than other commodities produced by industry. Publishing is a business and, therefore, vulnerable to the vagaries of the marketplace of supply and demand, fashion and taste, capital, profit, and investment. The finding, nurturing, and supporting of authors with all of their idiosyncratic needs must be coordinated successfully with the bottom-line business concerns of marketing, competition, profit, and cost. International mergers of publishing houses, the development of the Internet and electronic publishing, and the blending of publishing with multimedia entertainment all point to dynamic growth in publishing careers.

Background

The major publishing houses, small or specialty presses, newspapers, and magazines hire employees to fill a wide range of positions. Many of the larger publishing houses and news agencies maintain offices in Europe, Asia, the United Kingdom, Mexico, or Canada, where employment requires a high degree of competency in the local language.

Specific careers in publishing are generally divided into two broad categories: creative and business. On the creative side of the industry are the editor-in-chief, editorial staff, designers, photographers, writers, researchers, multimedia producers, and translators. On the business side of the industry are the publisher, marketing staff, advertising staff, production staff, permissions coordinator, foreign and domestic rights manager, and literary agent.

Experience is essential in this highly competitive industry. One of the best ways to enter the field is to attend a publishing program to make contacts and learn the basics of the industry. Some of the best known programs of this type are the Dow Jones Newspaper Fund, the New York University Summer Publishing Institute, the Radcliffe Publishing Course, the Rice University Publishing Program, and the University of Denver Publishing Institute.

Creative Careers

Writers are generally self-employed or freelance. Depending on the circumstances, writers might submit their work directly to publishers or producers, or they might submit their work through literary agents who act as liaisons between the writers and the publishers or producers. Only in very select careers, such as a copy writer for an advertising agency or a reporter for a newspaper, are writers hired as full-time staff employees. Writers contribute to all aspects of the publishing industry. Scholarly writers, writers for children, screenwriters, writers for television, and technical writers have skills that are unique to the type of writing they do. For example, technical writers should understand the specialized area that they are working in, such as engineering, education, and telecommunications. Such knowledge is necessary to write effectively for the specialized market. The technical writer may also oversee technical operations such as preparation of illustrations, photographs, diagrams, or charts that accompany the technical material.

Editor-in-chief and managing editor are the top slots in the editorial track. The career path to a managing editor position requires comprehensive understanding of the editorial process, usually gained by starting as an editor at the entry level. Editors (who may work in either print, multimedia, or online environments) perform a variety of duties, such as overseeing the layout for the way the final product will look and revising the content of written material in preparation for final publication. These positions require an excellent command of the English language and an understanding of the communication and media industry. Writing comprehension, originality, sensitivity to problems, and attention to detail are the knowledge, skills, and abilities necessary for starting out on the editorial track. Since the managing editor directs and coordinates the editorial operations and formulates editorial policy, a person in that position must know about administration and management responsibilities, be able to manage personnel (i.e., the editorial team) effectively, and have a working familiarity with computers and electronics. As for specific education, a bachelor's degree in any area is appropriate, but most editors come to publishing with humanities and social science degrees.

Book design, particularly of the book cover, is a critical aspect of marketing, and most book designers have a degree in graphic or fine art. A publisher may have a book designer on staff to provide these services. Some designers and illustrators work on a self-employed or freelance basis or are hired on contract to illustrate, design, or supply technical drawings or photographs that are needed for a publication such as a technical manual or a children's book. The newspaper and magazine industry employs staff photographers in addition to using freelance talent.

In addition to writers, editors, illustrators, and graphic artists, there are opportunities in publishing for translators, researchers, fact checkers, copy editors, proofreaders, and outside readers of manuscripts of books, plays, scripts, and other material.

Business Careers

The publishing industry is a business and employs personnel who watch the bottom line of the business. Managing the business side is the president, chief executive officer, or publisher, along with the directors of departments concerned with marketing, advertising, and production. An education in business management, finance, or marketing plus an in-depth understanding of the publishing industry is essential.

Agents guide an author's career. They understand the industry, and they know which people should be approached with ideas. They negotiate contracts on behalf of the author, forward promising manuscripts to publishers or producers, and handle foreign and subsidiary rights. Literary agents have many contacts in the industry and understand the process, generally having worked within the industry itself before moving on to become agents.

Literary scouts, who can be either selfemployed or publisher employed, seek out writing talent around the world. They do so by reading broadly and attending readings and book fairs, such as the Asia International Book Fair, the Frankfurt Book Fair, BookExpo America, the Bologna Children's Book Fair, the Guadalajara International Book Fair, the New Delhi World Book Fair, and the Zimbabwe International Book Fair.

With the increase in electronic publishing and desktop publishing, publishers hire technical support personnel to manage the technological aspect of publishing. Positions may include computer support personnel with skills in computer hardware, software packages, computer networks, telecommunications, and information technology in general. Knowledge of specific software packages for design, publication layout, and computer graphics is a trend in the industry, and employment opportunities will continue to grow in the electronic, multimedia, and web-based publishing environments.

Women, Minorities, and the Future

Conditions for women and minorities in the publishing industry could be improved. Although not a female-intensive profession, women have been traditionally better represented in publishing than in some other fields. The numbers of editors, journalists, and publishers from racial or ethnic minority groups, however, remain disappointing. To compensate for this and to fill the need for a minority voice in publishing, independent publishing houses have been founded by females and by members of minority groups.

Movies, videos, television, computer and video games, and the Internet compete for people's leisure time. Nonetheless, the outlook for publishing careers is strong, for there is no indication that the book-reading public is dead. The increasing numbers of magazines aimed at specialty markets and online "e-zines" indicate that there is a high demand for the technologically equipped and educationally prepared individual. International and national organizations also work to protect the right to read and to write so that free expression can exist. With free expression, there is publishing.

See also: Editors; Magazine Industry, Careers in; Newspaper Industry, Careers in; Publishing Industry; Writers.

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PUBLISHING INDUSTRY, HISTORY OF

See: Printing, History and Methods of

PULITZER, JOSEPH (1847-1911)

Joseph Pulitzer was a Hungarian-born American journalist and innovative newspaper publisher of the late nineteenth and early twentieth centuries, but he is perhaps best known as the founder of the Pulitzer Prize.

Recruited by an American agent, Pulitzer immigrated to the United States in 1864 to serve for one year in the Union army during the U.S. Civil War. Afterward he drifted, arriving in St. Louis, Missouri, in the autumn of 1865. Pulitzer studied law and was admitted to the bar in 1867. That same year he became a naturalized citizen. He began reporting for the German-language newspaper Westliche Post in 1868. In 1869, Pulitzer was elected to the Missouri state legislature, where he gained prominence fighting graft and corruption in the St. Louis county government. He later bought a controlling interest in the Westliche Post and then sold it for a considerable profit. In 1878, Pulitzer bought the bankrupt St. Louis Dispatch and merged it with the St. Louis Post, which then became the leading newspaper of the city. In 1883, he turned the Post-Dispatch editorial duties over to subordinates and moved to New York City to purchase (for \$346,000) and reinvigorate the financially troubled New York World, which had a circulation of 15,000. Within four years, Pulitzer turned the New York World into New York's leading newspaper, with a recordbreaking circulation of 250,000. By the mid-1890s, the New York World was earning yearly profits estimated at \$1 million.

Pulitzer's rise to journalism titan took place in the dazzling context of a burgeoning society. From 1870 to 1900, the U.S. population doubled. Immigrants flooded cities and mass-production techniques were stimulating commerce. Newspapers were becoming big business. Pulitzer appealed to the growing immigrant population by using simple language and clear writing. He published editorials of high character and verbally fueled crusades against poverty, crowded slums, and discrimination. Pulitzer urged the poor to educate their children rather than sending them to work. His determination to effect reform and be a voice for the underprivileged was reflected in his tenpoint platform, which was published in 1883 and advocated the taxing of luxuries, inheritances, large incomes, monopolies, and privileged corporations. It also proposed a tariff for revenue, reforming the civil service, punishing corrupt officials, prosecuting vote-buying, and punishing employers who coerced employees in their voting behavior.

Pulitzer was responsible for many publishing innovations. For example, he attracted advertisers by reserving more space for advertisements and pricing that space on the basis of circulation. He used illustrations, banner headlines, and large display type. He introduced the sports page, a color magazine section, and the first color comics.

Pulitzer understood that news could be manufactured. Nellie Bly's sensational reporting was a popular feature. She went undercover as a patient in an insane asylum so she could report on the abuses that were going on there. She also managed to beat the fictional record of Jules Verne's Phileas Fogg by circling the world in less than eighty days—completing the trip in seventy-two days, six hours, eleven minutes, and fourteen seconds. Pulitzer cleverly promoted his paper with such content, but the *New York World* overall, under his leadership, was a paper based on news and service to the common citizen. Many journalism historians deem him to be the most innovative and effective newspaper editor in American history.

After Pulitzer was well established as a newspaper publisher in America's largest city, a younger imitator became his fiercest competitor. William Randolph Hearst, of the wealthy Hearst mining family, took over the *New York Journal* in 1895 after building a successful circulation track record as publisher of the *San Francisco Examiner*. Gene Wiggins, in *Three Centuries of American Media* (1999), put it this way: "Hearst did everything Pulitzer did, but on a grander scale. . . . Hearst had learned from the master and now was ready for a little oneupsmanship" (p. 161). According to Wiggins, "what Pulitzer did with genius, Hearst did with money" (p. 161). Pulitzer was the innovator; Hearst was the imitator.

James Wilson and Stan Wilson, in Mass Media/Mass Culture (1998), called this period of fierce competition between Hearst and Pulitzer,



Joseph Pulitzer. (Bettmann/Corbis)

which lasted into the early 1900s, "one of American journalism's most degrading circulation wars" (p. 135). It was thought to be degrading because the key weapon was sensationalism—news coverage that emphasized the lurid, emotionally riveting, and titillating, such as sex crimes, gruesome domestic violence, and gossip. "Yellow journalism" is the pejorative term that came to represent such content. The idea for the term was based on a comic strip character that wore a yellow, sacklike garment and was featured in Pulitzer's *New York World*. Hearst enticed the cartoonist, Richard Outcault, with higher pay, but Pulitzer hired another cartoonist to continue a strip featuring a similar character.

Media historians generally regard Hearst rather than Pulitzer as the most flagrant publisher of sensationalism during this era, but many of his tactics were already in use, some pioneered by Pulitzer and, before him, by Wilbur Storey of the *Chicago Daily Times*. With a clever metaphor, Wiggins (1999) described it this way: "... editors like Storey poured the foundation for the yellow journalism period, Pulitzer put up the frame while Hearst finished the roof" (p. 158).

Although Pulitzer engaged in sensationalism to sell newspapers, he also practiced ideals that characterize modern journalism. A famous exhortation to his staff was "Accuracy! Accuracy! Accuracy!" At the time of Pulitzer's death, his fiercest competitor had nothing but praise for the man. Hearst said in an obituary, as reported in W. A. Swanberg's 1967 book *Pulitzer*, "[A] mighty democratic force in the life of the nation and in the activity of the world has ceased; a great power uniformly exerted in behalf of popular rights and human progress is ended. Joseph Pulitzer is dead" (p. 412).

The Pulitzer Prize continues Joseph Pulitzer's legacy of journalism excellence. Under the terms of an agreement made between Pulitzer and Columbia University in 1903, and later made a part of his will, the Pulitzer Prize Fund derives from a gift of \$2 million that Pulitzer bequeathed to Columbia. The gift also established Columbia's School of Journalism. The first awards were made in 1917, and they continue to be bestowed annually on the first Monday of May by the trustees of Columbia University, acting on the recommendations of the Pulitzer Prize Board of the university's Graduate School of Journalism. The board is guided by the principles that Pulitzer set forth in his will. In addition to fourteen award categories in journalism, various awards are given for books, drama, and music.

See also: Bly, Nellie; Hearst, William Randolph; Journalism, History of; Newspaper Industry, History of.

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CHARLES F. AUST

QUALITY OF AN ORGANIZATION

See: Organizational Quality and Performance Excellence

RADIO BROADCASTING

The radio broadcasting industry is the oldest form of electronic communication. At the beginning of the twentieth century, radio was purely an experimental medium, as innovators struggled with ways to transmit Morse code via the new wireless technology. Over time, the transmission of dots and dashes would give way to the broadcasting of voice and music. By the conclusion of the twentieth century, radio had developed into a multibillion-dollar entertainment and information industry used by individuals around the globe.

Radio is a business, linking advertisers with audiences attracted to a variety of programming formats. Radio has the ability to attract different demographic groups with its programming, making it an ideal medium for advertisers to target different messages. Programming is dominated by music on the FM (frequency modulation) band and by talk and information on the AM (amplitude modulation) band.

The radio industry consists of two distinct markets: the local market and the national market. Most listeners identify with the local market for radio programming, which consists of those stations licensed to a specific geographical area. The local market contains a mix of both AM and FM stations. Larger markets, such as New York, Los Angeles, and Chicago, each have more than sixty to seventy licensed stations. Smaller markets may only have three or four stations.

There are more than 10,300 commercial radio stations in operation in the United States. In addition, there are approximately 1,900 noncom-

mercial radio stations, consisting of stations licensed to schools, colleges and universities, and religious/nonprofit organizations. Noncommercial stations operate on the FM band, assigned to the range of frequencies between 88.1 to 91.9 megahertz.

Stations in local markets attract different listeners by offering a variety of different music formats. There are numerous variations of radio formats across the country. The most popular formats are country, adult contemporary, news-talk-sports, religious, oldies, classic rock, and Spanish.

At the national level, radio networks provide syndicated programming to local stations in the form of talk shows (e.g., Rush Limbaugh, Art Bell) and news and specials (e.g., concerts, interview programs). Programming is also available twentyfour hours a day in a variety of satellite-delivered formats, each targeting different demographic groups with various types of music. There are also regional networks in radio, most of which are geared to the broadcasting of collegiate and professional sporting events.

Major Companies in the Radio Industry

In terms of ownership, the radio industry is best characterized as a two-tiered structure. On one tier are several large conglomerates that together own hundreds of radio stations. The major radio owners include Clear Channel Communications, CBS/Infinity, Entercom Communications, Cox, and ABC Radio (Disney). The other tier consists of numerous owners that perhaps



While many people think of radio broadcasting in terms of commercial stations, licenses are also granted for school stations, such as this high school station operated by students in Newport, Washington. (Bob Rowan; Progressive Image/Corbis)

own a single AM–FM combination or a small number of stations.

Prior to the passage of the Telecommunications Act of 1996, groups and individuals were limited to a certain number of stations that they could own in each class of stations. The 1996 act, however, removed all national ownership limits, instead placing caps on the number of stations that a single owner could control in a local market, depending on the total number of stations in the market. For example, in the largest radio markets (those with forty-five or more signals), the maximum number of stations that a single owner could own would be eight, with no more than five stations in a single class (i.e., AM or FM). Freed from ownership restrictions, the radio industry experienced rapid consolidation, especially in the financially lucrative major markets.

By 1998, more than seventy-five different companies had merged into one of four major group owners: AMFM Inc. (formerly Chancellor Media), CBS/Infinity, Clear Channel, and Jacor Communications. Clear Channel acquired both Jacor and AMFM in separate transactions in 1999, becoming the largest radio owner in the world with more than eight hundred stations in its portfolio. Industry consolidation, involving stations in medium and smaller markets, is expected to continue, but at a slower pace.

The Products of Radio

The radio industry is a dual-product industry, in that it offers distinct products to consumers in the form of entertainment and information, and access to audiences for radio advertisers. In terms of targeting consumers, stations provide entertainment and information in the form of different music formats that appeal to different demographic groups. Stations deliver music that is provided by the recording industry and geared to the format of the station. The recording industry uses the exposure provided by radio to help sell recordings along with music videos, publications, and other promotional vehicles (such as concert tours). In terms of information, the radio industry offers talk, news, sports, and feature programming that is produced by a number of different sources. Information may be local in nature, such as news, sports, and features, or may be syndicated in the form of national news and talk programs. Talk programming became increasingly popular during the 1990s on AM stations, helping to rejuvenate the medium that, over the years, had lost audience share to FM stations. Sports-talk stations began to flourish as well, especially in large markets that were home to a mix of professional and collegiate teams.

Advertisers purchase radio time in order to reach audiences in cars, at home, or at work or school. Radio is an efficient medium for many advertisers, complementing the use of print and television to reach target audiences. Radio advertising is broken into three categories: local, national spot, and network. Local advertising is the most important area for the radio industry, reflecting the fact that radio is a locally driven medium. National spot refers to national advertising by major advertisers who buy radio time on stations in specific markets. National spot is primarily found in the top twenty-five radio markets. Network advertising, which consists of advertising that is sold for syndicated and network programs, represents the smallest category of advertising revenue.

Radio advertising experienced strong growth during the 1990s. According to the Radio Advertising Bureau, total radio advertising revenues totaled \$8.8 billion in 1990, but by 1998, revenue topped \$15 billion for the first time. From 1990 to 1998, the radio industry generated approximately 79 percent of its advertising revenue at the local level, with national spot advertising drawing about 15 percent, and network advertising drawing between 5 percent and 6 percent.

When it comes to audiences and advertisers, radio faces competition from a number of other media and an array of new audio-related technologies (e.g., Internet radio and digital satellite radio services). Economically, the radio industry has never been stronger, but the competitive challenges that face the industry are great. Aggressive marketing and branding remains the best strategy for radio to maintain its competitive edge and awareness among consumers and advertisers.

Industry Evolution

The radio industry showed remarkable resiliency during its first century of existence. As mentioned above, radio evolved as a result of a series of contributions by many different innovators, which led from being able to transmit dots and dashes to being able to broadcast voices and music. By the 1920s, radio had become an industry that was designed not to deliver programming but to sell radio receivers. Over time, radio became an important companion for Americans, a trusted friend during the Great Depression and World War II.

Radio historians refer to the 1930s and 1940s as the "golden age" of radio—a period when the popularity of the medium flourished. In a pre-television world, audiences tuned to radio for the latest news and entertainment programming, especially during the evening or prime-time hours. Amos and Andy, Bob Hope, and Bing Crosby were just as popular with listeners as were Edward R. Murrow, H. V. Kaltenborn, and President Franklin D. Roosevelt (with his fireside chats). Radio networks (e.g., NBC Red, NBC Blue, CBS, Mutual) distributed content on a national basis to affiliate stations around the country. Advertisers used radio to reach mass audiences with a single message, selling all types of products.

The 1950s forever changed the radio industry, as the advent of television in post-war America led to radio's loss of both entertainers and advertisers to the new visual medium. Networks de-emphasized their commitment to radio. Radio recast itself as a purely local medium, emphasizing different music formats to attract listeners. The FM medium began to emerge as an alternative to standard or AM broadcasting. FM provided a clearer signal, and during the 1960s, it would add the ability to transmit in stereo. FM growth was also fueled by the introduction of AM–FM radios in new automobiles in the mid-1960s.

The year 1973 marked the first time that more listeners tuned in to FM stations than to AM stations. FM radio became more suited for different types of music formats thanks to its higher fidelity and superior sound quality. As a result, AM radio began to lose audiences in significant numbers. An effort to revitalize AM radio with the introduction of AM stereo during the 1980s was a disaster. The Federal Communications Commission (FCC) refused to set a technical standard for AM stereo, which resulted in confusion among broadcasters and the public. Less than 10 percent of all AM stations adopted AM stereo.

During the 1980s, program consultants took on an increasing role in advising radio station owners how to program their stations. Formula radio was introduced and was quickly copied by other stations. "Formula radio" was a term to describe programming clusters of music separated by sets of commercials, leading to the perception of more music with fewer interruptions. Talk and information programming experienced a rebirth on AM stations, and shock radio, with personalities such as Don Imus, Howard Stern, and the Greaseman, both repelled and attracted audiences.

Most of the changes that the radio industry experienced during the 1990s involved revisions of ownership regulations. When the American economy suffered a recession in 1991-1992, many local radio stations experienced heavy losses as local advertising faced major cuts in their budgets. In 1991, three out of every four stations lost money. The FCC relaxed the duopoly rule in 1992, which previously limited ownership to only one AM-FM combination in a market. But it was the Telecommunications Act of 1996 that revolutionized radio ownership, eliminating all ownership restrictions at the national level and leading to the creation of several radio conglomerates. The strong revenue potential of radio, and the opportunity to cluster operations in many markets, led to increasing industry consolidation by the end of the 1990s.

Radio in the Twenty-First Century

Continuing evolution is expected to occur in the radio industry. A number of new technological innovations have the potential to affect the radio industry in both positive and negative ways. Digital audio radio services (DARS), such as Sirius and XM Satellite Radio, will offer high-quality subscription radio services to consumers. Because these services are subscription-based, their effect on terrestrial radio may be minimal in economic terms. However, they may help to siphon away radio audiences, especially among commuters using automobiles and public transportation. Digital audio broadcasting is now technically possible, but the expense to convert analog transmitters and millions of radio receivers to digital technology means digital audio will continue to be limited to technologies outside of radio.

The Internet has the potential to affect music listening habits. Hundreds of Internet-only radio stations have gone online, providing an alternative method of listening to music and information beyond a radio receiver. Internet-only stations face significant challenges in their ability to attract advertisers, but the costs to operate an Internetonly station are very modest compared to a traditional terrestrial station.

Another innovation in Internet-related broadcasting is the development of "personal" radio. The personal radio service uses digital music stored on a server. In a personal radio system, the user establishes a listener profile through an existing service. The user enters his or her music preferences, selecting a genre of music and, if preferred, individual artists. By adding a zip code, the listener can also access local weather. Eventually, access to other forms of local news and information will be possible.

Consumers can also build their own music collections by downloading MP3 audio files from the Internet and then record those files onto blank CD-ROM media. There are many issues, involving copyright and intellectual property, that are associated with MP3 technology. Recording companies are most affected by MP3, but radio stations could be affected as well if the recording industry adopts the Internet as the primary means to distribute music to consumers, thus bypassing radio. Furthermore, audience use of MP3 may mean less time spent with radio, which, over time, could have a cumulative effect on the ability of the industry to attract advertising.

The FCC established a new low-power FM (LPFM) service on January 20, 2000, to create new broadcasting opportunities for locally based organizations to serve their communities. LPFM stations will serve an area with a radius of approximately 3.5 miles, will have a maximum power of 100 watts, and will have noncommercial status. The commission began accepting applications for the new service in January 2001.

Conclusion

Although competition from new technologies is growing, traditional radio in the form of AM and FM broadcasting remains in a very strong economic condition. Furthermore, radio audiences remained stable throughout the 1990s, which in turn helped to increase radio advertising revenues. Consolidation has helped to make radio a more competitive medium for local advertising dollars, outpacing both television and newspapers.

See also: Broadcasting, Government Regulation of; Federal Communications Commission; Internet and the World Wide Web; Radio Broadcasting, Careers in; Radio Broadcasting, History of; Radio Broadcasting, Station Programming and; Radio Broadcasting, Technology of; Recording Industry; Telecommunications Act of 1996.

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RADIO BROADCASTING, CAREERS IN

Whether or not a person can find employment in the radio broadcasting industry depends on how well that individual's skills, professional background, and person interests fit with the requirements for on-air or off-air positions. When filling the high-profile on-air positions, employers are generally looking for individuals who have skills in vocal performance, a background in announcing or reporting, or an expertise with specific subjects such as sports or journalism. When filling the off-air positions, employers are looking for people who have sales, fundraising, organiza-



On-air personalities often answer telephone calls from listeners and respond to them as part of a live broadcast, as this senior reporter is doing for a Shanghai radio station. (AFP/Corbis)

tional, and management skills or are adept at working with engineering, electronics, and computer components. The opportunities for employment obviously depend on the size of the station. A small local radio station may employ a staff of fewer than ten people. A large regional station, however, will employ a correspondingly larger staff, which provides a broader range of possible careers.

On-Air Positions

The main on-air talent of a music-oriented station usually consists of a morning team of two announcers. One may be responsible for road traffic or news updates, while the other provides the flow of the program. Larger stations may have two people working together to provide the flow rather than just leaving it to one person. In any case, these prime positions are usually filled by the most appealing and experienced on-air personalities at the station. They have generally honed their skills by starting in the most basic entry-level jobs. Entry-level announcers are often assigned the overnight and weekend time slots at smaller professional or even college stations. This provides practice in on-air delivery and in handling the technical aspects of running a studio. When a person becomes proficient at the entrylevel job, he or she may become the midday or evening disc jockey (deejay), eventually moving to the more prestigious morning or afternoon time slots, when audiences are large.

Other on-air positions include sports announcer, news reporter, or talk-show host. Entry into these jobs may require additional experience outside of radio broadcasting. For example, many sports announcers have had successful, high-level athletic careers (either amateur or professional). Others have worked their way up from announcing high school games to college games (with a very small number progressing on to the professional-level sports events). Many news reporters have a background in journalism and have already worked for newspapers before changing over to radio broadcasting. Others move directly into a news reporting position with a commercial radio station after serving an internship or gaining experience at a college radio station. Reporters at all-news stations generally specialize in weather, sports, business, or consumer affairs. Talk-show hosts, who often get their start as successful authors, politicians, doctors, clergy, or actors, require several assistants. Some assistants help to produce the show. Others screen calls or operate the control board while the host talks and interviews guests.

Off-Air Positions

The top off-air positions in radio broadcasting are station manager and general manager. These two positions, which involve overseeing the entire operation at a station or group of stations, are most likely to be held by people who have previously served as a sales manager. Therefore, someone who wants ultimately to become a station manager or a general manger should probably look for an entry-level position in the sales department. To be on a radio sales staff often requires some sales experience, although the experience does not necessarily have to be related to media industries. The most successful sales people will often be given the opportunity to move up into managerial roles within the sales department. Top stations break the managerial roles into those of local sales manager, who oversees all sales of time for local advertising, and national sales manager, who works with advertising agencies or national advertisers that are interested in buying time. These two managers report to the general sales manager. Some stations have research directors who read and interpret national audience surveys and conduct in-house studies to determine who listens to the station and why.

Managers do not come just from the sales staff; they can also come from the programming side of station operations. Sometimes, an on-air employee lacks the performance appeal that is necessary for him or her to reach the top and become a morning host. If, however, this person has strong organizational skills, he or she might decide to make the transition to off-air personnel and take on a position such as music director, which is responsible for choosing the songs and helping to design the rotation of the music that the station uses. A person in this position needs to understand research methods such as auditorium testing of songs to determine what the audience will like. The music director reports to the program director, who is responsible for overseeing the total station sound. In connection with this, the program director should keep up with all industry trends and monitor the programming at competing stations.

In addition to the music director, the program director must work closely with the news director, the promotions director, the production manager, and the traffic manager. The news director, who oversees all news operations, is often someone who was a highly motivated reporter but decided to make the change to the off-air side of the business. A promotions director heads up the a station's publicity campaigns, which can include giveaways, live remote broadcasts, station promos (i.e., promotional recordings), and general hype. This person must be extremely creative and have strong skills in the area of public relations. The production manager is in charge of scheduling, facilitating, and assisting in studio production work for commercials, promos, and programs at the station. The traffic manager schedules all commercial and promotional segments, as well as any program segments that occur during a given period. This person sometimes has a traffic assistant, who may also be assisting with the production and news operations.

On the technical side, engineers are important for installing and maintaining the equipment within the studio, building towers, hooking up transmitters to power the signal, and establishing satellite receivers and uplinks. The chief engineer may be a one-man department, or there may be an engineering staff, including a maintenance engineer who is responsible for general upkeep. Contract engineers may substitute for or supplement the chief engineer. The contract engineer usually serves several small stations that cannot afford a full-time employee in this area. A contract engineer may also be a person who provides a very specialized skill, such as transmitter tower construction or maintenance, to a large number of stations. The newest position in radio is probably the technical job of webmaster. The webmaster's duties may be more in line with promotions, sales, or production functions, depending on the station. Often, the webmaster must work with all three areas.

Other Industry-Related Opportunities

It is possible to have a career that is part of the radio broadcasting industry without being employed by a radio station. For example, there are companies that produce syndicated programs and newscasts that are sold to stations, while others companies provide stations with professionalquality recordings of station identifiers and teasers. These companies have many of the same personnel requirements that the stations have. The difference is that the final product is being sold to someone else to broadcast rather than being broadcast by the people who produced it.

Other opportunities for employment exist with companies that sell equipment, supplies, promotional materials, and the like that have been created specifically for radio stations. These companies are looking for sales professionals, engineers, and people who have promotion savvy.

Communication lawyers interpret government and judicial decisions and file complicated legal documents or defend the license of a station. A few law firms specialize in this area. Small stations would be more likely to contact these firms on a case-by-case basis. Larger station groups might have their own legal department to deal with these types of issues.

Finally, some Internet websites provide webradio services. These operations may be run similar to an on-air station, but the signals are disseminated through streaming audio via computer. Thus, computer technicians are required in addition to many of the same personnel that are required for the operation of a standard radio station. See also: Radio Broadcasting; Radio Broadcasting, History of; Radio Broadcasting, Station Programming and; Radio Broadcasting, Technology of.

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STEPHEN D. PERRY

RADIO BROADCASTING, HISTORY OF

No single person in the colorful history of radio can be credited with inventing radio. Radio's "inventors" almost all refined an idea put forth by someone else. Wireless communication became a theoretical proposition in 1864 when Scottish mathematician and physicist James Clerk Maxwell predicted the existence of invisible electromagnetic waves. More than twenty years later, German physicist Heinrich Hertz conducted experiments in 1887 to prove that Maxwell's theories were correct. The fundamental unit of electromagnetic wave frequency, the hertz (Hz), is named for him, though Hertz never promoted wireless communications.

Early Development of Technology

In the 1890s, four inventors simultaneously worked on wireless transmission and detection. French physicist Edouard Branly invented a signal detector called a "coherer" that consisted of a glass tube filled with metal filings that reacted when a signal was detected. English physicist Oliver Lodge worked on the principle of resonance tuning, which allowed the transmitter and receiver to operate on the same frequency. Russian Alexander Popoff developed a better coherer and a vertical-receiving antenna.

The fourth and best-known inventor-innovator was the twenty-year-old Italian Guglielmo Marconi, who began wireless experiments in 1894.



Lee De Forest holds one of his Audion vacuum tubes, which enabled live radio broadcasts. (Bettmann/Corbis)

Within two years, Marconi created a wireless system that was capable of sending and detecting a signal. When the Italian government showed no interest in wireless communication, Marconi's family contacts enabled him to meet investors in England. He founded British Marconi in 1897 and began marketing radio as a telegraph that required no wires to send Morse code dots and dashes. British Marconi and the U.S. subsidiary, American Marconi, dominated wireless communication for ship-to-shore and transatlantic communications until after World War I.

Canadian Reginald Fessenden created a wireless system that would transmit speech. On Christmas Eve in 1906, Fessenden broadcast programming from studios at Brant Rock, Massachusetts. An audience consisting of startled radio operators on ships at sea, newspaper reporters who had been alerted to his publicity-generating broadcast, and a small number of home experimenters heard Fessenden speak and play the violin.

After several failures and claims that he was a fraud, American Lee De Forest's radio company aired publicity-generating broadcasts, including one from the Eiffel Tower in Paris. In 1906, De Forest also took credit for creating one of the most important wireless components, the Audion—a triode vacuum tube that amplified signals and improved reception. Previously, receivers had difficulty detecting weak radio signals. Though De Forest held the patent for the Audion, historians contend that he did not fully understand what he had invented or how it worked.

Beginning in 1912, Edwin Armstrong studied the workings of the Audion and discovered the principle of regeneration. Regeneration enhanced the quality of signal amplification and produced an oscillating signal, or carrier wave, which became the founding principle behind modern radio transmitters.

Greed, the quest for glory, and, perhaps, simply the combination of many individuals focusing simultaneously on the same topic led to a series of patent lawsuits. The U.S. government halted these disputes after the United States entered World War I in 1917. During the war, as a security measure, the U.S. Navy took over the operation of all radio stations, even those owned by American Marconi, and closed most amateur and experimental stations. After the war. American Marconi attempted to return to business as usual, but opposition to a foreign company having a monopoly over wireless communications in the United States eventually led General Electric (GE) to buy a controlling interest in American Marconi in 1919. Along with co-owners Westinghouse and American Telephone & Telegraph (AT&T), GE transferred American Marconi's assets to the Radio Corporation of America (RCA), which would manufacture radio receiving sets. Probably the biggest single breakthrough in receiver design came from Armstrong, who developed a tuner with better amplification and sound quality. The superheterodyne receiver was licensed in 1920 by RCA and soon went into production.

The First Wireless Regulations

After wireless was credited with averting several maritime disasters, the U.S. Congress passed the Wireless Ship Act of 1910 to regulate broadcasting. The act required ocean-going vessels with fifty or more passengers and crewmembers to carry a wireless system operated by a skilled person.

The legislation was put to the test when the *Titanic* sank on April 14, 1912, during its maiden voyage. More than fifteen hundred passengers and crew died. The ship *Carpathia* responded to distress calls from the *Titanic* and ultimately saved approximately seven hundred people. A closer ship, the *California*, did not respond because that

ship's sole radio operator, after many hours on duty, was asleep when the distress messages were being sent by the radio operator on the *Titanic*. The freighter *Lena* was closer but, because of its small crew and no regular passengers, the ship was not required to be equipped with a wireless.

The sinking of the *Titanic* led to newspaper and magazine editorials that called for federal government control over wireless operation and practices. Wireless regulation was viewed as a public good, equal in importance to previous social and antitrust regulation. Within four months, broadcast transmission in the United States was a privilege assigned by the U.S. government. The Radio Act of 1912 required all operators to be licensed, called for all stations to adhere to frequency allocations, made distress calls priority communications, and gave the U.S. Secretary of Commerce power to issue radio licenses and make other necessary radio regulations.

Public Embrace of Radio

The name for wireless evolved along with the technology. Known first as the "wireless telegraph," it transitioned to "radiotelegraphy" and "radiotelephony" (transmission of the human voice). The term was shortened to "radio" around 1912. The word "broadcast" was borrowed from agriculture and referred to the practice of planting seeds by scattering them across a field rather than in straight rows.

Until the invention of radio, it was impossible to transmit entertainment or information simultaneously to thousands of receivers. For the listener in 1920, 1930, or 1940, radio was the only way to learn about distant places and events. Radio programming was first developed as a means of encouraging people to buy receiving equipment. Radio networks were created to supply simultaneous, live, national programming to affiliate stations that encouraged receiver sales and then advertising sales.

Just as the public rushed to use the Internet in the 1990s, the public embraced radio in the 1920s. Middle-class Americans, intrigued with scientific applications and the potential for information and entertainment, purchased radio receiving sets at an astonishing rate. Sales of radio equipment totaled \$60 million in 1922, \$136 million in 1923, and \$358 million in 1924. Individuals and families could enjoy the newly available information and entertainment from the comfort and privacy of their homes, where receiver sets fit in nicely because manufacturers built them to look like elegant furniture.

Regulation of Radio

Station and operator licensing was intended to provide monitored growth of radio, but the U.S. government failed to realize how quickly radio would grow. By the end of 1922, 690 licenses had been assigned to stations airing entertainment and information. These stations occupied one of two frequencies, 360 meters (833 kHz) or 400 meters (750 kHz). Because multiple stations were broadcasting on the same frequency, interference occurred and caused many station signals to become inaudible.

U.S. Secretary of Commerce Herbert Hoover began to establish a limited number of "superpower" radio stations and to limit the hours of operation for other stations. These actions were supported by the radio manufacturers, who believed that the entire country could be covered by a handful of high-power stations. Their plan was to encourage receiver sales but to limit operational and programming expenses.

Hoover's powers to regulate radio were challenged in 1925 by Zenith Radio Corporation, the owner of a station in Chicago that had been licensed to broadcast for only two hours a week. The related federal district court ruling denied the U.S. Secretary of Commerce the power to regulate radio.

The U.S. Congress passed the Radio Act of 1927 (to create new federal authority to regulate broadcasting) and established the Federal Radio Commission (FRC). The plan for the FRC, which had five commissioners to sort out the mess of the airwaves, was to reduce the number of radio stations and to favor the creation of high-power stations. The act revoked the licenses of all radio stations. including commercial stations, transoceanic stations, coastal stations, experimental stations, educational, religious, and training stations, and approximately 14,885 amateur stations-more than 18,000 transmitters in all-and started the licensing process anew.

Development of Radio Networks

AT&T started station WEAF in New York City in 1922 as part of a national "toll" broadcasting



The November 15, 1926, premiere broadcast of the National Broadcasting Company (NBC) featured a performance by the Million Dollar Quartet, which included (left to right) Lew Fields, Joe Weber, Frank Goldman, and Cesare Sodero. (Bettmann/Corbis)

service. AT&T was the first station owner to recognize the potential of advertising sales to pay for the operation of radio. The first reported radio advertisement, for an apartment complex in New York, aired on WEAF in 1922. It cost \$100.

Antitrust concerns led AT&T to sell its radio stations in 1926 to RCA, which used the stations to form the National Broadcasting Company (NBC). The premiere broadcast of the network took place on November 15, 1926, when NBC aired a four-hour program from the Waldorf-Astoria Hotel in New York. The broadcast featured singers, orchestras, and comedy teams. It also included remote broadcasts from Chicago and Kansas City. As many as twelve million people were estimated to have heard the broadcast. In less than two months, NBC was operating two networks, the Red Network and the Blue Network.

The Columbia Phonograph Broadcasting System (named for partner Columbia Phonograph Record Company) was established in 1927 and later became the Columbia Broadcasting System (CBS). The Congress Cigar Company bought a controlling interest to promote its cigars. William Paley, son of the firm's founder, took over the network's operation and headed the network for more than half a century. The Mutual Broadcasting System (MBS) began operation in 1934. The four founding stations— WGN in Chicago, WOR in New York, WLW in Cincinnati, and WXYZ in Detroit—remain on the air. The Mutual Broadcasting System ceased operation as an entity in 1999.

Much of the early network and local programming was musical. Concerts featured live and recorded classical compositions, popular dance music, jazz, and country. Radio drama developed as the complement to the musical programming. Network programming ranged from fortunetellers to gory thrillers. Commercials became more numerous and insistent in their pitch to listeners. Advertisers saw radio as an inexpensive and effective way to reach a national audience.

Golden Age of Radio Programming

Congress passed the Communications Act of 1934 to create the Federal Communications Commission (FCC) to supervise wired and wireless communication and to replace the FRC. By 1935, the U.S. Department of Commerce estimated that radio broadcasts served 18.5 million families, or more than 50 million people. Approximately 60 percent of all homes in the United States had radios. The radio sets in operation in the United States comprised 43.2 percent of the world total. For the public, radio offered comforting entertainment in the aftermath of the stock market crash of 1929. Radio receiver sets were not cheap, but once purchased, they supplied free programming. The only additional cost for the owner of a radio was the time spent listening to commercials.

Serial melodramas, called "soap operas" because they were sponsored by soap companies, ran during the daytime and drew a large audience of housewives. Radio news programming in 1933 carried four speeches by newly elected President Franklin D. Roosevelt. Called "fireside chats" because of Roosevelt's informal and relaxed tone as well as the perception that he was sharing his thoughts with the public, Roosevelt's addresses created good will among the public and enabled many of his New Deal reforms to be quickly passed by the U.S. Congress.

Newspaper owners briefly tried to limit radio networks to only two five-minute newscasts to protect newspaper circulation. Eventually, newspaper owners recognized the value of owning radio stations and the stranglehold on radio news ended. During World War II, CBS reporter Edward R. Murrow reported live from London during actual bombings by the Nazis. Battlefield reports brought home sounds of war that listeners had never before heard.

The U.S. government established the Voice of America (VOA) through the Office of War Information to counter international radio broadcasts coming from Germany, Japan, and Italy. By congressional mandate, all VOA programming was transmitted by shortwave for reception by listeners outside of the United States.

The Invention of FM Radio

The prospect of creating an additional radio service, using frequency modulation (FM), was barely an issue until the late 1930s. Prior to that point, all radio transmissions had been based on amplitude modulation (AM). FM service might have died for lack of support but for the dogged determination of Armstrong, who began work to eliminate static in 1923. A decade later, Armstrong received five patents for frequency modulation. He demonstrated his invention to David Sarnoff, who was at that point president of both RCA and NBC. While Sarnoff recognized the superior sound quality of an FM broadcast, he was unwilling to back the system because RCA was developing television. FM was seen as a competitor to AM radio; it would divert scientific and government attention from television.

Armstrong did not give up. He built an experimental FM station in Alpine, New Jersey, in 1939, supplied the financing to have FM receivers built, and petitioned the FCC to create FM stations. Although the service was authorized in 1940, fewer than 400,000 receivers were in the hands of the public by the start of World War II. In contrast, twenty-nine million households could listen to AM radio at that point. After World War II, FM service might have grown had the FCC not changed the assigned frequency range. When FM was moved from 42–50 MHz to 88–108 MHz, all of the receivers that had been produced before the frequency change suddenly became obsolete.

Local Radio Develops

More than fifty million AM receivers were manufactured between 1946 and 1948. As radio set prices dropped, the multiset household developed. Radios spread from the living room to the kitchen and bedroom. The growth of television drew programming and audiences from radio, but radio survived by adopting the all-music format and shifting to a heavier emphasis on daytime listening. Radio became a local advertising medium.

One of the most popular all-music formats used by local radio stations in the 1950s was the Top 40 format. This format resulted from the independent work of four AM station owners, Todd Storz, Gordon McLendon, Gerald Bartell, and Harold Krelstein. In an attempt to develop a new approach to station programming, these four men all made substantial contributions to the development of the Top 40 format, which succeeded in creating a new identity for radio. One of the best explanations for a radio format built around forty songs came from Storz, who said he had observed people playing the same few songs over and over on the jukebox and concluded that listeners most wanted to hear hit songs over and over.

The Decline of AM Radio and the Rise of FM Radio

The Top 40 format helped reposition radio, but it also created a group of similar-sounding stations. AM stations aired similar music and jingles, played loud and lengthy sets of commercials, and generally had poor fidelity (i.e., sound quality). Attention thus shifted to FM radio during the 1960s. Besides the obvious availability of FM channels, operators began to recognize other FM benefits. FM provided day and night service, with uniform power levels and coverage areas. FM channel width meant superior audio, including stereo, and less interference.

If the Top 40 AM formula suggested playing no song longer than three minutes, the FM approach was to play an album cut that was ten-minutes long. Rock music, growing from the "flower children" and "make love not war" anti-Vietnam movements, provided much of the content for FM station programming. The music industry also encouraged the growth of FM radio. The playlists of Top 40 AM stations were tightly controlled, with few opportunities for new songs or new groups to gain on-air exposure. Many FM stations would play virtually anything, so record companies used FM radio to introduce new artists and styles of music. By 1971, nearly half of all radios sold included FM tuners. National FM listener share passed the AM listener share in the fall of 1978; 50.698 percent of the listeners were tuning to FM stations. FM radio subsequently became the *de facto* standard for most music-radio listeners, which caused many AM stations to shift to talk-radio formats in the 1980s.

In 1985, the FCC increased the limit on how many stations a person or company could own from seven stations to twelve stations. This number was increased to eighteen in 1992 and twenty in 1994. With the passage of the Telecommunications Act of 1996, broadcasters were allowed to own up to eight commercial stations in large markets and as many stations nationwide as they are able to purchase. As a result of these changes, many owners of smaller stations have sold their properties to corporate groups, who have built successful station groups that dominate not only station listening but also radio advertising sales in their markets.

Radio in 2000 and Beyond

By the year 2000, approximately 85 percent of all radio listeners were tuning to FM stations. The question, however, now may be whether AM radio and possibly FM radio are simply transitional delivery technologies. Already, broadcasters are investigating (and investing in) digital terrestrial broadcasting that could eventually replace the traditional AM and FM stations. At the same time, companies are streaming audio via the Internet and offering satellite-delivered audio services.

See also: Armstrong, Edwin Howard; Broadcasting, Government Regulation of; Communications Act of 1934; Federal Communications Commission; Marconi, Guglielmo; Morse, Samuel F. B.; Murrow, Edward R.; Paley, William S.; Radio Broadcasting; Radio Broadcasting, Careers in; Radio Broadcasting, Station Programming and; Radio Broadcasting, Technology of; Sarnoff, David; Telecommunications Act of 1996; Television, History of.

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Greg Pitts

RADIO BROADCASTING, PUBLIC

See: Public Broadcasting; Public Service Media

RADIO BROADCASTING, REGULATION OF

See: Broadcasting, Government Regulation of; Broadcasting, Self-Regulation of

RADIO BROADCASTING, STATION PROGRAMMING AND

Susan Eastman and her colleagues (1997) state very clearly that the business of broadcasting is "the business of creating audiences that advertisers want to reach" (p. 8). This focus originated in the 1920s when WEAF, a radio station owned by the American Telephone and Telegraph Company (AT&T), began "toll broadcasting" (i.e., the exchange of money for airtime). This led to sponsorships of blocks of programs, such as the "Palmolive Hour" and the "Mercury Theater." It was not long before sponsorships progressed to shorter, more frequent announcements.

Radio advertising became even more attractive with the rise of networks. AT&T initiated this trend by linking its stations by using its existing telephone infrastructure. The telephone company soon left the broadcasting industry, selling its holdings to the Radio Corporation of America (RCA). As a result, RCA created a new company, the National Broadcasting Company (NBC), which operated radio stations under a "Blue" network that included former RCA, Westinghouse, and General Electric holdings and a "Red" network that included mostly former AT&T stations. These networks increased the audience for the network programming and thereby increased the advertising revenue. The "golden age" of radio, from around 1930 to 1948, saw the culmination of David Sarnoff's dream of radio being the center of entertainment in American households. Programming of this period included music, drama, and live variety. In addition, while advertisers were spending about \$20 million on radio advertising by 1929, the figure had exploded to around \$500 million by 1948. However, a new competitor was looming: television. The television industry used radio as a model for its programming and, as a result, many of radio's finest artists made the move to the new medium. Radio had to change in order to attract salable audiences for advertisers. In doing so, its programming went through a significant evolution.

Station Formats

According to Joseph Dominick and his colleagues (2000), radio advertising revenue dropped 58 percent between 1952 and 1958. In addition, the networks provided much less programming to local affiliates because of the loss of popular talent. As it turned out, radio was about to advance not on the backs of a national network but rather from creative ideas on the local level.

Top 40 Radio

Todd Storz, a radio station owner in Omaha, Nebraska, was in a bar one night when he noticed that people loved hearing the same hit songs over and over again. Storz decided to apply this strategy to radio programming, and the result was Top 40 radio. Another station owner, Gordon McLendon of Dallas, Texas, took Top 40 and added the promotion of local on-air personalities called disc jockeys. This programming transition was also very timely. World War II had been over for a few years, and the United States was entering a period of economic prosperity. These economic freedoms trickled down to young people who had money to spend and were trying to distinguish themselves from their parent's generation. Listening to the newest hits and colorful disc jockeys of Top 40 radio gave this growing population a common rallying point. The Top 40 format was also very compatible with the rise of rock-and-roll music. Many of the early stars of rock (e.g., Elvis Presley, Jerry Lee Lewis, Little Richard) portrayed a rebellious image that teenagers admired. In addition, Top 40 helped to improve the relationship between the radio industry and the recording industry. The music industry found that the more the hits were played by radio stations, the more the records sold at stores.

As the number of radio stations grew in the mid-1950s, station owners were looking for other music formats that would target attractive audience groups. Middle-of-the-road, country and western, beautiful music, all-jazz, and album-oriented rock formats all grew out of this movement toward specialization. A programmer was also able to make changes to the station's sound as a response to the uniqueness of its market. This had not been possible when programming was fed via a national network.

FM Radio

A technological innovation also helped the development of music formats. From the early days, a radio station's signal was transmitted through amplitude modulation (AM). In simple terms, this process involves the transmission of radio information by the manipulation of the height of the electromagnetic waves. While this method served (and continues to serve) the industry well, it was not technically suited for the transmission of high-fidelity music. In 1933, Edwin Armstrong publicly demonstrated frequency modulation (FM), a mode of delivery that manipulated the distance between the electromagnetic waves. The technical differences resulted in a transmission system that had two key advantages over the existing AM method: an amazing reduction in static and the ability to reproduce high-quality music.



Howard Stern (center) is a well-known radio talk show host who has bridged the gap between radio and television by providing for a television broadcast of his radio broadcast. (Reuters NewMedia Inc./Corbis)

The advantage of FM was obvious, but the method was not adopted right away. FM broadcasting required a completely new system from transmitter to receiver. This meant that radio station owners would have to invest in expensive new equipment and that the public would have to replace their radios with new models. In the late 1930s, the radio industry was extremely strong, so major industry players, including RCA's Sarnoff, saw no reason to make this technological switch. In addition, RCA was investing at that time in a another developing technology: television.

It was not until the early 1960s that FM stereo broadcasting began to grow. The combination of excellent music reproduction and the proliferation of music formats helped with the expansion. FM received another boost when the Federal Communications Commission (FCC) passed the nonduplication rule. This regulation mandated that AM/FM combination stations must offer separate programming at least half the time. Original programming expanded on the FM stations, and by the late 1970s, listenership of FM stations exceeded that of AM stations. Music formats continue to flourish on FM progress into more even targeted genres (e.g., alternative, adult alternative, rock, active rock, adult contemporary, hot adult contemporary). However, just as the radio industry had adjusted to the introduction of television, AM radio was set to evolve once again.

Talk Radio

Talk radio had not attracted much attention in the early 1980s, but in 1988, when it was learned that Speaker of the House Jim Wright was about to push through a congressional pay raise without a vote, Ralph Nader turned to talk radio. He called *The Jerry Williams Show* in Boston and complained. At the same time, others called numerous talk radio hosts around the country to complain about Wright's action. After broadcasting Wright's fax number over the air, an enormous number of complaints filled his office. Needless to say, Wright's actions were halted, and the nation understood overnight the power of talk radio.

The years that followed marked a dramatic increase in the number of stations with either an all-talk format or a format that combined news and talk. In the early 1980s, there were only around two hundred stations that used these formats, but by 1994, that number had increased to more than eight hundred. This increase was fueled by the powerful personalities of talk radio. As had happened with the disc jockeys in the 1950s, these talk show hosts have become household names. The list includes such notables as Larry King, Howard Stern, Don Imus, Rush Limbaugh, Laura Schlessinger, and Jim Rome. By 1998, news/talk had become the most listened to format, attracting nearly 17 percent of the radio audience. As the popularity of confrontational talk grew on commercial radio, a similar growth was occurring on noncommercial radio.

The Pubic Broadcasting Act of 1967 created the Corporation for Public Broadcasting. This organization was designed to receive funds from the government and distribute it to public radio and television stations, as well as to television's Public Broadcasting Service (PBS) and National Public Radio (NPR). NPR produces much of its own programming, focusing mainly on national news. Jay Kernis, the creator of NPR's popular show All Things Considered, said that public radio should provide programming that "enriches and gives meaning to the human spirit" (Douglas, 1999, p. 286). The numbers speak volumes about the success of this approach. In 1971, 104 stations carried All Things Considered. By the mid-1990s, more than 520 stations carried the program, with a listener base of around 160 million.

The Era of Consolidation

The Telecommunications Act of 1996 loosened the longstanding radio ownership restrictions. After the national ownership cap was eliminated, group consolidation exploded. For example, Jacor Communications owned three radio stations in 1978, but by 1998, they owned more than two hundred. In 1999, Clear Channel Communications acquired both Jacor and AM/FM, Inc., creating a group of 959 stations and making Clear Channel Communications the largest group owner in the radio industry.

This boom in consolidation has received mixed reviews. The major group owners argue that the radio consolidation environment offers many advantages, including financial stability for the industry and improved programming for smaller markets through satellite delivered programs and formats. However, some critics say that consolidation is reducing the variety of voices in the public marketplace of ideas. While the jury is still out in this debate, both sides can offer support for their opinions. For example, the radio industry is on strong financial ground, despite the age of the Internet. Radio stocks saw 100 percent gains after the Telecommunications Act of 1996 was enacted, and radio's advertising revenue continues to grow. From the public advocate side, the FCC adopted rules in January 2000 that created a new low-power FM (LPFM) service for nonprofit organizations, churches, and community groups. By December 2000, the FCC had declared that more than 250 applicants were eligible for this new LPFM license. While technical interference issues remain paramount to broadcasters, the FCC believes that increasing the number of voices on the airwaves is of greater importance.

Contemporary Programming

While radio continues to be community based and primarily supported by local advertising dollars, that does not mean that all of the programming is locally originated. Many stations take advantage of satellite technology to acquire national network programming. Companies such as Premiere, Westwood One, the American Broadcasting Company (ABC), and the Cable News Network (CNN) provide choices for the local programmer that range from regularly scheduled news and high-profile talk shows to complete twenty-four-hour formats. These network programs provide a local station with a cost-effective alternative to the arduous task of recruiting and hiring quality local talent. Group-owned stations are also becoming more efficient with their programming practices by sharing their on-air talent. This practice, known as voice tracking, involves one station in a group programming three or more stations within the same ownership cluster. Highspeed datalines, computer-controlled formats, and satellite technology all help to make this process sound seamless to the local listener. While this activity has certainly improved the bottom-line of radio group owners, some critics argue that voice tracking can never replace the "feel" and "personality" of live local talent.

However, despite the availability of excellent national programming, radio is still a local business. While national personalities such as Tom Joyner and Howard Stern attract a great deal of attention, the vast majority of morning shows around the country are hosted by local talent. Music programming is shaped by the idiosyncrasies of the local market and approximately 75 percent of total radio revenue comes from local advertising. In order to judge how they are performing in the local market, most radio stations depend on Arbitron, a national company.

Ratings

As explained above, broadcasters are in the business of attracting "desirable" audiences to hear the messages that are paid for by advertisers. It should come as no surprise that advertisers initiated the measurement of the radio audiences. It was a logical step in the sponsorship process; advertisers wanted evidence that their investment in radio advertising was reaching a significant audience. Archibald Crossley and his Crossley Inc. began an audience data service in 1930. The first competition for Crossley's company did not appear until 1934, when Claude Hooper and Montgomery Clark formed the firm of Clark-Hooper. Since that time, other companies have attempted a national radio service, including A. C. Nielsen and Birch Radio. However, Arbitron has emerged as the preeminent supplier of radio audience measurement statistics. Arbitron asks its participants to complete a diary over a seven-day period in order to document their use of radio, both in and out of the home. This data is compiled for subscribing stations (more often in large markets and less often in small markets) and sent to them in a summary report that is often referred to as "The Book." In general, the higher the ratings for a station, the more that station can charge for advertising time. Program directors design their schedules to maximize time that people spend listening, thereby increasing the chances that diary keepers will identify their particular stations during a ratings period. Stations' promotion department also takes advantage of the Arbitron methodology. Stations often run contests during "sweeps" periods in order to keep listeners tuned into their frequency. Call letters, slogans, and onair imaging are all created to enhance a station's top-of-mind-awareness with listeners.

The Future

From a programming perspective, one could argue that radio's content has not changed a great deal from when the first radio broadcast was made. In that original 1906 broadcast, Reginald Fessenden played music on a violin, read passages from the Bible, and wished the listeners a merry Christmas—all of which, with slight stretches of the imagination, could be considered to fall into the music, news, and talk categories. While sweeping content innovations are rare, technological advancements continue to change the industry.

The Internet offers radio a tremendous opportunity and a challenge, both at the same time. Nearly half of all U.S. radio stations have an Internet website, and that figure is expected to grow. A website offers radio stations an additional opportunity to promote sponsors (creating a new revenue stream), receive feedback directly from the listeners, and provide up-to-date information for the local communities. In addition, more than eleven hundred U.S. radio stations are streaming their programming live over the web. While the Internet is growing by leaps and bounds, no one is predicting the death of overthe-air broadcasting. If history is any indicator, rather than disappearing, the radio industry can be expected to evolve while taking advantage of the online marketplace.

Another major advancement is digital radio. Digital audio broadcasting is a digital method of transmitting compact-disc-like quality audio signals to radio receivers, along with new data services such as station, song and artist identification, and news. The in-band, on-channel digital audio broadcasting (IBOC DAB) process accomplishes this goal. Basically, this allows broadcasters to transmit AM and FM analog signals simultaneously with the new digital feed. Just as with the television equivalent, digital radio offers great potential for expanded programming options. However, the established commercial model will most likely determine the direction of programming, which must continue to provide content that will attract a desirable audience for advertisers.

See also: Armstrong, Edwin Howard; Internet and the World Wide Web; Public Broadcasting; Public Service Media; Radio Broadcasting; Radio Broadcasting, History of; Radio Broadcasting, Technology of; Sarnoff, David; Telecommunications Act of 1996; Television Broadcasting, Programming and.

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John W. Owens

RADIO BROADCASTING, TECHNOLOGY OF

Any discussion of the technology of radio broadcasting must, at the outset, acknowledge its rapidly changing nature. The almost exponentially increasing effect of computers is being felt in the domain of radio as it is in most other areas. Although computers have not replaced all of the tools in use in radio broadcasting by any means, they have greatly enhanced the effectiveness of most, if not all, of them.

Microphones

There are a number of tools used to introduce various signals into a broadcast system, and the

microphone remains one of the most basic of these input tools in use in radio. The microphone is an instrument used to transduce, or convert, acoustic energy into electric energy. During this process, sound waves are changed into electricity that can then be sent through wires as variations in voltage. There are three types of microphones that are preferred by professionals: moving coil, ribbon, and condenser. These are also often referred to as dynamic, velocity, and capacitor microphones, respectively. Each produces the waveforms that are required for transmission in a different manner.

The moving-coil, or dynamic, microphone is the most widely used due primarily to its durable and rugged design and good frequency response to voices and most music. In this microphone, a flexible membrane, called the diaphragm, is suspended between two electromagnets and is connected to a conducting coil. When sound waves move the diaphragm, they move the coil through the magnetic field. This results in an electrical pattern in the wire that is analogous to the frequency of the sound wave.

The ribbon, or velocity, microphone replaces the moving voice coil and diaphragm with a thin, corrugated metal ribbon that is connected between two poles of a magnet to generate an electrical signal. The incoming sound vibrates the foil, thereby creating the effect. The long, vertical ribbon design of earlier ribbon microphones produced a very lush sound, especially with the human voice, but it was quite fragile and highly susceptible to wind damage. Newer designs use a smaller ribbon that is placed longitudinally between the pole pieces, making this type of microphone more durable and able to withstand louder sound-pressure levels. This microphone was quite common during the "golden age" of radio and is still frequently used in modern recording studios. The printed-ribbon microphone basically operates like the conventional ribbon microphone, but its more rugged design gives it some of the durability of the moving-coil microphone with the rich sound of the ribbon microphone.

Condenser, or capacitor, microphones operate on a different principle from that of the movingcoil and ribbon types. Condensers transduce energy by means of voltage variations instead of magnetic variations. They use a device that consists of two plates—a fixed backplate separated by a small space from a thin, metalized plastic diaphragm. Acoustic energy in the form of sound waves causes vibrations in the diaphragm, which creates voltage changes, varying the signal. These microphones require a power source, so they are usually equipped with internal batteries or with an outside "phantom" power supply. Advances in microelectronics make it possible to make condenser microphones small enough to clip onto a tie or lapel yet still produce a crisp sound. Because they are considered high-performance instruments, they are now the preferred microphones for news personnel.

Two important aspects of microphone technology are impedance and directional characteristics. Impedance is the electric flow resistance of a microphone, which is a factor in its performance. Lower impedance, or lower resistance to signal flow, usually means less interference from extraneous noise such as hum and static. Therefore, better performance can be expected from a microphone with low impedance. Directional characteristics are related to the fact that microphones are designed to pick up sound in varying ways. Lynne Schafer Gross (1986) identifies four basic pickup patterns: (1) unidirectional, which picks up sound mainly from one side; (2) bidirectional, which picks up sound mainly from two sides; (3) cardioid, which picks up sound in a heart-shaped pattern; and (4) omnidirectional, which picks up sound from all directions. The preference for a particular directional characteristic depends primarily on the use of the microphone. Unidirectional microphones are preferred when only one voice is to be picked up. Newscasters and sportscasters, for example, need background noises to be minimized by the single-direction pickup pattern. Bidirectional microphones, which are important for the production of radio dramas, allow actors to deliver their lines while facing each other. Cardioid microphones provide excellent results when two people are speaking side-byside, such as during a talk show. The omnidirectional microphone is preferable when dealing with a large crowd, such as recording a play with a large cast or recording music that involves a large number of singers or instruments.

Music Sources

The turntable is an input tool that most radio stations no longer use. Those that do still use

turntables mostly use them to access their "oldies" music files. Michael Keith (1990) lists the five primary elements of a turntable: (1) a heavy metal plate with a felt or rubber surface to protect the record and prevent slippage; (2) a power switch to control the motor; (3) a gear shift to act as a speed selector: (4) a drive mechanism that turns the plate; and (5) a tone arm or pickup arm that houses a cartridge and a stylus (i.e., a needle). The stylus picks up mechanical (analog) vibrations from the record grooves that the cartridge, acting as a transducer, then converts into an electrical signal. A phonograph preamplifier amplifies this small signal and then sends it to the console for further processing. Turntables were valuable in both production work and in on-air studios from the earliest days of radio broadcasting.

Compact disc (CD) players entered the radio production studio in the 1980s and quickly started to replace the turntable in many stations. Their almost instantaneous appeal was primarily due to superior sound reproduction. CD players offer far greater dynamic range than standard turntables, as well as a lower signal-to-noise ratio. Since the CD is "read" by a laser beam, physical contact is eliminated and distortion is virtually nonexistent. This superior sound performance derives from digital transduction instead of the analog system that is used for vinyl records; far less signal loss occurs. As a result, by 1987, the sale of CDs eclipsed the sale of records, and by 1996, vinyl records accounted for less than 2 percent of music sales. Both the buying public and the broadcast industry were opting for the better sound of digital. This CD dominance was to be of short duration, however; more changes were already on the way.

Just as the CD basically replaced the turntable in the radio station operation, computers have become the music source of preference for many broadcasters. Some stations transfer their music selections directly from CD to hard drive; others may skip the CD altogether and download directly from the music supplier. Another option for many stations is to eliminate in-house music completely. This may be especially applicable for stations that are part of multiple station operations. Music is received, usually by satellite, from outside sources. On-air personalities work from a list of preselected music that is downloaded before their show. That show may be done live, or the on-air



An employee monitors the control board at the radio station operated on the Hoopa Valley Indian Reservation in Humboldt County, California. (Bob Rowan; Progressive Image/Corbis)

personality might lay "voice tracks" (e.g., prerecorded song introductions and other remarks) between the songs in the computer and be at home asleep when the show is actually aired—and the listener will probably never know. The computer software perfectly times the introductions and segue remarks with the music "intro" and "outro" times to form a smooth, seamless programming flow.

Just as it took a while for CDs to replace records, it will be some time before computers completely replace CD players, especially in smaller stations. Economic factors are the primary reason for this delay; it costs more than many small-market stations can afford to completely make the switch. Still, the superior sound quality of digital reproduction will eventually bring about the change. As Joseph Dominick, Barry Sherman, and Gary Copeland (1996, p. 93) point out, "... unlike an analog signal, a digital wave is virtually constant—it is the identical shape on recording, on transmission, in the amplifier, and out of the speakers." Listener demand for digital quality will force technological change, even in the smaller markets. In the long run, the economy of replacing live on-air personnel with computer automation will also reach smaller stations.

Tape Recorders

Another input tool that is still in use but far less than in previous years is the tape recorder. These devices rearrange iron oxide particles on magnetic tape in order to store sound impulses on the tape for playing back later. Stationary heads over which the tape is run do this particle rearrangement. There are usually three heads placed in order to erase, record, and play back. The three basic types of tape recorder used in broadcasting are open reel (often called reel-toreel), cartridge, and cassette.

One important advantage of the open reel recorder is the accessibility of the tape for editing. Audio editing on this machine usually involves physically cutting the tape and then putting it back together with an adhesive tape. Open reel recorders are available in full-track monophonic (mono), stereo, and multitrack. The four-track is the most common multitrack recorder in radio stations. The advent of digital recording and editing is making the open reel machine only a memory in most radio stations.

Another item that is becoming obsolete at most radio stations is the cartridge machine. At one time, nearly every piece of short production intended for airplay was placed onto cartridge. The cartridge is a container with a loop of tape that varies in length from forty seconds to several minutes. There could be exceptions in length for specific purposes. A cue-tone was placed onto the tape when recording so as to stop it at the beginning of the recording. The machine itself might be a single player or a series linked together in a deck in varying numbers. Some radio stations recorded their music onto cartridges for convenience and to save damaging the vinyl records that were in use at the time.

The third type of tape recorder, the cassette, has more value for on-air play than for production purposes. Many stations still receive programs from outside sources on cassette. News personnel carry the small hand-held recorders to cover stories. Also, copies of advertisements are sent to sponsors on these tapes. Therefore, the cassette recorder may be the one recorder that is the most used by stations. Digital audiotape technology (DAT) has enhanced the usefulness of tape with a smaller cassette that holds more information yet allows a full 48-kilohertz frequency response. The digital signal processing also allows for fast-speed searching, quick cueing, and track programming, among other features.

The Audio Console

The place where all of the inputs meet is the audio console, or control board, as it is more often called. This is the piece of equipment through which all audio signals are processed. It can range in size from as few as five channels with two inputs each to dozens of channels with multiple inputs, looking as complicated as an airplane cockpit. The console has three basic functions: (1) allow the selection of one or more inputs, such as microphone, music, or tape, (2) amplify the sound, and (3) allow the operator to route the inputs to a number of outputs, such as monitors, transmitter, and so on.

A key, or toggle switch, allows an incoming signal to be routed to either an audition or program channel. Channels have volume controls called potentiometers, or pots or faders for short. These control the audio level, or gain, of each amplifier. Pots come in two forms: rotary and vertical slide, with the latter being more in vogue. In addition to individual pots for each channel, there is also a master gain that is usually set by the engineer, a monitor gain that controls the studio speakers, a cue gain, and a headset gain. The output signal is routed to the program amplifier, the final amplification stage before being distributed to a tape recorder or a transmitter.

Monitors, Audio Processors, and Transmitters

The signal is also sent to the volume unit (VU) meter, a device that measures the amount of sound that is being routed through the output of the console. Monitoring audio levels and keeping them consistent from one audio source to another are important in maintaining a consistent station sound. The modulation monitor indicates how the transmitter is performing and can reveal transmitter problems. A stereo monitor helps make sure that the left and right channels are not out of phase, since out-of-phase channels will cancel the majority of the signal in monophonic radio receivers.

Equalizers allow producers to correct problems by boosting and/or cutting frequency lows and highs. Equalizers help create parity between the different elements of production and are useful in creating special effects.

Compressors are used to enhance loudness and eliminate noise. Compression, which can remedy certain problems and get the listener to take greater notice of a piece of production, can make voices sound warmer, production tighter, and levels near perfect. Audio processors can be used to create a wide range of special effects, such as reverberation, echo, and so on.

When the transmitter receives the signal, usually by telephone line or microwave transmission, it is modulated, which means the electrical energy is superimposed onto the carrier wave that represents the frequency of the station. The modulated signal then travels to and through the antenna to, hopefully, many receivers.

Conclusion

As was stated earlier, radio is undergoing much technological change. Digital is thought to be the wave of the future and is already a powerful presence. Computers are replacing many of the input and storage devices in larger stations and will, doubtless, do so in all stations eventually. This is very important to the industry, but from the listeners' standpoint, the quality of what they hear is all that really matters.

See also: RADIO BROADCASTING; RADIO BROADCAST-ING, CAREERS IN; RADIO BROADCASTING, HISTORY OF; RADIO BROADCASTING, STATION PROGRAMMING AND; RECORDING INDUSTRY; RECORDING INDUSTRY, CAREERS IN; RECORDING INDUSTRY, HISTORY OF; RECORDING INDUSTRY, PRODUCTION PROCESS OF; RECORDING INDUSTRY, TECHNOLOGY OF.

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HAL HUGHES

RANGANATHAN, SHIYALI RAMAMRITA (1892-1972)

S. R. Ranganathan is considered by many to be the foremost theorist in the field of classification because of his contributions to the theory of facet analysis. In addition to being known as the "Father of Library Science" in India, his accomplishments include founding the Documentation Research and Training Centre in Bangalore, India; developing his *Five Laws of Library Science* (1931) and *Colon Classification* (1933); and authoring more than sixty books and two thousand articles.

Ranganathan was born in Shiyali in the Tanjavoor District of Tamil Nadu in southern India. His father, a learned and cultured man, was Ramamrita Ayyar, a landlord of a medium-sized rice-growing property. His mother was Seethalakshmi, a simple and very pious lady. Ranganathan attended school in his village and then went to Madras Christian College in 1909, where he earned B.S. and M.A. degrees in mathematics, studying with Edward B. Ross, who remained his favorite guru throughout his life.

As a teacher of mathematics at various institutions between 1917 and 1921, Ranganathan kept his students engaged and attentive by adopting the technique of assigning a new topic to students, having them gather data from books, and allowing them to learn from discussions among themselves and their teachers. From 1921 to 1923, he served as secretary of the Mathematics and Science Section of the Madras Teacher's Guild.

In January 1924, Ranganathan took the appointment as the first librarian of Madras University. In September of that same year, he left for England to spend nine months on a study-observation tour, during which he came into close contact with W. C. Berwick Sayers, Chief Librarian of Croydon Public Library and lecturer in the University School of Librarianship, London. Here Ranganathan discovered a social mission for the library profession and for himself. When he returned to Madras, he began to reorganize the university library in an attempt to attract more readers to the library and provide facilities for them. He took it upon himself to educate the public on the benefits of reading. Within the library he introduced the open shelf system and the active reference service. He designed a functional library building and developed principles of library management that expressed his philosophy of service. He shared his ideas with others by writing articles and books while active as a librarian and inspired them with his Five Laws of Library Science:

- 1. Books are for use.
- 2. Every reader, his book.
- 3. Every book, its reader.

- 4. Save the time of the reader (and the staff).
- 5. A library is a growing organism.

He helped form the Madras Library Association in 1928 and pushed the library movement to all corners of the Madras Presidency, which at that time covered almost two-thirds of South India. In 1929, Ranganathan initiated a school of library science (which is now at Madras University) and served as director for nearly fifteen years. In 1957, he donated his life's savings to endow a chair known as the Sarada Ranganathan Professorship in Library Science, to honor his second wife. Instead of retiring in 1945, he accepted an invitation to develop the library system of the Banaras Hindu University, where he single-handedly classified and cataloged 100,000 books between 1945 and 1947. He moved over to Delhi University in 1947 to teach and do research in library science, and from that time his international contacts began to grow. He served as chairman of the Classification Research Group of the International Federation for Documentation between 1950 and 1962.

While Ranganathan was in Delhi, he drafted a comprehensive thirty-year plan for the development of a library system for India as a whole, and he promoted the Madras Public Library Act. Earlier, he had delivered books to the prison where future leaders of an independent India were incarcerated. When they asked him what they should do about libraries in the new India, he had his plans ready.

In 1950, at age 58, Ranganathan visited the United States for the first time and wrote the book Classification and Communication. The second edition of his Prolegomena to Library Classification was published by The Library Association in London in 1957, and his lectures on classification in England were published in a book entitled Elements of Library Classification, which was edited by Bernard Palmer for The Library Association. The crowning achievement during the latter part of Ranganathan's life was the establishment of the Documentation Research and Training Centre in Bangalore, where young students and teachers from India and abroad could benefit from the atmosphere of academic excellence and simplicity that he created there. In 1965, Ranganathan was recognized by the Government of India, which made him the National Research Professor in Library Science. At that time, there were only four other National Research Professors: in Physics (C. V. Raman and S. N. Bose); Law (P. V. Kane); and in Literature and Linguistics (S. K. Chatterjee).

Ranganathan is called the "Father of Library Science" in India because he catalyzed a human movement of endeavor that is witnessed even to this day in the libraries and information centers of India. Through his writings, he awakened librarians around the world to the underlying theories and principles that govern their work as catalogers and classifiers of knowledge and to the tenets of service that ensure that the Five Laws will be observed.

The words delivered by Ranganathan in his opening address at an international study conference on classification research at Elsinore, Denmark, in 1964 probably best express the significance of library science and his role in its development:

Man has been reaching for one ideal for a long, long time-the ideal of "One World." Our discipline [of library science] brings us nearer to that much desired and much sought concept of "One World." In other contexts, that concept is very, very distant from the stage of realization. It is particularly so in the economic context. . . . In the political context, the resistance to "One World" idea is notorious. . . . In the technological context the profit motive obstructs us from a free sharing of ideas. . . . The whole idea of copyright itself is a barrier . . . [but] in our own subject, we come as near as possible to the idea of "One World." There is no secrecy. We know no cultural boundaries, no political boundaries, and no economic boundaries. We freely share ideas with one another. We believe that we find in everybody an identity. . . . The barriers melt away. We are prepared to think together without any reserve. . . . Our research can follow the relay method. That will lead to many technological achievements. [Our work] can lead to the elimination of all barriers except for the ego in man, the disturbance of which can be localized [Atherton, 1965, pp. 7-8].

See also: Librarians; Libraries, Functions and Types of.

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PAULINE ATHERTON COCHRANE

RATINGS FOR MOVIES

In the United States, most movies produced for theatrical distribution are rated by the Classification and Rating Administration (CARA), a division of the Motion Picture Association of America (MPAA). The rating system was first introduced in 1968, under the leadership of Jack Valenti, who was the MPAA president. This voluntary system was developed in the midst of increasing public pressure for censorship of movies.

The Rating Process

Under the MPAA system, producers or distributors submit their films to the Ratings Board for review. They pay a fee for this service. The board, by majority vote, determines a rating and provides a brief written rationale for the decision. CARA publishes the Motion Picture Rating Directory at quarterly intervals, with biweekly updates of the ratings decisions that have been made during the preceding two weeks. Producers or distributors who disagree with the rating their film receives have the option of editing their film and resubmitting it. If they are dissatisfied with the final ruling of the Ratings Board, they can submit their request to a separate Rating Appeals Board, whose membership is comprised of theater owners, producers, and distributors, with the president of the MPAA serving as chair. The decision of the Ratings Board may be overturned by a two-thirds vote

of the Rating Appeals Board. If they strongly object to the final decision, filmmakers can release a film without a rating, but strong economic concerns generally rule out this option.

There are no specific academic, professional, or occupational qualifications for serving on the CARA Ratings Board. All board members must be parents, however, and according to a description by the MPAA, members of the board must be "possessed of an intelligent maturity, and most of all, have the capacity to put themselves in the role of most American parents." With the exception of the board chair, the identities of the board members are kept secret from the public, although some information about family and occupational background is released, and the membership is diverse in terms of age, gender, race, and national origin.

The MPAA rating system has five levels that give general guidelines as to the age-appropriateness of a movie. The categories are as follows:

- **G:** General Audiences. All ages are admitted. Film content does not include anything that most parents would consider offensive for even their youngest children.
- PG: Parental Guidance Suggested. Some material may not be suitable for children. Parents are urged to give "parental guidance." Content may include some material that parents might not want their young children to see.
- **PG-13: Parents Strongly Cautioned.** Some material may be inappropriate for children under thirteen years of age. Parents are urged to be cautious. Content may include some material that parents might find inappropriate for preteenagers.
- **R: Restricted**. Admission of anyone who is under seventeen years of age requires him or her to be accompanied by a parent or adult guardian. The content includes some adult material. Parents are urged to learn more about the film before taking their young children to see it.
- NC-17: No One 17 and Under Admitted. The content is patently adult. Children are not admitted.

CARA does not publish data on the percentage of movies that are given each rating. However, in an independent analysis of the more than 1,400



Ratings for movies are closely tied to the continuing controversy over portrayals of violence, which was the topic on which Chris McGurk (far left), Vice Chairman of MGM, testified during hearings that the U.S. Senate Commerce, Science, and Transportation Committee conducted in September 2000 to examine the motion picture industry's marketing of violence to children. (AFP/Corbis)

movies rated during 1995 and 1996, Joanne Cantor (1998b) and her associates reported that 66 percent were rated R, 16 percent were rated PG-13, 14 percent were rated PG, 3 percent were rated G, and 1 percent were rated NC-17.

The various rating levels have been modified over the years. For example, the rating of PG-13 was added in 1984, as a reaction to children's responses to intense scenes in the PG-rated movies *Gremlins* and *Indiana Jones and the Temple of Doom*. The "X" rating that was originally included in the system was abandoned because it had not been trademarked. That rating is sometimes selfimposed by filmmakers. However, this process is entirely independent of the MPAA system. The rating of NC-17 was introduced in the early 1990s.

Criticisms of the Ratings

The MPAA ratings have been criticized over the years for a variety of reasons. There have frequently been disagreements with the ratings of individual films. Some critics have charged that the Ratings Board is more likely to give restrictive ratings to films with sexual content than to those with violent content. Other critics have argued that the Ratings Board is not sufficiently independent of the movie industry that employs it. Spokespersons for CARA insist that the Ratings Board is immunized from attempts to influence its members.

In its defense, the MPAA has also pointed to the public opinion polls that it commissions each year. For example, its own poll conducted in 1995 reported that 76 percent of the American public found the rating system to be either "very useful" or "fairly useful." *A New York Times* survey conducted the same year reported more modest approval, with 53 percent of the parents surveyed saying they thought the movie rating system "does a good job in informing people about how much sex and violence to expect in a movie" and 46 percent responding that it does not do a good job.

Public health and child advocacy organizations have been critical of the MPAA rating system. For example, at its annual meeting in 1994, the national House of Delegates of the American Medical Association (AMA) adopted a policy statement concerning the way the entertainment industry labels its products. The AMA referred to the MPAA system as "fundamentally flawed" and called on the MPAA to adopt changes. Recommendations included adding child development experts to the Ratings Board and incorporating more sensitivity to age differences in young children. CARA has responded to such criticism by arguing that it is not the function of the Ratings Board to suggest what is harmful for children but rather to suggest what parents would consider offensive or inappropriate.

The failure of the ratings to indicate the content of movies has been a major area of criticism by the AMA and other public health and child advocacy groups. The MPAA's own polls have not asked parents about their desire for content information. However, several polls conducted during the time that ratings for television were being developed (1996-1997) indicated that parents overwhelmingly prefer content information (i.e., the level of sex, violence, or coarse language) over age recommendations when making viewing decisions for their children. Research has also shown that MPAA ratings are often not informative about the violent or sexual content of movies. A content analysis of the Motion Picture Rating Directory, for example, reported that 26 percent of movies rated PG during 1995 and 1996 were so classified as a function of coarse language only, and another 13 percent contained unspecified "thematic elements" (Cantor, 1998b).

Although the age-based television ratings, the "TV Parental Guidelines," were amended to include content indicators as well as age recommendations as a result of public pressure, the MPAA ratings have not integrated content information into the ratings. Since 1995, however, the MPAA has provided information related to the reasons for the rating of a movie when the rating is PG or higher. This information is available on the MPAA's website and in the *Motion Picture Rating Directory*. In 1999, the MPAA announced plans to include this content information in newspaper advertisements for movies as well. Therefore, many advertisements that are of suffi-

cient size include content information with the MPAA rating.

Effects of the Ratings

Another criticism of the MPAA ratings has come from those who perceive that providing a restrictive label to a movie, indicating that it is inappropriate for viewing by young people, may make the movie more attractive to children and thereby work to defeat the purpose of shielding children from inappropriate content.

A study was conducted in 1980 by Bruce Austin, who explored whether the ratings of G, PG, R, or X (the MPAA categories in place at the time of the study) would affect high school students' reported likelihood that they would go to a movie. Austin reported that the ratings of movies had no significant effect on the interest of students in the movies. More recent research, however, has shown that MPAA ratings do have effects on children's interest in movies.

In the first year of research for the National Television Violence Study (NTVS), children between the ages of five and fourteen years were given a programming guide and were instructed to select one of the three programs or movies described on each page. The findings revealed that among children between the ages of ten and fourteen, and especially among boys in this age group, the ratings of PG-13 and R made a movie more attractive and the rating of G reduced its attractiveness. The second year of the NTVS reported the same results. Moreover, it reported that more aggressive younger children were more interested in movies that had restrictive ratings. The research also showed that a variety of content-based rating systems did not increase children's interest in movies with higher violence levels. Research by Brad Bushman and Angela Stack (1996) has confirmed that, in general, restrictive warning labels make programming more attractive, whereas content information has less of a tendency to attract children's interest in programming with violent content.

MPAA ratings have an economic effect as well. In some cases, this is due directly to the responses of potential audiences. In other cases, the economic effect is due to the policies of members of the entertainment industry, such as television advertisers and owners of movie theaters and video stores. Some producers and freedom of speech advocates argue that the MPAA's NC-17 rating, introduced to designate adult-only films, amounts to virtual censorship because many exhibitors refuse to show the films, many newspapers will not advertise them, and some leading video chains refuse to stock them. For example, Blockbuster Video, K-Mart, and Wal-Mart, which together account for more than half of the video sales in the United States, will not stock NC-17 videos. There is a commercial bias against unrated films as well. Few distributors will attempt to release a film without submitting it for a rating because 85 percent of theaters around the country will not accept an unrated film.

As a result of such commercial restrictions, the major studios, desiring releases of their largerbudget films in a thousand or more theaters, have usually chosen to cut films rather than face an NC-17 rating and thus be restricted to about three hundred theaters. Because of the commercial difficulties of an NC-17 rating, many directors are contractually obligated by the major studios to produce a film that is rated no more stringently than an R. As a result, films are often tailor-made to achieve a particular rating.

At the other end of the spectrum, however, there seems to be a desire on the part of moviemakers to avoid the rating of G except for movies that are explicitly designed for young children. As the research on the effect of MPAA ratings on children's interest in movies suggests, a G rating makes movies less attractive to youths as early as the preteen years. The economic implications of an unwanted G rating were acknowledged by former CARA president Richard P. Heffner in a 1999 television documentary aired on the Public Broadcasting System (PBS). He described the situation surrounding the 1981 Oscar-winning British film Chariots of Fire. According to Heffner, after CARA gave the film a G rating, the producer complained, asserting, "the G will kill us." When the Ratings Board refused to change the rating to a PG, the filmmakers forced CARA's hand by adding in one forbidden, off-color word. The film was then accorded the desired PG rating.

After the well-publicized school shootings in the late 1990s, many politicians called for greater scrutiny of the marketing of violence to children. One of the responses to these calls was an agreement by U.S. theater owners to check the identification cards of young people who were attempting to buy tickets for R-rated movies. The film rating system is likely to remain the subject of controversy as long as there is public concern regarding the effects of media content on audiences, especially on children.

See also: Film Industry; First Amendment and the Media; National Television Violence Study; Ratings for Television Programs; V-Chip; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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Joel Federman Joanne Cantor
RATINGS FOR TELEVISION PROGRAMS

The Telecommunications Act of 1996 contained a "Parental Choice in Television Programming" provision designed to permit parents greater control over the content seen on their home televisions. This provision passed in response to the accumulating evidence that television violence and other types of programming can have profound negative effects on the mental health of children, and in response to parental concerns about the increasingly violent and sexual content of television. The act mandated that within a specified time of its passage, new televisions be manufactured with a "V-chip," which would allow parents to block objectionable content on the basis of the rating of a program. It also recommended that the television industry develop a voluntary rating system that would be applied to television programs and be readable by the V-chip technology. Early in 1996, shortly after passage of the act, entertainment industry executives formed a Ratings Implementation Group and agreed to develop a rating system. The new system was released to the public on December 19, 1996, and began being implemented in January 1997.

The rating system is designed to be applied to all programming with the exception of news and sports programs. In addition to being read by the V-chip, the rating of a program (selected by that program's producers or distributors) is displayed visually in the upper left-hand corner of the television screen for the first few seconds of a program. Many newspaper programming guides and television schedules also publish the ratings in their listings.

The television rating system is referred to as the "TV Parental Guidelines," and in its initial form, it was based on the Motion Picture Association of America (MPAA) ratings for theatrical movies that have been in use since the late 1960s. The MPAA ratings contain four major levels based on the recommended age for viewing a movie: "G: General Audiences," "PG: Parental Guidance Suggested," "PG-13: Parents Strongly Cautioned," and "R: Restricted." The original TV Parental Guidelines had four levels similar to the MPAA ratings for programs not specifically directed to a child audience. They were "TV-G: General Audience," "TV-PG: Parental Guidance Suggested," "TV-14: Parents Strongly Cautioned," and "TV-MA: Mature Audiences Only." In addition, the system included two rating levels for programs designed for children: "TV-Y: All Children," and "TV-Y7: Directed to Older Children." Like the MPAA ratings, these ratings gave guidelines regarding the age of the child who should be permitted to see a program but did not provide specific information about its content.

The TV Parental Guidelines were controversial even before the official release of the system. Headed by MPAA President Jack Valenti, the Ratings Implementation Group had engaged in a public process of soliciting advice from child advocacy organizations such as the National Parent-Teacher Association (PTA), public health organizations such as the American Medical Association (AMA) and the American Psychological Association (APA), and academic researchers from a variety of universities. Most of the groups and individuals consulted advocated a program labeling system that indicates the content of a program rather than simply providing age recommendations. Many groups advocated modeling the television rating system after the system that is available on the premium cable channels HBO, Cinemax, and Showtime. The premium channel system indicates the level of sex, violence, and coarse language in a program with letters, such as, "MV: Mild Violence," "AL: Adult Language," and "SC: Strong Sexual Content."

Much of the controversy over the original television rating system was based on the findings of research regarding three issues: (1) the types of ratings that parents preferred, (2) the ability of different types of systems to communicate the content of programs, and (3) the effects of different types of rating systems on the interest of children in programs.

Research Relevant to the Television Ratings Controversy

The major disagreement between the Ratings Implementation Group and the majority of public health and child advocacy organizations related to whether the ratings should suggest the appropriate age for viewing a program (age-based ratings) or specify the type and level of content contained in the program (content-based ratings). Several national surveys conducted between August 1996 and March 1997 reported that parents overwhelm-

Experiments

Experiments are used when a researcher wants to observe effects under highly controlled conditions. For example, researchers for the National Television Violence Study (NTVS) conducted an experiment when they wanted to know whether adding a rating to a television program or movie would have an effect on the desire of children to see it. Rather than asking people their opinions regarding whether or not something would affect them, experimenters prefer to put people in a controlled situation, manipulate one thing while leaving everything else constant, and then observe whether what they manipulated made a difference.

In Year 2 of the NTVS, for example, researchers asked a group of 374 children between five and fifteen years of age to look at a booklet describing different programs and movies and to indicate how much they wanted to see each one. To increase the chances that they would give their sincere responses, children were told they would remain anonymous and they were led to believe that their opinions would count as votes influencing the program they would actually get to see. All the books contained the same program names and brief descriptions. However, unknown to the children, the same program was given different ratings in different booklets. For example, for one movie title and description, the effect of movie ratings was tested. In some booklets, at random, the plot description was followed by a rating of G; in others, it was followed by PG, PG-13, or R; and in some, there was no rating at all. All children indicated how much they wanted to see the movie on a scale ranging from "hate to see it" to "love to see it." Because everything was kept constant except the rating of the movie, the researchers could

ingly preferred content-based ratings for television over age-based ratings. Five out of six national surveys conducted during this period showed majorities ranging from 62 percent to 80 percent favoring content-based ratings. The one survey that showed a majority (54%) in favor of an age-based system was commissioned by the Ratings Implementation Group itself and was released on the day the rating system was introduced. determine whether the rating, in and of itself, made a significant difference. In this case, the rating of a movie did have a strong effect, especially among the older children tested: Children wanted to see the movie significantly more when it was rated PG-13 or R than when it was rated G.

Experiments work best when the response being observed is short-term rather than of long duration. Moreover, it is often challenging to study controversial behaviors, such as violence, experimentally. One cannot ethically bring children into the laboratory to study the effects of media violence and encourage them to get into fights with each other. For this reason, experiments on media violence often use measures that do not look like violence, but are related to violence. For example, some violence studies ask children to fill out a questionnaire indicating how right or wrong it is to hit or kick another child, and the researchers compare children who have just witnessed violence on TV to those who have not. Others studies use "aggression machines," and children are led to believe that by pushing a button they are delivering painful stimulation to another person in another room. (This is actually not true). Others allow people to inflict a nonviolent negative outcome on another person, such as giving a negative evaluation with the expectation that it will affect that person's chances to get a job. The important things to remember in evaluating experimental procedures is whether the conditions are adequately controlled, whether participants are assigned to the different conditions at random, whether the situation created is plausible to the research participant, and whether the outcome measure is psychologically relevant to the attitude or behavior of interest.

One reason that parents indicated a preference for a content-based system was that parents make distinctions between sex versus violence versus other types of content when they express concerns about the effect of television programs on their children. During the period in which the new rating system was being developed, researchers for the National Television Violence Study (NTVS), an independent monitoring project funded by the National Cable Television Association (NCTA), were exploring how the different MPAA ratings coincided with different forms of content in movies. Using a large, representative sample of television programming, the researchers investigated movies that were shown with both an MPAA rating and the premium channel content codes applied by the channel presenting the movie. For example, they explored the proportion of movies rated PG that contained different types of content. In their analysis for NTVS Year 1 (released in early 1996), 22 percent of the PGrated movies had neither sex nor violence, but only adult language. Another 22 percent had adult language and sex, and 28 percent had adult language and violence. A separate study, submitted to the Federal Communications Commission (FCC) in April 1997 as part of comments on the rating system of the industry, involved all movies rated by the MPAA during the years 1995 and 1996 according to the Motion Picture Ratings Directory of the MPAA. The findings indicated that more than one-fourth of movies rated PG were so classified as a function of coarse language only and another 18 percent had neither sex, nor violence, nor coarse language.

Extrapolating from these findings, critics argued that the content of a program rated TV-PG would be highly unpredictable—parents would not know whether it contained content they considered harmful and they thus would not be able to decide whether they should shield their child from it or not.

A third area of research relevant to the television ratings dealt with the effect of ratings on the desire of children to see programs. A major concern was whether parental advisories and ratings would have their intended effect or whether they would "boomerang," making the content seem more interesting and exciting and attract a larger child audience.

The first year of the NTVS research (released early in 1996) showed that the MPAA ratings of PG-13 and R increased interest in a movie, especially for boys and for young adolescents in general. The second year of the NTVS research (released in March 1997) subjected eight rating systems to the same test. Included in the systems tested were the MPAA ratings and three contentbased systems: the violence codes used by the premium cable channels HBO, Showtime, and Cinemax ("MV: Mild Violence," "V: Violence," and "GV: Graphic Violence"); the Recreational Software Advisory Council (RSAC) ratings used for video games ("Violence: Creatures Killed," "Violence: Humans Killed," "Violence: Humans Injured or Killed, Blood and Gore," and "Violence: Wanton and Gratuitous Violence"); and the violence ratings used in Canada in conjunction with early implementation of the V-chip ("Comedic Violence," "Mild Violence," "Brief Violence," "Violence," and "Graphic Violence").

The findings revealed that most of the rating and labeling systems did not significantly affect the interest of children. The only rating system to produce the so-called forbidden-fruit effect was the age-based MPAA system. For the older children (10 to 15 years of age) participating in the experiment, the more restrictive ratings of PG-13 and R increased the attractiveness of a program, and the lowest rating, G, decreased it. Moreover, children who were more aggressive and those who liked to watch television the most were the most likely to have their interest stimulated by the restrictive MPAA ratings.

Independently conducted research published in 1996 by Brad Bushman and his associates confirmed that restrictive warning labels make a program seem more enticing than labels that simply describe violent content. In three experiments, Bushman found that warning labels consistently increased the selection of violent programs and movies by both children and adults, but that violence labels did not.

In summary, the research findings reported around the time of the initial launch of the TV Parental Guidelines were uniformly unflattering to the new system: They showed that parents overwhelmingly preferred content-based labels over age guidelines; that age-based ratings are ambiguous as to the content contained in a program; and that restrictive, age-based ratings are more likely than content labels to entice children to violent programming.

Public Criticism and the Revised System

The critics of the TV Parental Guidelines were given several public forums in which to express their concerns. The U.S. Senate Subcommittee on Commerce, Science, and Transportation held a hearing on February 27, 1997, less than two months after the system began being applied. In addition to criticizing the rating system itself, several child advocates decried the fact that intense violence, crude sexual situations, and coarse language were quite common in prime-time programs that carried the TV-PG rating. The National Television Violence Study released its Year 2 report in March 1997, and press coverage of those findings publicized the possibility that the age-based ratings might be attracting more children than they were protecting. The FCC solicited comments on the acceptability of the system in April of that year, with most comments from the general public being critical of the new system. In May, the television industry held a town hall meeting in Peoria, Illinois, that was televised on C-SPAN. The participants in this forum were parents who were selected at random, and again the critics of the rating system remained more vocal and more numerous than the defenders. By this time, several members of Congress had begun threatening further legislation regarding television content if the television industry did not modify the system. By the beginning of the summer, the industry group had agreed to negotiate a compromise with representatives of the child advocacy organizations, and in July 1997, the groups released a compromise system, which added content indicators to the age-based guidelines.

In the revised system, the ratings of TV-PG, TV-14, and TV-MA could be supplemented by any or all of the following content indicators: V for violent content, L for coarse language, S for sexual content, and D for sexual dialogue or innuendo. In addition, for programs aimed at older children (designated with a TV-Y7), the supplemental indicator of FV for "fantasy violence" was added to indicate programs in which the violence may be "more intense or more combative." The industry group also agreed to add five nonindustry representatives from the advocacy community to the Oversight Monitoring Board for the guidelines. All but two networks agreed to use the revised system: NBC maintained the original TV Parental Guidelines without the addition of content letters, and Black Entertainment Television (BET), which had not adopted the original system, continued to refuse to rate its programs at all.

Research conducted after the revised TV Parental Guidelines were implemented showed that although parents liked the idea of television ratings, the revised system was poorly understood. For example, in a national survey of parents conducted by the Kaiser Family Foundation in April 1999, one and one-half years after the revised system was put in place, only 3 percent of parents knew that the content letters "FV" stood for "fantasy violence" and only 2 percent knew that "D" stood for "suggestive or sexual dialogue." Research also showed that although most networks were quick to adopt the initial TV Parental Guidelines, the revised system did not provide a consistent correspondence between the content letters and the presence of sex, violence, or coarse language in programs.

As the deadline of January 2000 was reached for all new televisions with a diagonal screen size of thirteen inches or larger to be produced with a V-chip, the FCC and child advocacy groups committed themselves to making greater efforts to publicize the V-chip and the revised rating system.

See also: National Television Violence Study; Ratings for Movies; Ratings for Video Games, Software, and the Internet; Sex and the Media; Telecommunications Act of 1996; V-Chip; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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RATINGS FOR VIDEO GAMES, SOFTWARE, AND THE INTERNET

Ratings are labeling systems that index media content (e.g., films, television programs, interactive games, recorded music, websites) primarily to control young people's access to particular kinds of portrayals. The underlying assumption is that children and young adolescents are particularly vulnerable to message influences and therefore need to be shielded from certain types of content. The content most typically rated consists of portrayals of sexuality, violence, vulgar language, or adult themes, although this varies from country to country. For example, nudity, all but ignored in the Scandinavian countries, often earns more restrictive ratings in the United States; in Germany, violence and racist speech are of particular concern; Australia explicitly adds suicide to the list of problematic kinds of content.

The Ratings Controversy

Ratings have been controversial since their inception, and attempts to rate the content of new media have intensified the debate. As advances in communication technology increase the amount, accessibility, and vividness of media content that is available to ever-growing audiences, particularly young audiences, questions that first emerged in the early days of motion pictures are revisited. Is rating any different from censorship? Who should do the rating? What kinds of content require ratings? What criteria should be used? What form should the label or advisory take? How do ratings affect audiences, the profits, and the content producers?

Ratings have been characterized as representing a "middle ground," somewhere between doing nothing at all (i.e., allowing youths unfettered access to any and all content) and government censorship. It is not surprising that how close to the "middle" rating systems are perceived to be depends largely on who is looking. In the United States, for example, some parents and child advocates contend that ratings are inconsistent and often ineffective; they argue that more stringent controls are necessary. Most content producers and civil libertarians, on the other hand, view any attempt to rate or label content, even voluntary systems exercised by nongovernmental bodies, a threat to free speech. They contend that, at worst, ratings provide a means for full-blown government censorship and, at best, exert a chilling effect on whether and how "nonmainstream ideas" are expressed.

Typically, content ratings are developed in response to public and political pressures to "do something" about media content, pressures that arise when someone makes a case that particular kinds of media depictions threaten youths, if not society in general. This has certainly been the case with each of the new communication media. For example, in the early 1980s, when music videos first enabled parents to see violent, sexual, and misogynist images in a few music videos, public pressures to "do something" about popular music resulted in record industry self-labeling of recordings in order to head-off government intervention. Similarly, when in the early 1990s the U.S. Congress responded to public outcries about graphic violence in interactive games by threatening regulation, the video game and computer software industries developed parental advisory systems. In the mid-1990s, reports of children gaining easy access to pornographic materials on the World Wide Web fueled an intense debate about controlling children's access to information on the Internet. That debate ultimately led to passage of the Communications Decency Act (CDA), making the display or transmission of "indecent or patently offensive material" to minors a criminal offense. Legal challenges on First Amendment grounds led the U.S. Supreme Court to overturn the CDA in 1997, so controversy over whether and how to protect children on the Internet continues.



As part of a 1999 announcement about plans for the official examination of the marketing of violent media to children, President Bill Clinton presented video game advertisements featuring quotes such as "What kind of psycho drives a school bus into a war zone?" and "Get in touch with your gun-tot-ing, cold-blooded-murdering side." (AFP/Corbis)

Descriptive Versus Evaluative Ratings

A fundamental issue in the debate over ratings concerns the difference between descriptive and evaluative ratings criteria (sometimes termed "rules based" and "standards based" criteria, respectively). Descriptive approaches attempt to classify content on the basis of concrete, objective criteria about which it is presumed very different individuals can agree (e.g., "Does a living creature suffer physical injury or death?"). Evaluative approaches attempt to be more sensitive to situational variations by allowing more subjective judgments (e.g., "Is the nudity artistic, erotic, or pornographic?"), but they risk disagreement over just what terms such as "artistic" and "erotic" mean to different people. Thus, a descriptive system would rule that any website displaying a bare female breast must be assigned the same rating, regardless of whether the was a painting by Amedeo Modigliani or Peter Paul Rubens, a Playboy centerfold, or an X-rated video. Under an evaluative system, on the other hand, these three websites could each be given different ratings, such as "artistic," "erotic," or "pornographic," with the ultimate ratings depending entirely on the judgment of the person doing the rating. Although evaluative approaches work relatively well within highly homogenous communities where values and definitions are closely shared, each successive step toward a more heterogeneous audience increases the likelihood of disagreement. Conversely, descriptive approaches increase the likelihood that different observers will agree with what is depicted but are less flexible in accounting for situational nuances. This issue becomes increasingly important as globalization makes the same content available to people in various locations that have widely different meaning and value systems. It has reached critical proportions with the development of the World Wide Web, a fundamental premise of which is that it reaches the most heterogeneous audience possible.

Age-Based Ratings

A closely related issue concerns whether and how to classify content on the basis of age. As the primary justification for ratings tends to be the protection of youths, it is not surprising that most systems around the world apply age-based advisories (e.g., "parental discretion advised") and/or restrictions (e.g., "no one under seventeen admitted"). In most cases, however, determination of which age restriction to employ is almost totally subjective. Different cultures, indeed individual parents, often disagree about what is or is not appropriate both for thirteen-year-olds in general and for particular thirteen-year-olds. Some of the most convincing testimony to the subjectivity of indexing by age is provided by the sheer number of different ages that various rating systems employ as markers. Depending on which medium and rating system is examined, advisories or restrictions can be found for ages six, seven, thirteen, fourteen, seventeen, eighteen, and twentyone in the United States alone. Similarly, a survey of ratings in thirty different countries shows that every year between three and twenty-one (with the exception of nine and twenty) is used to mark some kind of content.

The alternative to indexing by age is simply to provide descriptive labels or icons, leaving it up to individual caretakers to decide whether to restrict a particular child's access. For example, the International Content Rating Association (ICRA), a global consortium of representatives from the public sector and the Internet industry, describes website content (e.g., "explicit sexual acts," "passionate kissing," "innocent kissing"), but it leaves judgments about what is or is not appropriate for an individual child entirely up to the parents or caretakers. The ICRA system also provides extensive, relatively objective definitions of the terms used for each label, in an attempt to reduce uncertainty about the meaning of any particular label.

At issue, of course, is the amount of parental effort required by each approach versus the opportunity to tailor control of access to the needs and abilities of individual children. It is relatively easy for a parent to rely on some general statement indicating that a particular game or website is or is not appropriate for children under a specific age. It is relatively demanding for a parent to work through descriptions and definitions of all of the different kinds of rated content that might appear in order to decide what is and is not suitable for a particular child. Moreover, the value of age-based rating is further complicated by evidence that labeling content on the basis of age serves more to attract than to deter some children—a kind of forbidden fruit effect. This phenomenon seems most pronounced among youths who are slightly under a specified age. That is, labeling content as being inappropriate for children under thirteen years increases the appeal of that content among elevenand twelve-year-olds.

Who Does the Rating?

Still another point of controversy surrounding ratings concerns whether they should be administered by some independent third party or by individuals who are involved in producing or distributing the content. Here, the issue is one of trust. Can consumers trust ratings that game designers or webmasters assign to their own creations, or is this a case of "asking the fox to guard the hen house"? This question increases in importance as the sheer volume of content increases. For example, it is feasible for an independent rating board such as the one employed by the Motion Picture Association of America to view and classify several hundred motion pictures each year. However, the hundreds of hours of television programming that most U.S. households receive daily makes such third-party ratings problematic, contributing to the broadcast television industry's decision to adopt a system that allows producers or broadcasters to rate their own material.

These two approaches (i.e., independent ratings and producer ratings) resulted in the two systems that were initially developed to rate interactive games. In this case, the problem was not so much the number of titles developed each year but the sheer amount of time that it takes to move through all aspects of an individual game (often several hundred hours). The Interactive Digital Software Association opted to create the Entertainment Software Rating Board (ESRB), a third-party group, to review videotapes (submitted by game developers) of selected sections of the video games and assign one of five, age-indexed ratings categories. The ESRB categories and their descriptors are as follows:

EC: early childhood, ages three-plus; should contain no material that parents would find inappropriate,

- E: everyone, ages six-plus; may contain minimal violence or some crude language,
- T: teen, thirteen-plus; may contain violence, strong language, or suggestive themes,
- M: mature, seventeen-plus; may contain intense violence or mature sexual themes, and
- A: adult, eighteen-plus; may include graphic depictions of sex or violence.

In contrast to the ESRB, the now defunct Recreational Software Advisory Council (RSAC) developed a self-rating system that enabled software developers to attach descriptive labels, icons, and intensity ratings to computer games. Because computer games are often translated for video game platforms, which are almost impossible to market without an ESRB rating, over time most interactive games opted to use the ESRB system, effectively eliminating the RSAC system. Ironically, both systems ran the risk of public distrust-the RSAC system because it employed self-rating, the ESRB system because it depended on whatever videotape excerpts game designers chose to submit for examination. In both cases, the solution was to provide means for public scrutiny and comment, coupled with sanctions for misrepresentation. If the experience of consumers contradicted the rating assigned by either system, it was a simple process to check the product fully and institute sanctions, including denying a rating to any game that had been misrepresented. To the extent that lack of a rating reduces or closes off distribution channels, the economic threat is presumed to motivate game designers and producers to make accurate content disclosures.

The Internet further complicates many of these rating issues. The vast reservoir of global and continually changing information on the World Wide Web renders third-party rating of all accessible material problematic. Although third-party ratings can identify a limited array of websites that are judged to be inappropriate or appropriate for children, sheer volume implies that tens of thousands of websites must go unrated. Self-rating systems for the web face a different problem—how to convince content producers to rate their websites voluntarily, as well as to rate them accurately. Since a fundamental attribute of the Internet is the provision of a free distribution channel, many content producers may see few incentives to rate their websites, and there are even fewer sanctions for misrepresentation or failure to rate. If one does not care whether or not children can access a website, why bother to rate it? A counterbalance to this, of course, would be the development of an Internet-filtering system that allows only rated websites to be accessed, strong motivation for content producers who want to reach children.

Many Voices, Many Values

The multitude of voices, values, and meaning systems inherent in a global communication system also leads to a proliferation of content that people want rated. In addition to advisories for sex, violence, nudity, and vulgar language, various international groups have called for indexing of racist, misogynist, or antireligious content, as well as content that involves other forms of "hate speech," portrayals of drugs or other "taboo" substances, or suicide. As more kinds of content are included on the web, there comes a point at which ratings become too burdensome to use.

Finally, because the web makes little or no distinction between news, education, art, entertainment, casual conversation, or any other kind of informational context, arguments about whether and how to differentiate content depending on context have become particularly thorny. Should graphic violence in a news report be exempt from rating? Should human genitalia displayed on a health-related website be rated differently from those displayed on an entertainment website? Should these things be rated at all?

On the plus side, the Internet industry has developed the Platform for Internet Content Selection (PICS), a system that enables easy design of content rating systems and makes it possible for parents to specify the kinds of content their children will be able to access on the household computer. Moreover, PICS can simultaneously host both self-rating and third-party systems, making it possible for consumers to combine these approaches.

The ICRA is developing a voluntary, descriptive self-rating system to operate at the heart of a PICS-based system. The ICRA system provides parents the option of (1) examining a list of descriptive labels and definitions developed to index each kind of content and then setting the browser to filter as they choose, (2) accepting the judgment of whatever third-party organization wishes to share the system, or (3) both. Thus, one parent might rely on the third-party judgment of a religious organization, another on a group of educators, and a third might make individual judgments based entirely on a personal assessment of what kinds of information are appropriate to his or her own child.

Such a system depends on there being a critical mass of content websites that have either self-rated or have been indexed by some third party, as well as the option for parents to block websites that have not been rated. Even given such a system, the complexities of developing ratings that fit the needs and desires of parents from around the world make it unlikely that a "perfect" system will ever emerge. What is clear is that the extent to which any rating system is effective depends on thoughtful, active participation of parents who care about the kinds of content to which their children have access.

See also: Communications Decency Act of 1996; First Amendment and the Media; Internet and the World Wide Web; Pornography; Pornography, Legal Aspects of; Ratings for Television Programs; Ratings for Movies; Sex and the Media; V-Chip; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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See: Literacy

RECORDING INDUSTRY

The recording industry is dominated by five major companies that control about 85 percent of the marketplace for recorded music worldwide. The "Big Five" are Bertelsman Music Group (BMG), Electrical and Musical Industries (EMI), Sony Music, Universal Music Group (UMG), and Warner Music Group.

The Big Five

BMG is part of the German corporation Bertelsman, A.G., a large electronic media and publishing company. BMG acquired Arista in 1979 and the RCA Victor labels in 1986.

EMI, a British company, began with the merger of three labels in 1930. They were the Gramophone Company, Columbia Graphophone, and Parlophone. The company acquired U.S.-based Capitol records in 1956 and the Decca U.K. catalog in 1974. They also acquired Chrysalis records in 1989, and the Virgin Music Group in 1992. The company merged with the electronics company Thorn in 1979, creating Thorn-EMI, but they de-merged in 1996. The EMI Music Group now operates more than sixty record labels, a music publishing company, and the HMV stores (a retail division).

Sony Music is a unit of the Japanese electronics giant, Sony Corporation. It built its music interests (part of what is collectively referred to as its "software" interests) primarily through the acquisition of the CBS records group for \$2 billion in 1988. This gave them the Columbia and Epic labels and their subsidiaries, as well as contracted artists such as Bruce Springsteen and Michael Jackson. Sony owns numerous other entertainment software businesses, including film studios, television production companies, compact disc (CD) and tape manufacturing facilities, and half of the Columbia House record club.

UMG is owned by the French corporation Vivendi, who purchased it as part of the acquisition of The Seagram Company of Canada in 2000. Its holdings consist of labels acquired from Matsushita Corporation of Japan in 1995, which had previously purchased the MCA Corporation in 1990. Seagram also acquired Polygram Records from Dutch electronics giant Philips in 1998. Labels now owned by UMG include, but are not limited to, MCA, Geffen, Uni, Mercury, Polydor, Motown, DefJam, A&M, Island, and Decca.

The Warner Music Group is part of U.S.-based Time Warner Entertainment Company, which is being acquired by America Online (AOL), for stock, in the largest merger in corporate history. Warner Music Group began as Warner Brothers Records in the 1920s. This company grew its music business by acquiring Atlantic Records in 1967. The parent company was purchased by the 7 Arts company and then sold to the Kinney Corporation, which renamed it Warner Communications Inc. in 1969. The company acquired Elektra Records in 1970, organizing itself as the WEA Group and creating the WEA Distribution company. Warner Music Group labels include Atco, Atlantic, Elektra/Asylum, Reprise, and Warner Brothers. The gradual evolution of the mainstream record labels from entrepreneurial "independents" to members of corporate "groups" that in turn are owned by major transnational conglomerates has greatly increased concentration of ownership. The industry is moving toward conditions of tight oligopoly, where four or fewer firms hold 60 percent of the market. The movement of record companies into corporate business structures has led to increased emphasis on quarterly numbers and decreased focus on musical content, because parent companies depend on the cash flow generated by their music groups.

Corporate Versus Independent

Corporate music groups typically include record labels and music publishing companies, but they may also include CD and tape manufacturing companies, a distribution company, and record retail outlets. This vertical integration provides the parent company with the opportunity to profit from the creation, manufacture, distribution, and sale of music products. They are also horizontally integrated-by owning electronics hardware manufacturing companies, film studios, and television producers and networks, which can make use of their music products as content in other media. Some of the major labels have created smaller, subsidiary, "boutique" labels that operate with a degree of creative independence to serve specific musical genres (e.g., Americana, hardcore rap, and so on) or other niche markets. These labels usually maintain smaller artist rosters (allowing them to give more individualized attention to those who are under contract) and are often built around a key executive who has unique credentials and credibility in that area of the marketplace.

Independent labels, however, are those not owned in whole or part by the Big Five, although many of them do have distribution deals with the majors corporations to assure their product reaches all markets effectively. Throughout the twentieth century, smaller labels showed themselves to be better attuned to changes in popular music forms and evolutions in popular taste. When major labels would not sign artists in genres such as blues, jazz, rhythm and blues, rock-n-roll, and hip hop, the independents did. Around the 1950s, this shifted the balance of power in the industry away from established mainstream companies aligned with Tin Pan Alley commercial pop-song publishers. As the upstart independents gained sales momentum and the forms of music they championed proved to be more than fads, they were acquired by the larger companies. Decades of these acquisitions led to the concentration of ownership and marketplace domination described above. This has not completely undermined the marketplace for independent labels. They still serve as a development area for the Big Five, speculating on recording artists who have yet to find a mass audience.

the mid-1990s, independent labels In accounted for about 21 percent of record sales in the United States, releasing 66 percent of the titles. Most of these releases sell less than five thousand copies, and many of them sell far less. The scale of these companies' operations permits low-cost production, marketing, and distribution, allowing some to make a profit even at these comparatively low sales levels. With contemporary technology, professional quality recordings can be made without booking huge blocks of time in expensive studios, and tapes and CDs can be produced economically in shorter runs. When a recording artist on an independent label begins selling tens or hundreds of thousands of copies, the profits can be enormous, which often arouses interest from the major labels. When artists' contracts with independents expire, they can negotiate new contracts with larger labels from positions of relative strength. This pattern repeated itself, largely intact, for much of the twentieth century.

Despite the concentration of ownership, the vertical and horizontal integration of the Big Five, and their dominant market share of sales, the recording industry must be understood as an open system. None of these companies can infallibly predict or control consumer tastes and purchases. The industry takes the creative inputs of songwriters, musicians, and producers, transforms them into the final product (a packaged recording), and brings it to market. This involves making copies available to radio stations for airplay, producing videos for television outlets, advertising in trade and consumer media, making sure the product is in stores by the targeted release date, and creating promotional opportunities as the artist travels the country for concert appearances. In the production process, record label executives exert influence on the recording artists and repertoire executives who signed them to their contracts, as well as on the producers who work with them in the studio. Still, the executives for the label can only work from their existing assumptions about what sounds get radio airplay and are purchased for the collections of consumers. After shaping the final product to the best of its instincts and abilities, the industry then depends on the exposures it is able to create in hopes of actually finding a receptive audience who will purchase the product.

The greatest marketplace advantage the major labels have enjoyed is their distribution system. Their established relationships with retailers worldwide, warehouses, and shipping channels would be expensive to duplicate. Distribution costs have presented the highest barriers to entry into the recording industry for newcomers. Professional-quality recording equipment is available to consumers, and tape and CD duplication facilities can be found in most major cities. However, getting retailers to give up limited shelf space to untried artists on unknown labels is a nearly insurmountable challenge, especially with chain stores. Without a powerful distribution partner to place a product in the stores, independents must find alternate means of reaching consumers. Many independents have used a combination of ads in specialty magazines and direct mail to reach consumers. Free catalogs and low-priced sampler CDs are made available to introduce music buyers to the offerings of the label. Setting up display and sales spaces at music festivals featuring their artists and genres of music have also been successful. Still, the advent of the Internet is creating new, lower cost means of distribution.

Technology and the Internet

Digital data compression technology has made it possible to move sound files easily by computer. By putting up a company site on the World Wide Web, even garage- and bedroom-based independent labels can provide worldwide access to their offerings. Sample songs can be archived on a website for listening through realtime "streaming" technologies or by download. All of the other advertising and promotional activity of the independent labels can direct consumers to this site,



MP3 technology has become an important part of the recording industry. To fill that need, Japan's Casio Computer released in May 2000 the Wrist Audioplayer MPV-1V, which enables the owner to play a maximum thirty-three minutes of digital music downloaded from the Internet. (AFP/Corbis)

providing more immediate access to the company and its products. It then becomes possible to sell the digitized music electronically via download to the customers' computers or by taking credit card information and shipping product directly to the consumer. In the 1990s, the Motion Picture Experts Group created a data compression technology that could reduce the size of sound files tenfold, while retaining near-CD quality. What had been a 40megabyte (Mb) file could now be 4 Mb. This technology, called MPEG-1, layer 3 (or MP3 for short) quickly became widely available on the Internet.

Ambitious musical artists quickly began putting their work onto the Internet via the web to raise their profiles. Fans began digitizing bootleg recordings and legitimate label releases to make them more broadly accessible to online taste groups. Even some big-name groups made digital copies of their latest songs available as MP3 files before their official release dates. The Beastie Boys, Public Enemy, Prince, and Tom Petty and the Heartbreakers were all asked by their labels to take such files down. The advance Tom Petty single was downloaded 150,000 times in the fortyeight hours that it was available. To the labels, unauthorized digitization of the music that they release is piracy. Several individuals have already been sued for copyright infringement, and many more have been threatened. Often, sites with unauthorized MP3 files on them are maintained by technology-savvy college students, part of the vanguard group of users. When their host institutions are advised of the illegal status of some of this content, the offending websites are usually taken down quickly. What is happening with the dissemination of MP3 technology is a revolution in the distribution of sound recordings.

The industry has weathered technological revolutions before, not the least of which was the evolution from mechanical to electronic means of production. There have been revolutionary changes in the means of distribution as well. When radio arrived in the 1920s, the industry feared and resisted it, expecting that free access to music would slow consumer purchases. While that may have been true in the short term, exposure to more musical artists and styles led to more purchases by consumers who had disposable income. The widespread distribution of jukeboxes in the 1930s almost single-handedly pulled the industry out of the Great Depression. By providing audiences, especially young people, with lowcost access to the music that they wanted to hear, sales of "hit" records were stimulated. The industry's initial response to digital music did seem to be one of fear, even panic, glossing over legitimate uses of MP3 technology with shrill cries about piracy. However, as the major corporations adapt to the new environment, they are finding ways to make the technology work for them. Announced in December 1998, the major labels are voluntarily participating in the Secure Digital Music Initiative (SDMI), which seeks to foster a broad voluntary agreement by major companies on digital security and compatibility of music. If this agreement was not voluntary, some might see it as a potential restraint of trade.

SDMI is working on the development of digital data compression technologies that are more advanced than MP3 and will protect the participating companies' proprietary interests in the content. In March 1999, Leonardo Chiariglione, who was instrumental in the original development of MPEG, was hired to lead the project. MPEG-4 and MPEG-7 have already been announced. These upgrades offer greater compression, searchability, as well as copy protection and "watermarking" of digital music files. The greater compression will make it practical to send sound files by e-mail. Searchability makes favored selections in larger files more accessible. Copy protection will give labels a measure of control over the digital distribution of sound files, and watermarking embeds a record of how and when copies were made in the data, to facilitate tracing of unauthorized product. The aim of SDMI is to review existing technologies and recommend a standard to the industry that is acceptable to all participating companies. This would then lead to the promotion of a new consumer format for audio data files that would permit the industry to continue to realize revenue from the sale and distribution of such files. The sheer magnitude of the participating major companies will cause many consumers of digital music to embrace this standard, and hardware companies whose equipment becomes part of the standard will reap a windfall.

This does not mean that MP3 will be completely eclipsed. Small labels and niche artists will continue to use this technology, legally. Original compositions will continue to be made available for free download, or for a cost, without copy protection. Just as the scale of independents brought profitability at relatively low levels of product sales, so it is with downloads. Success through this new distribution channel can lead to subsequent contracts with larger industry companies, and thereby greater visibility and, in the best case, greater sales. The opportunities for direct promotion and distribution of digitized music by artists and small labels are profound. In addition to their own websites, there are search engines for MP3 files and centralized sites for digital music where artists can make their music available in partnership with the site owners. Portable units that make digital music files mobile are accelerating in sales. Technologies that make the swapping of MP3 files easier are appearing, and smaller labels that are not participating in SDMI are establishing partnerships with specialized firms that can make their catalogs available in this marketplace. The adaptation to the digital music revolution is ongoing, and there are many opportunities yet to come.

Conclusion

Many companies in the recording industry have attached themselves to this complex of new technologies in the name of profit-some more single-mindedly than others. Music, the primary content of recorded products, is an element of culture and, as such, cannot be fully contained or controlled by industry. Indigenous music is an acknowledged contribution that the United States has made to world culture, and it will likely continue to be. The mix of major labels, independents, and entrepreneurial artists allows for the simultaneous evolution and commercialization of American musical culture, which allows for both profit and artistic expression, neither fully excluding the other. Still, the profound influence that major companies possess because of their dominance over the music marketplace is weakening (perhaps only slightly and perhaps just for a short time), and this bodes well for music as artistic expression and for the ongoing health of the industry.

See also: Internet and the World Wide Web; Pirate Media; Radio Broadcasting; Radio Broadcasting, Station Programming and; Recording Industry, Careers in; Recording Industry, History of; Recording Industry, Production Process of; Recording Industry, Technology of.

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RECORDING INDUSTRY, CAREERS IN

The recording industry is made up of small companies as well as transnational corporations. Many are concentrated in music centers, such as New York, Los Angeles, London, and Nashville, while others thrive in markets where corporate and private products involving sound are produced, such as Chicago, Philadelphia, and Miami. Companies in the recording industry employ clerical and administrative staffs, accountants, and lawyers, though only the larger companies have in-house accountants and lawyers.

The everyday, essential staff areas are often the easiest way to gain employment with industry companies, thereby facilitating access to positions that are more directly engaged with creative processes. In major markets, there are usually temporary staffing companies that specialize in serving recording industry companies. Temporary assignments often lead to full-time jobs. Once an individual is employed in the industry, it becomes easier to find out about and move toward jobs that satisfy established desires and use specific skills. To land an entry-level position, a college degree, especially one related to the industry, is valued. Although it is possible to find employment without a degree, an individual in that situation must be able to compensate with positive assets such as daily dependability and the ability to deliver more than the minimum work that is requested. These characteristics can also lead to promotions and access to more responsible jobs. Recording industry jobs are part of the larger entertainment industry, a desirable place to work, so there are almost always more applicants than positions. Because of the highly competitive job market, even at the entry level, whom one knows and whom one has impressed can be very important.

Many people harbor the dream of becoming famous as recording artists, performing their own music. Few succeed, and the bulk of the industry is based on the expectation that dues will be paid before power and monetary payoffs are realized. For every visible star, there are at least twenty people behind the scenes working to keep them there. This is where most job opportunities in the industry appear. The recording industry is nothing without something to record, so beyond singer-songwriters, the song is key. Songwriters work on an independent basis, using personal and professional contacts, or under a contract to music publishing companies that market ("pitch," or "plug") songs. Personal managers, producers, and artist and repertoire (A&R) executives at

record labels who have the power to include people in projects that they are overseeing are on the receiving end of these pitches. Publishing companies typically have creative and administrative divisions. Publishers' creative divisions decide which songwriters to sign, which songs to make demonstration ("demo") recordings of, and to whom the songs should be pitched in hopes of getting a "cut" (a song included on a recording). The administrative division handles payroll, distributes royalty payments, and keeps the bills paid. Getting a contract as a songwriter depends on the strength of the material one brings to market. Song pluggers are often successful songwriters themselves, former label employees, and/or individuals who have good connections around the industry. It is a business of relationships.

Personal managers and record producers stand at the crossroads of creativity and commerce. Personal managers have earned the trust of musical artists, and they work toward getting recording contracts and booking agents for the artists in an attempt to maximize the artists' income. In return, they receive a percentage of the artists' incometypically 15 to 20 percent-for providing that guidance. They have creative input into the songs that are recorded and their style and sequencing, as well as the photographs, packaging, and marketing of the final products and the artists themselves. Sometimes, managers and producers must caution performers to rein in their artistic impulses to fit better with trends in chart success, radio airplay, and sales. Personal managers also serve as the artists' legal representatives when dealing with record companies, booking agents, public relations firms, and so on. Producers, in command in the studio sessions, have to balance the musicians' desires to express themselves and realize their artistic visions with delivering a product that the record label can energetically bring to market. Producers also choose the studios to work in, which affects engineers, backup singers, and session musicians. Business managers, employed by the most successful artists, should be mentioned here. Also working for a percentage of the artists' income-only 5 to 10 percent-these managers collect the artists' income (making certain that the artists are being paid fully and properly), pay their bills, provide them with living expenses, prepare their taxes, and often oversee their investments. The overseeing of financial matters by business managers provides a check on the activities of personal managers and the excesses of the artists themselves.

A&R executives are the creatives at record labels, the ears of the companies who advocate for performers they like-to get them "signed" to recording contracts. After signing, A&R executives serve as liaisons to the artists' management regarding the label's vision for the performer and the marketing plans. Within a major company, the ideal A&R person remains an advocate for the artists that they sign, "selling" them to the sales, promotion, publicity, and advertising departments. Marketing is usually the largest of these divisions, responsible for getting the product to consumers by getting it into stores and the awareness of the consumers. Promotion involves getting the recorded product radio and video airplay, as well as arranging live appearances at retail and broadcast outlets when the artist is on tour. Publicity efforts try to get unpaid exposure (other than airplay) for recordings. Advertising involves taking out advertisements in trade and consumer publications to create awareness and to arrange cooperative advertisements with retailers to promote the key releases of the company. At smaller labels, many of these functions may be combined. Because of the complex business nature of the industry, many of the presidents of major recording labels are attorneys.

Many job niches exist in working directly for recording artists. Performers who have recording contracts are expected to tour, which creates a demand for bus and truck drivers, roadies who set up the equipment, and technicians who set up and tune instruments and provide onstage support during performances. Some artists employ singers or dancers to enhance the onstage presentation, wardrobe people to look after their stage clothes, as well as hairstylists and makeup artists who travel with them so they look their best onstage and at media appearances. Road managers travel with performers to keep the complex logistics of a traveling show straight-getting all the people and equipment to the right place at the right time and looking after payment upon delivery of the performers' services.

In the recording industry, getting the first job is usually the hardest. Established relationships, such as becoming a trusted friend, can make one a road manager or personal manager overnight. Landing jobs with major companies may require contacts, or a stint as an intern or temp, to get noticed. Maintaining one's reputation as a sharp, dependable, and discreet person will do the most toward maintaining career momentum. Making decisions that make employers money provides the best chance of upward advancement.

See also: Public Relations, Careers in; Radio Broadcasting, Careers in; Radio Broadcasting, Station Programming and; Recording Industry; Recording Industry, History of; Recording Industry, Production Process of; Recording Industry, Technology of.

PAUL D. FISCHER

RECORDING INDUSTRY, HISTORY OF

Recording and playback of sound was first achieved by Thomas Edison in 1877. His first recording was the nursery rhyme "Mary Had a Little Lamb." (If Edison believed it was going to work, he might have said something more momentous.) Edison patented his "talking machine," or phonograph, in 1878. Nearly deaf, he noticed that each sound had a distinct vibration, and by etching or indenting those vibrations in a physical material, they could be retraced and replayed. The first phonograph combined previously existing technologies to record and play sound by mechanical means. He used a trumpet to gather sound and concentrate it, causing a taut membrane at its smaller end to vibrate like a drumhead (i.e., a diaphragm). A stylus attached to the diaphragm indented a hill-and-dale pattern (created by the sound vibrations) on a moving surface (initially a cylinder) of a malleable substance (originally tin foil or wax), which was turned by a wheel that was attached to a feed screw. This resulted in a spiral-shaped groove that could then be retraced with a lighter stylus, causing the same vibration in the diaphragm, sending sound back up the trumpet to be heard.

Edison believed the device would be most valuable as an office machine, a dictation device. He also listed talking books for the blind and the teaching of elocution ahead of reproduction of music on his initial list of potential uses. Last on his list was "connection to the telephone." Genius that he was, Edison envisioned the answering machine before the turn of the century. Early competitors with the phonograph were the graphophone, a remarkably similar device patented in 1885 and marketed by Alexander Graham Bell and his associates beginning in 1887, and Emile Berliner's gramophone that played flat, round discs rather than cylinders and was brought to market in 1891. The Berliner Gramophone Company was based in Philadelphia, and its first discpressing plant was located in Hanover, Germany. The similarities between the phonograph and graphophone prompted Edison to sue for patent infringement, but sufficient improvements were found in the graphophone that both were permitted in the marketplace. The gramophone was a playback-only device, geared to the home entertainment market from the outset, necessitating the development of the record business to spark and maintain the interest of the consumers.

There were substantial differences in the commercial production of cylinder and disc recordings. Cylinders depended on the technique of multiple simultaneous recording. Numerous "horns" (large trumpets) were arranged to capture the live sound and direct it to numerous phonographs and/or graphophones. In essence, each cylinder was an original recording. Phonograph discs were produced from a metal (zinc) master disc from the very beginning. Also, they used a lateral groove, rather than the hill-anddale formation. The first consumer discs were made of vulcanite, a mixture of rubber and sulfur that hardened when heated. Unfortunately, this material did not provide quality or durability that was consistent enough for a commercial product. The successful substance, durinoid (so named because it was a product of the Durinoid Company of Newark, New Jersey), was a plastic used in the manufacture of buttons. A combination of shellac, clay, cotton fibers, and lampblack, durinoid became the industry standard until the introduction of vinyl in the 1940s. The gramophone also introduced motors into the playback function, using a hand-cranked, spring-wound device with a governor, assuring constant turntable speed. These motors were manufactured by Eldridge Johnson, an engineer who had previously manufactured motors for sewing machines. Johnson also developed a wax mastering process for discs, which greatly improved their sound. Eventually, he became head of the



The Berliner Gramophone is shown with its various accessories. (Bettmann/Corbis)

Victor Talking Machine Company and the Victor Record Company. In 1906, the Victor Talking Machine Company introduced the "Victrola," which was designed to look more like furniture than a machine and won mainstream acceptance and massive sales. Edison continued to promote cylinders until 1913, when he finally began marketing discs and players under his name. His discs used a diamond-tipped stylus, had hill-anddale grooves, and sounded great, but he never seriously threatened the dominance of Victor Records in the marketplace.

With methods of production stabilized, the business turned its attention to matters of content. Fred W. Gaisberg, working with Berliner, was sent to Europe in 1902 to record operatic arias. There he found tenor Enrico Caruso, who would become the first million-selling recording artist. Caruso was recorded in a Milan hotel suite, using Johnson's wax mastering process. The ten selections that Caruso recorded were released on the Red Seal label of Victor Records. Despite the success of these recordings, and the dedication of several early labels to classical music, the biggest sales came from more popular genres. Brass bands, such as John Phillip Sousa's, did well-in part because their sounds reproduced clearly through the early processes. Songs made popular through Broadway and vaudeville shows found ready buyers, as did novelties such as gifted whistlers and players of saws and other offbeat instruments. The music business was still dominated by sheet music, sales of which peaked in 1910, driven by the Tin Pan Alley songwriters and publishers that were based in New York City.

Increasing sales of recordings in the 1910s and 1920s, with a peak of \$121 million in sales in 1921, shifted the balance of power in the industry

toward the recording companies. The explosion of in-home radio receivers in the 1920s brought recorded music to a new, and larger, audience. The first jazz hit was "Livery Stable Blues," recorded by the all-white Original Dixieland Jazz Band in 1917. Most of the bands that were featured live on radio programs were white. It was not until the 1920s that black musicians came to be recorded with market success, initially by smaller labels. Ralph Sylvester Peer, with Okeh Records, was instrumental in the first recordings of another indigenous American music, the blues. He recorded Mamie Smith singing Perry Bradford's "Crazy Blues," which became a hit. Throughout that decade, female artists such as Ma Rainey, Bessie Smith, Alberta Hunter, Sippie Wallace, and others found success with what came to be called the vaudeville blues, crossing this music over to an appreciative white audience. Peer coined a name for all the music recorded by blacks, "race music," which became a marketing category.

Peer also pioneered commercial recording of rural white musicians, performing what he called "hillbilly music," later known as country. In 1923, he recorded Fiddlin' John Carson in Atlanta, Georgia. The first hillbilly hit was "The Prisoner's Song," by Vernon Dalhart in 1924. Dalhart, himself anything but a hillbilly, was a formally trained operatic singer. Radio "barn dance" programs on Chicago's WLS, and later, Nashville's WSM, helped raise the national profile of the music. A set of 1927 recording sessions by Peer in Bristol, Tennessee, also advanced the music commercially, bringing The Carter Family and Jimmie Rodgers ("The Singing Brakeman") to national prominence. In the 1930s, singing cowboys in the movies, such as Gene Autry and Roy Rogers, advanced the popularity of country and western music even further.

The stock market crash of 1929 and America's Great Depression were devastating to the recording industry. Radio became the dominant entertainment medium and fewer people bought recordings for private use. "Big band" music was the most popular music on the radio, playing complex jazz arrangements popularly known as "swing" music. Clarinetist Benny Goodman led a popular band on radio, earning him the nickname "King of Swing." Other bands, including those led by Tommy and Jimmy Dorsey, Artie Shaw, Glenn Miller, and Woody Herman, enjoyed success on radio. Black bandleaders, such as Duke Ellington, Count Basie, and Cab Calloway, succeeded mainly through club dates and tours. A new distribution channel for popular music came along in the 1930s that almost single-handedly pulled the industry out of the Great Depression: the jukebox. By the end of the decade, nearly 250,000 of the coin-in-the-slot record machines were in place around America, and fully 60 percent of the record industry's output in 1939 was purchased by jukebox operators.

Recorded music in the 1940s faced a new set of challenges, mainly brought on by World War II. In addition to wartime rationing of products such as rubber, gasoline, butter, sugar, and flour, there were shortages of industrial raw materials. Shellac, a key ingredient in records, was imported, mainly from India, and quickly came into short supply. By April 1942, the government had limited the recording industry's consumption of shellac to 30 percent of prewar levels, and production thus ground to a halt. There was also a musician's strike by the American Federation of Musicians that made arranging commercial sessions difficult. Recording artists, however, began donating their services for inclusion in V-Discs ("V" for "Victory"), made by the War Department for distribution to Armed Forces Radio and servicemen worldwide. Many of the popular artists during the period, such as Bing Crosby, Frank Sinatra, and the big bands, made their only war-era recordings as part of the V-Disc effort.

The war years also helped lead to the death of the big bands. With many of the best players in the service and tires and gasoline rationed, it became uneconomical and somewhat unpatriotic to keep large performing units on the road. This gave rise to smaller combinations (or "combos") playing hard jazz (or "bebop") and "jump blues." The former, typified by the works of Dizzy Gillespie, John Coltrane, and Charlie Parker, went largely unrecorded, and the latter, epitomized by Louis Jordan's Tympani Five, sparked new commercial trends. Electric blues, featuring electric guitar leads by Muddy Waters and the like, also surfaced at this time, but this category did not reach a mainstream audience. During the war, the Union Carbide Company developed vinylite, a petroleum-based substance that was suitable for making discs. Soundwise, they offered substantial improvements over shellac-based discs-includ-



One of the key turning points in the history of rock-n-roll was the appearance of Elvis Presley on The Ed Sullivan Show in 1956. (Bettmann/Corbis)

ing less surface noise, hissing, and popping. The 1940s also saw the introduction of replacements for the 78-rpm (revolutions per minute) records that had generally become the standard for the industry. Columbia Records introduced their 12inch, 33 1/3-rpm, long-playing record, and RCA introduced their 7-in, 45-rpm record. The longplaying records offered up to twenty minutes of playing time per side, a boon to jazz and classical fans. As other classical labels adopted the longplaying format, even RCA was forced to go along. By 1950, the 78-rpm record was a thing of the past, but the 45-rpm record offered inexpensive consumer access to the most popular songs, a key to the teen-driven music market of the period.

The late 1940s saw more black music being played on the radio, notably by 50,000-watt, clearchannel WLAC-AM in Nashville, Tennessee, which crossed jazz and rhythm and blues (R&B) sounds over to a large white audience. However, the major labels resisted recording black artists,

which created an opportunity for new, independent labels. As more radio stations began playing jump blues, electric blues, and rhythm and blues, the records began selling in larger quantities. In 1951, WJW-AM disc jockey Alan Freed called this music "rock and roll," to lessen its racial connotations to his white teen audience, paving the way for a new wave of success for the industry. The major labels resisted signing R&B and rock-n-roll artists, believing either that the music was just a fad and/or that it was too raw and crude for corporate association. This created opportunities for songwriters, publishers, and independent record labels to get in on the ground floor. One of the biggest success stories in this era was Atlantic Records, founded by Ahmet Ertegun and Herb Abramson, with the early addition of Jerry Wexler. Recording artists such as Ray Charles and Ruth Brown rode the crest of the R&B wave into the rock-n-roll era to great success.

Elvis Presley was instrumental in making permanent the crossover of these types of music to white teenagers. He brought the style and substance of R&B to television in 1956 on the Milton Berle, Steve Allen, and Ed Sullivan shows, and his fusion of country, gospel elements, R&B music, and performance styles brought rock-n-roll closer to the American mainstream. Radio still did not play much music by black artists, which led to the regular creation of "cover versions," in which white vocalists and groups rendered faithful copies of songs that were successful on the R&B charts. Pat Boone enjoyed extensive chart success with songs that were originated by Fats Domino, Little Richard, and others. The beginning of the 1960s looked much like the decade that preceded it, but before it was half over, things had changed drastically. In 1964, the "British Invasion" began, with The Beatles. Appearing on Ed Sullivan' show in February of that year, their first U.S. long-playing record, Meet The Beatles, went on to sell 3.6 million copies, the first album to outsell its hit single. Their early records included covers of Chuck Berry and Little Richard songs, as well as original songs. Their sales momentum caused the major labels to take notice and opened the doors of the industry to many British pop groups, including The Dave Clark Five, Herman's Hermits, and Peter and Gordon.

The success of this first wave led to a second British wave, of more blues- and R&B-influenced bands such as The Yardbirds, The Rolling Stones, and The Animals, who covered hits by Muddy Waters, John Lee Hooker, Howlin' Wolf, and other American bluesmen. In effect, these developments brought these powerful American types of music to white teenagers for the first time and provided a new foundation for the evolution of popular music with a blues base. Also, in the mid-1960s, Bob Dylan electrified his music, bringing the social conscience, lyrical complexity, and social commentary of folk into the rock mainstream. provided a base for introspective This singer-songwriters to share their personal insights about life, love, politics, the environment, and the world with millions of fans and propel the industry into the 1970s. By the end of the 1960s, even the largest record companies were recording rock artists and/or moving to acquire and distribute companies that did.

The 1970s was the decade when rock music and the recording industry really became big business. Top artists such as The Eagles, Elton John, Fleetwood Mac, and Peter Frampton could be counted on to sell more than ten million copies of each release. The more than seventy million "baby boomers" (born between 1946 and 1964) were a massive market, hungry for the musical input of their peers. Mid-decade, two types of music came in from the fringes to reenergize the complacent mainstream: disco and punk. Disco came out of the dance clubs, with fast beats, reintroducing the effect that rock-n-roll originally had of getting young people dancing. Punk took social commentary to a new extreme, criticizing many aspects of modern industrial society, even the companies that brought their sounds to the audience. For a time, both genres sold well and very expensive studios were built, including the first using digital recording technology. The 1980s saw the introduction of the "compact disc" (CD), the first digital playback format for consumers, and vinyl discs were quickly eclipsed at retail.

The massive cash flows generated by record companies in the 1970s made them attractive takeover targets, even with their countercultural cachet. The 1980s saw an accelerating concentration of ownership in the recording industry. By the end of the decade six major corporations, Columbia Broadcasting System (CBS), Radio Corporation Of America (RCA), Warner-Elektra-Atlantic (WEA), Britain's Electric and Musical Industries Ltd. (EMI), the Music Corporation of America (MCA), and Polygram, dominated the business. For a brief time these companies controlled more than 90 percent of the recorded music business worldwide. That percentage has since declined to somewhere in the mid to upper eighties, but even greater concentration has taken place. CBS was sold to Sony Corporation of Japan, RCA sold its labels to the Bertelsman Company of Germany, WEA became part of Time-Warner, EMI became part of the Thorn-EMI conglomerate, and MCA was sold three times-first to Matsushita of Japan and then to the Seagram Company Ltd. of Canada, which in turn bought out Polygram before being sold to the French environmental services and media giant Vivendi. These companies have tried to maintain their dominance in the marketplace by developing secure standards for the digital distribution of music over the Internet-yet another revolution in the distribution of music.

See also: Music, Popular; Radio Broadcasting; Radio Broadcasting, History of; Radio Broadcasting, Station Programming and; Recording Industry; Recording Industry, Careers in; Recording Industry, Production Process of; Recording Industry, Technology of.

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PAUL D. FISCHER

RECORDING INDUSTRY, PRODUCTION PROCESS OF

The process that allows a song, from its inception as a creative seed in the mind of a songwriter, to blossom into a compact disc, cassette, or data file downloaded from a website is a complicated one that includes a wide range of specialized vocations. In general, the recording production process can be broken down into three phases: preproduction, production, and postproduction. Although each genre of music, such as pop, urban, modern rock, or country, has some idiosyncrasies, all typically share similar procedures in the production chain.

In addition to the three production phases a song goes through, the completed work must be manufactured, promoted, and distributed to the public. Although these business functions are not part of the production process, they have a pervasive effect on most production decisions. Therefore, people who work in creative vocations such as songwriter, producer, audio engineer, and performer must understand them.

Preproduction

A song is born, from a legal standpoint, the moment that it is put into some fixed form. The most common fixed form is an audio recording cassettetape or digital audiotape—which is the rough song demo. Once a song is fixed in this manner, it is protected by federal copyright laws. However, most songwriters go one step further and register their songs with the U.S. Library of Congress. By merely completing and mailing the appropriate copyright registration application (form PA), including a copy of the song demo and a nominal fee, the song becomes registered with the Library of Congress Office of Copyright. That simple procedure activates statutory protection and provides an accurate date of ownership.

An active songwriter, trying to earn a living from creating marketable songs, usually enlists the help of a publisher. The publisher will, for a percentage of future royalties, endeavor to get the song recorded and distributed. A songwriter generally agrees to a 50/50 split of all royalties derived from use of the song. One of the first things that a publisher does with a new song is record a more fully produced demo of the song to present to potential users.

Song pluggers from the publishing company pitch the song to people who are looking for songs for upcoming albums. The people who influence the decision regarding what songs will be included on a recording are the producer, record company staff members, the artist, and the artist's manager. Songs go through several levels of screening before even being seriously considered for the album. However, when the producer asks the publisher to "put the song on hold," it is not pitched to other producers. The responsibility for signing new artists to a record label falls on the artist and repertoire (A&R) department. After an act is signed to a label, the A&R director works with the artist and the artist's management to select a producer for the album. Once a producer has agreed to take on the project, the A&R administrator and album producer develop a production budget. Odd as it may seem, the production costs are paid by the artist. A label will normally give the artist an advance against future royalties to pay for producing the album. The advance is, however, usually in the form of a production budget that is under the control of the producer.

The producer is responsible for developing the creative concept for each song that is included on the album. The producer might also enlist the assistance of specialized arrangers on one or more songs. A vocal arranger specializes in creating background vocals; a "horn section" arranger orchestrates arrangements for brass and woodwind instruments; and a string section arranger creates orchestrations for violins, violas, and cellos.

A critical part of preproduction is the selection of a recording studio in which to work. A studio not only provides the obvious recording equipment necessary to capture music on tape, it also offers an ambiance to support long and tedious recording sessions. Studios generally offer the option of analog or digital tape recorders. The mix console—or board—is an important factor in the producer's choice of studios.

The last set of choices the producer makes during preproduction concerns personnel who will be hired on an hourly basis. Even if the act being produced is a band, additional instrumentalists and vocalists are hired for the recording sessions. Recordings that are distributed by major labels typically use union performers. Singers fall under the jurisdiction of the American Federation of Television and Radio Artists (AFTRA), and instrumentalists are most often members of the American Federation of Musicians (AF of M).

Because much of the recording process is dependent on the skills of the audio engineer, a producer often has a preferred engineer (i.e., the first engineer) to work with in studio situations. In turn, first engineers characteristically work with a second engineer of choice. A team that consists of producer and first and second engineers is somewhat common in the industry.

Production

The production phase of a recording normally begins with the in-studio recording of the master recording. A master recording is created using either an analog or a digital tape recorder. The newest generation of recording media, hard-disk recorders, will likely replace magnetic tape in the future. All recording devices that are used for master recordings have one thing in common: multitrack capability.

Multitrack recording evolved as technological advances permitted. The early monophonic (1track) recording format gradually evolved into the stereophonic (2-track) format. Then the number of tracks available to producers began to increase every few years: 4-track, 8-track, 16-track, and 24track. Using tape recorders that are locked together offers a producer the option of 48 or more tracks for isolating sound inputs.

The first sounds to get recorded come from the rhythm section: keyboards, rhythm guitar, electric bass, and drum kit. These basic rhythm tracks are recorded using a vocalist to sing the melody and lyrics. This rough vocal track is referred to as a "scratch track" or "guide vocal" because it will, in all likelihood, be replaced with "keeper vocals" at a later time. This phase (i.e., tracking or cutting rhythm tracks) is laborious but critical. If these basic tracks are recorded without correct pitch, tempo, and rhythmic continuity, the entire album will be in jeopardy. The old adage "We'll fix it in the mix" is pure fiction.

In order to lock-in tempos, the producer usually records a click track onto one track of the multitrack tape. The click track acts like a metronome and helps ensure that each new layer of sound retains the rhythmic integrity. A click track is also very helpful in the editing stage, where precise location of the rhythmic pulse is essential. A more sophisticated variation on a click track is a musical instrument digital interface (MIDI) track. A MIDI track is created with the aid of synthesizers, drum machines, and computers.

Each instrument in the rhythm section is recorded in isolation from the other instruments. That way, if the bass player makes a mistake, the bass part can be fixed in isolation; the other parts will not need to be fixed. This is accomplished by using soundproof isolation booths or movable sound-absorbent baffles (i.e., gobos). In addition, each instrument—especially the drum kit—has the option of multiple input devices.

Input devices include microphones and direct boxes. A direct box routes an electronic signal from its source—guitar, electric bass, or keyboard—directly into the console. This eliminates the possibility of any sound from other instruments bleeding into the instrument's signal. Microphones, on the other hand, are placed near the sound source and are susceptible to other studio sounds bleeding into the sound of another instrument or voice being recorded.

It is possible to have the guitar played through an amplifier and speaker cabinet in the studio and then place a microphone in front of the cabinet. In addition, one could also simultaneously take the same guitar signal through a direct box. This range of options—the selection of microphones and/or direct boxes by the engineer—is somewhat like a painter choosing from a pallet of colors.

After basic tracks are recorded, subsequent sessions are used to layer more sounds (i.e., overdubs) onto the existing tracks. The first in a series of overdub sessions replaces scratch vocals with more precise lead vocals. Often, the lead vocal is recorded several times on different tracks to offer numerous versions from which to choose. This process (i.e., comping or compiling), gives the producer and engineer the ability to piece together selectively the best sections from different vocal tracks.

Because each instrument and voice is isolated on a separate track (or several tracks), "punching in" can be used to fix small mistakes by replacing them without disturbing other sounds. The singer or instrumentalist plays along with the recorded track, and the engineer punches the record button on the tape recorder just prior to the mistake. When done well, a punch-in is imperceptible to most listeners. The use of punch-ins and comping gives the illusion that studio recordings are nearly perfect performances.

After lead vocals are completed, guitar solos and harmony vocals are added to the existing tracks during overdub sessions. The last overdubs are horns and strings, if they are included in the arrangement.

Postproduction

The multitrack master contains many tracks that must now be manipulated and mixed down to a delivery format that might be 2-channel stereo or one of the newer multichannel formats such as 4- or 5.1-channel surround. This process (i.e., mixdown) is done by an audio engineer with input from the producer. It is not uncommon for the mixdown engineer to be different from the tracking engineer.

Each track on the multitrack tape can be electronically processed as it is blended with other tracks in the mixdown process. The most obvious type of signal processing that occurs during mixdown modifies the volume of each signal going to the tape. Slide faders on the console allow the engineer to change the volume of each track, either gradually or quickly. If a console is equipped with memory automation, all changes in volume throughout the recording are stored in memory and replicated during mixdown.

Dynamic range, something related to volume, can also be manipulated through signal processing of each track. If one thinks of dynamics, or volume, on a scale of 1 to 10, an engineer might want to keep certain sounds between 2 and 8. Still others might be electronically limited to between 4 and 6. Electronically limiting or compressing sounds is an important, but often abused, part of mixing tracks.

Another form of signal processing that is used during mixdown is equalization of the tonal quality of a sound. Most of the control knobs or sliders on a recording console are for adjusting the equalization of signals that are going to the tape. The equalization on a console is like a more precise version of the treble and bass controls on a home stereo.

The third type of signal processing manipulates the time domain of recorded sounds. Because recording studios are often nonreverberant by design, the mix engineer must add some type of reverberance (i.e., reverb) and echo to each sound. Echo, the discrete return of a sound after the initial articulation, gives music what some engineers call a third dimension. Reverb, a continuing nondiscrete return of the original sound, adds a sense of space to music. Different types of reverb are sometimes referred to with terms such as "big room," "cathedral," or "concert hall" named after the types of acoustic space that they are intended to emulate.

Signal processing technology has reached a point where it is now possible to correct the pitch of vocals or instruments automatically or selectively. Some purists find this type of modification to be disturbing. However, the technology exists to correct out-of-tune singers, and many producers use it.

Mixdown of one song might take eight hours or more when the producer and engineer seek perfection. As sounds are blended from the numerous tracks of the multitrack master to the 2track stereo version, the magic of the recording studio emerges; it sounds as if the singers and instrumentalists simply sat down and performed the song while someone recorded it. In reality, the process may have involved six separate recording sessions over a period of two months. In fact, some of the performers may have never met.

The last step before manufacturing is mastering. This type of mastering, not to be confused with the multitrack master production, is done by a mastering engineer. The mastering engineer puts the songs into the correct sequential order, makes any edits that are needed, and does a macro-mix to balance the overall recording. Mastering prepares the recording to be manufactured into compact discs, cassette tapes, vinyl records, or other configurations.

Variations in the Production Process

Although most commercially released recordings are created in a studio environment, occasionally albums are recorded live during a concert. The rationale is that some performers have an energy when they are interacting with a live audience that cannot be duplicated in the studio. The trade-off is, obviously, accepting the occasional imperfection that is inherent in a concert performance.

In order to record live shows with the same technology of a studio, remote audio recording trucks arrive at the performance venue with what is essentially a studio on wheels. The inside of the truck contains the mobile equivalent of a control room for the producer and engineer. The stage replaces the studio floor, with microphone and direct-box lines split three ways: one set to the onstage monitors, another set to the audience public address system, and the third set running out to the production truck.

Because mobile production trucks can provide the same multitrack tape formats as found in a studio, it is possible to record the act live to multitrack and later fix mistakes or add overdubs in the studio. This gives the best of both worlds: audience interaction and multitrack isolation of sound inputs. Another variation on studio multitrack recording is a process of recording directly to the 2-track format. This simple setup has the advantage of being quite portable. It is, therefore, a cost-effective alternative to multitrack remote recordings of live performances. In addition to its simple setup, direct to 2-track leaves more control of the recording in the hands of the performers. Direct to 2track is more amenable to acoustic ensembles, such as classical and jazz, that do not characteristically depend on the mixdown process for dynamic balance of each instrument.

The development of synthesizers and computer interface software created the new concept of using MIDI in music production. MIDI technology allows a producer to assemble portions of the recording prior to any in-studio performances. It is not uncommon, especially in urban and pop genres, for a producer to employ a "drum programmer" to create the drum sounds in MIDI format. The drum sounds are transferred to the multitrack tape prior to or during the rhythm section sessions.

As the capacity of digital storage media increased since the advent of hard drives on personal computers, the viability of hard-disk recording has emerged. Hard-disk recording systems depend on the same storage media that computers do. Instead of storing audio information on magnetic tape, this new format converts analog sounds to digital information and stores the data on a hard drive or hard disk much like a computer. Therefore, in all likelihood, the cost associated with hard-disk systems will decrease in the future and the technology will become more sophisticated.

A major advantage of digital recording technology is the economy of space that is associated with it. For example, a digital console, MIDI system, and hard-disk recorder might fit neatly into less than one-third of the space that an analog console and tape recorder would require. The low costs that are associated with this type of studio, plus the small amount of space required, make it possible for more producers to have professional home studios. An additional advantage of these types of systems is that the recording process remains totally in the digital domain. No longer does one need to worry about the degradation of audio quality as tracks are mixed or transferred. The world of recorded music is clearly moving in the direction of digital technology.

TABLE 1.

otal Units Sold	Genre
25.2%	Rock
10.8%	Country
10.8%	Rap
10.5%	R&B
10.3%	Pop
5.1%	Religious
3.5%	Classical
3.0%	Jazz
0.8%	Soundtracks
0.7%	Oldies
0.5%	New Age
0.4%	Children's
9.1%	Other*

The Business Environment of Recordings

Even before a song is written, one must consider certain facts of life that will ultimately decide the fate of any recording released to the public. Most music that is produced in a recorded format is intended to be heard by an audience. The audience may hear it broadcast on radio, played on a personal listening device, or in a myriad of other environments. However, the efforts that go into recording a musical work must be matched by equally masterful forms of promotion and distribution, or the production will exist in a vacuum.

Music that is created for aesthetic reasons, as opposed to music that is created to generate income, is most often appreciated during live performances in concert halls rather than in recorded form. On the other hand, most modern genres are created to be broadcast and sold to the general public in the form of compact discs and cassettes. Music producers depend on the sales of these recordings to make a living, so they pay close attention to statistics that indicate which genres of music sell more than the others.

The Recording Industry Association of America (RIAA) is a trade association that represents the interests of record companies in the United States. It monitors sales of recordings in the United States and presents annual summaries (see Table 1).

In addition to identifying the genres of music that are being sold, record companies (i.e., record

labels) also get valuable information about the configurations on which music is recorded for distribution to consumers. As new configurations become more popular, and as others go out of vogue, producers of music must adjust to accommodate the newer technologies. For example, as the digital compact disc configuration began to replace analog recordings such as vinyl records and cassette tapes, producers were able to extend the range of dynamics. One marketing strategy of record labels in the early days of compact discs was to offer recordings with exaggerated dynamic range in order to dramatize their advantage over analog recordings. This is just one example of how people who are involved with the creation of recorded music have had to adjust to innovations in technology.

Record Promotion

The manner in which a recording will be promoted has a significant effect on production decisions. The primary medium for promoting recordings is radio, and a recording must meet certain criteria in order to be broadcast by radio stations. The most obvious, but nonetheless controversial, criterion is the lyric content of the song. Rap and rock music producers occasionally create two or more versions of a song in the studio. One is the "clean" version, also known as the "radio version," which is free of profanity or other lyrics that would prohibit stations from airing it. The other version, complete with explicit lyrics, is created for compact disc and cassette releases. A third mix (i.e., the dance mix or "remix) is a longer version that has strong bass and kick drum.

Another restriction that is placed on music by radio is the length of the completed production. Radio programmers prefer songs that are between 2.5 and 3 minutes in length. Again, producers often create a single version for release to radio and an album version and dance mix that are longer versions. The different lengths of a song are often created in the editing process.

No matter how great a recording is, the public needs to hear it before they can decide whether or not to buy it. In other words, the recording must get airplay on mass media in order to generate potential buyers. Although music videos and reviews in print media help create an awareness for a new record release, radio remains the primary means for promoting recordings. All major record labels fights tooth-and-nail to obtain radio airplay for their artists. Each broadcast on radio, or "spin" in promotional jargon, ordinarily results in sales of recordings. The process of getting radio stations to play a record is one of the most controversial aspects of recordlabel operations.

The radio promotion department of a label uses several techniques to get airplay. First, they send information about the artist, along with a copy of a "single" from the album, to radio station program directors and music directors across the country. A single is merely the song that the label wants the radio stations to play first. The next step is the art of promotion—calling the station to persuade them to play the record and play it often.

Occasionally, a label will also enlist the help for a pretty stiff fee—of an independent record promoter. Some independent promoters have been accused of going beyond legal means to get radio airplay. One illegal technique is the bribing of radio station employees to play the record. This nefarious tactic (i.e., payola) can get both the radio station employee and the promoter in big trouble with the law. Payola is, therefore, not something in which legitimate promoters ever engage.

Assuming that the record starts getting airplay on radio stations throughout the nation, it will appear in trade publications (i.e., the charts). A chart lists the top albums and singles in various radio formats, such as urban, adult contemporary, or country. Some well-known charts are *Billboard*, *Cashbox*, *The Gavin Report*, *Monday Morning Quarterback*, and *Radio and Records*.

The information that is used to create the various record charts has become somewhat more scientific than it was in the past. Airplay is monitored by a broadcast detection system operated by the Broadcast Data Systems (BDS) company. When a single is manufactured by a label, an electronic detection code is imbedded in the recording. This detection fingerprint is inaudible to human ears, but it is detected by BDS reception towers located throughout the country. Each detection indicates the code number for the single, what station broadcast it, and the time and date of the broadcast. All detections are transmitted to a central computer, and summaries of airplay are updated daily.

The other criterion for getting a record charted—sales—is also monitored electronically.

Bar-coded information that is scanned at the cash register of a record store is transmitted to Sound-Scan, a company that is somewhat like BDS. Sound-Scan captures sales data on all configurations that are sold at cooperating retail outlets and the cumulative data is maintained in their database. Anyone who wishes to access those data files can do so by subscribing to SoundScan and paying an annual fee.

Both labels and chart publishers watch BDS and SoundScan results on a daily basis. Some charts also include data from key radio stations in various markets. These stations (i.e., reporting stations) offer information on newly added singles and album cuts plus how often they are being played in program rotation.

Record Distribution

If a promotion staff has been successful in gaining airplay for a single, the next stage is distribution of the product. As fans hear a new single on the radio, many go to a retail store or website to purchase the album from which the single came. The path from the factory where a compact disc is replicated or cassette tape is duplicated to the retail outlet is not as simple as one might think. The channels of distribution, from label to consumer, have evolved into a strange labyrinth of subdistributors.

Although there are hundreds of record labels in the United States, there are relatively few distribution organizations. As major labels began buying independent labels in the consolidation era that began in the 1980s, each created a separate affiliated distribution entity. There are only five major distribution companies and several independent distributors. Oligopoly, which describes the situation where a few companies dominate an industry, is nowhere more apparent than in record distribution. The five major distribution companies account for about 80 percent all of records sold worldwide.

After a recording is manufactured, its marketing plan is created under the watchful eye of the label's product manager. The product manager, somewhat like a traffic cop, directs the recorded product through the distribution network. Working with the label's in-house sales staff and distribution arm, the product manager constantly works to get the product on the streets.

Orders are filled through a system of branch distribution offices. Branch offices, generally located in several large cities around the country, have the difficult balancing act of having adequate inventory in the warehouse but not overstocking any one release. Their goal is to process orders and returns in a timely manner.

Two types of subdistributors have emerged to serve special types of accounts. One such subdistributor, the "one-stop," acquires recordings through major- and independent-label branch offices and sells them to retail accounts. It is appropriately named, because it allows small independent retail stores the opportunity to purchase product from all major labels and many independent labels with only one stop.

A second type of subdistributor is a "rack jobber." A rack jobber supplies a full range of recordings, from all viable labels, to department stores, mass-marketing retail chains, and other retail stores that do not specialize in music. The largest rack jobber in the United States, The Handleman Company, essentially manages the recording sections of chains such as K-Mart and Wal-Mart. Because Handleman services more than twenty thousand retail locations, it is an extremely important account for a major label.

It is important to reiterate that the producers of music for commercial distribution must be cognizant of the preferences—and restrictions—of the marketing system. If a recording does not meet the demands of mass retailers, such as K-Mart or Wal-Mart, it simply will not be made available in their record bins. If a recording does not meet parameters dictated by radio broadcasters, it will not receive the necessary airplay to sell significant numbers to the public. Therefore, people who are involved with the creation of the artistic product must be aware of the business system in addition to the technical and artistic elements.

See also: Copyright; Radio Broadcasting; Radio Industry, Station Programming and; Recording Industry; Recording Industry, Careers in; Recording Industry, History of; Recording Industry, Technology of.

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RICHARD D. BARNET

RECORDING INDUSTRY, TECHNOLOGY OF

Thomas Edison never envisioned that the phonograph that he invented would ever be used for entertainment. He saw it as a business dictation machine or as a telephone answering machine, not as a music player. However, when he made the first acoustic music recordings on wax cylinders in 1877, Edison unwittingly unleashed the entertainment potential of prerecorded music. The possibility of a library of music recordings being available for personal use sparked a frenzy of recording that has continued unabated.

Many of the early electrical recording studios were essentially radio station facilities. The equipment that was so vital to the broadcasting industry was quickly adopted by the entertainment industry to record music as well as soundtracks for motion pictures. Whether broadcasting or making a record, the sequence of events was the same—performers and musicians created sounds that were gathered by microphones and transformed into electrical signals. These signals were sent to an audio mixer, where they were amplified and combined. Engineers monitored the signals, adjusted their levels, and mixed them into a single-channel output. This output was either recorded on a storage medium or broadcast live. An acetate disc was the preferred recording medium until magnetic tape was developed in the late 1940s.

The technical evolution of the music recording studio was slow, however, compared to the film industry. When Walt Disney's film Fantasia premiered in 1940, the soundtrack had been recorded on nine separate channels that were mixed down to four channels for theatrical presentation. Multiple-channel recording in the audio studio, however, would not be adopted until stereophonic (two-channel) sound was introduced to the public in the 1950s. Regardless of the format, the components in any recording studio signal chain were, and still are, microphones, audio consoles, recording equipment, and monitor loudspeakers. Peripheral equipment used to modify the audio signal includes equalizers, compressors, limiters, and reverberation chambers.

Microphones and Loudspeakers

Mechanical transducers, such as microphones and loudspeakers, are often considered to be the most critical links in the recording chain. They must accurately convert acoustical sound waves into electrical signals and vice versa. When sound waves strike the diaphragm of a microphone, small electrical currents are created that are proportional to the amount of diaphragm movement. This current, or signal, must be amplified for use. There are literally dozens of microphone types with varying electrical and physical characteristics, ranging from a rather large studio condenser microphone to a subminiature lavalier microphone that is the size of a pencil eraser.

Several characteristics that describe microphones include the type of diaphragm element, the directional pattern of sensitivity, and the frequency response. The element types for most professional applications are dynamic, ribbon, and condenser. Dynamic microphones come in all sizes and shapes, and they are very rugged and utilitarian. Ribbon microphones are more fragile, are more sensitive to low-level sounds, and have a better frequency response than do dynamic microphones. Condenser microphones generally have the widest frequency response, and they are preferred for studio use. They have built-in amplifiers that require external or internal power supplies to operate.

Microphones are sensitive to sounds coming from different directions. Directional sensitivity patterns in the shape of a heart (one direction), a figure-eight (two directions), and a circle (all directions) correspond to the pattern names of unidirectional, bidirectional, and omnidirectional, respectively. Some microphones have variable patterns, and a switch can be used to change the directional characteristics.

The human hearing range or audio spectrum is generally considered to go from 20 Hz (hertz, a unit of frequency) to 20,000 Hz. Although the best microphones should have a comparable frequency response, many sonic variations are acceptable and may even be desirable. Microphones with increased treble response can add brightness in some applications, while those with an increased bass response can enhance vocal performances.

Monitor loudspeakers should be able to reproduce the same audio spectrum but at volumes approaching rock concert level. Sonic variations are not desirable; they can actually overemphasize or mask portions of the musical material, making accurate audio evaluations in the control room somewhat difficult. Many speaker enclosures contain three or more loudspeakers called tweeters, midranges, and woofers. Each is designed to reproduce only a portion of the spectrum: high, middle, or low frequencies, respectively. Some loudspeaker systems use separate amplifiers for high and low frequencies, as well as multiple speakers for each frequency range to ensure the most accurate sound reproduction possible.

The Audio Console

The complexity of an audio recording console may initially be overwhelming, but its basic operations are relatively simple. Regardless of the console size or layout design, there are provisions for assigning inputs to outputs, adjusting the input and output levels, watching the levels on meters, and listening to the entire process on control room loudspeakers. A typical 1960s audio production console contained 24 input modules each identical to the other—feeding 16 outputs. There were literally hundreds of knobs, switches, meters, and dials spread all over the seven-footlong control board. Contemporary consoles can contain as many as 96 input modules feeding 48 outputs.

During recording, the signal from a microphone goes to an input/output (I/O) module or channel strip, and its volume and equalization are adjusted. The signal is then assigned to an output bus, or a pan control sends the signal to two output buses to create a stereo effect. Each I/O module includes auxiliary outputs (sends) either for external effects such as echo or for monitoring requirements such as headphone mixes for performers. A special patch point on each I/O module, called an insert jack, permits connection of external signal-processing devices. Compressors or limiters can control input signal dynamics by reducing sudden, extremely loud sounds to more manageable audio levels. Effects processors can create reverberation or delays, or modify virtually any aspect of an audio signal, while different types of equalizers increase or decrease portions of the audio signal. Stanley Alten (1999) separates processors into four categories: spectrum processors that affect the overall tonal balance, time processors that affect the time interval between a signal and its repetition, amplitude processors that affect a signal's dynamic range, and noise processors that reduce tape noise. A VU (volume unit) meter monitors the signal level of each input module, as well as the output buses. Each output bus is connected to a multitrack audio recorder.

After recording, the multitrack master is played back through the same console so the engineer can mix down or combine all the channels into a new master recording. The same signal processing that is available during recording can be used during the mixdown process as well. Trying to get the precise balance, equalization, effects, and stereo panning when mixing down 24 or 48 channels requires hundreds of level and control changes during a short recording. Prior to the development of console automation, recording engineers typically kept detailed logs of all the settings, and numerous rehearsals were required to get the right mix. With automation, a computer captures and stores each console setting change automatically, which greatly simplifies the mixdown process.

The Magnetic Tape Recorder

When Elvis Presley recorded his first demonstration tapes in 1954, an old six-input radio mixer



Country singer Garth Brooks leans on an audio mixing console as he listens to a playback in a recording studio in Nashville, Tennessee. (*Nubar Alexanian/Corbis*)

and two single-track recorders were all that was needed to launch the career of the "King of Rockn-Roll." The Beatles recorded their first songs on a two-track tape recorder in 1962, putting all of the instrumentals on one track and the vocals on the second track. As artists demanded more creative flexibility, 16- and 24-track audio recorders using two-inch tape were developed, and by the 1970s, 32-track recorders were common.

Regardless of the number of tracks, all magnetic tape recorders operate on the same principles. A spool of iron-particle recording tape passes across three heads that are aligned in a tape transport. The tape is drawn at a precise speed by the drive mechanism. Each head contains a coil of wire wrapped around layers of steel, called poles. A very narrow gap between the poles focuses a magnetic field on a portion of the recording tape. The first head erases a track on the tape, the second head records a new audio signal on the track that has just been erased, and the third head plays back the recorded track. A typical professional magnetic recorder can handle 70 dB (decibels, a unit of loudness) of dynamic range. Because the dynamic range of some music—measured as the difference between the loudest passages and no sound—can exceed 120 dB, the quietest passages can be lost in electronic noise. Each time a tape is played back and copied or re-recorded, the level of noise increases relative to the signal. The first noise reduction system, named Dolby after its inventor (Ray Dolby), improved a recorder's signal-to-noise ratio by as much as 20 dB, permitting more extensive rerecording or overdubbing.

Digital Conversion

Analog audio signals consist of continuously changing information with two characteristics: duration (or time) and volume (or amplitude). For example, a musical score visually represents notes of various frequencies that are played over time. The performer determines the appropriate amplitude. This musical information must be converted to digital data for processing and storage. The musical characteristics of time and amplitude correspond to the digital audio characteristics of sampling and quantization in the analog-to-digital (A/D) conversion process.

Sampling takes a snapshot of a musical moment in time, while quantization assigns numerical values to the snapshot information. The sampling rate must be able to capture successfully the highest frequency in the audio spectrum while avoiding sampling errors, so sampling rates have been standardized at 32, 44.1, and 48 kHz (kilohertz) for different digital audio applications.

Quantization uses binary numbers—ones and zeros—to measure the amplitude of an audio signal. These numbers are formed into words, or bits. The bit length determines the accuracy of a measurement. It actually takes a 16-bit word of 65,536 steps to quantize most audio signals. More accurate quantization calls for 20- or 24-bit words (more than 16 million steps). Reverberation devices, equalizers, and dynamics processors often use a 32-bit system to ensure the highest fidelity audio processing.

Along with multiple standards for sampling and quantization to convert analog audio to digital information, there are also standards for communication among digital devices. Signals sent from one machine to another can remain as digital data, rather than having to be converted to analog audio signals for transmission. There are two transmission standards or protocols: professional equipment uses AES/EBU (Audio Engineering Society/European Broadcast Union), while consumer equipment uses S/PDIF (Sony/Philips Digi-Interface) for machine-to-machine tal communication. With one of these protocols, digital signals can be distributed to a number of devices without any degradation or digital-to-analog (D/A) conversion.

Digital Consoles

Digital audio consoles follow the form and function of analog audio consoles, although the inputs are converted directly into digital data before any channel assignment or signal processing occurs. Many consoles feature built-in signal dynamics and effects processing in each channel, rather than having to patch external devices into the desired channels. Full remote control is possible via the musical instrument digital interface (MIDI) protocol, working with a MIDI controller, sequencer, or computer. The output signals are in the AES/EBU format that can be connected directly to a digital audio recorder, although they must be converted to analog signals for monitoring purposes.

Innovative designs of the latest digital consoles permit I/O module cluster swapping from one console to another, enlarging a 48-channel console to 96 channels or more for a particular recording session. Some digital consoles offer an expansion capability of 200 channels or more. All the controls of any I/O module can be replicated on a central control module, so the recording engineer does not have to move constantly from one end of a ten-foot-long console to the other while making adjustments. Sampling frequencies are as high as 96 kHz to ensure the utmost fidelity.

Digital Recorders

Some digital audiotape machines are based on analog open-reel tape recorder transports that use fixed audio heads (the digital audio stationary head, or DASH, format). Others are based on videotape transports that use rotating heads and cassette tapes. A third group of digital recorders does not use tape at all; these record directly to computer hard drives or other portable storage media such as ZIP disks or magneto-optical (MO) disks.

The DASH machines appear similar to analog machines, and they retain many analog tape machine functions, including editing electronically or by the traditional cut-and-splice method. Either 24 or 48 tracks can be recorded on half-inch tape at 30 ips (inches per second).

The rotary-digital-audiotape (R-DAT or DAT) system has become one of the more popular formats. The miniature size of the DAT tape—about half the size of a standard audiocassette—belies the capabilities of the recording system. The DAT features two record tracks, digital inputs and outputs, high-speed search and cueing, and the capability to record time code for video production. Portable recorders with many of these features can be as small as a paperback book.

Multitrack digital tape recorders, also called modular digital multitrack (MDM) recorders, use two manufacturers' incompatible standards: ADAT that records on standard S-VHS videotape and DTRS that records on Hi-8-mm videotape. Both types of MDMs feature 8 tracks of recording, external synchronization for videotape editing, and the ability to link several machines together to create a virtual 128-track digital audio recorder (the modular aspect of the name).

Newer machines record directly to a removable computer hard disk, thereby eliminating tape altogether. Some hard-disk recorders feature up to 24 tracks while retaining many of the MDM features. The more advanced hard-disk recorders are capable of 48 tracks, using 24-bit resolution and 96 kHz sampling. Still another type of digital recording format uses various-sized MO disks as the storage media. Personal mixer/recorders use the 2.5-inch MiniDisc to mix and record either 2 tracks or 8 tracks, while the professional MiniDisc recorders have replaced the venerable endlessloop tape cartridges for many broadcast applications. Consumer MiniDisc recorders and players are replacing analog cassette machines as the preferred portable personal format.

Digital Workstations

The digital audio workstation (DAW) is a computer-based audio recording and editing system that replicates every function of an entire recording studio-from the audio console, equalizers, compressors, and effects units to the multitrack recorders and editing controllers. Some systems are designed as computer software programs with plug-in boards for computers (hostbased), while others feature custom control surfaces and function as stand-alone units. Various storage media are used with the DAW. These can be MO, ZIP, or internal hard disks, or they can be external MDMs. Because the DAW is a totally integrated system that includes recording, editing, and signal routing and processing, speed of operation and flexibility are superior to similar analog equipment. Control of external tape machines or video recorders, as well as MIDI control of electronic music devices, is often included.

Conclusion

Because the ultimate goal of any studio is to capture an artist's performance with the greatest fidelity and to provide the technical and creative tools that are necessary to produce the final mix, acquiring the right assemblage of analog hardware and digital software can be a never-ending quest. The tools can be a multimillion-dollar studio complex, an inexpensive, personal portable mixer/recorder, or a computer. When producer George Martin worked with the Beatles to create the *Sgt. Pepper's Lonely Hearts Club Band* album in 1967, more than seven hundred hours were spent recording, mixing, and editing on 4-track analog tape recorders to finish the project. Using modern digital equipment, Martin could have significantly reduced the amount of time spent producing that classic recording.

See also: DISNEY, WALT; EDISON, THOMAS ALVA; FILM INDUSTRY, TECHNOLOGY OF; RADIO BROAD-CASTING, TECHNOLOGY OF; RECORDING INDUSTRY; RECORDING INDUSTRY, HISTORY OF; RECORDING INDUSTRY, PRODUCTION PROCESSES OF.

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JOHN M. HOERNER, JR.

RECORDS MANAGEMENT

See: Archives, Public Records, and Records Management

REFERENCE SERVICES AND INFORMATION ACCESS

The term "reference service" is defined simply as personal assistance provided to library users seeking information. Individuals who hold a master's degree in the field of library and information sciences or information studies typically provide the service. Reference librarians are variously referred to as "mediators between the user and the information" and "navigators of the information superhighway." Reference service traditionally has been offered in person at a designated desk within the library building, over the telephone, and through correspondence. More recently, libraries have expanded to offer reference service electronically via the World Wide Web, e-mail, and even twoway videoconferencing. Another form of reference service is classroom and one-on-one instruction in the use of print and electronic resources. Regardless of the delivery method, the value of reference service remains the same: to provide quality information through personalized service to library users at the time of need. Reference service is characterized by human interaction.

The Foundations of Modern Reference Service

The history of reference service is neither as long nor as illustrious as the history of libraries. Samuel Rothstein (1961) noted "May I remind you that in the United States of less than a century ago the library still took no responsibility whatsoever for the provision of personal assistance to its users." Samuel Swett Green, librarian at Worcester Public Library in Massachusetts, is credited with the "founding" of reference. In a paper read at a meeting of the American Library Association and published in Library Journal in 1876, Green provided numerous specific examples of questions that required the assistance of a librarian. He used the illustrations to "show that readers in popular libraries need a great deal of assistance." In this way, Green laid the foundation for reference service as it has been practiced ever since. His article noted that although catalogs and indexes are valuable, most users require instruction in their use. Users also must be guided in selecting the books that best meet their information needs. Green highlighted the importance of human interaction in the personal assistance process-librarians must be "easy to get at and pleasant to talk with"

(i.e., approachable), and librarians must mingle freely with users and help them in every way. Green further emphasized that "certain mental qualities are requisite or desirable in library officers who mingle with readers. Prominent among these is a courteous disposition which will disclose itself in agreeable manners. Sympathy, cheerfulness, and patience are needful." He concluded that "a librarian should be as unwilling to allow an inquirer to leave the library with his question unanswered as a shop-keeper is to have a customer go out of his store without making a purchase." This was the beginning of user-centered service. Green based his views on his experience at the Worcester Library, where he observed that the reference room was seldom used. His implementation of the practice of providing personal assistance to library users resulted in an increase in the use of the reference room.

The idea of personal service to users caught on slowly, particularly in academic libraries where it was thought that it was the faculty's role to provide research guidance to the students. The debate raged for years regarding the value of such service. At the heart of the matter was economics—this was just one more service competing for funds. By 1893, a government report identified "personal assistance" as one of the five library primary practices; the other four practices were book selection, classification, cataloging, and planning the building.

The period between World War I and World War II evidenced the growth and specialization of reference services. Beyond face-to-face interaction within a building, questions were handled by telephone and correspondence. Larger libraries installed separate information desks to help users with basic directional and information needs, hired librarians with subject expertise, and established reader advisory services.

Textbooks for students in librarianship programs began to appear by 1902. In 1930, the American Library Association published James I. Wyer's *Reference Work: A Textbook for Students of Library Work and Librarians*. As Green did in 1876, Wyer focused on the humanistic aspects of reference work. He wrote, "[H]ere is a service which defies and transcends machinery. It still is, and always will be, imperative to provide human beings as intermediaries between the reader and the right book. The utmost use of great libraries never can be attained by mechanics." The words continue to be echoed in the writings of modern thinkers on the reference process. *Buildings, Books, and Bytes: Libraries and Communities in the Digital Age* (1996), a report prepared by the Benton Foundation, recommends a high touch, high technology role for librarians, and it encourages greater publicity for the librarian as information navigator with the human touch.

Philosophies of Reference Service

The goal of the reference librarian is to meet the individual need of the user to the fullest extent possible. How and to what extent this is done varies from library to library and depends on the type of library. Academic libraries focus on teaching users how to find information, special libraries primarily find information and package it for their users, and public libraries practice some of both approaches. Special libraries (e.g., for governments, corporations, museums, and newspapers) developed after World War I and emphasized locating information over building and maintaining extensive collections. These were the first type of libraries to make use of online databases to identify appropriate resources. Limits of staffing, subject expertise, and resources prohibit most public and academic libraries from providing similar in-depth service.

In his textbook, Wyer (1930) identified three concepts of reference work. The conservative philosophy instructs users in how to find the information on their own. The liberal philosophy holds that the reference librarian should locate the information for the user and provide it in the form needed. The moderate philosophy recognizes that maximum assistance will be offered based on a combination of library staffing, resources, time factors, and user need. The latter approach balances the instructional function with the full-service mode. Debates on these issues raged in the 1960s and 1970s, but they have abated as reference librarians have determined that a balanced approach takes into account the needs of the user at a particular time.

The Reference Interview

At the center of the interaction between user and librarian is the reference interview, sometimes referred to as "question negotiation." The ability to draw from and work with the users to determine their precise information needs is an art and a science. Entire books have been written on the subject, and reference textbooks generally devote considerable space to this important facet of reference work. The reference interview is the process by which the librarian helps the user to state the information need—listening carefully to the user's responses, asking questions of clarification as necessary, and communicating clearly to move the discussion forward. Important features of the interview include the ability to be objective and nonjudgmental. The librarian must also be sensitive to nonverbal behaviors, as well as alert to signs of frustration that may indicate the need for a change in direction. Flexibility is critical, since what works with one user may not work at all with another. Too many questions from the librarian can lead to user self-doubt and withdrawaland ultimately to failure in filling the information need. Wyer (1930) said that "there must be in evidence the reassuring psychology of a sympathetic manner, personally and more than casually intent upon and interested in the matter in hand." Wyer also stressed the importance of reading the user's mind: "The aim of library mind-reading, then, is to know how to give people what they do not know they want!"

The Practice of Reference

Reference service has traditionally been offered by librarians at a reference desk. Depending on the library, desks are generally staffed for many hours on all of the days on which the library is open. This structure, although considered by some administrators to be inefficient, has had the advantage of providing service to users at the time of need. In this face-to-face environment, the approachability of the reference librarian is of utmost importance. All of the knowledge in the world will be of little use if the librarian has an unwelcoming demeanor. The librarian's behavior toward the user sets the stage for the success of the interaction. Wyer devoted a chapter of his 1930 textbook to handling reference questions and "meeting the public." His simple list of appropriate behaviors is as applicable today as it was then: "Never appear annoyed or indifferent. Never look or seem too busy to be interrupted. Meet all comers more than half way. Meet the public as you would like to be met in a strange library. Never be patronizing or openly amused. Laugh with a person, but not at him. Never say 'Never heard of such a thing' in a way that might offend." Since the 1930s, many libraries have developed guidelines for service. The Reference and User Services Association (RUSA) of the American Library Association has been a leader in formulating standards for reference services. Two of their major documents are *Guidelines for Information Services* (2000) and *Guidelines for Behavioral Performance of Reference and Information Services Professionals* (1996). The latter set of guidelines addresses approachability, interest, listening/inquiring, searching, and follow-up. In all interactions, the user should be made to feel a partner in the transaction.

Once the librarian and the user have agreed on the nature of the question, the librarian begins the search process. If the question is factual, such as biographical or geographical, the librarian will determine which source might provide the best answer in the quickest manner. That source may be printed or electronic, or it may entail a telephone call or e-mail to another librarian, library, or agency. If it is an open-ended inquiry, as are most questions by those people who are undertaking research on a subject, the librarian will work with the user on a search strategy, suggesting resources and instructing in their use. The librarian will often provide guidance to the user in deciding which books, articles, or Internet sources provide the most relevant information given the scope of the topic and the level of information that is required. Research questions generally involve far more instruction than factual questions.

The telephone was the first electronic device to be used in reference services. Librarians quickly adopted it for use in providing service, but they have always had mixed feelings about its place. Most libraries locate their telephone reference service at the reference desk, so the librarian must juggle the in-person inquiries with those coming via telephone. Libraries often have a policy that the onsite person receives assistance before the caller, so the telephone goes unanswered. A number of public libraries operate their telephone reference service separately from the desk, advertising it as an "answer line" or "quick reference." Callers who need research assistance are generally asked to come to the library. Librarian interaction with the telephone user is more challenging than in-person communication. Cues must be obtained from voice level and intonation. The librarian needs to determine quickly the information need, determine whether or not to put the caller on hold or call back, and decide when a call should be referred.

Reference by correspondence is another form of reference service, but it has never enjoyed the same popularity as on-site or telephone reference. Much of the correspondence that is received by libraries entails questions that are related to genealogy or special collections. Much of this mail correspondence has been replaced by e-mail inquiries. Most libraries provide e-mail reference service, with policies following those that were already established for telephone and correspondence service. Reference librarians have found the reference interview to be problematic in the e-mail environment, since the interaction is asynchronous and it may take several days to elicit all of the information that is needed to respond satisfactorily to the inquiry.

In many academic institutions, reference librarians offer consultation services by appointment. This provides yet another option to users who need more time with a librarian than is generally available at the reference desk. In addition, the librarian has an opportunity to prepare for the session in advance.

Technology has had a major effect on reference services. Although the growing number of printed indexes made it possible to identify journal articles in many subject areas, the user had to wade through each year's index separately and search by prescribed subject headings or by the name of the author. Card catalogs allowed searching by title, author, and subject, but again, the subject headings were prescribed and users often had to seek the assistance of a librarian to identify the correct heading. In the 1960s, online databases were available only in the science areas, and they were used primarily in corporate libraries. Their use in academic and public libraries did not become common until the 1970s, when selected staff was trained. By the 1980s, the increase in the number of requests for online searching and the growth in the number of databases required that most reference librarians receive training. The searching was not performed by the user, and often, a fee was charged. Librarians began to experiment with the notion of end-user searching, but that did not occur until databases became available on CD-ROM. By the late 1990s, many libraries moved from CD-ROM to providing databases through the Internet. These databases encompass several years

of indexing and offer a variety of searching options. Many also include the full text of the article, making searching by keyword rather than prescribed subject heading a powerful tool. The conversion of card catalogs to online catalogs has enabled librarians and users to find books by keyword as well. Modern reference librarians provide a strong link between the highly technological information environment and the user, advising on search strategies that help the user to focus the topic better and evaluate the information even as the user is able to access library catalogs and databases from home, office, and school.

Readers' Advisory Services

Of the many aspects of human mediated information services, recommending books to library users has long been a function of library services, primarily in public libraries. In the 1920s, libraries in Chicago, Cincinnati, Cleveland, Detroit, Indianapolis, Milwaukee, Portland (Oregon), and New York established what is known as readers' advisory services. Librarians interviewed readers to determine their interests, and the readers were also judged on their reading ability. Following the interview, a list of readings was prepared and mailed to the reader. Readers' advisory services expanded from 1936 to 1940. A number of articles written during this time exhibited a moralistic tone, assuming that reading recommendations would result in the improvement of readers. After 1949, the readers' advisory function declined, but it is enjoying a resurgence in the early 2000s. The focus is centered on the reader and emphasizes the personal relationship between librarian and reader. The service is less didactic, with librarians viewing themselves as the link between readers and their recreational reading interests. Forms of readers' advisory services are also offered in other venues, such as Amazon.com and Oprah Winfrey's book club. The former retains data about customers' reading interests to alert them to related books. Storing information about users' preferences jeopardizes their privacy, however, making it difficult for libraries to compete with commercial services.

User Education

User education, variously called "bibliographic instruction" or "library instruction," has in the past been the purview of academic libraries, but it has since been encompassed by public libraries. The service, which is generally a part of the reference librarians' responsibilities, is considered to be complementary to desk service.

Lizabeth A. Wilson (1995) identifies four periods in the development of user education services. The first, between 1850 to 1920, saw slow growth as the focus of librarians was on building collections, not on service. An early pioneer in user education was Azariah Root, who ran a program at Oberlin College between 1899 and 1927 in order to introduce students to library systems, resources, and the history of the printed word. Public and academic libraries experimented with instruction through lectures and at the reference desk. The second period identified by Wilson, between 1920 and the 1970s, laid the foundation for instructional services. Notable during this time was the Monteith College Library Experiment at Wayne State University, which provided discipline-specific library instruction as an integrated part of the university's curriculum. One of the most significant developments in the 1970s was the shift from toolbased to concept-based instruction, as librarians realized that students needed a systematic way to develop, use, and evaluate a search strategy. This was also a period during which librarians drew upon learning theories and explored and debated a number of instruction techniques. The third period identified by Wilson occurred in the 1980s, when instruction became an accepted part of public services in libraries. By the fourth period, the post-1980s period, instruction had established itself as a field with its own literature, organizations, theories, and history. Librarians who are involved in instruction regularly draw upon current learning theory and instructional techniques. The term "information literacy" is widely used to refer to the entire scope of user education. In 1988, the American Association of School Librarians developed Information Power, which outlines standards and guidelines for user education programs in school library media centers. The 1999 edition includes information literacy standards for student learning. In 2000, the Association of College and Research Libraries issued "Information Literacy Competency Standards for Higher Education." Public libraries have increased their user education programs as well. Sessions are offered in those subject areas that are most heavily used by the public (e.g., genealogy and business resources) and in

general areas (e.g., learning how to search the World Wide Web and evaluate the results). The teaching role of the reference librarian is very important, since it encourages users to use creativity in their searches and to evaluate the results from a critical perspective. User education can also serve to heighten user awareness of the library.

Models of Reference Service

Despite the advances wrought by technology, the structure and organization of reference service has changed little since its inception. Services continue to be tied to the physical desk, requiring that users come into the building for assistance. In 1992, a new model was proposed by Virginia Massey-Burzio of Brandeis University. She experimented with tiered reference service within the building, staffing a service desk with graduate students who were to refer complex questions to a librarian who was available in a consultation office. In 1993, Anne Lipow offered institutes devoted to "rethinking reference services," at which a number of speakers challenged reference librarians to examine whether or not their current structures best met the needs of users. Tiered models often failed, not because they were without merit or because they were inefficient, but because they were contrary to the deeply ingrained reference librarian value of providing quality service when users need it without barriers and because they required significant training of staff to ensure that inquiries were answered correctly.

Jerry Campbell, the then director of libraries at Duke University, outlined a new role for reference librarians in a controversial article published in the Reference Services Review in 1992. Campbell observed that reference service is essentially without a conceptual framework, lacks a clear mission statement, and is cost ineffective. He observed that the model of reference focused on a physical desk could not survive the information age. Campbell noted that users' expectations of service were changing and that the demand for rapid delivery of information in electronic form was growing. He challenged reference librarians to create a service that is "increasingly electronic and nonbuilding-centered." Although much of what he envisioned has occurred, the reference desk remains in the center of reference services.

In an article published in 2000, Chris Ferguson calls for the integration of reference and computing support services into a comprehensive information service for both on-site and remote users. The line between what is a pure technology question and what is an information question has blurred as they have become intertwined and interdependent. The concept of tiered service needs to be refined, making intermediate-level service available twenty-four hours a day. Ferguson emphasizes the need in this convergence to retain the values of equity of access, personal service, and services tailored to the individual in ways that are humane and scalable. He calls for reengineering libraries "in ways that bring librarians and technologists together within a common service environment" to meet users' needs in a more effective manner.

Reference Referral Centers and Networks

Some states and regional library networks offer tiered reference services, which allow reference librarians to refer questions to another level when they do not have the resources to respond to their users' needs. California is a good example of a state that has a strong referral system. Formal reference referral in California began in 1967, with the founding of the Bay Area Reference Center (BARC), which was funded by a Library Services and Construction Act grant to the San Francisco Public Library. Public libraries in the Bay Area could refer questions they were unable to answer to BARC, which drew on the collections of the San Francisco Public Library, as well as numerous sources beyond those walls. In 1969, the Southern California Answering Network (SCAN) was born, serving all of Southern California. By the mid-1970s, public libraries were organized into fifteen systems under the provisions of the California Library Services Act. As part of the act, each of the fifteen systems established a System Reference Center. Considered to be second-level reference, Centers were designed to work with the public libraries in their systems to ensure that the needs of users could be met regardless of physical location and to facilitate document delivery through the member libraries. The Centers provided training to local librarians, focusing on basic services and on those reference tools that are typically held in small public libraries. They became a primary conduit for questions to the third-level centers, BARC and SCAN. Although BARC and SCAN no longer exist, second-level reference service is still

operating, and the involved reference centers collaborate in answering inquiries.

Many of the referral centers serve all types of libraries. They may be funded through state funds, through membership fees, or a combination of the two. The advantages of referral are many, with the strongest being the ability to answer even the most difficult questions received from users. Reference service at referral centers is characterized by creativity and the use of a wide range of resources and methods that are not generally employed in traditional reference settings. Personal contacts, organizations, associations, and businesses are often called on to provide answers that are not easily found in printed books or even on the Internet. Referral center librarians seldom work directly with users; they instead expect that the local librarian has done a thorough reference interview. Referral centers take advantage of the combined strengths of libraries and reference librarians. Resource sharing, collaboration, and cooperation among libraries of all types create a whole that is greater than the sum of its parts.

Fee-Based Reference Services

Users who have no time to devote to large research projects have the option of turning to a fee-based reference service. Although not widespread, some large public and academic libraries offer such a service. This is considered a valueadded service that provides the research requested by the user, along with delivery of the cited documents. Users generally pay an hourly fee, in addition to charges for photocopying and mailing the resulting materials. The primary users of fee-based services are corporations and law firms that do not have their own libraries. They view information as a commodity and consider it worthwhile to pay for the service. Individuals often use fee-based services on a one-time basis for a special project, such as tracking down genealogy material, researching job opportunities, or seeking funding for college.

The Future of Reference Services

The advent of e-mail, the World Wide Web, and other new technologies has had a major effect on the provision of reference services. In the late 1990s, reports indicated that the number of inperson and telephone reference transactions had sharply decreased. The ability of many library users to access information via the web contributed to this decline, as did the growth of commercial services that offer to answer questions on almost any subject without charge. Many of these services do not employ librarians and rely solely on web resources to provide information. Questions are often taken at face value, with little or no follow-up communication with the inquirer to discover the real information need. Lacking the financial resources of commercial entities and working within the often bureaucratic structures of libraries, reference librarians nevertheless have moved rapidly and tirelessly to offer a variety of information service options to their users.

The combination of users connected to the Internet and a growing emphasis on distance learning places a demand on reference services to expand aggressively beyond the walls of the library. Although a number of Internet companies exist to provide answers to questions, they are not equipped to provide in-depth advice, access to sometimes costly databases that are restricted by licensing agreements, or assistance with complex search strategies. Reference librarians can play a unique role in this area, developing methods with online technologies to assist users with difficult questions, to offer guidance on research strategies, to instruct users in evaluation techniques, and to provide services customized to the users' needs. Digital reference removes the barriers of time and place, and it masks the internal operations of the library to which users are exposed in an on-site visit.

Reference librarians in the early 2000s are experimenting with a variety of new technologies designed to respond to user inquiries. Reference via e-mail has been practiced since the early 1990s and has expanded to include web forms that guide the user through the inquiry. Software that enables the librarian to work collaboratively with the user and to guide the web browser in providing searching assistance is being applied in some library settings. Susan McGlamery and Steve Coffman (2000) write that although it is too early to determine the effectiveness of such web contact center software, it may be readily adaptable to the new reference environment, which uses a number of web resources to answer inquiries. In an article published in 2001, Coffman notes that a combination of web contact center software and Voice over Internet Protocol (VoIP) shows promise for reference services. The application would allow the reference librarian to
guide the user through web searches and hold a voice conversation through the same web connection, as though they were talking over the telephone. This technology would also solve some of the challenges that the digital environment presents in conducting an effective reference interview.

Joseph Janes (1998), a faculty member in the School of Information at the University of Washington, was one of the first to be involved in digital reference service. In 1995, Janes taught at the University of Michigan and wanted to provide his students with a laboratory for learning and doing reference and at the same time merge the strengths of the traditional, physical library with the virtual and timeless features of the World Wide Web. Thus was born the Internet Public Library (IPL). Janes specializes in researching the use, integration, and effect of digital reference services.

A number of other library-based and commercial digital reference services were established beginning in the early 1990s. David Lankes (1998), a pioneer in the field of electronic reference services, defines digital reference as Internetbased question and answer services that connect users with individuals who possess specialized subject or skill expertise. Digital reference services are often called "AskA services" because of the names of services such as Ask A Scientist. Many of these services cater to kindergarten through high school students. One example of such a service is KidsConnect, a project of the American Association of School Librarians.

On a large scale, the Library of Congress, in cooperation with a number of reference service providers, is experimenting internationally with a cooperative web-based reference service called the Collaborative Digital Reference Service. The goal of the project is to provide a service that is available seven days a week and twenty-four hours a day to users around the world. Libraries in North America, Australia, Europe, and Asia are part of the pilot program. The service combines the strengths of local library collections and staff with those of librarians around the world.

Stuart Sutton, in a 1996 article discussing the future roles of reference librarians, comments that "a library's principle goal is the creation of a context that increases the probability that the user will find the information he or she needs," regardless of whether this is through face-to-face service or through technological means. Reference librarians provide the value and context to information, helping users to ferret out what they need, providing instruction to guide the work, and teaching evaluation skills.

Electronic reference is the future, and reference librarians need to be actively involved in the development of systems that ensure quality and retain the human element. Technology affords reference librarians the opportunity to work internationally to provide timely, accurate, and expert reference services to all users. A major challenge facing reference librarians is the ability to retain the value of performing reference work as a highly personalized service in a largely digital environment.

See also: Cataloging and Knowledge Organization; Internet and the World Wide Web; Knowledge Management; Librarians; Libraries, Functions and Types of; Libraries, Digital; Libraries, History of; Libraries, National; Library Associations and Consortia; Library Automation; Retrieval of Information.

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NANCY HULING

REGULATION

See: Broadcasting, Government Regulation of; Broadcasting, Self-Regulation of; Cable Television, Regulation of; Telephone Industry, Regulation of

RELATIONSHIPS, STAGES OF

William B. Gudykunst and his colleagues (1995) have argued that a stage model of relationship development is built on the assumption that relationships are characterized by patterns and regularities that are relatively consistent across relationships. This type of model helps to explain the general patterns that are involved in developing intimacy with others.

The model presented by Mark Knapp and Anita Vangelisti (2000) has gained wide acceptance in the field of communication. This model of relationship development consists of five stages of "coming together" (initiating, experimenting, intensifying, integrating, and bonding) and five stages of "coming apart" (differentiating, circumscribing, stagnating, avoiding, and terminating) and can be applied to both friendships and romantic relationships. It is important to remember that this model is descriptive, not prescriptive. In other words, this model does not describe what should happen in a relationship; it merely describes what researchers have observed in numerous studies of interpersonal relationships. Some relationships skip stages, while others move back and forth between two or more stages. Thus, this stage model of relationship development focuses on the consistent overall pattern that tends to occur as interpersonal relationships develop and potentially deteriorate over time.

Coming Together

The coming together stages usually begin with initiating, in which the participants in a potential relationship first meet and interact with each other. Most people tend to follow the "scripts" they have learned for meeting people at this stage. This is the "hello, how are you, it's nice to meet you" stage in which the participants make initial judgments about each other, such as "he seems friendly" or "she seems interesting."

In the experimenting stage, the participants try to reduce their uncertainty about each other. Small talk is the predominant form of communication, and a wide variety of topics may be covered in a superficial way. Knapp and Vangelisti consider small talk to be an "audition for friendship" in which the participants identify topics of mutual interest that they feel comfortable talking about. These topics help people identify areas of similarity that can form the basis for a developing relationship.

During the intensifying stage, the participants increase the information they disclose to each other. This step may make the participants feel more vulnerable because their disclosure can potentially be rejected by the other person. For example, one person may be ready to say "I think I'm falling in love with you," but the other person may not have reached this level of feeling, yet. Forms of address become more informal at this point, and generally affectionate terms may be used.

The intensifying stage is followed by the integrating stage, in which the participants begin to arrange their daily lives around each other and become involved in each other's social networks. The relationship begins to become visible to others. Interaction increases in frequency (e.g., daily telephone calls instead of weekly ones), and references to past conversations increase ("Remember when we . . . ").

Finally, the bonding stage involves a public ritual that signifies a formal commitment to the relationship. This involves actions such as getting engaged, moving in together, or getting married.

Coming Apart

Although many relationships remain at the bonding stage, some relationships do come apart. The coming apart stages begin with differentiating, in which the partners begin to recognize their differences and are unhappy with the realization. Fighting or conflict may occur as the partners begin to feel a growing interpersonal distance.

Constricted communication occurs during the circumscribing stage. Partners restrict their communication to "safe areas" in which they know they can agree. Controversial topics are avoided, and there is little depth to the conversations. The partners may exchange little personal information during their interactions with each other, but they are still able to maintain the public facade of a healthy relationship.

Stagnating occurs when the expectation of unpleasant conversations begins to emerge, along with the feeling that there is little to say to the other person. The partners avoid talking about the relationship at this point because they believe there is nothing to gain by further discussion.

In the avoiding stage, partners reorganize their lives so that they can minimize interaction with each other. Sometimes the partners try to avoid each other, or they directly state their desires, such as "I don't want to talk to you anymore."

Finally, the terminating stage involves physically and psychologically leaving the relationship. This stage may occur very quickly, or it may take a number of years for it to be accomplished. One partner may decide to move out, or both people may agree to stop contacting each other. Messages at this stage of a relationship are designed to create distance between people ("Please don't call me.") or to prepare for life without the other person (saying "I" or "me" instead of "we" when talking about certain topics with others).

Movement Between Stages

Knapp and Vangelisti argue that movement through the stages of relationship development tends to be systematic and sequential. That is, coming together or coming apart occurs in the order in which these stages are described above. Nevertheless, participants can skip stages in either coming together or coming apart.

In addition, movement through the stages may be either forward toward greater intimacy or backward toward less intimacy. Movement forward or backward may also increase in speed if both participants in the relationship want it to change. In other words, if both participants want to become more intimate, the relationship will change faster than if one participant is unsure of his or her feelings.

Conclusion

Understanding the ways in which relationships develop and potentially disintegrate is extremely important for people who live in a world that is based on interpersonal relationships. Individuals spend a significant amount of their time thinking about, being involved in, and attempting to maintain their relationships with others. Understanding how these relationships develop helps clarify ways in which relationships can be improved or terminated if necessary. In addition, it is important to realize the patterned nature of relationships so individuals may understand the commonalities among their relationships and those of others.

Terminating relationships is often a painful task but a common occurrence in the world of interpersonal communication. Understanding that others have gone through this experience in similar ways may help individuals cope with this distressing event. In addition, individuals who are contemplating ending a relationship may derive help by knowing what to expect as a relationship enters its terminating stages.

Understanding interpersonal communication, and especially the stages of interpersonal relationships, is a complex task, but one that may result in more fulfilling interpersonal relationships.

See also: INTERPERSONAL COMMUNICATION; INTER-PERSONAL COMMUNICATION, CONVERSATION AND; RELATIONSHIPS, TYPES OF.

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LEA P. STEWART

RELATIONSHIPS, TYPES OF

In general, researchers in communication define close or intimate interpersonal relationships as "friendships," "romantic relationships," "marital relationships," and "family relationships." These types of relationships are often characterized by interdependence (i.e., doing things together and feeling like part of a relationship) and mutual definition (e.g., introducing someone as "my friend").

Friendships

Friendships are social relationships in which the participants feel comfortable engaging in activities together and generally define their participation on an equal basis. Friendships are based on self-disclosure in which the participants feel free to share their thoughts and feelings about a variety of issues. Self-disclosure in friendships is particularly significant for women. For men, however, friendships may revolve around mutual activities such as sports or game playing.

In general, people assume that their friends will "be there" for them in a crisis or at other times when they need social support. Since friendship is voluntary, people are able to choose their friends and to decide when the friendship is no longer worth maintaining. People can maintain friendships over long distances through mediated contact such as telephone calls. Long-distance friendship is made even easier through electronic forms of communication such as e-mail.

William Rawlins (1992) has developed a dialectical theory of friendships that helps to explain how people can remain individuals while still being part of a friendship and loyal to the other person in the relationship. He believes that friendships involve tensions between competing responsibilities. For example, teenagers in certain situations may feel a conflict between remaining an individual and being a good friend. If a teenager's friend engages in a behavior that is not supported by the teenager, a tension may arise between loyalty to oneself as an individual and loyalty to the friendship. He also notes that friendships change as people grow older.

Romantic Relationships

Simply put, romantic relationships involve love. Romantic relationships are intimate (i.e., individuals feel connected to each other) and exhibit shared values (i.e., individuals agree on a number of important issues).

The individuals in this type of relationship may feel that they are getting more from the relationship than they are contributing. For example, the popular phrase "you complete me" may characterize the feelings of an individual in a romantic relationship. Dating has become more egalitarian over the years as it has become increasingly acceptability for women to ask men for a date and to pay at least their share of the dating expenses.

Leslie Baxter and William Wilmot (1984) have identified several "secret tests" that people in

romantic relationships may use to test their partners. These tests include indirect suggestion (e.g., flirting to see if the partner responds), public presentation (e.g., introducing the other person as "my boy/girlfriend" to see how the person reacts), separation (e.g., spending time apart to test the strength of the relationship), and third-party questioning (e.g., asking a friend to find out the other person's feelings).

Romantic relationships may become institutionalized through marriage, dissolve, or remain as an intense connection between people.

Marital Relationships

Mary Ann Fitzpatrick (1988) has conducted extensive research on communication in marriage and divides marital relationships into three types: traditional marriages, independent marriages, and separate marriages.

Traditional marriages involve individuals who hold traditional views about the roles of men and women in relationships. The participants are highly interdependent and believe in concepts such as the man as breadwinner and woman as caretaker of the children. Companionship is important to traditional couples, and they tend to follow regular daily schedules that contribute to consistency in the relationship (e.g., the wife cooks dinner at approximately the same time each night).

Independent marriages are characterized by more nontraditional values in which the participants maintain a high degree of autonomy. Although there is an emphasis on companionship, the spouses may maintain independent spaces and not follow regular daily schedules. There is a great deal of negotiation in this type of relationship as the spouses continually negotiate their roles (e.g., whose turn it is to cook dinner on a given night).

Separate marriages are composed of individuals who may have a fairly traditional view of marriage but are not particularly interdependent. There is less sharing and companionship in separate marriages than in either traditional or independent marriages. The spouses in a separate marriage may try to persuade each other to do something, but they drop the idea if it looks like further attempts at persuasion will lead to conflict.

According to Fitzpatrick, 60 percent of married couples fit into one of these three categories. This means that both people in the relationship share

the same characteristics. If the individuals in the relationship have different orientations, their union is categorized as a mixed-type marriage, such as separate-traditional, independent-separate, or traditional-independent. It should be kept in mind that the purpose of this scheme is to categorize couple types, not to determine the likelihood of marital happiness. Fitzpatrick maintains that no one type of marital relationship is more satisfactory than another type and that she has found satisfied individuals in all types of relationships.

Family Relationships

Family relationships are those relationships created among parents and children by birth, adoption, marriage, or life partnering. This means that unlike the other relationships discussed in this entry, family relationships, from a child's perspective, are not voluntary.

Many communication theorists have contended that the communication patterns people learn from their families are maintained throughout their lives. These families, according to Kathleen Galvin and Bernard Brommel (1999), are systems that need communication in order to adapt to their environments, including the communities in which they live, the educational systems they may be a part of, and the political and legal systems in which they exist. Because of the systemic nature of families, individuals in families adapt to their family, and the family, in turn, is influenced by their behavior. Galvin and Brommel contend that most families have sets of "rules" about behavior. These rules govern, among other things, what can and cannot be discussed (e.g., it is not appropriate to discuss a family member's tendency to abuse alcohol), how various topics are discussed (e.g., it is more important to tell the truth than to worry about hurting someone's feelings), and who can be told what (e.g., children should not be involved in discussions of their parents' health problems).

Because the rules can vary from one family to the next, conflict or other difficulties may occur when people from families with very different sets of rules get married and try to establish their own family.

Conclusion

This discussion has focused on the types of relationships that are typical of North American cultures. Although these types of relationships can be found in most other cultures, the specific norms and rules for conducting these relationships may vary—particularly in terms of appropriate communication behavior within a particular relationship type.

Understanding the types of relationships that characterize human experience is important to all people given the relational nature of human existence. It would be impossible to function in the world without these types of relationships. Most children are born into a family structure and are significantly affected by it throughout their lives. Friendships play a major role in the social activities of many individuals. Romantic relationships are important sources of interpersonal satisfaction throughout the life course. Knowing some of the sources of tension in these relationships, as well as the commonalities across relationship types, will foster individual growth and satisfaction.

See also: INTERPERSONAL COMMUNICATION; RELA-TIONSHIPS, STAGES OF.

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LEA P. STEWART

RELIGION AND THE MEDIA

Religious freedom is as integral a part of American cultural heritage as is freedom of speech. It is, therefore, not surprising that religious content can be traced to the onset of every form of mass communication technology and has evolved as American media has evolved. As popular media became distinctly evangelistic in their business practices, hoping to convert consumers to their respective medium to maximize ratings or increase readership, religious content turned entrepreneurial. As entertainment formats proved increasingly effective in capturing audiences, religious expression mimicked the methods of secular media, becoming increasingly high profile and, in turn, controversial.

Since the birth of mass communication, religious institutions have believed in the power of modern technology and in technology's ability to communicate the importance of faith. One of the first printed texts produced upon the introduction of movable type to the Western world in the 1400s was the Gutenberg Bible. Today, religious book publishing is a billion-dollar business, producing more than 175 million texts a year. Consumer magazines such as the Christian Herald and newspapers such as the Boston Recorder helped shape the developing American press in the 1800s. Today there are approximately 111,000 periodicals around the world, one-tenth of which are published in the United States, and one-tenth of those published in the United States-including Christianity Today-are religious in nature. With the advent of radio, religious expression found a voice of unparalleled reach. Religious broadcasting became even more powerful with the popularization of television and development of cable.

The Electronic Church

Religious broadcasting began as an experiment. On Christmas Eve 1909, voice transmission pioneer Reginald Fessenden demonstrated the practical utility of radiotelegraphy by reading passages of the Bible to ships at sea. The first radio church service was broadcast just two months after KDKA in Pittsburgh became the nation's first licensed radio station in 1921. Of the six hundred stations in operation by 1925, more than sixty were licensed to religious organizations. Many religious groups regarded radio as a means of promoting and enhancing local ministries; others debated the suitability of electronic media for religious expression. However, according to religious media scholar Quentin Schultze (1990, p. 25), the evangelical church was interested in radio as the best means to "catechize its youth, evangelize the unsaved, defend the faith, and organize religious institutions." The evangelicals-an umbrella term for Protestants who stress a conservative doctrine and literal interpretation of the Bible-regarded technology as God's gift for their work in spreading the gospel.

Finding it necessary to take control over an increasingly chaotic radio industry, the government issued the Radio Act of 1927 and assigned frequencies and licenses "as public convenience, interest, and necessity requires." According to policy, religious stations did not serve the public interest as well as their commercial counterparts, so, by 1928, many religious stations were reassigned low-powered frequencies or they had ceased operation. It is interesting to note that the airing of religious programming on commercial stations met public interest requirements for broadcast licenses. Thus, while fewer than thirty religious stations remained on the air by 1933, more than 8 percent of all programming was still religious in nature thanks to the free, or sustaining, airtime offered to mainstream Protestant, Jewish, and Catholic organizations and to the airtime sold to evangelical groups and others.

The result was an odd blend of religious fare. In order to appease the commercial stations and their networks, local houses of worship accepted free airtime in exchange for poor time slots and a lack of creative freedom. Programmers for paid time, however, experimented with various fundraising strategies to pay for airtime and a variety of programming formats to attract audiences. By the early 1940s, several innovative paid-time programs became nationwide successes. Charles E. Fuller's *Old Fashioned Revival Hour*, for example, was carried on 456 stations, 60 percent of all the licensed stations in the country. Walter Maier's *The Lutheran Hour* was regularly heard by approximately twelve million people.

Televangelism

As with radio, the television networks agreed to give free airtime to the three major faiths through centralized organizations and to allow others to purchase airtime. Long-running and award-winning programs such as *Lamp Unto My Feet* (CBS) began production in the early 1950s. However, in 1960, the Federal Communications Commission ruled that stations did not have to give away airtime to meet public interest requirements. This declaration was followed by a precipitous drop in the proportion of religious programming that was sustaining time, from 47 percent in 1959 to only 8 percent in 1977.

Many mainstream religious organizations chose not to pay for airtime that was once free,

resulting in a corresponding growth in the number of evangelical programs. As a means to facilitate more cost-effective program distribution, some evangelical ministries created their own networks by acquiring failing and relatively inexpensive UHF television stations. Others hooked up with cable, which offered increased market opportunities and better quality reception for their programs. The first religious cable network was the Christian Broadcasting Network (CBN) which, in the early 1980s, reached thirty million cable subscribers, making it not only the largest Christian cable operation at that time but the fifth largest cable operation of any kind. The structural changes in and sudden growth of religious broadcasting had a profound effect on the nature of religious fare in many ways.

Prime Time Preachers

The power of personality-driven religious programming was best demonstrated by Roman Catholic Bishop Fulton J. Sheen. His Life is Worth Living (Dumont) and Mission to the World (ABC) programs in the early- and mid-1950s were among the few religious shows ever aired during prime time. The success of these programs, along with the entrepreneurial individualism embraced by evangelicalism, led to the development of large media organizations headed by identifiable, charismatic individuals. By the early 1970s, the perceived truth of the gospels of media ministries was often associated with the personality and achievements of the individual ministry leader. According to religious television scholars Jeffrey Hadden and Charles Swann (1981, p. 19), evangelicals realized full well that they were not only in hot competition with secular and a few mainline religious programs, but with each other as well: "[T]hey realized that the sophistication and slickness of their production-in effect, their Hollywood quotient-can determine their success or failure." This led some critics, such as Janice Peck (1993) and Mark Pinsky (1989), to question whether the power of the message was overshadowed or undermined by the personality of the messenger.

The Electronic Church and State

As the prevalence and popularity of religious television programs increased in the 1980s, so too did the debate regarding the exercise of social and political power by nationally televised preachers and the new "religious right" they embraced. On September 15, 1980, televangelist Jerry Falwell and his organization, the Moral Majority, were the subject of the cover story in *Newsweek* and "Preachers and Politics" was the feature story in *U.S. News & World Report.* "The idea that religion and politics don't mix," asserted Falwell (as cited in Lear, 1988, p. ix), "was invented by the devil to keep Christians from running their own country."

According to scholar Peter Horsfield (1984), the growth of evangelical broadcasting represented a massive takeover by the political and moral right and, for some observers, a plot to establish a religious republic with evangelical and fundamentalist broadcasters as the major spokespersons. Evangelicals accounted for roughly 20 percent of the votes received by Ronald Reagan in the 1984 presidential election, and this percentage was obtained largely through his close affiliation with religious broadcasters. Research by Robert Abelman and Gary Pettey (1988) examining viewers of religious television programming reported that Pat Robertson's national exposure as a televangelist on CBN and the politically peppered telecasts of his The 700 Club program launched and fueled his campaign for the Republican nomination in the 1988 presidential election.

Prosperity Gospel

Fund-raising became a critical task for religious broadcasters in order to pay for airtime, purchase radio and television stations, or maintain their presence on cable. In the early 1980s, the top-rated televangelists typically spent between 15 to 40 percent of their airtime on fundraising, which according to Razelle Frankl (1987) exposed the average viewer to approximately \$31,000 in explicit requests per year. It appeared as if the business of religious broadcasting evolved into a "fiscal Catch 22" situation: the logic of the evangelical success formula demanded reaching as many people as possible, but in order to pay for the increased production and airtime costs of reaching larger audiences, one needed an even larger audience. This made it hard to tell whether televangelists were raising money to stay on television or whether they were staying on television to raise money.

Some critics have accused religious broadcasters of selling salvation. Joe Barnhart (1990), for example, suggested that fundraising has led to the transformation of the Gospel of Luke 6:38 ("Give, and it will be given to you")—which suggests the spiritual rewards of stewardship—into the Gospel of Prosperity, where spiritual gain is subordinated by material blessings and financial success. Similarly, Theologian Carl F. H. Henry (1988) found that these programs were transforming a motivation for giving into a motivation of getting.

Money and Sex Scandals

At their peak of popularity in the mid-1980s, the top four religious television programs received more than one-quarter of a billion dollars through on-air solicitations. The quest for financial gain led to controversial practices by some ministries. In March 1987, Oral Roberts, renowned tent show revivalist and head of Oral Roberts University, announced on the 165 television stations carrying Oral Roberts and You that God would claim his life if he could not raise \$4.5 million by the end of the month. Although Roberts met his goal, many contributors became highly skeptical of televangelism as a result. Skepticism turned to dismay when viewers learned through the popular press that Jim and Tammy Faye Bakker, co-hosts of the religious talk show PTL Club and heads of the Praise The Lord ministry, had misappropriated PTL funds by amassing vast real estate holdings, an expensive home, and \$1.9 million in combined salaries and bonuses.

That same month, Jim Bakker announced his resignation as head of his \$129 million-a-year PTL empire because of a sexual encounter with a ministry secretary. Shortly thereafter, Jimmy Swaggart, a fiery preacher from Baton Rouge, Louisiana, with a syndicated television ministry on 222 stations, admitted to numerous encounters with prostitutes and a long-standing obsession with pornography. According to Robert Abelman and Stewart Hoover (1990), Swaggart reported a \$1.5-1.8 million-permonth decline in contributions. Other televangelists were found guilty by association, and their revenue also diminished. Robert Schuller, whose Hour of Power was carried by 172 stations at that time, showed a 3 percent dip in donations. In a seven-month period, CBN revenues fell 32.5 percent. Collectively, these scandals rocked the very foundation of personality-driven televangelism, contributing to Pat Robertson's inability to obtain the Republican nomination and marking the end of the era of religious television programming's unprecedented popularity and prevalence.

Several electronic ministries survived the scandals. The Eternal Word Television Network and



Before the PTL (Praise the Lord) scandal occurred, Jim Bakker (right) and his wife Tammy hosted the program People that Love as part of their televangelism; this particular episode aired on April 28, 1986, and featured Edwin Louis Cole as the guest. (Bettmann/Corbis)

the Inspirational Network still had 41 million and 11.6 million subscribers, respectively, by the mid-1990s. Despite criticism of its own fundraising efforts, the Trinity Broadcasting Network could still be seen in 35 million homes through more than eight thousand broadcast and cable affiliates. It is interesting that in the aftermath of the scandals, many viewers turned to a most unlikely source for religious programming—the commercial television networks.

Faith-Friendly Secular Content

Network news has long been identified as slighting or ignoring religious issues. A recent study by the Media Research Center, a conservative media watchdog, revealed that only 14 percent of all nightly news stories broadcast by ABC, CBS, CNN, NBC, and PBS throughout the 1990s concerned religion, and most of the ones that did merely reported the activities of religious leaders rather than matters of faith or spirituality (Gahr, 1997). Similarly, the Center for Media and Public Affairs, a nonpartisan research organization, reported that the majority of network news stories related to religion between 1969 and 1998 provided accounts of church politics and wrongdoings by prominent religious figures (Lichter, Lichter, and Anderson, 2000).

The depiction of people of faith on prime-time entertainment programming has been even more distorted. Michael Suman (1997) notes that commercial television has traditionally underrepresented people for whom religion is a strong force in their lives and tended to marginalize and often denigrate religious expression. According to social observer Steven Stark (1997), commercial television is ruthlessly secular and orthodox religion is antithetical to television's very notion of itself that is, unless it can generate a sizable audience.

With the new millennium approaching and baby boomers beginning to confront their mortality, CBS was in search of light entertainment programming to reach this audience. In 1994, the network offered a drama, *Touched by an Angel*, in which an angel is dispatched from on high to inspire change. The program quickly reached the Top-10 in the Nielsen ratings. In response to this success, a significant body of prime-time programming surfaced that had religious or spiritual themes and featured angels or ministers (e.g., Second Noah (ABC), Promised Land (CBS), 7th Heaven (WB), The Visitor (Fox)). In fact, the Parents Television Council, the entertainment-monitoring arm of the Media Research Center, reported an increase in the number of religious depictions on secular television, from 287 in 1995 to 436 in 1996 and a fourfold increase since 1993 (Rice, 1997). In addition, the majority of clergy and people of faith depicted in prime-time programming during the mid- to late-1990s were increasingly portrayed in a positive light.

Conclusion

Although televangelism is no longer the prominent method of religious expression it was in the 1970s and 1980s, the spirituality on broad-cast television and conservative Christianity on cable are still flourishing. With 61 percent of television viewers in a 1997 *TV Guide* poll wanting "references to God, churchgoing, and other religious observances in prime-time" (Gahr, 1997, p. 58), religion in media will likely have a continuing presence on television.

See also: Federal Communications Commission; Cable Television, Programming of; Radio Broadcasting, Station Programming and; Television Broadcasting, Programming of.

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ROBERT ABELMAN

RESEARCH

See: Audience Researchers; Marketing Research, Careers in; Psychological Media Research, Ethics of; Researchers for Educational Television Programs; Research Methods in Information Studies; Violence in the Media, History of Research on

RESEARCHERS FOR EDUCATIONAL TELEVISION PROGRAMS

Among the various production companies responsible for educational television programs, there is a vast range in the degree to which research plays a role in these productions. Many producers rely on little or no research input, limited, perhaps, to occasional consulting by educational advisers or a test of the appeal of a pilot episode. By contrast, a smaller number of producers use research more extensively. As Gerald Lesser (1974) has recounted, the latter approach was originated in the late 1960s by the Children's Television Workshop (CTW), the producer of numerous, highly respected educational television series such as *Sesame Street, The Electric Company, Square One TV, Ghostwriter, and Dragon Tales.*

Under the model of production that has come to be known as the "CTW Model," television producers, educational content specialists, and researchers collaborate closely throughout the life of a television series, from the creation of the original idea through the delivery of the finished program. Production staff (i.e., producers, writers, actors, and so on) are responsible for the physical production of the series. Educational content specialists devise the educational curriculum that sets goals for the series (e.g., to encourage literacy, positive attitudes toward science, or social development among viewers) and help to ensure that the material being produced is educationally sound. Researchers test material hands-on with the target audience (e.g., children of a certain age) to help ensure that the program will be appealing and comprehensible to that audience.

The testing that researchers conduct in support of educational television production falls into two broad categories. "Formative research" is conducted while material is being produced-or even before production begins-to investigate questions that arise out of the production process. These questions include such diverse issues as: Will a particular part of the program be comprehensible and appealing to its target audience? Where on the screen should text be placed to catch the attention of viewers and encourage reading as they watch? Which of several potential designs for the "look" of a character will be most appealing to viewers? What do viewers already know about a particular topic and where do their misconceptions lie, so that subsequent scripts can address these misconceptions directly? The results of these research studies inform subsequent production decisions and revisions of the material being produced. In this way, the voice of the target audience itself becomes a vital part of the production process.

The other type of research that is used is called "summative research." Summative research is conducted after the production of a television series is complete, and is intended to assess the impact of the series on its viewers. The kinds of questions addressed by summative research might include: Are viewers better able (or more motivated) to read and write after watching a television series about literacy? Do viewers become more interested in mathematics or science after watching series about these topics? Are preschool children more likely to cooperate with their peers after watching a television series designed to promote social development? The results of these studies provide a gauge of the success of a series in achieving its educational goals.

A book edited by Shalom Fisch and Rosemarie Truglio (2000) provides many examples of formative and summative research studies conducted to inform the production of Sesame Street over the past thirty years. These kinds of applied research studies bear numerous similarities to the kinds of research that might be conducted in an academic setting on the topic of the interaction of viewers with television. Yet, these two types of research are also very different. One of the chief differences between academic research and applied research in this area lies in their ultimate purposes. For example, the ultimate purpose of academic research on children and television is generally to inform our understanding of children's processing of, interactions with, and reactions to televisionas exemplified by a review of the literature by Aletha Huston and John Wright (1997). Although such concerns are also important in applied research on children and television, they are not the end goal of the research; rather, the ultimate purpose in this case is to use that information to inform the design of television programs that will be comprehensible, appealing, and age-appropriate for their target audience. In other words, the implications of the academic research focus on children; the implications of the applied research focus on the television program.

Researchers in the field of applied television research typically come from backgrounds in education, psychology (particularly developmental psychology, in the case of educational programs for children), communications, anthropology, and related areas. Entry-level researchers generally come to their positions with bachelor's or master's degrees. Higher-level staff (e.g., research directors, content directors) generally hold doctorates, although some have master's degrees and extensive prior experience. Unpaid internships are often available in these types of research departments, and can provide valuable experience for those interested in the field. See also: Children's Comprehension of Television; Sesame Street; Television, Educational.

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SHALOM M. FISCH

RESEARCH METHODS IN INFORMATION STUDIES

Researchers in the field of information studies investigate information systems and services to understand how people use them and to discover better designs for those systems and services. The research questions addressed are wide-ranging, and they evolve as information systems and services change. To meet the challenge of these many research questions, investigators have borrowed and adapted techniques from many other fields of science. These methods, each with its own advantages and disadvantages, offer a range of insights into information systems and services, the people who use them, and the intellectual and cultural content that they preserve. Research in information studies can be divided into three categories: (1) research into information interactions, using methods drawn from the social sciences, (2) research into cultural history, using methods from the humanities, and (3) information technology research and development, using methods from science and engineering.

Information Interaction

Information systems are developed for people who interact with them to search for, evaluate, and employ information. The interactions of users with information systems, and the factors that influence those interactions, are important focuses of information studies research. Researchers ask a variety of questions about information interactions, and they base these questions in a variety of perspectives drawn from the social sciences.

Researchers with backgrounds in psychology might ask the following questions: What mental characteristics of users lead them to search for information in specific ways? How do personality, mental abilities, or learning styles affect how peowith information systems? ple interact Researchers with backgrounds in sociology, anthropology, or business administration might ask the following questions: How does membership in a group such as a profession, or an economic class, lead people to use information systems in distinctive ways? How do people in organizations such as firms and non-profit associations understand information technology, and how do such organizations establish norms for information-related behavior? How do ethnic or organizational cultures construct their own understandings of information and of information technologies and services? Researchers with backgrounds in political science might ask the following questions: How does information influence policymaking by legislatures and government agencies? How does information influence voting patterns in the electorate? What effect do information policies have on society as a whole? Researchers with backgrounds in economics might ask the following questions: What value does information have for people? How much are people willing to pay for information?

To study information interactions, researchers sometimes use public opinion surveys to ask users about their perceptions of information systems. For example, investigators have surveyed engineers to determine the kind of information that they need and how frequently they consult various information resources. From these kinds of surveys, researchers have found that many professionals prefer to ask people for needed information, rather than to consult books or databases. Knowing these preferences can help in the design of information systems and services. Researchers also use surveys to investigate why consumers select specific information services, as well as the value that is attributed to the retrieved information. They then compare the perceived value of information services with the costs that are incurred in providing the services. The result is a

cost-benefit analysis of information services that can influence how information systems and services are implemented and funded.

Surveys distributed by mail, telephone, or email provide a quick and reasonably easy way to gauge user opinions about information systems. However, surveys typically collect only a limited amount of detail. In addition, survey responses tend to relate to perceptions rather than to actual behaviors. For example, a respondent may truly believe that he or she uses a particular information source several times a week. However, that perception may be mistaken, and only direct observations of user behavior can verify its accuracy.

When surveys fail to provide sufficient depth of detail to allow researchers to understand users' behaviors, qualitative research can provide a more complete understanding. Qualitative methods, which include observation and in-depth interviews, provide a great deal of personal detail about information users. For example, researchers have observed users in their workplaces to find out how people select information resources. Results have emphasized the importance of internally generated information (e.g., company policies and memos) over information that is derived from external resources such as books and databases. Similarly, researchers have interviewed users in depth to discover their opinions about information systems and their motivations in searching for and using information. Using detailed analysis and interpretation of interview responses, researchers have developed interpretations of the factors that influence how users interact with information systems. Another approach to qualitative research asks questions about culture and uses ethnographic methods to answer those questions. Such methods have been used to investigate how the organizational culture of corporations influences the employees' use of information systems, or how people in specific occupations or socioeconomic classes seek and use information. Market research provides another pattern for investigating how users interact with information systems. In order to study whether members of target markets are likely to use specific information systems, researchers have used focus groups to elicit the opinions of typical systems users.

Experiments give researchers the ability to investigate information interactions in much detail. For example, experimenters have randomly assigned individuals to several different information systems and then asked them to complete an information search. When researchers compared the results of the searches statistically, it was possible to assess the effect of different information system designs on search success. Other experimenters have used more complex experiments to assess how different users interact with information systems. Such experiments have shown the effect of cognitive abilities, cognitive styles, learning styles, and problem-solving styles on user interactions with information systems. The results of such experiments allow systems designers to tailor information systems to suit the cognitive abilities or learning preferences of different users.

One final method of investigating information interactions deserves mention. Researchers have analyzed patterns of information use to provide detailed analyses of the structure of intellectual communities. For example, investigators have examined how scientists refer to previous research when they report their findings. They have found that there are groups of scientists who focus on the same topic, read each other's work, and communicate with each other. This type of research, called citation analysis, has been used to chart the development of specialized areas of research and publication and to visualize the structure of scientific communities.

Cultural History

Information systems and services are part of a group's intellectual and cultural history. Consequently, approaches to scholarship that have been developed in the humanities can also be applied to information studies research.

From a historical perspective, research questions focus on the history of ideas, technologies, and institutions. Researchers study the development and evolution of scientific schools of thought, the history of the development of new types of communication media, and the influence that these new media have on communication patterns. The history of libraries and similar information agencies and institutions is also a component of this type of research in information studies.

Historical methods employ a wide-ranging search for evidence about the past. Scholars find primary evidence in the contemporary accounts of people who participated in past events. These accounts are typically preserved in letters and similar archival materials. Other documents may preserve the social and political context in which particular historical events or trends occurred. By combining primary evidence with secondary evidence (i.e., interpretations of events by individuals who were not participants, such as later critics), historians develop interpretations of historical events and trends. Historical research has been applied to both information systems (such as the development of computerized information retrieval systems) and to information services (such as the history of information services provided by public health agencies). As with most history, the idea behind this kind of research is to document approaches that have been taken and decisions that have been made, so future information systems and services can be founded on previous work.

Scholars use other types of primary evidence in studies of the history of ideas. For example, researchers have examined records showing the sales and circulation of books or the patterns of scholarly citations over time to investigate the evolution of ideas and their transfer by communications media. Sometimes these studies are controversial because it is not always easy to associate patterns of information transfer with social and historical trends. Researchers have tried to interpret the effect of certain information (e.g., specific books) or certain information technologies (e.g., printing) on events. For example, there is little consensus among scholars about the effect of Enlightenment publishing on the American and French revolutions. However, detailed studies of patterns of publishing and reading have revealed how some ideas may have influenced the ways in which people perceived their societies, thus setting the stage for revolution.

From a philosophical perspective, research questions focus on the theoretical foundations of knowledge and on the ethics of information services. Philosophical research methods are hard to define. In many cases, investigators read extensively the ideas of other scholars and then try to fit ideas together into new interpretations of information and information services. For example, interpretations of ontology and epistemology can influence how information systems and services are created. If information is considered to have external reality with fixed attributes such as "aboutness," it is possible to treat information as objects and to develop systems to manage, categorize, and handle those objects. However, if a different philosophical view about the reality of information is maintained, the approach to information systems may be quite different. For example, if designers think that information is the process of becoming informed, then information systems must be created to facilitate the user-centered process rather than simply to manage information objects. Through the exposition of different philosophical approaches, scholars in information studies explore new ways of viewing information systems and services. In the area of information ethics, investigators have studied how people apply general principles to specific actions. These studies permit researchers to track the evolution of norms of behavior and to understand how these norms govern both professional practice and the actions of users.

Technology Research and Development

Information systems occur in the natural world, and they can be investigated just like any other natural phenomena. Aspects of information systems can be counted, measured, and documented. Here, the research questions are similar to those that are encountered in the natural sciences. Investigators might focus on patterns of authorship or on the use and obsolescence of materials. They would then describe these patterns mathematically and try to account for the influences that cause information patterns to vary.

This type of research is informetrics, and it includes more specific areas of study, such as bibliometrics and scientometrics. Informetrics involves measuring information phenomena and noting their distribution. For example, researchers have observed author productivity, the frequency of coauthorship, and the scatter of journal articles on a topic across a set of journals. Having observed the ways in which information phenomena are distributed, informetrics researchers create mathematical models that reflect these distributions. The mathematical models can then be used to predict how information phenomena behave in general and to compare how a variety of factors influence the distribution of information phenomena. A brief example will help to clarify this type of research. In any field of study, there are a few authors who produce a lot of the literature. These prolific authors write a lot of books and journal

articles. There are more authors who are somewhat less prolific, writing fewer publications. There are also many authors who are not very prolific at all, writing only a few items. This relationship between author productivity and the number of authors can be described mathematically with a formula (i.e., Lotka's Law). Starting with this mathematical relationship, researchers have been able to compare different scientific fields to determine which fields tend to produce a greater concentration of prolific authors. Then, moving beyond pure science to applied science, researchers have been able to use Lotka's Law to optimize author indexes in databases of scientific literature.

Some informetrics studies relate to information services rather than information systems. For example, researchers have examined closely the patterns of book circulation from libraries. From these observations, the relationship between the age of materials and the probability that they will circulate has been quantified. Researchers have used this model of obsolescence of literature to decide how long certain materials should be maintained in active collections. The same models can help to predict numbers of hits on websites or the obsolescence of materials in digital libraries.

One of the most important goals of information studies research is to enable the design of new and improved information systems. Research that is patterned on that conducted in engineering helps researchers to achieve this goal. In general terms, these investigations involve building new or experimental information systems and then evaluating those systems in a variety of ways. One simple way of evaluating experimental systems is the information retrieval experiment. Here, researchers create a set of typical queries and a set of documents that may be relevant to those queries. They use these standard queries and documents in a series of different information retrieval systems. Using standardized measures of search quality, researchers can then assess which of the system designs produces the best search results.

Information retrieval experiments are, of course, very much more complex than this simple description would imply. Increasingly, researchers have moved toward evaluating new information system technologies in realistic settings. Rather than using small sets of documents, information retrieval experiments have begun to use very large databases. Similarly, instead of using a small set of "typical" queries, evaluations have begun to use real users with real information needs to test innovative technologies. This new approach to information retrieval experiments has introduced a new set of problems. In simple information retrieval experiments, researchers assumed that a document was either relevant or nonrelevant to a particular query. Once real users started to participate in information retrieval experiments, it became clear that users do not always have a clear assessment of document relevance. For example, the user might consider a document to be partially relevant. The user might also consider a document to be relevant but not particularly useful or important. Consequently, the crucial variables that allow information systems to be evaluated and compared have become considerably more complex.

The variety of technological innovations in information systems adds to the complexity of information retrieval experiments. The advent of information systems that handle images, video clips, and sounds has multiplied the number of retrieval capabilities to be assessed. To compare the many full-text retrieval engines that are being invented in laboratories has required a substantial, multiyear, international effort with funding from a number of public and private sources. Similarly, to develop and test the first generation of digital libraries has taken large efforts supported by substantial infusions of public funds in several countries.

Usability testing is another technique that has been derived from engineering research. In usability testing, the focus is not on the effectiveness or efficiency of the information systems; the focus is placed instead on how easy information systems are to use. Researchers typically give users the opportunity to work with experimental information systems and to assess their ease of use. Although this sounds like a relatively simple process, there are many factors to be considered. For example, any user group will include individuals who have different cognitive abilities, learning styles, or problem-solving preferences. Different ethnic and cultural groups in the user population may bring unique approaches to information seeking and use. In addition, there is usually a series of tradeoffs between ease of use and the capabilities of the information systems.

Finally, users frequently will find a familiar-looking system easier to use than a system that has greater capabilities and ease of use but looks "new" or "difficult." Balancing all of these user characteristics to come up with a meaningful assessment of usability requires rigorous investigation techniques.

Some usability testing uses a combination of experts and real users to test the features of new information systems. Experts in information system design can frequently judge certain aspects of the system designs more efficiently and effectively than the users themselves can. Experts can, for example, determine whether information systems provide users with adequate knowledge of the techniques that they need to use to conduct a successful search. Once experts have tested the design of the systems, users can test their functionality and ease of use.

Conclusion

Research in information studies addresses a large number of research questions. Because information systems and services are constantly evolving, there are always new questions about the best ways in which to meet the information needs of users. As a result, new avenues of research in information studies appear on a constant basis. Researchers in information studies have used techniques from a wide range of other scientific disciplines. Social science perspectives and methods predominate, but the humanities, natural sciences, and engineering have contributed to the variety of information studies research. Because of the use of multiple perspectives and varied research methods, information studies research is interdisciplinary and eclectic in nature. However, the many perspectives and methods that researchers bring to information systems and services have the potential to provide a rich understanding of information interactions, intellectual and cultural history, and information systems design and development.

See also: Archives, Public Records, and Records Management; Chief Information officers; Culture and Communication; Ethics and Information; Information Industry; Information Society, Description of; Libraries, Digital; Libraries, History of; Management Information Systems; Opinion Polling, CAREERS IN; PRICE, DEREK JOHN DE SOLLA; PRINTING, HISTORY AND METHODS OF; RETRIEVAL OF INFORMATION; SYSTEMS DESIGNERS; TECH-NOLOGY, PHILOSOPHY OF.

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RETRIEVAL OF INFORMATION

Information Retrieval (IR), has been part of the world, in some form or other, since the advent of written communications more than five thousand years ago. IR has as its domain the collection, representation, indexing, storage, location, and retrieval of information-bearing objects. Traditionally these objects have been text-based documents such as articles, reports, and books; however, as multimedia computing has progressed, the list of information-bearing objects has grown to include such things as images, videos, maps, sound, and music recordings. In the modern sense of the term, IR has its roots in the scientific information explosion that accompanied, and followed, World War II. Predating the computer, early modern IR systems used ingenious manual

mechanisms to deal with the millions of scientific and technological research papers that were being written as part of the war against tyranny.

The remarkable growth in computerization has lead to a "chicken-or-the-egg" scenario with regard to the growth in IR research and design. As computers become more powerful, more information is generated. As more information is generated, the need for bigger, better, and faster IR systems increases. This need in turn spurs the need for bigger, better, and faster computers, and so on, ad infinitum. Until the mid-1990s, interest in IR was limited to a handful of highly trained researchers, librarians, information scientists, computer scientists, and engineers. With the growing use of the Internet, however, information retrieval through the use of search engines has become an activity that is engaged in by a large portion of the general public. This newfound popularity is making IR research and development one of the hottest growth areas in the new digital "e-economy."

General Model of Information Retrieval

An IR system begins with a person who has some need for information. A student may need to find information for a class project on IR, for example. If there were just a little information available, then a purely manual approach might work. If the student knows that all of the needed information is available in a specific book or encyclopedia, and the student knows where that resource is, then he or she can just go get it. There is no need for any retrieval system beyond the rather remarkable one in the student's head. What happens, however, when the student does not know where to get the information? Perhaps an appropriate book exists in the library. Perhaps more is available in an online database or on a CD-ROM. Finally, perhaps some useful information may even be available on the World Wide Web. The problem is that in all of these cases the student cannot just wander around, hoping to find the needed information. These information collections are all much too large for that. Fortunately, for hundreds or thousands of years, people have been making retrieval tools to help with this task. Since the 1960s, many of these tools have involved computer applications. The following discussion will focus on these computer-based systems, with occasional reference to the earlier manual systems.

FIGURE 1. Information retrieval model. Query Querv Searcher Interface Processor Result Result Index Display List Files Document Index Collection Engine

A general IR system has the following eight components (each with a particular function): (1) a query interface, (2) a query processor, (3) an index, (4) an index engine, (5) one or more collections of information, (6) a result list, (7) a result display, and, most important, (8) a user or "searcher" of the system. The basic relationships among these elements of an IR system are shown in Figure 1.

Query Interface

The student, who might more generally be called the "user," interacts directly with the query interface and the result display. Users tell the IR system what they need through the query interface. A query is the string of words that users input to tell the computer what they need. The retrieval system interface provides a place for users to write the request. It would be easiest if users could speak a request in their native language. Unfortunately, this would require a special kind of artificial intelligence that has not yet been developed for computers. Users must tell the information system what they need in a language that the computer can understand. Usually, this is a language composed of the words that the user thinks will be in the documents that they are trying to find. In some systems, these words can just be presented in a list. Other systems fake natural language queries by allowing users to enter natural language word strings from which the system strips out all but the nouns. Most systems, however, require that the user connect the words together with the words "and," "or," or "not." This is called Boolean logic. So, the student searcher might look for information on the topic of "information retrieval" by typing "((information OR data) AND retrieval)."

Query Processor

While this language is simple, the computer still needs to figure out what to do with the string of words. The part of the system that does this is the query processor. The query processor breaks the query, (information OR data) AND retrieval, into a set of simple operations. The processor searches for "retrieval" in the collection first. If no documents are found with this word, the search may stop, since the query states that the document that the person is looking for must contain the word "retrieval" plus something else. If it cannot find "retrieval," then there is no point in looking for anything else. If documents are found that contain the word "retrieval," then the system will search to see if those documents also contain either the word "information" or the word "data." Those documents (if any) that do contain one of those words in addition to the word "retrieval" then become part of the retrieved set.

Index Files

How does the system know which documents contain a word and which do not? While computers are fast, they are not fast enough to read all of the documents in a collection to see of a word is there every time a person asks. For example, if the World Wide Web were searched this way, the computer would need to read through millions of documents on millions of computers for each query. A better approach is to create an index file.

In full-text retrieval systems, an index file is an organized list of words. Each entry in the list contains a word and points to all of the documents that contain that word. It is something like a set of thousands of index cards. If they are unsorted, it would take a long time to find any one card, but if they are sorted into alphabetical order, then the search is much quicker. Once the correct entry is found in an index, it is relatively simple to read off the list of names of documents that contain the word.

There is a set of important issues related to the words that go into the index. This includes word selection and normalization. Indexing can be accomplished manually or by the computer. Computer indexing is generally faster but less precise, while manual indexing takes a long time, is generally of high quality, but is still fraught with problems such as inconsistency between indexers' choice of words. Vocabulary chosen by the indexers may not match that used by the individual searchers who are looking for information. Users must guess what terms are in the index, unless there is a term thesaurus.

Index Engine

An indexing engine is software that creates index files. It does this by processing the documents in the collection one by one. It takes each word from the document and tests to see if it should be included in the index. Some words are used so frequently in texts that they are not of much use for indexing. Words like "the" appear many times in all documents, so there is no point in including them in the index. The group of words that are to be ignored during indexing is called the "stop list." Sometimes the index engine performs additional processing on the words for the index. For example, the index engine may stem the words. Stemming is the process of removing endings from words that might otherwise tend to hide the similarity between words. For example, a person might be searching for "computing" but would be happy to match words such as "computer," "computers" and "computed." Stemming would reduce them all to "comput*." The indexing engine may perform other operations as well, such as converting all words to lowercase. After all of this processing, the index engine will make an entry in the index file for each word that it encounters in the documents and create a pointer back to the documents where the words occur.

Result Lists and Result Display

When a computer system combines all of the result lists of documents that match each of the search terms in the query, it displays a list of the names of the documents, or some sort of document surrogate, such as a brief description of the document. In traditional displays, the system will present a list that contains the document title, author, name of the publication, where the document came from, and in some systems, an abstract. This list must be presented in some order that is convenient for the user. Short lists can be presented in alphabetical order. Many result lists, however, particularly on the World Wide Web, tend to be very long, sometimes containing hundreds or even thousands of document names. Since only ten to twenty records at a time can appear on a computer screen, because of screen size limitations, this list may require the user to look though many screens to find a desired document.

Since the length of these lists makes alphabetical listings less than useful, it is typical in IR systems to present the list in an order that reflects how well the particular document matches the query. One simple way to do this is to count the number of words in the query that match the document. In the example, "((information OR data) AND retrieval)," some documents may match all three words while others may match only two words. Another ordering technique is to count the number of times the query words occur in the documents. For the sample query, if one document contains the word "retrieval" once and another contains the word "retrieval" three times, the document containing the word three times might be considered a better match and would be put closer to the front of the list.

Collections

An IR system searches for information in a collection of documents. These documents can take many forms. They might be individual articles from a scientific journal, newspaper stories, e-mail messages, poems, or encyclopedia entries. What all of these collections have in common is that they are composed of text.

The first and most important step in retrieving information is for the searcher to decide on what collection to search for the information. Collections are put together for different purposes. There are collections of news stories, collections for branches of science, collections of poems, and collections of web-pages. In short, there are collections for nearly every possible topic. No one index covers all of the topics. Collections may also exist in a variety of formats. Some collections are of music, sound, photography or video. The query example used above was based on a text-based collection. Usually, collections of sound or pictures are indexed using words that have been added to the documents to describe them. Alternatively, music can be indexed by its notes, sound by its dominant frequencies, images by their dominant colors or color layout, and video by the key images extracted from the motion. All of these indexing techniques are content-based methods. This contrasts with concept-based methods that are usually provided by humans and are more closely tied to the actual meaning of the document. In content-based methods, automatic computer programs are used to extract not the meaning but just some patterns from the documents. So, for example, a program must find the distribution of the most common colors in a photograph. These colors would be used to index the image. This, of course, changes the way in which a searcher must specify a query. It is difficult to type in a list of words that describes a photograph's distribution of color. Instead, some of these systems allow a person to search by drawing, by painting, or by selecting examples that are like the one that they want.

Display

After the IR system selects a set of documents, the selections are displayed to the user. The format of the display varies according to what part of a document is displayed, which documents are given prominent positions, and how the full text is displayed if it is available. The common form of display is a list of matching document identifiers. In a magazine, journal, or newspaper collection, the document identifiers might be the author, article title, name of the publication, and the date of publication. Only a small number of document identifiers, usually about ten, can be displayed on a computer screen at one time. If there are more then ten items in the retrieval set, then there is usually a button or command that will display the next group of ten items. If the collection contains the full text for an item, the computer interface usually provides a way to bring the full text onto the computer screen or to print it.

Frequently, a user's first search does not produce the information that the user wanted, there is not enough information, or the list of results is too long. In each of these cases, the user may choose to reformulate the query, perhaps by using some new knowledge that was gained by looking at the results of the earlier search. This search and retrieval cycle continues until the user either finds the desired information or gives up. All too often, people do not find the information that they want. Even worse, they sometimes believe that they have found all of the relevant information when they have not. Many new systems are being developed with advanced features that will help remedy this situation.

Advanced Search Features

Each of the components of the IR system as discussed above can be improved, particularly the query interface, the query processor, the index, the collections, and the result display.

Natural language query systems allow people to use everyday language, rather than Boolean logic, to state what they are interested in finding. The Boolean query "(information OR data) AND retrieval" could be written as "give me all records about information or data retrieval." While this may look like a good alternative to Boolean queries, some caution is warranted. Computers have limited ways of processing human languages, so it is easy to be misled about what a computer will do with a statement like the one given above. The computer is likely to select only the nouns from the sentence, remove words like "record" and "document," and then "OR" the nouns together into "information OR data OR retrieval." A cleverly written program might figure out the correct use of the "and" and the "or" in this situation, but such proficiency is the exception rather than the rule for most computer-based IR systems.

Vocabulary aids can improve retrieval. It is sometimes difficult for users to guess what words were used by the author or the indexer to describe the topic that is of interested. Consider what would happen in the above example if the author used the words "database retrieval" and not "data retrieval." Neither the Boolean query processor nor a natural language search would be able to find the record if the searcher used the term "data retrieval" instead of the term "database retrieval." To help with this problem, some systems provide either a term thesaurus or a controlled vocabulary. A term thesaurus can be provided in a separate printed book, or it can be built into the retrieval system. A term thesaurus lists what words can be used in place of other words in a query. This type of thesaurus has entries such as "DATA STORAGE use DATABASE" to tell the searcher, in this case, to use the word "database" rather than "data" when performing a search. The thesaurus may also suggest broader and narrower words. For example, "DATABASE broader term is DATA MANAGEMENT" or "DATABASE narrower term is RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBM)". A thesaurus may also be used for automatic query expansion. For example, when a person searches for "data," the system might automatically add the word "database" to the query without asking the person.

Another feature that is available in more advanced systems is relevance feedback, which allows users to incorporate previously retrieved documents into a query. Users mark the documents as "relevant" (i.e., similar to what they are wanting) or "irrelevant" (i.e., not at all what they are wanting). The query processor uses this information to form a new search for the user. The query processor might do this by adding keywords from the relevant documents to the query and adding "not" to the keywords from irrelevant documents.

When most information retrieval systems return a list of retrieved documents, the only way to indicate potentially "good" documents is to put them at the top of the list. Using computer graphics, some systems can give the person doing the search more information about why a particular document was returned. One such system is called WebVIBE. In this system, queries may be broken into parts at the "or" in Boolean queries. For example, one query might be "information AND retrieval," and at the same time, the user can search for "data AND retrieval." Each query is represented as a "magnet" on a different part of the screen. The documents that match the queries are represented on the computer screen as icons, such as small images of pieces of paper. The magnets attract icons that represent documents that match the query. If a document icon matches only one of the queries, the icon for that document will fall directly on the magnet. The more interesting case is when a document matches both queries. In that case, the magnets that represent the queries have a "tug-of-war" over the document icon, and it will end up on the computer screen somewhere between the two magnets. The searcher can see which parts of a query best match a document by the position of the icons on the computer screen. Contrast this with the standard result list format, which simply lists relevance-sorted matches to the query "(information OR data) AND retrieval." In this case, the user cannot tell if a document was returned because it matched "information," "data," or both "information" and "data."

Evaluation of Information Retrieval Systems

Information scientists are continually arriving at new ways to improve IR, requiring the evaluation of IR systems to become an important component of IR research and development. In order that the comparisons be as consistent as possible, IR researchers have developed the "Cranfield Model" of evaluation. The Cranfield Model is named after a series of experimental IR evaluations performed by Cyril Cleverdon and his colleagues in Cranfield, England, during the 1960s. The second of the Cranfield studies (Cranfield II) has been called "the exemplar for experimental evaluation of information retrieval systems" (Harter and Hert, 1997). Thus, the Cranfield experiments are considered by most IR researchers to be the progenitor of the discipline of IR evaluation. The Cranfield Model can be described as

- 1. a test collection of documents,
- 2. a set of queries, and
- 3. a set of relevance judgements (i.e., lists, for each query, of all of the relevant documents in the collection).

For a given query and act of retrieval, the following document sets and associated numbers are known:

- 1. relevant and retrieved documents (RelRet),
- 2. nonrelevant and retrieved documents (NRelRet),
- 3. relevant and nonretrieved documents (RelNret), and
- 4. nonrelevant and nonretrieved documents (NrelNret).

Ideally, for any given query, an IR system should find for the user all relevant, and only relevant, documents. To determine how close to this ideal an IR system is working, a collection of IR evaluation measures, or metrics, have been developed. Two metrics, recall and precision, are the most commonly used measures. Recall evaluates, for any given query, how close an IR system comes to retrieving all the relevant documents in its database. Precision evaluates, for any given query, how close an IR system comes to presenting to the user only relevant documents. Recall and precision are both expressed either as a number from 0 to 1, or as a percentage. A score of 0 (0%) represents complete failure, while a score of 1 (100%) represents perfection. An ideal system would, therefore, have a recall score of 1 (100%) and a precision score of 1 (100%) for each and every query submitted. The recall and precision metrics can be expressed as easy-to-calculate equations:

Recall= RelRet/(Relret + RelNret)= A/(A+C) Precision= RelRet/(RelRet + NrelRet)= A/(A+B) Imagine that a test collection contains 100 documents that are relevant to the query "What is information retrieval?" Further imagine that when this query is submitted to the system, 25 documents are retrieved. After examining all 25 retrieved items, it is determine that 20 of them are relevant to the original query. In this case, the recall for the search is 0.2 (20%) and the precision is 0.8 (80%). These scores were calculated:

- Recall= RelRet/(RelRet + RelNret)= 20/100= 0.2= 20%
- Precision= RelRet/(Relret + NrelRet)+ A/(A+B) = 20/25= 80%

The spirit of the Cranfield evaluations lives on in the form of the Text REtrieval Conferences (TREC), which started in 1992 as a joint IR evaluation project between the National Institute of Standards and Technology (NIST) and the Defense Advanced Research Projects Agency (DARPA). The TREC evaluations are famous for the depth and breadth of the assigned retrieval tasks on which the entered IR systems are evaluated.

The evaluation of IR system performance is more of an art than a true science. The accurate calculation of recall scores is just one of the many problems that IR evaluators must overcome in their quest to be scientific. Note how the calculation of recall is predicated on knowing exactly how many relevant documents there are in the database for each query. When evaluators use a test collection, this is not a problem because previous researchers have examined every document in the collection to determine whether a given document is relevant to a given query. In real-world IR systems (e.g., AltaVista), systems with millions of documents, the examination of each document to determine its relevance to a query is impossible. Various techniques have been used to estimate the number of relevant documents that are present in a collection. For example, in their evaluation of a real-world legal collection, David Blair and M. E. Maron (1985) used a method of iterative searching to uncover potentially relevant documents that had initially been missed by a set of legal researchers. Using this technique, they revealed two important facts. First, users consistently overestimate the recall scores of their initial searches. Second, recall scores, in general, were shockingly low. Because the Blair and Maron approach is timeconsuming and labor-intensive, other researchers

have attempted to estimate the number of relevant documents by randomly sampling unretrieved documents. Still others have compared results of a series of similar searches and used the documents that were found to be in common as the basis for their estimates. Notwithstanding the estimation technique that is employed, it is important to stress that these methods provide only rough estimates of the actual number of relevant documents in a collection. Because real-world recall scores are based on such estimates, they too are considered mere estimations.

Since IR systems are developed by, and used by, humans, all of the problems associated with measuring the myriad variety of human behaviors also apply to IR evaluation. Questions of experimental validity are often raised. Are evaluators really measuring system performance, or are they measuring the IR skills of the users? Human users come to a system with a wide range of skills and abilities that must be accounted for if one is to determine whether the observed retrieval scores are the result of system performance or user skill. Experimental reliability is another problem. How well does the experimental evaluation of a system predict its behavior in the "real world"? It is one thing to claim that a system works well under laboratory conditions, but it is quite another to claim that it will work just as well once an IR system has been released to the public for general use.

A classic example of the reliability issue is the "recall-precision tradeoff" problem. Some users, such as doctors, lawyers, and graduate students, often need to conduct exhaustive searches (e.g., "I need all legal decisions handed down concerning malpractice lawsuits."). Exhaustive searches are those where each and every relevant document must be retrieved and then examined to ensure that no important information has been overlooked. Obviously, an IR system would need to have perfect recall to satisfy such users. Other users (even doctors, lawyers, and graduate students) occasionally need to conduct questionanswering searches (e.g., "What year was Roe v. Wade decided?"). Specific searches, as this type of quest is sometimes called, require only that a small set of documents be retrieved. So long as one or more of the documents contains the desired answer, the size of the retrieved set is immaterial because once an answer-bearing document is retrieved and the answer is found, the remaining documents are no longer needed. Under this scenario, users with question-answering searches would be best served by an IR system with high precision. In a perfect world, the ideal IR system would be able to satisfy both types of uses simultaneously. Research has consistently shown that when users of IR systems aim for high recall, precision suffers significantly; similarly, when precision is the goal, recall performance suffers. This inverse relationship between recall and precision is the recall-precision tradeoff.

Since system evaluators cannot know all the different types of queries that an IR system might be called on to address, some researchers have questioned the meaningfulness of recall and precision scores as measures of true IR system performance. For example, how meaningful is a low recall score when a user only needs one document to answer a query? To overcome the problems posed by the recall-precision tradeoff, some IR researchers have proposed the adoption of special metrics that combine aspects of both recall and precision simultaneously.

Another difficulty that plagues the scientific examination of IR systems is what is meant by the term "relevance." Most researchers agree that relevant documents are those that somehow "satisfy" the query that is presented by a user. The debate hinges on the idea of "satisfaction." For some, the question is black and white-either the documents in question answer the query, or they do not. For others, satisfaction comes in shades of gray, with some documents being more relevant than others. Into this contentious mix is often thrown the notion of "pertinence," or the usefulness of the documents irrespective of relevance. Pertinent documents are those that a user finds useful. Pertinence and relevance are closely related, but they are not necessarily the same. Think of pertinence, like beauty, as being in the eye of the beholder. For example, a document retrieved about astrophysics might be relevant in response to a student's query about solar eclipses; however, the same document might also be nonpertinent to the student because the complex mathematical formulas that are presented within the document make the text incomprehensible. This debate over the nature of relevance might appear esoteric to an outsider, but it is important to IR researchers. Note the central role played by the counting of relevant documents in the calculation of both recall and precision. If one researcher decides to calculate precision by using the black-and-white interpretation of relevance and another decides to use pertinence, two very different sets of information will be generated. Since these two sets of results purport to evaluate the same thing, it is obvious how the relevance problem can lead to considerable confusion and uncertainty.

In reaction to the many problems that are associated with the accurate measurement of recall and precision, a new group of researchers has emerged, and they are called the "user-centered" school. User-centered IR evaluators believe that the Cranfield style of evaluation, along with its reliance on recall and precision, is fundamentally flawed because it is too "system centered" and thus does not capture the most important aspect of the interaction between users and IR systems, namely the successful informing of the users. Under the user-centered theory, an IR system is only successful if it assists users in moving forward with their lives by quickly, and with minimum of effort, fulfilling their broadly defined information needs. User-centered researchers perform qualitative assessments of achievement using a mixture of personal interviews, focus groups, surveys, and observations, and they eschew the quantitative measures of recall and precision.

Multimedia Information Retrieval

If one thinks of the development of modern computerized IR systems as forming a family tree, then in some sense the early online public access catalogues (OPACs) that are found in libraries would be the grandparents to all subsequent systems. Their children, nicely matured, would be the text-based search engines that are now found just about everywhere, including the World Wide Web, CD-ROM workstations, and palmtop personal digital assistants (PDAs). The teenaged grandchildren, full of promise but not quite ready to leave home, would be the visual information retrieval (VIR) systems that are designed to provide access to image and video information. To complete this family tree, the youngest grandchildren, just barely toddlers, would be the music information retrieval (MIR) systems and their cousins, the auditory information retrieval (AIR) systems. MIR provides an illustrative example of the challenges that are faced by multimedia information retrieval (MMIR) as it grows to maturity.

Interest in MMIR is growing rapidly. The advent of powerful multimedia-capable home computers and the point-and-click ease of the Internet have combined to create a huge demand for nontext information, including pictures, maps, speech, video, and music recordings. For example, according to WordSpot (2000), an Internet consulting company that tracks queries submitted to Internet search engines, the search for music—specifically, the now-popular MP3 format—has surpassed the traditional search for sex-related materials as the most popular search engine request.

Why is the obvious demand for music and other multimedia information not being met by IR research and development? Why are the "MP3 search engines" merely indexing the textual labels supplied by the creators of the files and not the music itself? MMIR is fraught with difficult problems that must be overcome before the technology can mature. First, multimedia information objects (e.g., images and music recordings) tend to be large. A single minute of CD-quality music takes up about 10 MB. These large sizes make multimedia information difficult to transmit, process, and store. Second, and more problematic, multimedia information is multifaceted (i.e., it has many different components that together make up the information). Music information can be said to comprise a complex array of pitch (e.g., notes), temporal (e.g., rhythm, meter), harmonic (e.g., chords), timbral (e.g., tone color), editorial (e.g., performance instructions), textual (e.g., lyrics), and bibliographic (e.g., composer, publisher) information, which together all form a coherent whole. The fact that the facets themselves have many different ways of being represented compounds this complexity to dizzying heights. For example, the pitch facet can be represented by note name (e.g., e-flat, g-sharp), interval (i.e., distance between notes), solfège (e.g., do, re, mi, fa, sol, la, ti), and sonic frequency, to name but a few options. MIR and other MMIR researchers must find comprehensive methods of dealing with this awe-inspiring complexity before MMIR systems can achieve the success of their text-based ancestors.

The goal of every MMIR system is to provide the user with the ability to search for and then retrieve multimedia objects using the medium of the desired objects. Thus, in the case of music information, MIR systems are being designed so music queries can be posed musically. Music-specific query methods that are being developed and refined include singing, humming, notation (i.e., traditional note and staff), pitch names, intervals, melodic contour (i.e., the overall shape of a melody), music keyboard, and so on. Each of these methods has its strengths and weaknesses. For example, contour queries are forgiving of user errors because they only have to remember the general shape of a melody, rather than the exact pitches. This approach, however, can result in retrieval of many unwanted songs (i.e., high recall but low precision). Using a music keyboard to input the exact pitches does offer the user the opportunity to achieve more precise results, but many users are not trained to play a music keyboard, so the chance for error is greatly enhanced. It is interesting to note that the recall-precision tradeoff of traditional text-based IR appears to have been handed down in full measure to its MMIR descendants.

See also: Artificial Intelligence; Computer

SOFTWARE; COMPUTING; DATABASES, ELECTRONIC; INTERNET AND THE WORLD WIDE WEB; MANAGE-MENT INFORMATION SYSTEMS; USE OF INFORMA-TION.

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RHETORIC

Although it is frequently understood to refer to the art of effective discourse, the term "rhetoric" refers variously to the study or analysis of discourse, to the ability to create and deliver messages effectively, and to the study of the theoretical issues that underlie the relationship that exists between knowledge and language. It refers to both the study and application of communicative practices. Traditionally associated with the art of persuasion, especially in the oral tradition, rhetoric has at times been viewed as encompassing the study of virtually all communication interactions on the grounds that all communication can be viewed as intentional. Rhetoric is the foundational discipline on which contemporary concerns for subjects as diverse as audience research, media criticism, marketing, public speaking, semiotics, communication ethics, nonverbal communication, and the philosophy of language are based. The term also has a long history of pejorative use as a label for dishonest or empty discourse, such as when a politician characterizes the speech of his or her opponent as "mere rhetoric," suggesting that its claims are unsubstantiated or that its beautiful phrases are actually meaningless. One reason for the complexity of meanings in the term is simply that rhetoric is an ancient art, the practices of which are closely linked to political systems and cultural norms. As cultures have risen and fallen since ancient times, the significance, meaning, and practice of rhetoric has gone through a variety of transformations.

Rhetoric Emerges as a Discipline

The first formal discussions of the art of rhetoric in the Western tradition emerged in the fifth century B.C.E. in Greece, though more ancient texts of Chinese and Jewish origin as well the works of Homer indicate that there was an even earlier interest in speech making. The growing use of the courts to adjudicate disputes, such as those concerning property ownership, prompted by political changes in Sicily, led to the increasing use of oral public argument that was aimed to produce a decision that was favorable to an advocate. Some individuals began to observe that there were standard practices or lines of argument that were successful. Recognizing that people would pay to learn these strategies, these individuals began to teach the strategies that they had observed or used. News of these prescriptions for successful arguments was soon carried to Athens, where the emergence of increasingly democratic forms of government offered fertile ground for the development of the art of public oratory beyond the courtroom. The teaching of the art of rhetoric flourished in this environment.

From these early days, the teachers of rhetoric, who were often philosophers in a group that was known as the Sophists, faced opposition. Plato, a major spokesperson for this opposition, was concerned that rhetoric, at best, was no art but simply a knack, and, at worst, that it was a morally bankrupt endeavor. Rhetoric, he argued, was not concerned with discovering truth or reality; it was only concerned with appearances. Rhetoric was not considered to be a science, as it led to no certain knowledge, and it was not a respectable art such as dialectic (the use of strict deductive logic to test and defend claims when scientific demonstration was impossible). The Sophists defended their position on philosophical and practical grounds. Truth is rarely attainable and often what one imagines to be the truth of an issue will not be considered true elsewhere. "Man is the measure of all things," argued Protagoras in his contemporary-sounding expression of cultural relativism. For the Sophists, rhetoric was a necessary art, useful to discover and reach agreement about truths, as well as to decide on courses of action when no truth about an issue could be known.

In the most influential work on rhetoric from the Greek period, Aristotle's Rhetoric (circa 335 B.C.E.), an effort is made to transcend this debate. Defining rhetoric as "the faculty of observing in any given case the available means of persuasion," Aristotle offered a scientific examination of rhetoric to counter the almost mystical powers that the Sophists sometimes attributed to it. Aristotle saw rhetoric as a morally neutral art-a habit of mind and a systematic practice that could be of help to anyone who was engaged in persuasive practice in any situation. He agreed with the Sophists that rhetoric was necessary to answer questions about contingent matters-issues of discussion where "Truth" could not be known. He also identified three areas where rhetorical activity took place. These were the courtroom, where, in response to the presentations of advocates, judges rendered decisions about disputed past facts (e.g., Did they

commit the offence? What offence was it?); the senate, where, in response to public arguments, judges rendered decisions about future actions (e.g., Should we go to war with Sparta? Should we spend public money for this building?); and the realm of what might be called public opinion, where the listeners in the audience rendered a decision about present attitudes toward a person who was attacked or praised in a speech or even about the speaker himself. For example, in his speech "On Helen" (circa 414 B.C.E.), Gorgias, a prominent teacher of rhetoric, beautifully exonerated the historical figure Helen of Troy-whom popular culture accused of causing the Trojan War. Aristotle also systematically addressed lines of argument, the psychological characteristics of audience members, cultural values and norms on which one could build an argument, and even how to use language successfully. Aristotle was most interested in the effectiveness of discourse because speakers functioned as advocates who were trying to persuade judges or audiences to decide in their favor. Perhaps his most long-standing contribution is his discussion of the three basic modes of proof. Aristotle identified (and modern textbooks on public speaking echo) three basic ways in which people come to be persuaded: logos, or appeals that are grounded in rationality or logical argument; ethos, or appeals that are grounded in the credibility of the speaker; and pathos, or appeals that are grounded in emotions or are aimed to arouse emotions in such a way that a listener is placed in the right frame of mind to render appropriate judgment.

Rhetoric as a Practical Skill and Master Art

Ancient Rome (from 200 B.C.E.) was deeply influenced by Greek thought about rhetoric and adopted rhetorical training into its emerging educational system. The Romans produced a clear course of study for the training and development of orators. Textbooks such as the Rhetorica ad Herennium (which appeared around 84 B.C.E.) set forth the five elements that students were expected to master. These are referred to as the "rhetorical canon," and they continue to influence how public speaking is taught. The first canon, inventio, or invention, referred to the creation or discovery of the content of the speech. This is the issue to which Aristotle had devoted most of his energies. Modern public speaking textbooks treat issues related to invention when they advise students

about selecting and narrowing speech topics, conducting research, and developing supporting materials and arguments for their speeches. The second canon, dispositio, or disposition, referred to the selection and arrangement of this content to create the speech. Modern teachers of public speaking continue to advise students about appropriate patterns of organization and ways to connect one idea to another in an oral presentation. Elocutio, or style, constituted the third rhetorical canon, focusing on the creation of the right wording to express ideas and on the use of stylistic devices to enliven discourse. Modern courses in public speaking still discuss the use of strategies such as clarity, metaphor, antithesis, and parallel structure as ways to increase the effectiveness of a public speech. The fourth canon was called *memoria*, or memory. Ancient orators were trained to commit even lengthy addresses to memory. Special mnemonic strategies were developed to aid in this process. Contemporary public speakers are trained to use key-word outlines, TelePrompTers, and computergenerated visual aids to assist them in recalling the main points and details of their presentations. The fifth canon was training in pronunciatio, or delivery. To be effective, a speech must be delivered with the voice and body used in a way that enhances the ability of the audience to understand and/or be moved by the message.

The rhetorical canon and its institutional status in Greco-Roman culture, as well as its place as a pillar of the Seven Liberal Arts, demonstrates that from its earliest days, rhetoric has been linked to pedagogy; it has been recognized as a necessary skill of an educated person. However, there has always been a competing history that viewed rhetoric as more than a skill. The Sophists saw it as a way to generate truth. Cicero, regarded as the greatest of the Roman rhetoricians, saw rhetoric as a master art that was linked to the development of the person of public affairs. Cicero's eloquence in speaking in defense of the Roman Republic as it tottered toward monarchy in the first century B.C.E. demonstrates his powerful fusion of rhetorical theory with rhetorical practice. In the first century C.E., Quintilian's Institutes of Oratory set forth an exhaustive system for the education of young men, where rhetoric was no longer the neutral art of Aristotle but was deeply linked to ethics. Although written in Imperial Rome when the political structure constrained civic discourse and Cicero's vision of the rhetorician as a man of public affairs had become unviable, Quintilian's writings nevertheless held up the ideal of "the good man speaking well." Modern communication scholars continue to be concerned with the place of discourse in a democratic community as well as with the ethical dimensions of discourse.

The Persistence and Expansion of Rhetoric

From the Medieval period through the Enlightenment, the study of rhetoric passed through a series of highs and lows as the economic, religious, scholarly, and political conditions changed. Instruction in at least part of the rhetorical canon continued alongside studies of grammar and logic, but in some writings during the period, rhetoric was reduced to a focus on the single canon of style or expression, while logic (or dialectic) was elevated in importance. In the early Renaissance, manuals on the art of letter writing and on poetry were linked to classical treatments of rhetoric, but the oral tradition faded while the connection of rhetoric with style in writing was strengthened. Other handbooks on courtly etiquette and preaching kept alive some interest in other aspects of the rhetorical canon. These works clearly express human interest in developing rhetorical sensitivity; they underscore the belief that there is a strategy or art concerning how people know what to say and how they express themselves in language, whether written or oral. The rediscovery of key classical texts during the fourteenth and fifteenth centuries renewed interest in rhetoric, and rhetorical training continued as a regular part of Western educational systems well into the nineteenth century. The Ciceronian ideal of the public orator experienced a renaissance in the nineteenth-century American oratorical tradition, but in schools, rhetorical training was typically limited to elements of composition and, in some quarters, practice at declamation (reciting speech excerpts) or elocution (developing skills of memorization and delivery).

The renewed interest in rhetorical studies in the mid-twentieth century grew out of several causes. Internationalism, wartime propaganda, new media, and the growth of advertising all increased attention to the creation and analysis of persuasive messages. Academic interest in argumentation, a maturing sense of the complexities of audience analysis, and a renewed interest in the relationships that exist among knowledge, language, and power have supported a burgeoning field of study that reaches across disciplinary boundaries. Practitioners such as motivational speakers, marketers, and politicians are interested in how to discover information about their audiences and, once they have that information, how to create appeals that will be successful.

One way to learn how to create more effective messages is to study past rhetorical efforts. From this theory emerged the discipline of rhetorical criticism. When discourse intends to have an effect on an audience, the questions that are used to analyze it should concern rhetorical rather than simply literary features. In the 1940s and 1950s, Kenneth Burke argued that "identification" rather than "persuasion" is the key rhetorical concept, and he encouraged critics to investigate both the conscious and unconscious ways in which symbol users attempt to get an audience to share their beliefs and values. Rhetorical scholars have investigated a wide range of public discourse, examining everything from the arguments and appeals of the abolition movement of the nineteenth century to the rhetorical power of public memorials to the influence of media coverage of war.

Rhetorical studies is influencing and being influenced by many disciplines. Feminist rhetorical critics have added new perspectives by asking a new set of questions. A contemporary rhetorical study, for example, may investigate how many times women are cited as experts in hard news versus soft news stories and may hypothesize about what that data means as a reflection of the value system of a culture. Influenced by European thinkers such as Michel Foucault and Jacques Derrida, rhetorical critics have explored the hidden assumptions that are revealed by the choices that are made in the production of discourse. Even the discourse of the sciences has been examined to expose the rhetorical conventions that are common to the disciplines and to reveal the belief and value systems as well as the power structures that constrain and shape research questions, processes of investigation, and the reporting of results. The study of semiotics and the relationship among words, meanings, and reality offers further richness for analytical study that produces both practical and theoretic insight.

Although rhetoric as a discipline continues to offer opportunities to reflect on theoretical questions that concern the nature of knowledge and language, for the contemporary student, rhetorical study often remains focused on the effective use of discourse. Students of composition develop the skills that are necessary to improve the clarity and effectiveness of their writing. Students of public speaking practice analyzing the particular demands of a speaking situation and audience, creating materials for a speech, and then organizing, wording, and delivering it. Rhetoric instruction leads students to consider how their choices of content, structure, language, and/or delivery strategy will have a rhetorical effect. Students learn that their choices will influence how the audience receives the message; indeed, they will influence the very meaning of the message for that audience. By developing this consciousness, as well as by underscoring the potential power of discourse in shaping and maintaining culture, the study of rhetoric persists at being central to the mission of higher education.

See also: Democracy and the Media; Ethics and Information; Language and Communication; Language Structure; Nonverbal Communication; Propaganda; Public Speaking; Semiotics.

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AMY R. SLAGELL

ROLES AND RESPONSIBILITIES IN GROUP COMMUNICATION

See: Group Communication, Roles and Responsibilities in

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SARNOFF, DAVID (1891-1971)

David Sarnoff was born in Minsk, Russia. Sarnoff's serious adult demeanor evolved from a childhood of poverty and hardship. His family suffered through Cossack raids and repression that characterized life for millions of Jewish people in Russia. From the time he was four years of age, Sarnoff was drilled on the Torah and the Talmud because his parents hoped that he would become a rabbi. The family emigrated to the United States in 1900, first settling in Albany, New York, and then moving to New York City. After he arrived in the United States, however, Sarnoff's life took on the characteristics of a Horatio Alger story. His father's poor health meant young Sarnoff became head of the family. He began selling Yiddish newspapers, taking English lessons, and delivering telegraph messages.

After being fired from a telegraph delivery job because he requested time off from work for a religious holiday, Sarnoff was hired as an office boy at American Marconi, the struggling U.S. subsidiary of British Marconi. A chance opportunity allowed Sarnoff, at age fifteen, to introduce himself to Guglielmo Marconi, and the relationship that developed between the two of them enabled Sarnoff to pursue additional career opportunities with the company and to further his education.

His employment as a wireless operator for American Marconi, served as the basis for one of Sarnoff's feats of self-promotion. According to stories that he told later in life, Sarnoff monitored the first distress messages from the *Titanic* when it was sinking on April 14, 1912. According to Sarnoff's accounts, he did not leave his post for seventy-two hours because he was the lone wireless operator who was responsible for monitoring the wireless dispatches. In fact, Sarnoff was one of several dozen operators who may have heard transmissions from or about the Titanic. Tom Lewis (1991) notes that Sarnoff's wireless equipment was located atop the Wanamaker Department Store in New York City and that the store was closed on Sunday night, April 14, 1912. Therefore, Sarnoff probably did not have access to his equipment until the next day. Furthermore, because of his location in relation to the sinking ship, any reports he did hear would have probably been retransmissions of information received from ships at sea.

Some histories report that Sarnoff envisioned the use of radio as a source of personal entertainment during radio's infancy. The so-called radio music box plan was reported to have been written by Sarnoff to his boss at American Marconi in 1915. Neither the document nor the reply from his boss exists, nor do any other confirming documents from the time. Louise M. Benjamin (1993) notes that there is record of a 1920 memo from Sarnoff to Owen D. Young, who was the chief executive officer of the Radio Corporation of America (RCA) and General Electric at that time. The memo, which is twenty-eight pages long, discusses a number of possibilities for the development of radio broadcasting and was written at a time when a number of ventures were already underway to experiment with radio broadcasting for public consumption. Furthermore, a 1920



As part of the first television broadcast, David Sarnoff speaks at the dedication ceremony for the RCA Building at the 1939 World's Fair in New York City. (Bettmann/Corbis)

"prediction" lacks the foresight that is sometimes falsely attributed to Sarnoff, and the 1920 document illustrates the awareness Sarnoff's superiors already had regarding the future possibilities of radio broadcasting.

These historic myths, however, should not deprive Sarnoff of proper recognition for his role in the development of broadcasting. Sarnoff, who became general manager of RCA in 1921, helped push RCA beyond the business of selling radios and into the field of network radio broadcasting. The National Broadcasting Company (NBC), a wholly-owned subsidiary of RCA, began network service on November 15, 1926. As many as twelve million people were estimated to have heard the premiere broadcast. Soon thereafter, Sarnoff was operating two networks, NBC Red and NBC Blue. Sarnoff faced competition from William Paley and the Columbia Broadcasting System (CBS) network. Paley reportedly admired Sarnoff's propensity for empire building and his Horatio Alger adeptness in creating an industry. Although Paley

lacked Sarnoff's intellect and technological vision, his personal magnetism would create a strong rival for Sarnoff. Sarnoff sought to identify technology that would be useful to the development of both RCA and NBC. He purchased rights to massproduce Edwin Armstrong's superheterodyne tuner in June 1922 and secured first refusal rights for all other Armstrong inventions. Sarnoff invested in television research in 1929 by hiring Vladimir Zworykin to develop an electronic television system. The RCA television system was publicly demonstrated at the New York World's Fair in 1939. Although inventor Philo Farnsworth successfully demonstrated electronic television in his laboratory in 1927 and in extensive public demonstrations in Philadelphia in 1935 and 1936-and won television patent infringement suits against RCA in 1940-history often reports Sarnoff and RCA as the inventors of television.

Sarnoff's plans for television were almost halted by Armstrong's invention of FM (frequency modulation) radio. While Sarnoff recognized the superior audio quality of the FM signal, he was unwilling to back the system because RCA was developing television. FM radio was seen as a competitor to the success of AM radio, and it would have diverted scientific and government attention away from television. FM service was first authorized in 1940 on the frequency range of 42–50 MHz. After World War II, Sarnoff was able to lobby the Federal Communications Commission (FCC) to move FM service to the frequency range of 88–108 MHz. Because this made all existing FM radio sets obsolete, the change effectively halted the development of FM radio, and Sarnoff moved ahead with his plans for television.

When CBS, in 1945, introduced a color television system that would have made all black-andwhite receivers obsolete, Sarnoff used the resources of RCA to develop a color system that was compatible with the existing black-and-white system. Ultimately, the FCC adopted a color system patterned after the RCA system in 1953, giving Sarnoff his greatest company victory by maintaining RCA's dominance in set production and NBC's leadership in color broadcasting.

Sarnoff's service during World War II included planning the radio stations that would broadcast news and information during the D-Day invasion. He was promoted to the rank of brigadier general. After the war, Sarnoff instructed staff members to call him "General Sarnoff."

Sarnoff's RCA and NBC companies were, for him, the start of a dynasty. He retired as chairman of the board in 1970 and died a year later. Including his years with American Marconi, Sarnoff spent more than sixty years with RCA/NBC. Sarnoff's son Robert became president and later chief executive officer but was fired four years after his father's death. After that, Sarnoff's dynasty drifted, lacking a company vision and the necessary leadership. General Electric purchased RCA/NBC in 1985 and promptly sold the RCA assets, including the RCA name.

See also: ARMSTRONG, EDWIN HOWARD;

FARNSWORTH, PHILO TAYLOR; FEDERAL COMMU-NICATIONS COMMISSION; MARCONI, GUGLIELMO; PALEY, WILLIAM S.; RADIO BROADCASTING, HIS-TORY OF; RADIO BROADCASTING, TECHNOLOGY OF; TELEVISION BROADCASTING, HISTORY OF; TELEVISION BROADCASTING, TECHNOLOGY OF.

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Greg Pitts

SATELLITES, COMMUNICATION

In the most basic terms, the communications satellite industry is made up of those who use satellite transponder time and those who provide or broker satellite time. Satellites are used to transmit all types of video and other data. Uses include news feeds and other occasional services, special events transmission for broadcast and cable outlets, transmission of syndicated programming, video conferencing for business and other applications, distance learning, satellite media tours, distribution of video news releases (VNRs) and commercials, direct-to-home delivery of television programs and events, as well as telephone, data, and Internet applications. Local television and radio stations, or even broadcast networks or major corporations, would find it very costly to launch and maintain their own satellites. Therefore, most outlets lease time on existing satellites if they are going to send satellite news and programming feeds or other types of data.

Major Satellite Service Providers

Some in the industry credit General Electric (GE) with playing a major role in the beginnings



An artist's rendition shows the 7,600-pound DirecTV 1-R satellite, which was launched in October 1999 and made possible the delivery of local broadcast network channels to DirecTV customers. (AFP/Corbis)

of satellite newsgathering (SNG). GE Americom, one of the largest satellite brokerage firms in the United States, operates a fleet of twelve satellites that serves the United States and Canada. Additional satellites serve Latin America, Europe, and Asia. The company operates four tracking, telemetry, and control Earth stations in the continental United States, along with other global facilities.

GE Americom introduced "hybrid" satellites that contain both C-band and Ku-band transponders. GE's subsidiary, NBC, was the first commercial network to have programming delivered by satellite, via Americom satellites and facilities. Americom was also the first provider to make it possible for newsgathering operations to maintain voice communications with home bases while transmitting video.

Loral Skynet is another major supplier of satellite space and services. Loral Skynet came into being when the satellite manufacturer Loral Space & Communications purchased Skynet from AT&T in 1997. Loral Skynet operates eight satellites in the Telstar fleet and has acquired or partnered with ventures in France, Mexico, and Brazil to expand its reach to most of the world's population.

Vyvx is another of the primary suppliers of satellite time to users in the United States. In addition to its fiber-optic services, Vyvx operates both analog and digital satellites that use both C-band and Ku-band frequencies. Like most providers, Vyvx allows its customers to book time in increments that are as short as fifteen minutes for transmission of news items and short programming segments.

Smaller companies often serve as intermediaries between the users and the providers. These companies, such as Centrex, specialize in acquiring satellite time during peak demand periods. Other providers with more of an international focus include PanAmSat, Intelsat, and ComSat. ComSat is headquartered in Clarksburg, Maryland, and began operation in the 1970s. ComSat is a major investor in New Skies (the commercial component of Intelsat), which was introduced as part of the organization's move toward privatization. Intelsat was formed in 1964 and is an international satellite consortium of more than 140 member countries. Intelsat operates seventeen geostationary satellites, bringing global access to more than two hundred territories and countries worldwide.

PanAmSat is the youngest of the three major international providers. PanAmSat serves major companies such as ESPN and Associated Press Television News (APTV, which is the international television arm of the Associated Press). PanAmSat is also a primary provider of satellite services for transmission of special events, such as the 1996, 1998, and 2000 Olympic Games. When PanAmSat merged with the satellite operations division of Hughes Electronics in 1997, its fleet and support systems grew dramatically. PanAmSat operates twenty-one satellites, with plans to increase its fleet to twenty-five. PanAmSat operates seven technical ground facilities and each month beams approximately ten thousand hours of news, sports, and special events transmissions to audiences around the world.

Independent and Network News Feed Services

The primary users of satellite time for news distribution are local stations, networks, and feed

services. A local station can book time unilaterally through one of the major providers, but often stations acquire transponder time through the satellite feed arm of their networks or through satellite newsgathering cooperatives. One of the first of these cooperatives was Florida News Network. The news managers of the involved stations agreed to share video via satellite, allowing each of them to increase coverage of other parts of the state. CONUS (derived from "continental United States") works on the same principle, but on a much broader scale.

CONUS is the world's largest satellite newsgathering cooperative (though not the largest feed service). The company is based in Minneapolis– St. Paul, Minnesota, with offices in New York, Washington, D.C., and London. CONUS offers a number of daily news feeds, custom live reports, and other video services to more than one hundred domestic partners. The company operates eight regional news hubs and transmits more than five hundred news stories each week. CONUS also sells and brokers satellite time via its full-time transponders on SBS-6 and operates All News Channel. In addition to working with news users, CONUS offers its services for a wide range of transmissions for educational and business applications.

The cooperative specializes in customized, live remote coverage using Ku-band satellite technology. CONUS and its members point to a strong regional presence as its biggest strength. Using the satellite trucks of its members and a few that are owned by the company itself, CONUS sends crews to remote sites to cover breaking news such as tornadoes, hurricanes, train wrecks, and other disasters. In this way, they provide a live presence to any station that wishes to include the reports in its newscasts. Stations that are owned by the same parent company often work together through their own satellite cooperatives, outfitting news crews to cover events and issues for the group stations.

CNN NewSource is not strictly a cooperative in the sense that CONUS is. NewSource is the news feed arm of the cable network CNN, which was originally founded on the idea of getting worldwide news to consumers using an extensive network of satellites. NewSource operates on a nonexclusive basis, meaning that more than one station in a market can be affiliated with CNN. In many cases, every station in a market works with CNN, and though some in the business suggest that NewSource is used to supplement rather than supplant network-run news services, it remains the dominant force in the news feed business with more than five hundred commercial news clients in the United States. Because NewSource has multiple affiliates within markets, it is able to offer its stations a choice of video shot by each of the stations in a particular market when news breaks in that area. The only restriction is that the stations in that market cannot use each other's video. This is referred to as a market embargo.

Other feed services have more of a specific focus, such as Bloomberg, which primarily feeds items about the stock market and business in general, and international news providers, such as *Reuters* and APTV. APTV bought World Television News (WTN) in 1998, leaving only two major suppliers of world news. ABC owned a substantial portion of WTN, and as part of the deal, APTV provides material to ABC and its affiliate news service.

As is the case with other feed services, New-Source offers franchise pieces and features on its twelve regular weekday feeds. It also works with visiting affiliates that want to do live coverage of events in Washington or in other cities in which CNN operates bureaus. NewSource is also available to university and high school news operations at no cost. Through this program, CNN occasionally receives material from its student partners and, perhaps more important, builds name recognition among those who will be making newsroom decisions in the future. In addition to NewSource, CNN also runs NewsBeam, a satellite booking service for its affiliates.

Each of the over-the-air networks offers a feed and satellite booking service for its affiliates as well. NBC News Channel is the only such operation not located in New York City. News Channel is headquartered in Charlotte, North Carolina. Its personnel believe being located somewhere other than New York gives News Channel and the NBC affiliates an edge when it comes to getting the affiliates the video and live-shot capabilities that they need. This is because although News Channel is part of the network, it operates as more of a surrogate for the affiliates than it could as part of the large New York operation. Similar to its counterparts at the other networks, News Channel provides as much as six to eight hours of rolling video per day, sending up to 250 stories in

twenty-two different feeds. Approximately 185 NBC affiliates do local news, and News Channel employees estimate that they provide some six hundred live reports per month to the local news operations. Some practitioners say that local stations fill between 10 and 15 percent of their news time with material from satellite feeds. To help feed this appetite for video, News Channel and its counterparts offer business and sports reports, regional coverage, and technical assistance for affiliates that want a live presence at the major national stories.

ABC's feed service is known as NewsOne. As with other services, it has correspondents who do reports that are specifically intended for the local affiliates that use the service. These correspondents travel extensively, covering big, breaking stories and doing custom and/or generic live reports for the affiliates. NewsOne personnel estimate that the service provides some ten thousand custom live reports per year. There are approximately two hundred ABC affiliates that use NewsOne, and those affiliates receive hundreds of stories per day (including medical, consumer, and entertainment reports) for possible inclusion in their newscasts.

The CBS feed service is Newspath, which provides some three hundred to four hundred stories per day to approximately two hundred affiliates through thirteen regional offices. As is the case at the other networks, CBS Newspath works to provide its affiliates with news material for all of their daily newscasts, from predawn to late night. To meet the demand for material, Newspath feeds video every hour, twenty-four hours a day. Newspath also offers its service to college and high school television news operations, the only network feed service to do so. Newspath also provides special sports feeds that allow affiliates to use material to preview NFL games that the network will televise. In addition, Newspath coordinates satellite time for nearly two hundred satellite trucks worldwide.

Fox NewsEdge supplies video to more than one hundred Fox affiliates that offer local news. Compared to the other news feed services, NewsEdge does not have as many affiliates that can contribute material. Therefore, NewsEdge tries to tailor some of its stories to make them specific to Fox affiliates and their viewers. These stories include material such as behind-the-scenes looks at popular Fox programs. As the more established feed services do, NewsEdge strives to make live shots from the sites of breaking news possible for its affiliates. NewsEdge assists affiliates with their regional news needs and provides coverage from cities, such as Washington, D.C., that generate a lot of national news.

Benefits and Costs of Satellite Services

It is common for local television stations to affiliate with more than one video feed/satellite booking service. This generally occurs because station news managers desperately want to avoid "getting beat" on a story. It would be disastrous for stations to see compelling video of a major news event that happened elsewhere in the country appear on the competitor's newscast but not on their own. Having more than one source also makes it possible for news managers to choose the best available video, which allows them to achieve two goals: (1) get material and (2) get better material than the competition.

Belonging to multiple services can be expensive, though all services charge according to market size. The networks would like to see their affiliates sever ties to other feed services, but it is important to the local stations to make sure that they can get material and set up live shots at any time they need. If that means paying for more than one service, news managers appear willing to accept that cost. However, as in any competitive environment, the degree to which a particular service is used, and, ultimately, whether contracts are renewed, depends on which outlet provides the best service at competitive rates.

The biggest benefit satellites provide to any news organization, business, or educational institution is the ability to get video and/or program material to multiple sites simultaneously. For example, well into the 1990s, advertising agencies that placed commercials on television stations in markets across the country had the expense of duplicating and shipping analog (nondigital) videotapes to each station. Being able to transmit digital signals via satellite solves that problem for advertising agencies and any other organization that is interested in top-quality video arriving on the other end of a satellite transmission. Of course, video and programming signals had been sent via satellite for years before digital technology became available, but signal breakup was always a

possibility. With digital technology, the receiver gets either a crystal-clear signal or no signal at all.

Satellites, Compression, and Digital Technology

Every company that uses satellites on a regular basis is involved in the move to digital transmission, which goes hand-in-hand with signal compression, video on demand, and media convergence. Digital transmissions make it possible for those who are sending information via satellite to put more material on existing satellite transponders. With geostationary orbit already as crowded as a Los Angeles freeway, satellite users are finding ways to put more signals on existing space. Being able to compress up to six signals on a single transponder allows communications organizations to make better use of resources without having to purchase lots of transponder time from outside vendors.

Digital technology also makes news-ondemand possible. Video feed services are able to make stories available on central data servers as soon as the stories are received. News stations that wish to use the stories do not have to wait until a scheduled feed time, nor is failing to record feeds a problem with news-on-demand. Rather than rolling a videotape at a specified time and waiting until the desired item appears (or forgetting to record the feed), producers can call up a story from a central server on desktop workstations, view the story there, read the accompanying script, and download the story if they choose to use it. Some in the industry say the move to digital news-on-demand is as important as the move from film to videotape. Stories are available as soon as they are stored in a server, and they remain available indefinitely, with none of the quality loss that comes with making analog copies.

Conclusion

Satellites have and will continue to play a key role as media continue to converge. All media have information delivery in common, and satellites are an effective and efficient way to deliver a lot of material to a number of sites at once. Satellite businesses already deliver the Internet to fifty countries, and as print, broadcast, and online operations come together, satellites are likely to remain a mainstay in the delivery of information to audiences worldwide. Satellite providers realize that satellites are the medium that they use, not the business that they are in; they are in the business of information delivery.

See also: Cable Television, Programming of; Cable Television, System Technology of; Digital Communication; Radio Broadcasting, Technology of; Satellites, History of; Satellites, Technology of; Telecommunications, Wireless; Telephone Industry, Technology of; Television Broadcasting, Programming and; Television Broadcasting, Technology of.

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SATELLITES, HISTORY OF

A history of communication satellites must begin with the first satellite, though it was not used for communication. On October 4, 1957, the former Soviet Union launched *Sputnik I*, making the Soviet Union the first space power and starting the space race between the United States and the Soviet Union. The United States was the second country to reach space. Four months after *Sputnik I* achieved orbit, the United States launched *Explorer I*.

The idea of using satellites for communication predates both *Explorer* and *Sputnik*. In 1945, Arthur C. Clarke first suggested that satellites in geosynchronous orbit could be used for communication purposes. The belt that circles the Equator more than 22,000 miles in space is often called Clarke orbit, in his honor.

In 1960, the National Aeronautics and Space Administration (NASA) and Skynet joined forces to launch an experimental aluminum-coated balloon. *Echo I* was used to reflect microwave radio signals between Holmdel, New Jersey, and Goldstone, California. What engineers learned from *Echo I* formed the basis of all future satellite transmission engineering calculations. In 1962, *Telstar I*, another joint venture of NASA and Skynet, became the world's first active communication satellite. The founding of the Communications Satellite Corporation (ComSat) in 1963 marked the beginning of deployment and operation of satellites on a commercial basis.

Early Satellites

The International Telecommunications Satellite Organization (Intelsat) was created in 1964. Intelsat is a consortium of countries that bonded together to form a cooperative to operate communication satellites. In August of that year, NASA's *Syncom 3* became the first geostationary communication satellite. A few months later, in April 1965, Intelsat began operations with *Early Bird*, which provided 240 telephone circuits and a single, fuzzy black-and-white television link between Europe and the United States.

Once Intelsat had launched additional satellites, it was able to establish the first global communication satellite system in 1969. On July 20, 1969, Intelsat provided television coverage of the historic lunar landing of the U.S. spacecraft *Apollo 11.* The first words spoken by a human on the moon (Neil Armstrong's "That's one small step for man, one giant leap for mankind") were heard by millions of people around the world because of one giant leap in communication technology, which continued to improve. In 1978, approximately one billion people in fortytwo countries were able to watch World Cup soccer matches that were beamed around the globe by Intelsat.

Westar I, which was the first U.S. domestic communication satellite, was launched on April 13, 1974. By the end of 1976, there were 120 transponders available over the United States. Each transponder could provide fifteen hundred telephone channels and one television channel. The Public Broadcasting System (PBS) was the first network to send programming to its affiliates via satellite. On February 1, 1978, twenty-four stations in the southeastern United States began receiving programming through a single C-band transponder on Westar I. For a month, PBS continued to use telephone company lines as a backup to the satellite. It took nearly one year to get all PBS affiliates across the nation on the system. By then, PBS was using three transponders to provide time-delay feeds to stations in different time zones.



Lyndon Johnson watches the first television transmission from France via the Telstar satellite, which was put into orbit by the United States in July 1962. (Bettmann/Corbis)
The Satellite Boom

In the early 1980s, the Intelsat V and VI spacecraft series made it possible, for the first time, for broadcasters to transmit news feeds using relatively small, portable Earth stations. Prior to that time, broadcasters used the land lines of a single company, AT&T, to transmit news feeds, and indeed, until the late 1970s, all network programming was fed to affiliates via land lines. A failure of AT&T's lines meant no television for viewers in the affected area. The networks first began to use C-band satellites as a backup to the telephone company lines, and generally, the satellite transmissions proved to be more dependable. However, C-band dishes are quite large and not very portable, and all transmissions on those frequencies require clearance by the Federal Communications Commission (FCC) to minimize interference problems with other communication devices (such as terrestrial microwave) that operate on the same frequency band. All of those factors made it almost impossible to use Cband to transmit news feeds, except of the most important, preplanned events. When CNN went on the air on June 1, 1980, the cable network fed its programming using C-band.

At about the same time, Ku-band became more of a possibility. There was only one class of primary users for Ku-band, and the higher frequency meant that the wavelength was shorter, hence, the size of the dish was about one-third that needed for C-band. The size, mobility, and lack of interference on Ku-band opened up a world of possibilities for news operations.

One date in the early 1980s stands out in the minds of many as the day that satellites made a lasting change in the way in which local stations covered news. On the same day that Ronald Reagan was sworn in as president of the United States, January 20, 1981, Iran released fifty-two American hostages who had been held for more than one year. News operations from markets across the United States had crews in place to cover the inauguration and in place to cover the return of hostages to the soil of a friendly country and, eventually, back to the United States. Many local stations devoted extensive coverage to the return of "home-town" people among the hostages.

Satellites gave news operations a whole new array of news sources, and they changed the very definition of local news. Prior to the early 1980s, local news included only what stations could cover in the surrounding area. After satellites became a part of a local station's coverage options, local news expanded to include anything that would be of interest to local viewers, regardless of where the event occurred. News managers could send crews to cover interesting cultural events in other parts of the state, events of the day from the state legislature, and even events that took place in other parts of the world.

The mid-1980s saw an explosion of live reporting via satellite, as news outlets and programmers realized that properly sizing Ku-band dishes would eliminate most of the concern about weather interference with Ku-band signals. Technological advances also made the equipment smaller, lighter, and, perhaps most important, less expensive. Various satellite cooperatives arose at that time, including CONUS (derived from "continental United States"), which was formed in 1984 by Hubbard Broadcasting and a group of limited-partner television stations. CONUS built its product with the needs of local news operations in mind, and uplink-equipped trucks became the satellite equivalent of electronic newsgathering (ENG) field units. CONUS began feeding video on half transponders as early as 1985. Because the dishes had to be larger to send narrower bandwidth signals (to take up only half a transponder), Earth stations were more expensive, but news operations and satellite vendors were able to recoup those expenses by spending less on satellite time. Being able to get more than one signal on a transponder became increasingly important during peak news hours as more and more stations started to do live reporting.

Video Feed Services

CNN started its video feed service, NewSource, in October 1987, and it and CONUS became viable ways for local stations to get video from other stations across the country. The success that New-Source and CONUS had in attracting local stations to use their services caused news executives at the major networks to rethink their commitment to their affiliates, and all three networks soon revamped their own feed services. For example, NBC helped many of its affiliates to purchase Kuband satellite trucks and was a leader in the switch to Ku-band feeds. Many industry observers say satellites changed the relationship between networks and their affiliates forever, as the networks turned more and more to the affiliates to get news material for network programs and became more responsive to the affiliates' needs for video from other markets.

Soon, local stations and networks were sending and receiving video so frequently that what some have called a "river of video" developed in space. Through the 1980s, more stations acquired satellite newsgathering equipment and more channels developed, requiring the distribution of programming to cable headends (distribution points) throughout the United States and beyond. The explosion of cable channels would have been impossible without satellite distribution of material. Likewise, local news operations began to expand from sixty or ninety minutes of news per day to as much as three or four hours per day. In many cases, this was done with little or no additional staff. Much of the material that was used to fill the extra news time came from regional and national feed services and consortia.

About that time, Hubcom developed fly-away packs. All of the hardware that was needed to send satellite signals could be put into cases that were small enough to fit into the cargo area of airliners. With an engineer to operate the system, a news crew could be on-site and sending signals from some of the most remote places on Earth within a few hours of landing.

International Uses

The international market for satellite distribution continued to expand as well. However, one man felt that the Hispanic market was being ignored by the only international carrier at the time, Intelsat. Rene Anselmo was head of what has since become the Spanish-language network, Univision. In the late 1980s, he lobbied the Reagan administration for permission to launch his own satellite. He hoped to use the satellite to link the United States and Latin America. PAS-1 was launched in 1988. It was the world's first privately owned international satellite, and it cost Anselmo most of his personal fortune to put it in the sky. Still, the company that he founded-PanAmSatsoon came to rival Intelsat as an international provider of satellite services.

Compression

The early 1990s saw the beginning of signal compression as more and more users tried to fit

more and more material on a limited number of communication satellites. Because there is only so much room in geostationary orbit, the satellite industry had to figure out a way to get more signals onto existing satellites. PanAmSat was an early leader in this arena. The idea is simple. If more than one signal can be squeezed (compressed) so that they fit on a single transponder, feed capacity can double, triple, or even quadruple without the launch of a single new satellite. The only other option was to reduce the spacing of satellites in Clarke orbit from two degrees to one degree, but that would have made it necessary to double the size of Earth-based uplink antennas. That would have limited the number of places where ground stations could go, and it would have been costly as well.

Satellite companies continue to launch new spacecraft that occupy the few remaining orbital slots and expand the number of transponders that are available. In July 1997, *Telstar V* ushered in the digital age, giving users the opportunity to use full transponders or to channelize (compress) signals to get more capacity out of existing hardware with no loss of quality. On January 24, 2000, PanAmSat deployed a powerful hybrid satellite (having both *C*- and Ku-band transponders).

See also: Cable Television, System Technology of; Digital Communication; Satellites, Communication; Satellites, Technology of; Telecommunications, Wireless; Telephone Industry, Technology of; Television Broadcasting, Technology of.

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C. A. TUGGLE

SATELLITES, TECHNOLOGY OF

As with radio or television itself, it is not necessary to understand thoroughly the electronics and physics of satellites in order to understand how they work. Operating a satellite system is a bit more complicated than turning on a television and changing the channel, but the concepts are not difficult to grasp.

Satellites are Earth-orbiting spacecraft that are used to relay radio frequency signals. They are normally powered by batteries and/or solar cells. Satellites operate on various frequency bands, and they carry voice, data, fax, audio, and video information. The focus of this entry will be on television news uses of satellites, so it will be more concerned with audio and video than with other types of transmissions.

The Uplink

All satellite transmissions (i.e., feeds) begin with an uplink, which is the Earth-based transmission station that sends a signal to the satellite. The word "uplink" is also used as a verb; to uplink is to send a signal to a satellite. Two of the most common frequency bands that are used for audio and video transmissions that originate in the United States are Ku-band and C-band. C-band is the part of the electromagnetic spectrum between 3.7 and 4.2 gigahertz, and the range for Ku-band is 11.7 to 12.7 gigahertz. Ku-band is the more portable of the two, but it is not as powerful as Cband. Because C-band is very powerful and because some frequencies in the range are also used for other types of transmissions, each Cband transmission that originates in the United States requires clearance from the Federal Communications Commission (FCC).

The dishes that are used for C-band transmissions are so large it takes tractor-trailer rigs to get them into place. Ku-band satellite dishes are small enough to fit on the roofs of medium-size trucks, and transmissions on those frequencies do not require prior clearance. Hence, the portability and speed that are afforded by Ku-band transmissions make it the choice for most news uses. However, because Ku-band signals can be affected by adverse weather, C-band transmissions are commonly used for lengthy, planned events, such as sports contests or political conventions.

Hardware and "Windows"

In order to make a satellite feed, a television or radio station needs hardware and satellite time. The hardware includes the uplink. Uplinks can either be fixed or portable. Fixed satellite uplinks are those that would be mounted on the roofs of television stations or elsewhere. Portable uplinks (PUPS) would be mounted on the roofs of large vans or medium-size trucks, and it is those types of uplinks that are used to send signals from remote sites. The technology has become sophisticated and small enough that all of the necessary hardware for a satellite transmission can fit into a case that is the size of a large suitcase. These flyaway packs allow news crews to access sites to which they could not drive even a medium-size satellite truck.

Most satellite trucks include the following elements:

- controls to raise and position the dish,
- monitors to check that signals are meeting technical requirements and are going to the desired satellite and transponder,
- a complete communication package, including land-line phones, cell phones, and a way to communicate via audio subcarrier on the satellite in places that have no regular or cell phone service,
- a means to access electrical power and a generator for use in remote locations,
- videotape playback units, and
- inputs for one or more live cameras.

Many trucks also come equipped with redundant transmission systems, which means they contain two of every component that is needed to send a signal. Some also include editing equipment for on-site compilation of stories.

Some large-market television stations or networks might own one or more uplinks, but most do not own satellites; instead, they lease space. A coordinator merely calls one of the many providers of satellite time and books a window. The "window" is the time that is reserved by that news operation for that particular satellite feed. Windows are set up in military-style time (meaning, for example, that they are scheduled for "18:10" instead of "6:10 P.M."), and they can be booked in intervals that can last for as little as five minutes. Satellite feeds run the allotted time and no more. Should a station book a window from 18:10 to 18:15, someone in the news operation must ensure that the feed ends by 18:15 because the computer that times the window will "pull the

plug" at 18:15.00, even if the reporter who is live on the scene needs only a few more seconds to finish the story.

Once the window is purchased and "opens" (at 18:10 in the above example), an uplink operator directs the signal to a specific transponder on a satellite. Most communication satellites carry a minimum of twenty-four transponders, which are the specific parts of the satellite that accept the signal, process it, and direct it back to Earth. Some satellites carry as many as seventy-two transponders, thirty-six C-band and thirty-six Ku-band. Each transponder operates on a specified frequency, and all communication satellites are in the same relative orbit at all times, so by merely consulting a chart of satellite positions and "dialing in" the signal, the uplink operator can locate the desired satellite. This does require some precision. Because there are more than two hundred communication satellites in geostationary orbit above the Equator, they are so close to each other as to be positioned only two degrees apart. (If satellites are aimed at different landmasses or operate on different frequency bands, they can be even closer than two degrees apart.) If a satellite suddenly stopped in its orbit for some unexplained reason, there would be a space pile-up of major proportions. The International Telecommunications Union (ITU) and the FCC help maintain order in the satellite industry by assigning orbital slots to spacecraft. Because of the closeness of one satellite to another, technicians must be careful not to "light up" the wrong satellite. However, once the proper satellite has been identified, it is merely a matter of punching in the frequency of the particular transponder on which the news or programming operation has booked time and then sending the signal.

Geosynchronous Orbit

Communication satellites are always in the same relative orbit because they are programmed to match the speed of Earth's rotation. This puts them in geosynchronous (or geostationary) orbit. What this means is that the satellite appears to be stationary relative to a given point on Earth. In the early days of satellite communication, before the use of geosynchronous orbit, Earth-based transmission units had to track the satellite as it passed overhead, and because of that, the satellite was available to accept signals only a few minutes out of each hour. Modern satellites, until they fall out of geostationary orbit, are available around the clock and never change their relative locations.

The Downlink

The transponder accepts the signal, processes it, and sends it back to Earth on a different frequency. Many satellite dishes are equipped both to send and receive, so the dish on top of a building or atop a satellite newsgathering (SNG) truck is capable of sending a signal on one frequency and receiving the return signal on a different frequency. If two different dishes were required, it would be a much more costly and difficult process to do satellite feeds. Although the signal from the uplink to the satellite is very directed, the signal that comes back to Earth from the satellite covers a wide area that is referred to as the "footprint." Any receiver (downlink) that is within the footprint can receive the downlink signal if the receiver is tuned to the correct frequency. As with the term "uplink," "downlink" can refer to the hardware or the process.

Any given satellite can have a footprint that covers land area that is equivalent to the size of the continental United States. Beyond that, Earth's curvature becomes a problem. So, for example, in order to broadcast portions of the 2000 Summer Olympics live back to the United States from Sydney, Australia, NBC had to use satellite "hops." This entails sending the signal up to a satellite, back to a downlink, back up to another satellite, and so on until the signal reaches the intended receiving point on the other side of the globe.

Often, a satellite feed actually involves two feeds: the distribution feed and the backhaul. The backhaul is the feed that goes to the distribution point for refeed. For example, a news feed service brings in a number of stories from various sources and compiles those stories to be sent out as part of a regularly scheduled feed. Another example is sports. A game might be beamed back to a central point for insertion of commercials, graphics, or other material before it is beamed back out for distribution. Therefore, a game telecast might occupy two transponders for hours. The same is true of coverage of political conventions and the like.

Because of the large area that is covered by the footprint, stations are able to share audio and/or video with each other quickly and efficiently. In the "dark ages" of television news, if several sta-



The large number of television satellite trucks that were parked next to the State Capitol in Tallahassee, Florida, in the period shortly after the 2000 election testify to how pervasive satellites have become for the transmission of news material. (AFP/Corbis)

tions in various markets requested a story from a sister station in another city, it would involve reshooting film for each of the requesting stations and putting it on a bus or driving it to the other city. Even when video came into use, stations had to make a copy of the story for each of their requesting partners and ship the tapes somehow. With satellite technology, however, the originating station merely sends its version of the story via satellite to all of the requesting stations at once. To take advantage of the technology, groups of stations have banded together to share video from market to market. These cooperatives are called consortia.

All geostationary communication satellites are positioned 22,300 miles above the Equator. It is at this precise distance that a satellite can maintain an orbit that perfectly matches the period of rotation of the earth: twenty-four hours. Although satellites are so far out in space, they are not necessarily directly overhead, and a line-of-sight is required between the uplink and the satellite. For example, if a particular satellite is low on the eastern horizon and the satellite truck is positioned on the west side of a high-rise building, it will be impossible to hit the satellite with the signal, and the news operation will have to move the truck or use a different satellite.

Mix-Minus

It takes about half a second for a signal to hit the satellite and bounce back to Earth. Because of that delay, a reporter can be caught off-guard and be confused if he or she starts hearing what was just said as he or she is trying to say something different. It is necessary for a reporter on a remote site to hear any questions that a news anchor might ask, so to deal with the problem of voice delay, an audio operator feeds "mix-minus" into the earpiece of the reporter. Mix-minus is the audio mix that is going out from the station to the viewers, minus the reporter's own voice. The station's program audio is fed to the reporter onscene through an interruptible fold back (IFB) system. This is the same system through which a producer in the control room communicates with the news anchors in the studio.

Consortia

At times, a reporter will be doing a story live and will do the same live report for sister stations in rapid succession. However, if the story is big enough to be the top story on a number of stations in a state or region, the personnel at station B will not want to postpone airing the story for the three to five minutes that it might take station A to complete its report. In these instances, news managers will arrange for the story to appear simultaneously on the reporter's station and on other stations within a consortium. These are referred to as "hit-time" or "hard-start" live shots. Each station in the consortium must arrange to "hit the window" at a precise time. At each station, an anchor will say something like "John Smith joins us from the scene." Since the reporter can hear only his or her own station's anchor, timing is critical, because the reporter will start talking as soon as the anchor tosses to him or her. Therefore, a hard-start live shot with a hit time of 6:01:00 means exactly that. Each station must be ready to have the reporter start talking at exactly 6:01:00.

In most cases, the reporter would have fed the taped portion of the report via satellite earlier, and each station will have a copy. When the reporter reaches a predetermined roll cue (i.e., the final few words that will be said before the tape is to begin), each station will play its copy of the tape. When the tape reaches its conclusion, each station will switch back to the reporter live on the scene. He or she will then wrap up the story and end it with a generic line such as "and now back to you in the studio." All stations that are using the hit-time live report can move on to other stories, and the anchors at the reporter's own station can continue to talk to him or her if the newscast producer has decided to have the anchors do so. By doing shared live shots this way, all the stations that are within the consortium have the advantage of having a reporter live on the scene, even though, except for one station, it was someone else's reporter and equipment that generated the story.

Conclusion

It is no exaggeration to say that satellite technology has changed many things about television and radio news. In fact, the technology has changed the very definition of local news. No longer does a local newscast on television or radio contain only stories that occurred within a halfhour drive of the station; it can include anything of interest to the local audience, from anywhere in the nation or the world. Whereas it once took a crew of technicians the better part of a day to set up a live television remote, now one person can set up a satellite truck and be sending pictures to any number of stations within about fifteen minutes of having arrived on the scene. This has led to concerns that technology now drives journalism, particularly in television news. It has also led to calls for news managers to use the technology to advance stories rather than as an end in itself.

See also: Cable Television, Programming of; Cable Television, System Technology of; Digital Communication; Radio Broadcasting, Technology of; Satellites, Communication; Satellites, History of; Telecommunications, Wireless; Telephone Industry, Technology of; Television Broadcasting, Programming and; Television Broadcasting, Technology of:

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C. A. TUGGLE

SCHRAMM, WILBUR (1907-1987)

Wilbur Schramm established the field of communication study by founding the first doctoralgranting programs and the first university-based communication research institutes and by writing the first textbooks for the field. For several decades, he had great influence in shaping the directions of communication research. The academic field has since grown to approximately two thousand university departments that award about fifty thousand bachelor-level degrees per year—5 percent of all the degrees awarded by U.S. universities. In addition, communication study is widely taught in Latin American, European, and Asian universities, where far more students are enrolled than in the United States.

Schramm grew up in the town of Marietta, Ohio, and received his bachelor's degree from Marietta College in 1928. He then earned his master's degree in American civilization at Harvard University in 1930 and his doctoral degree in English literature at the University of Iowa in 1932. After two years as a postdoctoral fellow in experimental psychology, Schramm became a faculty member at the University of Iowa, where he also founded and directed the Iowa Writers' Workshop, a famed graduate-level fiction-writing program. Here, from 1934 to 1941, he worked out the pedagogical principles for the doctoral programs in communication that he was to establish later at the University of Iowa, the University of Illinois, and Stanford University. His approach involved the careful selection of graduate students, smallsized classes and seminars, and a supportive and participatory learning environment.

The turning point in Schramm's career, leading to his founding the new field of communication study, occurred when the United States entered World War II. A patriot, Schramm immediately volunteered for government duty in Washington, D.C., where he directed programs for the Office of Facts and Figures and its follow-on agency, the Office of War Information (which became the U.S. Information Agency). From 1941 to 1943, he worked with the sociologist Paul F. Lazarsfeld, the political scientist Harold Lasswell, the social psychologists Kurt Lewin and Carl Hovland, and other American social scientists who were involved in various wartime duties in Washington. They met regularly to plan communication activities to promote the war effort (such as national campaigns to grow Victory Gardens; conserve gasoline, tires, and certain foods; buy War Bonds; and participate in scrap iron and scrap rubber drives). Schramm and his network of fellow scholars shared an interest in communication research and sought to apply this new scholarly perspective in evaluating military training films, in analyzing Allied and Axis propaganda, and in designing public communication campaigns aimed at the American people. Schramm's vision for the scholarly field of communication study grew out of the multidisciplinary network to which he belonged in Washington. He possessed the can-do spirit needed to launch this vision in the university setting.

In 1943, Schramm left Washington to return to the University of Iowa, where he was appointed director of the School of Journalism. He promptly established the Bureau of Communication Research and offered a doctoral degree in communication. His model for the research institute at Iowa was Paul Lazarsfeld's Office of Radio Research at Columbia University, which Schramm saw as an opportunity to found the new academic field of communication within existing university structures. There were other movements in launching doctoral programs in journalism and mass communication at the University of Wisconsin and at the University of Minnesota at about this same time, championed by Willard Bleyer, a professor of journalism at Wisconsin, and his former students, but Schramm's vision was to have a greater eventual influence.

From 1947 to 1953, Schramm was to implement his vision for communication study on a grander scale at the University of Illinois at Urbana. Here he served as director of the Institute of Communications Research, a research and doctorate-granting unit, and became dean of the newly formed College of Communication. He also was editor of the University of Illinois Press, and in this capacity he published Claude E. Shannon's important book, The Mathematical Theory of Communication (1949). Schramm's University of Illinois Press also published his edited book, The Process and Effects of Mass Communication (1954), a textbook that helped define the new field. Administrative support for Schramm's innovative academic activities at Illinois ended when the university president was fired. Schramm began to look for other opportunities.

In 1953, Schramm went to Stanford University, where he was to spend the next twenty years as director of the Institute for Communication Research, which became the most respected and influential center for communication study. Schramm was also the Janet M. Peck Professor of International Communication, a title that reflected his growing interest in international communication and in the role of communication in the development of the nations of Latin American, Africa, and Asia (his 1959 and 1964 books, respectively, defined these new applications of communication theory and research). Schramm was also influential in directing communication study to the effects of television violence on children (this in his 1961 book with Jack Lyle and Edwin Parker). At Stanford, Schramm trained a cadre of outstanding scholars in communication research and theory.

These new doctorates in communication from Schramm's research institute joined the faculty of existing schools of journalism and departments of speech, gradually converting these units to a dominant concern with communication science. This change, reflected in the increasingly widespread use of the term "communication" in their names, largely occurred in the 1970s and 1980s.

In 1973, Schramm retired from Stanford University and then wound down his career at the East-West Communication Institute at the University of Hawaii at Manoa. During this final stage of his career, Schramm served as the Ah Boon Haw Professor of Communication at the Chinese University of Hong Kong in 1977. More generally, during his fourteen years in Hawaii, Schramm assisted the growth of communication study in Asia. He died in 1987, leaving unfinished a book of his memoirs about the beginnings of communication study. This volume was finally published in 1997.

Unlike such forefathers of the field of communication as Lasswell, Lazarsfeld, Lewin, and Hovland, who pioneered in conducting research on propaganda, mass communication effects, smallgroup communication, and persuasion, respectively, Schramm left his original academic field of English literature. He was the first scholar in the world to carry the title of professor of communication. He founded communication research institutes, departments of communication, and a college of communication, and thus his students earned degrees in communication. Then they spread out like scholarly missionaries to implement his vision at various universities in the United States and abroad. His quality as a visionary, institution builder, and trainer of early communication scholars distinguished Schramm from the four forefathers of the field. For this reason, Wilbur Schramm is the founder of the academic field of communication.

See also: LAZARSFELD, PAUL F.; MODELS OF COMMU-NICATION.

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EVERETT M. ROGERS

SEMIOTICS

What do words, visual ads, art performances, make-up, uniforms, and pictures have in common? They all are signs-"something which stands to somebody for something in some respect or capacity," to use the words of Charles Sanders Peirce. They all mean something to someone; for example, the word "house" may stand for "a building that serves as living quarters for one or more families," uniforms may represent certain occupations, and so on. What signs mean, how meaning is generated and interpreted, and how signs are used are all issues that are studied in the field of "semiotics" (from the Greek word semeion, or "sign"). Sometimes, the study of signs is referred to as "semiology," but the term "semiotics" is much more common.

Origin of Semiotics

People have been interested in signs for many centuries. In fact, the first definition of "sign" was given by Hippocrates (460–377 в.с.е.), who treated it as a medical symptom (e.g., sore throat standing for a cold). After that, signs have been studied through the ages by such thinkers as Plato, Aristotle, St. Augustine, John Locke, and Immanuel Kant. However, it was only toward the end of the nineteenth century that semiotics was developed as a separate field, thanks to the works of Peirce, an American philosopher, and Ferdinand de Saussure, a Swiss linguist.

Conceptual Framework of Semiotics

The range of semiotics is very broad, but there are a number of concepts that are central to the

field, including sign, code, medium, types of signs, and dimensions of signs.

There are two main conceptions of sign: dyadic, developed by de Saussure, and triadic, developed by Peirce. In the dyadic conception, sign is an arbitrary relationship between signifier and signified. Signifier is an image of the world that people experience through the senses; signified is the concept people connect with their experiences. For example, an advertisement (sign) combines the signifier (acoustic or visual image) and the signified (corresponding concept). In the triadic conception, sign combines representatum that stands for its object and generates interpretant (its meaning). It is important to note that, in both conceptions, signs have meanings only because the experience and the concept are connected by people (i.e., signs generate meanings only within sociocultural frameworks).

Signs are organized into codes, or coding systems, for example, spoken/written language, dance, clothing, dating rituals, body language, and Morse code. Codes are normative since they present a set of rules of how (not) to act; in this sense, codes can be broken deliberately or through incompetence (e.g., offending someone by using inappropriate gestures that one knows will cause offense or offending someone by using inappropriate gestures without knowing they will cause offense). Codes are used for designing and interpreting messages.

One and the same message can be designed in more than one medium, that is, involve different senses (e.g., visual, auditory, tactile, etc.). The medium presupposes the use of certain code/s (e.g., the phonemic code presupposes the auditory medium). Each medium has its own sense ratio, depending on how much information can be processed during a certain time interval. For example, in most situations the visual medium is more dominant. In all cases, the medium is not something separate from information. In that respect, signs do not simply transmit meanings; they constitute a medium in which meanings are constructed. To use the famous expression of Marshall McLuhan, "The medium is the message."

The most well-known classification of signs is the one developed by Peirce, who identified three types of signs, based on how they represent the objects of the world. Icons signify the world through resemblance so that people can recognize the object (e.g., a photograph visually looks like its object; the word "cock-a-doodle-do" resembles the sounds made by a rooster). Indexes signify the world through indication so that people can figure out this causal relationship (e.g., smoke indicating fire; pointing finger indicating where an object is located in space). Symbols signify the world through convention so that people must learn the relationship between the sign and its object (e.g., most verbal signs). Signs are considered genuine, that is, generating most meanings, if the connection between the representatum and the object is conventional.

According to Charles Morris, a famous American semiotician, all signs have three main dimensions: syntactic (signs in relation to other signs within the same system), semantic (signs in relation to the objects they represent), and pragmatic (signs in relation to their users, i.e., people who produce and interpret signs). For example, syntactically, the sign "cow" is made up of three letters in a certain order; semantically, the sign denotes "mature female of cattle"; and, pragmatically, this sign may generate different responses (e.g., in India a cow is viewed as a sacred animal).

Scope of Semiotics

The scope of semiotic studies is very broad. Among the objects of semiotic analysis are literary works, clothing, advertisements, music, architecture, urban planning, human-computer interaction, sports and games, law, and so on. All these objects are regarded as "texts." When people interpret these semiotic objects, they gain an access to the world and make it meaningful. They always try to capture the most immediate (the most "real") meanings; however, these meanings are presented in an indirect way (i.e., mediated). Thus, signs as texts are forms of mediation; in this sense, different communication situations are characterized by different degrees of mediation (e.g., theatrical performance is less mediated than television). With the development of new information technologies, the line between the natural world taken for granted and the constructed world becomes more and more blurred. This could have certain advantages (e.g., the use of "virtual reality" for educational purposes) and possible disadvantages (e.g., increase of violence, especially among youths, due to the influence of mass media).

Semiotics is applied to the study of both the structural organization of texts ("structural semiotics") and the different social meanings these texts may generate ("social semiotics"). Thus, semiotics moves from language to all modes of representation employed in production and interpretation of texts. Semiotics can reveal the signifying practices behind ideology, power, gender, and so on. Semiotics emphasizes the role of signs in the construction of reality and demonstrates how the "real world" can be challenged and changed. Ultimately, semiotics can help people to understand how they construct their identities, that is, make sense of themselves.

See also: Advertising Effects; Human-Computer Interaction; Language Acquisition; Language and Communication; Language Structure; McLuhan, Herbert Marshall; Peirce, Charles Sanders.

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SESAME STREET

Sesame Street, produced by Sesame Workshop (formerly known as the Children's Television Workshop), premiered on November 10, 1969. What began as an experiment to use television to help prepare preschool children for school, partic-

ularly those children from minority and lowincome families, has grown into a cultural icon. *Sesame Street* has won more Emmy awards than any other series in the history of television. It is watched each weekday by one million children in the United States who are between two and five years of age, and it has been viewed in more than 140 countries, including twenty co-productions.

History

Sesame Street was a revolutionary departure from the existing state of children's television in the late 1960s. While some television series conveyed positive messages to children, none attempted to address a set of specified educational goals-to teach a holistic curriculum that encompasses traditional academic subjects (e.g., number and literacy skills) and interpersonal skills to foster self-confidence and getting along with others. In 1966, Joan Ganz Cooney, a producer at Channel 13 (a New York affiliate of the Public Broadcasting Service (PBS)), developed the original vision of using television to educate preschoolers, an idea she discussed with Lloyd Morrisett, Vice President of the Carnegie Corporation of New York. With funding from the Carnegie Corporation, the Ford Foundation, and the U.S. Office of Education, Cooney formally launched planning for Sesame Street.

In the context of adorable, warm, and zany muppets, nurturing adults, and lots of humor, *Sesame Street* is designed to foster intellectual, social, and cultural development. Reaching far beyond letters and numbers, *Sesame Street* introduces children to a broad range of ideas, information, and experiences about diverse topics such as death, cultural pride, race relations, people with disabilities, marriage, pregnancy, and even space exploration. For many children, *Sesame Street* may be the first place they see a ballet or see someone who resembles them on television. Moreover, it may be the only place they see a ballet performed by a girl in a wheelchair.

Research and Production

Sesame Street was the first series to employ research as an integral part of its production. From the beginning, the Sesame Street team realized it would need substantial and ongoing involvement by experts in education and early childhood development to develop curriculum

Formative and Summative Research

 \mathbf{F} ormative research is conducted while the story or a segment is being produced, or at times before production begins, to investigate questions such as the appeal and comprehension of the messages among the target audience. Research results then inform subsequent production decisions and revisions.

In 1983, *Sesame Street* dealt with the death of its longtime storekeeper, Mr. Hooper. Will Lee, the actor who had played this character since it was created in 1969, died in 1982, and the producers decided to deal with his death on the show rather than replace him with another actor. This single episode was kept simple, conveying the following messages: Mr. Hooper is dead; Mr. Hooper will not be coming back; and Mr. Hooper will be missed by all.

Prior to broadcast, the *Sesame Street* Research Department conducted a series of formative studies to answer the following questions for the production staff: (1) will children understand the three key messages about Mr. Hooper's death; (2) how attentive will children be to the story line; (3) how will parents respond to the treatment of such a sensitive topic; and most important of all, (4) will children be disturbed by this story either immediately after viewing or during the following week?

Research revealed that the majority of four- and five-year-olds understood that Mr. Hooper was not coming back and that Big Bird and the adult characters felt sad. The second study revealed that on average, the majority of the children were attentive during the show. Reception of the show by parents was overwhelmingly positive, with parents using words such as "well done," "compassionate," "helpful," "honest," and "age-appropriate" to describe the episode. Approximately one-half of the twenty-one parents who were interviewed stated that they discussed death with their children after viewing the show, and none of the parents reported any negative immediate or delayed reactions in their child.

Summative research is conducted after the production of a television series is complete, and it is intended to assess the effect of the series on its viewers. Although most of the summative research is conducted by independent researchers, the following is an example of a summative study conducted internally by the *Sesame Street* Research Department.

For the twenty-ninth season, the producers of *Sesame Street* decided to revisit the science curriculum. The objective of the "Science of Discovery" curriculum was to link the natural curiosity of preschoolers with their love of exploration by illustrating both science content and scientific processes. The topic of space was included in the science curriculum because the production department decided to develop an eighteen-week story line featuring Slimey, Oscar the Grouch's pet worm, as he participates in the very first "wormed" moon mission for the Worm Air and Space Agency (WASA).

A longitudinal study was designed to assess (1) children's understanding of space, the moon, astronauts, and space travel and (2) the degree to which their understanding of such concepts changed as a result of exposure to the "Slimey to the Moon" story. Baseline results revealed that preschoolers from a middle-income center had significantly greater knowledge of space and space exploration than did preschoolers from a low-income center. After viewing the programs, children from the lowincome center demonstrated the greatest gains in comprehension. These children gained knowledge about what to call someone who travels to the moon, what astronauts do and how they travel to the moon, what astronauts wear on the moon, and that the planet they live on is called "Earth." Although preschoolers from the middle-income center already had a good understanding about space, they also showed some significant increases in their knowledge of how long it takes to get to the moon and what astronauts wear on the moon. Overall, children enjoyed the space shows, remained interested in the story, and most important, they acquired more specific knowledge about astronauts and space travel over a period of time.

goals and to work with the producers and writers to create appealing and educational stories and segments. The *Sesame Street* Research Department, with guidance from educational advisors, develops the *Sesame Street* curriculum and evaluates it annually to incorporate current changes in knowledge and understanding of children's growth, development, and learning; innovative educational methods; and changes in society. The research department also conducts formative research studies with preschoolers to inform the production team about the appeal and comprehension of the content of the program. In addition, the research department contracts independent researchers to evaluate the effect of the series through summative research.

This unique, ongoing integration of curriculum development, formative research, and summative research into the process of production is known as the Sesame Workshop model. This interdisciplinary approach to television production brings together television producers, educacontent experts, and educational tional researchers to work hand-in-hand at every stage of production. Many media professionals and educators predicted that this operating model would never succeed because of the very different backgrounds and values of the three groups. However, the model was effective and this "marriage" between these three groups of individuals continues today as the cornerstone of the long-term success of Sesame Street.

Educational Effectiveness

Sesame Street is the most researched series in the history of television, with more than one thousand studies examining its educational effectiveness in areas such as literacy, numeracy, and prosocial behavior, as well as investigating the use of production features to enhance children's attention and comprehension. The following is an overview of the key studies on the educational effectiveness the series has had in the area of school readiness, academic achievement, and social behavior.

Before any production began, the Educational Testing Service was contracted to design and conduct an evaluation of the educational effectiveness that *Sesame Street* had on a variety of cognitive skills during its premiere season. Both before and after the broadcast of the first season, children who were three to five years of age (predominantly from disadvantaged backgrounds) and were from geographically and ethnically diverse backgrounds were tested extensively on a range of content areas including knowledge of the alphabet, numbers, relational terms, names of body parts, recognition of forms, and sorting and classification skills. The results of the study indicated that exposure to *Sesame Street* had the desired educational effects across content areas. Children who watched the most showed the greatest gains between pretest and posttest, and the topics getting more screen time on the show (e.g., letters) were learned better than were topics receiving less screen time. The gains occurred for children across the ages (although three-year-olds showed the greatest gains, presumably because they knew the least before viewing), for both boys and girls, and for children from different geographic and ethnic backgrounds. The study also showed that these results were not influenced by whether the children watched at home or in school.

The results of the second-year evaluation confirmed earlier findings, demonstrating significant gains in many of the same content areas and in new areas, which were added in the second season. Moreover, viewers who watched *Sesame Street* on a frequent basis were rated by their teachers as being better prepared for school (e.g., verbal and quantitative readiness, attitude toward school, relationships with peers) than were their classmates who watched infrequently or not at all.

With success comes questions and criticisms. Some question whether television is a suitable medium for teaching intellectual and academic skills, particularly those that depend on language, because its salient visual qualities interfere with children's processing of language. Others criticize the rapid pace and entertaining qualities of *Sesame Street* that leave children with little or no time to process information at more than a superficial level (i.e., learning information by rote rather than acquiring skills at a deeper or more conceptual level). For both criticisms, there is little or no supporting evidence.

In fact, several studies assessing the long-term effects of viewing *Sesame Street* echoed the earlier research on the positive educational benefits of the program. Researchers at the Center for Research on the Influences of Television on Children (CRITC) found that preschoolers who watched *Sesame Street* spent more time reading and engaged in educational activities, and performed significantly better than their peers on age-appropriate standardized achievement tests of letter-word knowledge, mathematical skills, and vocabulary development. Results from a national survey conducted for the U.S. Department of Edu-



The early members of the Sesame Street cast of characters included (left to right) Big Bird, Mr. Hooper, Oscar the Grouch, Gordon, Bob, and Susan, as well as (in the windows) Cookie Monster, Grover, Ernie, and Bert. (Bettmann/Corbis)

cation revealed significant associations between viewing *Sesame Street* and the ability of preschoolers to recognize letters of the alphabet and tell connected stories when pretending to read. In addition, when they subsequently entered first and second grade, children who viewed *Sesame Street* as preschoolers were also more likely to read story books on their own and were less likely to require remedial reading instruction.

Perhaps most notably, a "recontact" study by researchers from CRITC and the University of Massachusetts at Amherst employed a sample of high school students whose television viewing as preschoolers had been tracked ten to fifteen years earlier. The results showed that adolescents who viewed *Sesame Street* on a frequent basis as preschoolers (compared to those who rarely watch the program) had significantly better grades in high school English, science, and mathematics; read more books for pleasure; perceived themselves to be more competent in school; placed higher value on achievement in math and science; and elected to take more advanced mathematics courses.

Clearly, the curriculum goals included in the *Sesame Street* segments cannot directly improve high school grades. Rather, it is more likely that a related series of processes can be initiated by watching educational programs. Children who watch *Sesame Street* enter school not only with good academic skills but with a positive attitude toward education. Perhaps as a result, teachers consider them bright and ready for school, expect high levels of achievement, place them in advanced groups, and give them positive feedback. Early school success, in turn, fosters better learning and greater enthusiasm about school, leading to a trajectory of long-term achievement.

Influence on Social Behavior

Sesame Street can have a significant effect on children's social behavior, but the research evidence is not as strong as it is with cognitive effects, nor are there as many studies in the literature. One of the earliest studies to examine the effect of *Sesame Street* on social behavior focused on cooperation. Levels of cooperation among children from disadvantaged, inner-city backgrounds were tested before and after viewing the third season of *Sesame Street*. Results indicated that viewers cooperated more than nonviewers when tested in situations similar to those presented on the program. Also, viewers were more likely than the nonviewers to recognize examples of cooperation presented in the show, to judge the cooperative solutions as "best," and to use the word "cooperation" in an appropriate manner.

These results were consistent with other studies conducted in the 1970s that found exposure to prosocial segments on *Sesame Street* was associated with positive social behavior only when the measures closely resembled the behaviors modeled in the program. However, results of a smallscale field observational study showed that viewing prosocial segments on *Sesame Street* reduced aggressive behavior (physical and verbal aggression) in free-play sessions conducted later on the same day.

More generalized effects of viewing Sesame Street episodes that had prosocial content were found in a quasi-experimental study conducted in eight daycare centers. Across eight days, children watched either prosocial or cognitive show segments and engaged in follow-up activities that were either cooperative or individualistic. Observations were made during the activities and during free play, with an eye toward several types of prosocial behavior: positive interaction, cooperation, helping, giving, sharing, turn taking, comforting, and affection. Viewers of the prosocial segments exhibited the highest level of prosocial behavior during the planned activities. Furthermore, viewers of prosocial segments who also participated in cooperative follow-up activities were lowest in antisocial behavior during free-play.

Over the years, *Sesame Street* has dealt with many social issues relevant to preschoolers (e.g., childbirth, marriage, death). Since its inception, *Sesame Street* has been a celebration of diversity, and race relations is a core curriculum area. In 1989, as a result of rising racial unrest in the United States, a four-year race relations curriculum initiative was launched to be more explicit about physical and cultural differences and to encourage friendship among people of different races and cultures. In collaboration with the production staff and with consultation from content experts, the Sesame Street Research Department developed curriculum goals to promote positive interactions among five cultural groups: African Americans, American Indians, Latinos, Asian Americans, and white Americans. Emphasis was placed on the similarities that make individuals all human and on fostering an appreciation of racial and cultural differences. Through these curriculum goals, preschoolers were encouraged to perceive people who look different from themselves as possible friends and to bring a child who has been rejected because of physical and/or cultural differences into the group.

Initial results from a series of formative research studies produced striking results, indicating that it was clear that preschoolers were not only aware of racial differences, but the topic was both appropriate and timely. For example, although the majority of African-American, Crow-Indian, Chinese-American, Puerto Rican, and white children tested said that they would want to be friends with children from other groups, less than half reported that their mothers would be positive about them having a friend from another race. Moreover, when given the opportunity to create a neighborhood using paper dolls, white preschoolers, in particular five-year-olds, were significantly more likely than African-American children to segregate cut-out dolls of African-American and white children in homes, schools, playgrounds, churches, and stores.

To achieve a better understanding of the children's nonverbal responses, small groups of white preschoolers were told a story about a group of white children who separated white and African-American children in each of the neighborhood structures. The children were then asked to explain why the children responded as they did. The majority of the white children agreed that the African-American and white children should be separated and gave the following reasons to explain the segregation: physical differences, economics, conflict, existing separate housing, and the opinions of others. However, they also said that the separation would lead to sadness for both white and African-American children.

Based on these results, segments were produced with the intention to counteract some of these beliefs. For example, in direct response to the segregation that was noted in the formative research, two segments were created: "Visiting Ieshia" and "Play Date." In "Visiting Ieshia," a white girl visits an African-American girl in her home. "Play Date" shows a similar family visit with a white boy visiting an African-American friend in his home. Formative research revealed that the majority of the children, regardless of race or sex, found the segments appealing and stated that the visiting white child felt positive about being at the other child's home.

Conclusion

While Sesame Street has varied its formats and approaches over the years to remain innovative, one thing remains constant—its desire to entertain and educate children. By addressing children on their own level, by employing appealing characters and authentic depictions of the children's own worlds, and by continually demonstrating the fun of learning, *Sesame Street* strives to help all preschool children reach their greatest potential.

See also: Children's Comprehension of Television; Children's Creativity and Television Use; Children's Preferences for Media Content; Minorities and the Media; Public Broadcasting; Researchers for Educational Television Programs; Television, Educational.

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ROSEMARIE T. TRUGLIO

SEX AND THE MEDIA

Most young people are in contact with some kind of media during most of their waking hours. Much of the media content they are exposed to contains messages, images, and ideas about sex and sexuality. This content is especially salient for adolescents and young adults who are developing their own sexual beliefs and behaviors.

The Media As Sex Educators

Research suggests that adolescents do learn about sexuality from the media, and some young people deliberately turn to the media for information that is difficult to obtain elsewhere. Mike Sutton, Jane Brown, Karen Wilson, and Jon Klein (2001) analyzed a national sample of high school students and found that more than half of the respondents said they had learned about birth control, contraception, or preventing pregnancy from magazines or television. School health classes, parents, and friends were the only other sources that were cited more frequently. However, parents often broach sexual topics awkwardly, if at all, and schools tend to address sexuality in clinical terms rather than in the context of relationships, emotions, and desire. Television, movies, music, music videos, magazines, and websites, in contrast, capitalize on topics that are considered taboo in other social situations, thus often making sexual media fare especially attractive for younger consumers.

TABLE 1.

Medium	Sexual Content	Effects
Television	 Women are most likely to be young and thin. Sexual talk is frequent; sexual behavior less frequent but common. Negative consequences of sex are infrequently shown. Contraception and planning for sex are also rare. 	 Ideal body image programming and commercials affect the perceptions that girls have of their own bodies. Gender-role stereotypes are accepted by some viewers. Heavy viewers are more likely to believe that single mothers have an easy life. Intercourse is initiated earlier by heavy viewers.
Magazines	 One-third of the articles concern dating; one-third focus on appearance. One to six articles per issue focus on sexual health. Women's magazines encourage females to put men's interests before their own. 	 Exposure to thin models in magazines can produce depression, stress, shame, and body dissatisfaction. Girls report that images in women's magazines make them feel bad about themselves.
Movies	 Romantic and sexual relations are present in almost all top-grossing movies. More sexual talk than behavior is represented. Women are more likely than men to talk about romantic relationships. Women are the only characters seen "promising" sex. Sexual relations tend to occur with little reference to characters' attraction for each other or relationship expectations. Older people rarely are shown expressing tenderness or love for each other. 	
Music and Music Videos	 Videos emphasize physical appearance of women musicians over musical ability. Frequent references are made to relationships and sexual behavior. Less gender-role stereotyping occurs in videos than earlier, but females are still more often affectionate, nurturing, and sexually pursued than males. 	 Exposure to music videos results in more permissive attitudes about premarital sex. Exposure to stereotypical images of gender and sexuality in videos has been linked to greater acceptance of interper sonal violence.

Sexual Content

The perceived sensitivity of sex as a research topic and a focus on television to the exclusion of other media has restricted the kind of research that has been done. Much of the work has been analyses of content, rather than assessments of effects on audiences. However, the few studies that go beyond content to address how audiences respond to and incorporate sexual content in their lives suggest that the media may indeed play a role in the sexual lives of young people. (See Table 1 for a summary.)

Television

Television has received the bulk of attention from researchers who are interested in portrayals of sexuality and the effects of these portrayals. After all, according to a national study conducted by the Kaiser Family Foundation (1999), the television is turned on about seven hours per day in the average home, and children spend about three to four hours per day watching television.

Content analyses of various television dayparts and genres reveal that sexuality, broadly defined, is a frequent ingredient across the television landscape. In a study by Dale Kunkel and his associates (2001), more than two-thirds of 1,114 television programs on 10 popular broadcast and cable television channels contained sexual content (either talk or behavior). Prime-time television shows (8:00 Р.М. ТО 11:00 Р.М. eastern standard time) were full of talk about and depictions of sexual activity.

Kirstie Cope and Kunkel (2001) analyzed forty-five episodes of the prime-time television shows that teenagers watched most frequently in 1996 (including Friends, Seinfeld, and Married with Children) and found that the primarily late teenage and young adult characters talked about sex and engaged in sexual behavior in two-thirds of the shows. However, most of the sexual content on television still is talk-characters discussing their own or others' current or future sexual activity.

Sexual behaviors on prime-time television, although frequent, are relatively modest-mostly flirting and kissing. Sexual intercourse rarely is depicted on these shows, but it is sometimes implied (e.g., the scene fades as a couple is kissing in a bed and the next scene shows the couple waking up in each other's arms). In the forty-five episodes of top shows viewed by teenagers, Cope and Kunkel found that sexual intercourse was depicted once (although no genitals were displayed) and implied five times.

Talk shows that frequently feature dysfunctional couples publicly disclosing their troubles and infidelities are another favorite television genre of older children and teenagers. These shows also talk about, rather than explicitly depict, sexual behavior, but the discussions often are detailed and racy. Some studies have found that parent-child relations, marital relations and infidelity, other sexual relations, and sexual orientation are common topics. Sexual themes are more frequent on the shows that teenagers most prefer (e.g., Geraldo Rivera, Jenny Jones, Rolonda Watts, and Jerry Springer) rather than on others that attract older audiences (e.g., Oprah Winfrey). Bradley Greenberg and Sandi Smith (2001) found that a number of talk shows include professional therapists who are supposed to comment on how the problems might be solved, but these "experts" get less airtime than anyone else on the set, including the audience.

Frank discussions about sex—ranging from Dr. Joy Browne's on-air psychological counseling to the sexual banter of disc jockeys such as Howard Stern who were hired to capture the teenager/young adult audiences as they drive to school or work—are common on radio as well.

Soap operas, another popular genre, also have a prominent focus on sex. Katherine Heintz-Knowles (1996) analyzed one hundred hours of daytime soap operas and found that they depict more sexual talk than sexual behaviors, although sexual behaviors (ranging from kissing to sexual intercourse) are not infrequent. Although planning for sexual activity (e.g., visiting a health clinic, purchasing contraceptives) as well as negative consequences of sexual activity (e.g., the transmission of a sexually transmitted disease, an unplanned pregnancy) are shown more frequently than in the past, such precautions and consequences still are rarely portrayed.

Despite their prolific portrayal of sexuality, most television programs do not provide realistic depictions of the risks that accompany sexual activity. Indeed, the American Academy of Pediatrics concluded in 1995 that only 165 of the nearly 14,000 sexual references, innuendoes, and jokes that the average teenager views on television per year deal with topics such as birth control, self-control, abstinence, or sexually transmitted diseases.

Across all television depictions, most sexual intercourse takes place between adults, but although more than half of the couples are in established relationships, a majority are not married to each other, and about one in ten have only just met. Kunkel and his colleagues (2001) found that in almost two-thirds of the programs in which characters have sex, no clear consequences are shown. When consequences are portrayed, they are almost four times more likely to be positive than negative. Only about one-tenth of programs include anything to do with sexual patience, sexual precaution, and/or the depiction of risks and negative consequences of unprotected sex.

Monique Ward (1995) found that one in four of the speaking interactions between characters of the top shows for children and adolescents (1992–1993 broadcast year) contained some sort of sexual message. The most frequently occurring types of messages equated masculinity with being sexual or commented on women as sexual objects. The picture of sexuality presented was one of sex as recreation, where competition and game playing are anticipated and the prize is a physically attractive person.

Women on television, as in most other media, are unnaturally physically attractive and slim. The standard of attractiveness on television and in magazines is slimmer for women than for men, and the standard is slimmer than it was in the past.

Studies of media content can tell only so much, however. The big question remains: How do viewers apply what they see about sex on television to their own sexual lives? Only a few studies have investigated the link between exposure to sexual media content and sexual attitudes and behaviors. These few studies suggest that television depictions of sexuality do have an influence on beliefs, which may in turn influence behavior.

Surveys have found relationships between viewing daytime soap operas and beliefs about single parenthood. In a study by Mary Larson (1996), junior and senior high school students who frequently viewed daytime soap operas were more likely than those who watched less often to believe that single mothers have relatively easy lives, have good jobs, and do not live in poverty. The soap viewers also thought that the babies of single mothers would be as healthy as most babies and would get love and attention from adult men who are friends of the mothers.

The perception that frequent viewers of television have about marriage is not as pleasant as the perception of single motherhood. Nancy Signorielli (1991) found that college students who watched large amounts of television were more likely than viewers who watched less frequently to be ambivalent about the possibility that marriage is a happy way of life.

Two studies suggest that more frequent exposure to sexual content on television is related to earlier initiation of sexual intercourse. In surveys of high school students, Jane D. Brown and Susan Newcomer (1991) and James Peterson, Kristin Moore, and Frank Furstenberg (1991) found that those students who watched more "sexy" television shows were more likely than those who watched fewer such shows to have had sexual intercourse. However, because neither study assessed television viewing and sexual behavior at more than one time, it is not possible to say whether the television viewing or the sexual behavior came first. It may be that sexually experienced youths seek out sexually relevant media content because it is now salient in their lives. It may also be that sexual content encourages youths to engage in sexual behavior sooner than they might otherwise, but studies that follow young people over time are needed to sort out the causal sequence.

Magazines

Sexuality portrayed in magazines is especially salient for teenage girls. Kate Peirce (1995) analyzed magazines directed at teenage girls and concluded that these magazines are designed primarily to tell girls that their most important function in life is to become sexually attractive enough to catch a desirable male. The message (e.g., "What's your lovemaking profile?" "Perfect pickup lines: Never again let a guy get away because you can't think of anything to say") is repeated even more explicitly in women's magazines, such as *Cosmopolitan*, *Glamour*, and *Mademoiselle*, which many adolescents read.

Kim Walsh-Childers, Alyse Gotthoffer, and Carolyn Lepre (2001) found that magazines for girls and magazines for women have both increased their coverage of sexual topics since the mid-1980s. Magazines for teenage girls may be doing a better job than the magazines for women in educating their readers about such sexual health topics as contraception, pregnancy, abortion, emergency contraception, and sexually transmitted diseases.

These magazines are the standard bearers of unattainable beauty ideals. A study by Children Now (1997) found that 33 percent of the articles in leading magazines for teenage girls include a focus on appearance, and 50 percent of the advertisements appeal to beauty to sell their products. Approximately 33 percent of the articles focused on dating, compared to only 12 percent that discussed either school or careers.

Ana Garner, Helen Sterk, and Shawn Adams (1998) analyzed 175 articles and columns about health, sex, and relationships appearing in *Glamour, Seventeen, Teen, Mademoiselle,* and YM magazines during the 1970s, 1980s, and 1990s. Garner and her colleagues argued that the magazines were urging girls to be enthusiastic consumers in pursuit of perfection—perfect hair, perfect complexions, and perfect wardrobes. They concluded that the magazines were serving as "field guides" for sexual indulgence.

Movies

Teenagers are one of the primary audiences for Hollywood movies in theaters or at home on television or videocassettes. More than two-thirds of the movies produced and rated each year in the United States are R-rated movies, frequently because of the sexual content. Although, technically, only people older than sixteen are allowed to see R-rated movies unless they are accompanied by an adult, most children see R-rated movies much earlier than that age.

Bradley Greenberg and his colleagues (1993) conducted an analysis of the R-rated movies that were popular with teenagers in the early 1980s. They found an average of 17.5 sexual portrayals per movie. Carol Pardun (2001) found that in the top-grossing movies of 1995, romantic and sexual relationships were present even in action-adventure movies such as *Apollo 13*. In these 1995 movies, there was more talk than action, and women tended to talk about sex more than men.

Although more thorough character and story development might be expected in movies than on

television, sexual relations tend to occur in movies with little reference to why the characters are attracted to each other or what they might expect from each other in the future. Older people in long-term relationships are rarely shown expressing tenderness or love for each other, and precautions against unwanted outcomes are as rare in movies as they are on television.

Music and Music Videos

Even before the gyrating hips of Elvis were censored on *The Ed Sullivan Show* in 1956, popular music had been linked with sex. Especially appealing to young people, popular music and music videos contain frequent references to relationships, romance, and sexual behavior.

Music videos may be especially influential sources of sexual information for adolescents because they combine visuals of adolescents' favorite musicians with the music, and many of the visual elements are sexual. Although adolescent girls watch videos as frequently as their male peers, popular music videos underrepresent women, with men outnumbering women in lead roles by almost a five to one margin. Joe Gow (1996) found that when women do appear in music videos, their physical appearance rather than musical ability is emphasized. Steven Seidman (1999) documented that the women in music videos are more affectionate and nurturing, wear the most revealing clothing, and are more often sexually pursued than the males in the videos.

Music lyrics have drawn criticism from groups such as the Parents Music Resource Center, leading to some voluntary labeling of recorded music. For some teenagers, however, such warnings may represent a stamp of approval rather than a deterrent to buying the recording. Keith Roe (1995) proposed a theory of "media delinquency" that suggests that some teenagers may gravitate toward socially devalued or outlawed media content because it reflects their anger or estrangement and helps signal to others that they are not a part of the mainstream culture.

Some variants of rap music (e.g., gangsta rap) are particularly explicit about both sex and violence. Although some observers are critical of the sometimes misogynistic and violent imagery and lyrics, Imani Perry (1995) argues that the explicit "sexual speak" of black women rappers follows in the liberating tradition of the "blues," which gave voice to black women's sexual and cultural politics during the black migration to northern states in the early twentieth century. This striving for empowerment may explain why some rap musicians have responded to concerns about unsafe sex and sexually related behavior and have included alternative messages in their songs. Some rap music includes talk of "jimmy hats," or condoms. An album by the female rap group Salt 'n' Peppa, for example, was about the responsibilities as well as pleasures of sex.

Only a few studies have investigated how exposure to the sexual content of music and music videos is related to the sexual beliefs and behaviors of adolescents. An experiment by Larry Greeson and Rose Ann Williams (1986) found that adolescents who were exposed to a few music videos had more permissive attitudes about sex than did those who were not exposed. Another experiment by Linda Kalof (1999) found that exposure to the stereotypical images of gender and sexuality in music videos had an influence on college women's sexual beliefs, especially greater acceptance of interpersonal violence.

Conclusion

In short, it is clear that the media are an important part of how young people learn about sexual norms and expectations in the culture. From music to magazines, to television and movies, sex is a staple of young people's media diets. Although relatively little is known about how this ubiquitous sexual content is used by and affects children and adolescents, existing research suggests that such media content can have powerful effects, especially when other sources of information are difficult to access or are less compelling. Most of the media that young people attend to provide alluring and relatively risk-free opportunities to learn more about sex than their parents, teachers, or even friends are willing to provide. These portrayals rarely, however, include accurate depictions of the emotional and physical risks that may be involved in sexual activity. In the media world, women still are engaged primarily in seducing men, but the costs of doing so regardless of love, commitment, or protection against pregnancy or disease are rarely addressed.

See also: Advertising Effects; Body Image,

MEDIA EFFECT ON; GAYS AND LESBIANS IN THE

MEDIA; GENDER AND THE MEDIA; MUSIC, POPU-LAR; PORNOGRAPHY; RATINGS FOR MOVIES; RAT-INGS FOR TELEVISION PROGRAMS; SOAP OPERAS; TALK SHOWS ON TELEVISION; TELEVISION BROAD-CASTING, PROGRAMMING AND.

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JANE D. BROWN SUSANNAH R. STERN

SOAP OPERAS

Daytime serials, or soap operas as they are better known, have a form and structure that separates them from other television genres. Rather than beginning and ending within the space of thirty to sixty minutes, soap operas never really begin or end. The stories continually unfold year after year at a slower pace than other genres and without episodic resolution. Soap operas leave unanswered questions at commercial breaks, they include flashbacks and repetition as a device to clue viewers in on elements they may have missed and to prompt further contemplation, and there are no reruns. In other words, a soap opera is a never-ending story that does not abide by traditional television rules.



One of the biggest nighttime soap operas in the early 1980s was Dynasty, which dramatized events surrounding the wealthy Carrington family and featured the actors (left to right) Kathleen Beller, Pamela Sue Martin, Joan Collins, Linda Evans, and John Forsythe. (Bettmann/Corbis)

Soap operas began on the radio in the 1930s as a device to sell soap products to women. Sponsors created programming to air between their product commercials. In 1940, there were sixty-four soap operas on the radio that ran fifteen minutes each. *Guiding Light*, which debuted on the radio in 1937 and on television in 1952, was the only soap opera to make the change from radio to television.

By the 1980s, each of the three major networks had more airtime dedicated to daytime serials (210 to 240 minutes) than to prime-time programming (180 minutes). Indeed, prime-time programming included a number of its own serials such as *Dallas*, *Dynasty, Falcon Crest*, and *Knots Landing*. Although audiences eventually declined and several soap operas were canceled, including NBC's *Another World* (which aired for thirty-five years), by the end of the 1990s, eleven serials were broadcast daily.

One reason for the apparent decline in viewers was the introduction of videocassette recorders (VCRs), which allowed viewers to decide when to watch. Although nearly 12 percent of the U.S. population reported videotaping soap operas in 1996, VCR viewers have not generally been included in audience ratings because advertisers assume the viewers do not watch the commercials. In response to the viewers' need for alternative viewing times coupled with the advertisers' need to show commercials, a new cable network was launched on January 24, 2000, in Los Angeles and New York. SoapNet runs current ABC soap operas three times a day along with reruns of older soap operas that are no longer on the air. By June 2000, SoapNet was available in select cities across the United States and through DirecTV. New technology continues to affect soap operas. The introduction of the Internet brought more of a sense of community among soap opera fans who discuss the serials online.

The audience for soap operas has always been mostly women. However, in the United States, the percentage of male viewers increased to about 25 percent in the 1990s. The percentage of teenage viewers also increased over time. African Americans represent nearly 27 percent of the viewers for some soap operas, although they comprise only 12.8 percent of the total U.S. population.

Other than the occasional content analysis, academics paid little attention to soap operas until the early 1980s, when feminists began to defend the decidedly female genre. Feminists challenged academics to examine what made soap operas so popular with women. Tania Modleski (1983) argued that women were attracted to soap operas because they followed a feminine rather than a masculine narrative. She defined the feminine narrative of soap operas as stories that are (1) nonlinear, which means they have no clear beginning, middle, and end, (2) based on dialogue rather than action, (3) contain numerous interruptions, and (4) disperse the attention and loyalties of the viewers. Modleski also argued that unlike masculine narrative, in which the climax is resolution, the ultimate resolution is constantly yet to come in soap operas. Pleasure comes from anticipation rather than resolution.

Content is another defining element of soap operas, in which the elements of conflict and family are central. The ratio of male characters to female characters is approximately equal, similar to that of the United States, whereas in prime-time television male characters have outnumbered female characters as much as three to one. Although the number of African-American characters on soap operas has increased, research has found that those characters are less likely to have intimate contact than white characters. In the late 1960s and early 1970s, serial writers and producers introduced more social issues, such as interracial romance, mental illness, homosexuality, AIDS, abortion, and alcohol and drug addiction. Health issues have long been a part of soap operas, particularly women's health issues, such as breast cancer and systemic lupus erythematosus.

Sexual content has been a controversial mainstay of soap operas since the 1970s. The frequency of sexual behaviors on daytime serials is greater than that on prime-time television. According to a 1996 content analysis by Bradley Greenberg and Rick Busselle, sexual portrayals substantially increased during the 1980s, slightly decreased by the early 1990s, and increased again in the mid-1990s. As Katherine Heintz-Knowles reported in a 1996 Kaiser Family Foundation study, until the mid-1990s, talk about sex was more prevalent than actual depictions of sexual behavior. Although early studies found that consequences for sexual behavior were rarely shown, discussions about planning for and the consequences of sexual behavior increased in the 1990s. Yet, even with the increase, those discussions remain infrequent. Some studies have found that a majority of the portrayals of sexual behaviors are socially responsible because they are in the context of a healthy, committed relationship. Other studies have found that messages about sex are contradictory.

A 1983 book by Muriel Cantor and Suzanne Pingree reported that in the early 1980s, violence on soap operas was less frequent than in prime time. In addition, it was mainly verbal, between men and women, and between family members or lovers. In contrast, in prime time it was mostly between men who were strangers, and it was physical. Soap opera depictions of rape that start off as socially responsible and then send mixed messages when the rapist is redeemed, have drawn a lot of fire from critics. Extreme physical aggression that is rewarded in relationships has also been criticized, although aggressive sexual contact has decreased, according to research.

Although soap operas are shown all over the world, the content is not necessarily all the same. Soap operas in North America focus more on the rich, whereas soap operas in Great Britain focus more on the working class. Soap operas in Latin American (where they are called "telenovelas") are used as educational tools for issues such as family planning. The introduction of soap operas from North America and Latin America prompted several countries around the world to produce their own serials. These serials, however, are not simply copies; they reflect more of their own cultural values and social norms. Content is not the only difference in soap operas produced around the world. In Latin America, Japan, and China, the serials are often finite, even though they run for long periods of time.

Robert Allen (1995) claims that content analyses of soap operas are meaningless because any potential implication of daytime serials must be derived from the entirety of the serial (something that cannot occur until a show is cancelled) rather than in small chunks. Allen and others have also argued that the structural characteristics that make soap operas "open" allow viewers to make multiple interpretations of story content. According to this reasoning, in order to understand how viewers might be affected by soap operas, it is necessary to understand the interpretations that they make. Research from this perspective has proposed that women are empowered by watching soap operas. Moreover, it has found that how viewers identify with and perceive characters has an influence on how they are affected by those characters and their actions. Finally, it concludes that some viewers are affected by the more obvious message of the content, whereas others negotiate their own meanings for the content and are therefore affected differently.

Traditional research about the effect of soap operas on viewers usually looks at the amount of time that viewers spend watching soap operas in relation to how viewers might be affected by soap opera content. This research has found that viewers who watch a large amount of soap operas overestimate the number of divorces, illegitimate children, pregnancies, extramarital affairs, and cases of sexually transmitted diseases in the real world, as well as the amount of crime. Other research has found that women who are depressed spend more time watching soap operas than others; viewers who watch a large amount of soap operas believe single mothers live a much better life than they really do; and soap operas can effectively promote health concerns and practices when tied to a public-service announcement.

See also: Attachment To Media Characters; Dependence On Media; Gender and the Media; Health Communication; Sex and the Media; Violence In the Media, Attraction To; Violence In the Media, History of Research On.

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Renée A. Botta

SOCIAL CHANGE AND THE MEDIA

The influence of the media on society has for a long time preoccupied researchers in the field of communication. Various normative, social scientific, and critical communication theories have addressed how media influence social change. Early media effects theories assumed a direct and unmitigated influence of media on individuals and society. Later research questioned the assumption of all-powerful media effects, launching what became known as the limited-effects tradition. From those early days of communication research, there has been a constant ebb and flow of theories and empirical research attempting to understand the real effect of media on social change.

Numerous theories have also attempted to understand the effect of the media on social change from a variety of perspectives and for different objectives. These include theories of media and democratization, theories of development communication and social learning, and theories in health communication, social marketing, and participatory communication. Also, a variety of areas of inquiry in mass communication dealt with social change. These include research on alternative and pirate media, public service and educational broadcasting, public opinion and political communication, and research on propaganda.

Development Communication

In the 1950s and 1960s, the wave of decolonization in the developing world created a need for nation-building and social, political, and economic development. It is in that context that development communication emerged as a strategy to use the mass media to foster positive social change, which, in turn, was believed to enhance the socioeconomic development of a country. Among the pioneers in development communication were Daniel Lerner and Wilbur Schramm. Lerner's The Passing of Traditional Society (1958) and Schramm's Mass Media and National Development (1964) were founding texts of development communication, and they have had a defining influence on the paradigm since their publication. Their basic principle was that desirable social change could be produced by scientifically designed and executed communication campaigns.

Until the late 1970s, development communication theory, research, and practice was grounded in what Everett Rogers (1978) termed a "dominant paradigm." This dominant paradigm, according to Rogers, was a consequence of a specifically Western legacy. That legacy includes the Industrial Revolution in North America and Western Europe, colonialism in the developing world—from Latin America to the Middle East, and from Africa to East Asia—the quantitative tradition of American social science, and capitalism. These historical, geopolitical, economic, epistemological, and ideological factors molded the dominant paradigm on the role of the mass media in development and social change.

That perspective led to shortsighted theories and applications. For example, Rogers (1978) wrote that the dominant paradigm wrongly relied on the introduction of technology to solve the social problems of the developing world. In addition, the strong dependence on quantitative information inherited from American social science reduced standards of living to mere numbers. which often failed to reflect actual social situations in the developing world. More relevant to this discussion was the gradual realization by development researchers and practitioners that the role of the mass media was indirect and more limited than it was previously assumed. Advocating a shift in the general orientation of development communication, Rogers (1978, p. 68) gave a new definition of development that he called "a widely participatory process of social change in a society, intended to bring about both social and material advancement . . . for the majority of the people."

Two years after Rogers thus declared the passing of the dominant paradigm, Robert Hornik (1980) published an article in the Journal of Communication in which he reviewed and summarized evaluations of a cluster of development projects spanning several continents. This evaluation was done as part of a review of Agency for International Development communication policy, which Hornik undertook with several colleagues. Hornik articulated his article around three central questions. The first question was concerned with the role that communication plays in processes of development. The second question focused on the conditions that make a particular development communication project a success or a failquestion concerned Hornik's third ure. knowledge about specific applications in development communication.

In addressing these questions, Hornik drew examples from development projects in El Salvador and Nicaragua (in Latin America), Tanzania and Senegal (in Africa), and India, China, and Korea (in Asia). The geographical diversity of these examples made Hornik's piece an excellent review of how development projects work or do not work in different sociocultural environments. At the end of his article, Hornik reached the following conclusions. First, he found communication to be a useful complement to development because communication functioned as a catalyst, organizer, maintainer, equalizer, and legitimator-motivator for social change. Second, Hornik concluded that development communication is effective only as a complementary strategy to changes in resources and environments. Finally, Hornik states that the relationship between communication and development was more complex than previous research tended to assume. In conclusion, Hornik's wide-ranging review indicated that communication is necessary, but not sufficient, for meaningful development to take place.

Social Learning Theory

Social learning theories are based on the simple but powerful assumption that people learn from observation. This assumption has been held for generations as conventional wisdom, and it has been applied in areas such as education and training. Applied to the mass media, this assumption becomes more problematic and more difficult to prove, since media scholars cannot reach a strong agreement on what behaviors people learn from the media, to what degree, and under what conditions. There are rare examples in which viewers, especially younger ones, imitate a scene from a television program or a movie in close detail. Copycat crime is one of the worrisome examples of imitation. Most people, however, will imitate images and behaviors they see on television screens in discriminate, selective, and, often, indirect ways.

In his book *Psychological Modeling: Conflicting Theories* (1971), social psychologist Albert Bandura has argued for an indirect and complex understanding of how people model their behavior on images that they obtain from society. Bandura's social learning theory maintains that humans acquire symbolic images of actions and behaviors, which they adapt and then use to inspire their own behavior. According to Bandura, social learning from the media is achieved in one or a combination of observational learning, inhibitory effects, and disinhibitory effects.

Observational learning is the most direct way in which social learning operates. It is based on the fact that by observing a behavior, people can learn how to perform it themselves. In vocational training, for example, apprenticeship developed as a more or less lengthy process of initiation primarily based on learning by observation. By observing the master at work, the apprentice was to learn the trade. Inhibitory effects operate on the assumption that if someone observes a person being sanctioned for behaving in a certain way, then the observer will learn not to behave in that way. In other words, inhibitory effects produce an avoidance of a behavior that the observer associates with sanctions. The opposite occurs with disinhibitory effects. If a person is rewarded for destructive behavior, it is probable that an observer would imitate the behavior. This is why some television critics have been especially disturbed by programming that glorifies violence and leaves it unpunished. Social learning theory has had a lasting effect on efforts to induce social change using the mass media because it recognized that social learning is not a rote process of direct imitation, but one in which several forces affect both observation and behavior.

Social Marketing Theory

In 1971, the same year that Bandura published *Psychological Modeling*, Philip Kotler and Gerald Zaltman published an article in the *Journal of Marketing* in which they proposed and coined the term "social marketing theory." Reprinted in 1997 in the specialized journal *Social Marketing Quarterly*, the Kotler and Zaltman article is considered to be one of the leading pioneering publications in the field of social marketing. The authors advocated the application of consumer marketing techniques to social problems, and they laid the conceptual foundations for their approach.

Social marketing is based on one basic premise. Since marketing has been largely successful in making people chose to buy some products as opposed to competing products, then the same techniques should be effective in encouraging people to adopt certain behaviors that would lead to better physical and mental health, and eventually to wide-scale social change. As a hybrid theory that proposed to induce positive social change, social marketing borrowed concepts from psychology, sociology, communication, and preventive medicine. Similar to communication theory and research, social marketing theory is an interdisciplinary venture that requires collaborative research between scholars in several traditional disciplines.

Social marketing campaigns are simultaneously directed at two audiences. First, because social problems have behavioral causes, social marketing campaigns target the individuals and groups who would benefit from a behavior change. Second, since social problems have socioeconomic causes as well, social marketing campaigns are aimed at policymakers who have the power to make policy changes that would enhance the chances of success of social marketing campaigns.

Social marketing campaigns are organized around three principles. First, in order to be successful, a campaign has to have a consumer orientation. This means that the target group is treated as an active audience whose members participate in the process of social change. Second, the campaign should be premised on a social exchange of values and ideas between campaign organizers and the target group. This exchange is based on the important idea in social marketing that behavior is voluntary and not coerced. Third, campaigns should have a long-term plan that goes beyond immediate or short-term measures of success. This should include mechanisms of monitoring, feedback, and evaluation. Social marketing has been criticized for fostering a consumer approach to social change, with its underlying capitalist premise. Still, social marketing has become a preferred approach to creating and sustaining positive social change.

Convergence, Critique, and Conclusion

Development communication and social marketing theory share several assumptions and methodologies. In fact, they share the most basic of assumptions: that social change can be achieved by using carefully conceptualized and operationalized persuasion campaigns. Since the dominant channels of persuasion are radio, television, popular music, and the Internet, these mass media are highly significant and hold considerable potential for positive social change.

However, the motives of media campaigns for social change have been scrutinized by critics who believe that development communication is a neocolonialist paradigm that maintains a relationship of dependency between the rich industrialized countries and the developing world. Peter Golding (1974) was one of the early critics of the role of the media in national development. He criticized development communication as an ethnocentric theory that constructed and maintained Western European and North American social and economic standards as "goal-states from which calibrated indices of underdevelopment can be constructed" (p. 39). In the same vein, development was criticized for being a self-serving, even colonial, Western project that is designed to open markets in the developing world for commodities produced in the wealthy countries of North America and Western Europe. Both development communication and social marketing theory do have elements that are grounded in assumptions about the relationship of consumption to social change. Development communication, starting from Schramm's early work, has tended to focus more on economic issues than on social and cultural issues. Social marketing theory, after all, is derived from concepts developed in marketing and advertising, two areas that focus on making individuals good consumers. As a result, social marketing theory runs the risk of regarding individuals as consumers to be persuaded to buy a commodity, rather than citizens to be informed about issues.

The line between regarding individuals as either consumers or citizens in campaigns focusing on promoting positive social change is understandably difficult to draw. Theories of media and social change have tremendous potential, but they also have serious limitations. Research has attempted to move beyond previous models of social change and has advocated more interactivity, transparency, and sensitivity to context in using media for social change. Even if the influence of the mass media is indirect and difficult to monitor, measure, and understand, the media are an important instrument to be used in continuous efforts to improve people's quality of life.

See also: Democracy and the Media; Pirate Media; Propaganda; Public Broadcasting; Public Health Campaigns; Public Service Media; Social Cognitive theory and Media Effects; Social Goals and the Media; Society and the Media; Television, Educational.

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MARWAN M. KRAIDY

SOCIAL COGNITIVE THEORY AND MEDIA EFFECTS

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on

direct experience to tell them what to do. Direct experience is a toilsome, tough teacher. Fortunately, humans have evolved an advanced capacity for observational learning that enables them to expand their knowledge and competencies through the power of social modeling.

Much human learning relies on the models in one's immediate environment. However, a vast amount of knowledge about styles of thinking and behaving and the mores and structures of social systems is gained from the extensive modeling in the symbolic environment of the electronic mass media. A major significance of symbolic modeling lies in its tremendous reach, speed, and multiplicative power. Unlike learning by doing, which requires shaping the actions of each individual laboriously through repeated consequences, in observational learning a single model can transmit new ways of thinking and behaving simultaneously to countless people in widely dispersed locales. Electronic delivery systems feeding off telecommunications satellites are now rapidly diffusing new ideas, values, and styles of conduct worldwide.

Symbolic modeling can have diverse psychosocial effects. Such influences can serve as tutors, motivators, inhibitors, disinhibitors, social promoters, emotion arousers, and shapers of the public consciousness. The determinants and mechanisms governing these many effects are addressed in some detail by Albert Bandura in *Social Foundations of Thought and Action* (1986) and by Ted Rosenthal in "Observational Learning Effects" (1984).

Observational learning of behavioral and cognitive competencies is governed by four component subfunctions. Attentional processes determine what people observe in the profusion of modeling influences and what information they extract from what they notice. A second subfunction involves an active process of transforming the information conveyed by modeled events into rules and conceptions for memory representation. In the third subfunction, symbolic conceptions are translated into appropriate courses of action. The fourth subfunction concerns motivational processes that determine whether people put into practice what they have learned.

Modeling is not simply a process of response mimicry as commonly misbelieved. Observers extract the rules underlying the modeled style of



News images of injured people being carried away from Tiananmen Square after clashes between students and Chinese soldiers in 1989 shocked the world and had a chilling effect on further pro-democracy protests. (AFP/Corbis)

thinking and behaving, and those extracted rules enable the observers to generate new behaviors in that style that go beyond what they have seen or heard.

Much of the research on media effects has centered on the effect of televised violence. Exposure to televised violence has at least three distinct effects. It teaches aggressive styles of conduct. It also reduces restraints over aggressive conduct. This occurs because violence is portrayed as a preferred solution to conflict that is often successful, and relatively clean. Superheroes are doing most of the killing. When good triumphs over evil by violent means, such portrayals legitimize and glamorize violence. In addition, heavy exposure to televised violence desensitizes and habituates people to human cruelty.

With live global broadcasts of societal conflicts, televised modeling is becoming an influential vehicle for political and social change. In his analytic article "A Sociology of Modeling and the Politics of Empowerment" (1994), John Braithwaite provides evidence that the speed with which Eastern European rulers and regimes were toppled by collective action was greatly accelerated by televised modeling. The tactic of mass action modeled successfully by East Germans was immediately adopted by those living under oppressive rule. Televised modeling of civic strife is a double-edged sword, however. Modeling of punitive countermeasures can also curb social change, as when the Chinese watched on Cable News Network (CNN) as the army broke down doors and arrested student activists following the 1989 Tiananmen Square massacre.

The actions of others can also serve as social prompts in activating, channeling, and supporting previously learned styles of behavior that are unencumbered by restraints. By social exemplification one can get people to behave altruistically, to volunteer their services, to delay or seek gratification, to show affection, to select certain foods and drinks, to choose certain kinds of apparel, to converse on particular topics, to be inquisitive or passive, to think creatively or conventionally, or to engage in other permissible courses of action. Thus, the types of models that prevail in a social setting partly determine which human qualities, from among many alternatives, are selectively activated. The fashion and taste industries rely heavily on the social prompting power of modeling. The actions of models acquire the power to activate and channel behavior when they are good predictors for observers that positive results can be gained by similar conduct.

In her article "Fright Reactions to Mass Media," Joanne Cantor (1994) reviews the literature on fear arousal and the acquisition of fearful dispositions through exposure to modeled threats. The world of television is heavily populated with unsavory and villainous characters. Consequently, people who watch a large amount of violent fare have a greater fear of being criminally victimized and are more distrustful of others than are viewers who watch only a limited amount of violent fare.

Fears and intractable phobias can be eradicated by modeling influences that convey information about effective coping strategies. In *Self-Efficacy: The Exercise of Control*, Bandura and his colleagues (1997) have shown that modeling influences exert their effects partly by altering viewers beliefs in their personal efficacy to exercise control over events that affect their lives. The stronger the instilled perceived coping efficacy, the bolder the behavior. Values can similarly be developed and altered vicariously by repeated exposure to modeled preferences.

During the course of their daily lives, people have direct contact with only a small sector of the physical and social environment. In their everyday routines, they travel the same routes, visit the same familiar places, and see the same group of friends and associates. As a result, their conceptions of the wider social reality are greatly influenced by symbolic representations of society, mainly by the mass media. George Gerbner and his associates (1994) provide a comprehensive analysis of this cultivation effect through symbolic modeling in their work "Living With Television: The Dynamics of the Cultivation Process." To a large extent, people act on their images of reality. The more their conceptions of the world around them depend on portrayals in the media's symbolic environment, the greater is the media's social effect.

See Also: Advertising Effects; Cultivation theory and Media Effects; Desensitization and Media Effects; Fear and the Media; National Television Violence Study; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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Albert Bandura

SOCIAL GOALS AND THE MEDIA

Media effects researchers have tended to focus on negative rather than positive effects of watching television. However, given that the same processes of observation, learning, and imitation should be at work for both types of effects, it is plausible that there should be prosocial as well as antisocial outcomes of television exposure.

Prosocial Content on Television

During the 1970s, prosocial behaviors were reported to appear quite frequently on television. However, these behaviors typically occurred in a context of violence and hostility. As Bradley Greenberg and his associates reported in 1980, the favorite programs of a sample of grade-school children contained equal numbers of prosocial and antisocial acts. Marsha Liss and Lauri Reinhard (1980) found that even those cartoons that were considered by the researchers to have moral messages contained high levels of violence-the same amount as in standard cartoons that had no such moral lessons. Moreover, only some types of prosocial behaviors were shown. Rita Poulos, Eli Rubinstein, and Robert Liebert reported in 1975 that although there were an average of eleven altruistic acts and six sympathetic acts per hour, there were very few depictions of self-control (e.g., controlling aggressive impulses or resisting temptation).

Content analyses of prosocial behavior on television were scarce throughout the 1980s, but prosocial content received more attention again in the 1990s with the introduction of legislation aimed at improving the quality of television programming for children. The Federal Communications Commission (FCC) enacted a processing guideline known as the "three-hour rule" that went into effect in 1997. Under the three-hour rule, broadcasters that wish to have their license renewals expedited are required to air a minimum of three hours a week of educational and informational (E/I) television that meets the "cognitive/intellectual or social/emotional" needs of children. The E/I programs must be specifically designed for children who are sixteen years of age or under and must air between the hours of 7:00 A.M. AND 10:00 P.M. Broadcasters are required to place an on-air symbol at the beginning of E/I programs to indicate to the public that they are educational. This information must also be provided to listing services, such as the local newspaper and TV Guide.

In the late 1990s, the Annenberg Public Policy Center conducted a series of content analyses of all children's programs that were aired over the course of a composite week in Philadelphia, a large urban media market. Emory Woodard (1999) examined the frequency with which programs contained social lessons about how to live with oneself (i.e., intrapersonal skills such as understanding emotions, maintaining self-esteem, and overcoming fears) and how to live with others (i.e., interpersonal skills such as acceptance of diversity, altruism, and cooperation). In Woodard's sample, 50 percent of all children's shows contained at least one social lesson. These were mostly concentrated in programming for preschool children; 77 percent of preschool children's programming contained a social lesson. Public Broadcasting Service (PBS) programming had the highest overall rate with 72 percent of the children's programming containing social lessons. This was followed by premium cable channels, such as The Disney Channel and Home Box Office (HBO), with 59 percent of the children's programs containing social lessons. PBS also had the highest level of programs with traditionally academic lessons (i.e., reading, writing, and arithmetic), since 89 percent of the programs fell into this category.

Using the same sample of programs, Kelly Schmitt (1999) reported that of the subset of children's programs that had been designated as meeting the "educational and/or informational needs of children," 75 percent of those offered by the commercial broadcast networks were prosocial in nature. In this case, "prosocial" was broadly defined as promoting "learning to live with oneself and others." That is, broadcasters appeared to be meeting the three-hour rule by focusing on general prosocial messages rather than conveying traditionally academic information.

Although these content analyses suggest that children's television is full of material that has the broad social goal of teaching life skills, children may actually see relatively little of this potentially positive content. Woodard (1999) examined the content of the twenty shows in the sample that received the highest Nielsen ratings among children between two and seventeen years of age. Only four of the twenty contained social lessons in the episodes that were analyzed. Of those four, only two contained content that was related to specific prosocial outcomes such as positive social interactions, stereotype reduction, or altruism. Of these two, only one was designed explicitly for children. These findings highlight the fact that it is relatively rare for children to watch the prosocial programming that is designed for them.

Evidence of Prosocial Effects?

Marie-Louise Mares and Woodard (2000) conducted a meta-analysis to summarize the results of thirty-nine studies of prosocial effects of television. Meta-analysis involves averaging statistical information across studies on a particular topic, in order to estimate the overall consistency and strength of effects. Mares and Woodard reported that prosocial content had an overall weak to moderate effect. Effects were strongest for studies of altruism, largely because such studies were more likely to model behaviors that were identical to the behaviors that were subsequently observed in the children. Efforts to promote other prosocial behaviors such as positive interaction, aggression reduction, and stereotype reduction were less likely to use identical treatment and outcome measures. Effect sizes for these treatments were smaller and remarkably similar to each other.

How do these effect sizes compare with the effects of violent content? Hae-Jung Paik and George Comstock (1994) looked at studies of the effects of television violence on viewer aggression. They reported an overall moderate negative effect of violent television content. Therefore, it is reasonable to suggest at this point that the effects of violent and prosocial content are reasonably close in magnitude.

Investigating Prosocial Effects

Research strategies for investigating television effects have evolved over the years, which is true of research on prosocial effects as well as in other areas. Early studies of prosocial effects were often simple one-shot experimental tests of modeling. These simple tests of modeling generally found quite strong, positive effects when comparing a group that watched explicit depictions of prosocial actions with a group that did not see the content.

A second strategy was to conduct a field experiment that typically involved repeated exposure to real television content in relatively uncontrolled environments. The major field experiments in this area looked at the effect of using a particular prosocial program such as *Sesame Street*, *Mister Rogers' Neighborhood*, or *Barney & Friends* as part of the school or preschool experience. Children generally watched whole episodes every week for a number of weeks and were then evaluated, often by observation over several days or weeks, rather than by assessing their performance on a single task. These studies often found that prosocial content could be effective, but chiefly when the content was combined with other forms of teacher intervention.

A third strategy was to conduct a survey to find out how much of an effect could be observed when children simply self-selected to watch prosocial programming at home. That is, these studies examined the effects of everyday viewing rather than special interventions. The results of such correlational studies are more easily and reliably applied to general audiences than are the other types of studies. However, as in all correlational studies, the question of whether prosocial programming causes prosocial outcomes is plagued by issues of causal direction and spuriousness. Maybe children who are already tolerant, friendly, caring people are attracted to prosocial programming. Maybe prosocial behavior and prosocial viewing are both caused by other variables such as parental style, gender, and so on. Overall, once these possible third variables are statistically controlled, most correlational studies find very weak effects of prosocial viewing.

Effects on Positive Social Interactions

In one example of a field experiment, Lynette Friedrich-Cofer and her associates (1979) focused on the effects of Mister Rogers' Neighborhood on "urban poor children." They had children who were in Headstart programs watch twenty episodes of the program over a period of eight weeks. Comparisons were then made between children from four different groups: (1) those who simply watched Mister Rogers' Neighborhood at the Headstart center without any additional prosocial materials, (2) those who watched it and had access to prosocial books, games, and so on, (3) those who watched it, had access to the prosocial materials, and had follow-up activities such as verbal labeling of the prosocial behaviors and role playing, and (4) those who were part of a control group that simply saw neutral films.

Friedrich-Cofer and her associates found that Mister Rogers' Neighborhood alone produced relatively few behavioral changes. Children who watched the program and had access to the prosocial materials became more active overall—they had a greater number of positive interactions, but they also had more aggressive interactions. The most successful group, in terms of prosocial behavior, was the one that watched the program and received training in role playing and verbal labeling. That group showed significant increases in positive social interactions without any increases in aggression.

Jerome and Dorothy Singer (1998) examined the effects of repeated exposure to *Barney & Friends* in preschool and daycare settings, and they found similar results. There were minimal effects of exposure when children simply watched the program without further adult elaboration of the content, but there were significant positive effects when viewing was combined with adult commentary and related activities.

Maurice Elias (1983) examined whether videos could be used as one component of treatment for boys who had serious emotional and educational disturbances. The ten videos, which were shown twice a week for five weeks, portrayed realistic scenarios of common problematic situations such as teasing and bullying, dealing with peer pressure, learning how to express feelings, and coping with new social situations. After watching each video, the boys were encouraged to discuss what they had seen and how they felt about it. The boys were measured (both for three months before and two months after the video series) on a variety of behavioral and emotional responses that were related to interactions. Compared to control children who did not see the videos, participants in the experiment were rated by their counselors as being less emotionally detached and less isolated, as having improved in their ability to delay gratification, and as having decreased in overall personality problems. These effects were still evident two months after the intervention.

Despite these encouraging results, researchers generally find much weaker outcomes when they use surveys to look at the effects of normal, everyday viewing. Joyce Sprafkin and Eli Rubinstein (1979) studied children who were seven, eight, and nine years of age and lived in middle-class communities. The children reported how often they watched each of fifty-five television series that were then rated for levels of prosocial and antisocial content. The children's prosocial behavior was measured by teacher and classroom peer reports. Sprafkin and Rubinstein found that the strongest predictors of prosocial behavior were background variables. Children who were high academic achievers or whose parents were well educated received more reports of prosocial behavior. Girls were also rated as being more prosocial than boys. Compared to these effects, television viewing was only weakly related to prosocial behavior. The partial correlation between prosocial viewing and behavior (controlling for background variables) reflects very minimal differences between heavy viewers of prosocial content and light viewers of prosocial content.

Oene Wiegman, Margot Kuttschreuter, and Ben Baarda (1992) studied second- and thirdgrade children in The Netherlands for three years (until the children were in fifth and sixth grade). Children were measured once a year on a number of variables, including exposure to prosocial television content and levels of prosocial behavior. As in the Sprafkin and Rubinstein (1979) study, prosocial and antisocial exposure were measured by the frequency of viewing specific programs, and prosocial behavior was assessed by peer nominations. Wiegman and his colleagues found no relationship between prosocial viewing and prosocial behavior, despite the considerable power granted by their large sample size (i.e., 466 children). If anything, the relationship tended to be very weakly negative, rather than positive. Why was this the case? The researchers noted that watching prosocial content was very highly correlated with watching antisocial content-children who saw the most prosocial content were simply heavy television viewers who were exposed to numerous antisocial models as well.

Effects on Altruism

In a well-known study of altruism (i.e., generosity), Poulos, Rubinstein, and Liebert (1975) randomly assigned first-grade children to one of three viewing conditions: (1) a prosocial episode of *Lassie*, in which the protagonist, Jeff, risked his life to save a puppy, (2) a neutral episode of *Lassie*, or (3) a neutral episode of *The Brady Bunch*. After viewing the episode, the children were told how to play a "game" in which they could accrue points by pressing a button. The more points they earned, the larger the prize they would win. At the same time, they were asked to listen to puppies in a distant kennel and to push a help button to call the researcher if the puppies seemed distressed. As children played the game, the recorded puppy sounds grew increasingly loud and intense. The researchers compared the average number of seconds children spent pushing the help button (and thereby sacrificing points in the game) in each of the conditions. Children who saw the prosocial episode pushed the help button nearly twice as long as children in the other two conditions.

In a more typical study of altruism, conducted by James Bryan and Nancy Walbek (1970), children were brought into the laboratory and told that they would learn how to play a new game by watching a video. The children watched one of several versions of the video, in which the model played the game, was rewarded by tokens that could be used to win a prize, and then immediately behaved either altruistically (giving some of the tokens to charity or to another child) or selfishly (cashing in all the tokens for a big prize). The children then played the game, won a fixed number of tokens, and were given the opportunity to donate some tokens. Children who saw the altruistic model donated more tokens than those who had seen the selfish model. As in this example, studies of altruism have generally involved explicit modeling of very specific behaviors immediately after observing the model.

Effects on Tolerance and Stereotype Reduction

In one of the largest and most impressive studies of stereotype reduction, Jerome Johnston and James Ettema (1982) conducted a field experiment that involved more than seven thousand children. Fourth- to sixth-grade classrooms in seven sites across the United States were randomly assigned to watch twenty-six episodes of Freestyle, a public television program that was designed to reduce stereotypes about gender roles. Children were assigned (1) to watch the program at school and to engage in teacher-led discussions about the material, (2) to watch the program at school without any such discussions, or (3) to watch the program at home. The students completed extensive questionnaires before seeing any episodes and again after the exposure period. Compared to a control group that had not viewed the program, there were significant positive changes in the students' perceptions of personal ability and their interest in various types of jobs, and there were reductions in the stereotypes that students had about gender roles in employment. These effects were strongest when the program was viewed in the classroom and accompanied by teacher-led discussions. Much smaller effects were observed among students who simply watched the program in school or at home.

Two studies of attempts to counteract gender stereotypes suggest that the same content may have positive effects on some groups but cause a backlash in other groups. Suzanne Pingree (1978) showed commercials to children who were in the third and eighth grades. The commercials featured women in either traditional or nontraditional roles, and Pingree found that, among most children, stereotyping was reduced when the children viewed the commercials that showed the nontraditional behaviors. This result was particularly strong when children were told that the advertisements depicted real people. However, among eighth-grade boys, there appeared to be something of a contrary reaction because stereotyping was significantly higher for this group when commercials featured the nontraditional condition than when they featured the traditional condition.

Shirley O'Bryant and Charles Corder-Bolz (1978), over a period of one month, showed nine half-hour cartoons to children who were between five to ten years of age. Embedded in each cartoon were commercials for a fruit-juice drink. In the traditional condition, the commercials featured a female telephone operator, fashion model, file clerk, and manicurist. In the nontraditional condition, the commercials featured a female pharmacist, welder, butcher, and laborer. Over the course of the month, children saw many repetitions of the commercials. Comparisons between pre- and post-test scores for occupational stereotyping found that children who were exposed to the nontraditional commercials were significantly more likely to say that a traditionally male job was also appropriate for a woman. Moreover, girls who viewed the nontraditional condition gave higher ratings to traditionally male jobs when asked how much they would like to have that job in the future. Boys' ratings of future interest in traditionally male jobs were lower for those who had viewed the nontraditional condition-apparently seeing women in those roles was a deterrent. This effect is consistent with the finding by Pingree (1978) of a "backlash" among boys, and it underlines the point that seemingly prosocial content can have unintended effects on certain subgroups.

Gerald Gorn, Marvin Goldberg, and Rabindra Kanungo (1976) assessed the effects of Sesame Street on children's tolerance for playmates of different ethnic and racial backgrounds. They assigned white, English-Canadian children who were 3.5 to 5.5 years of age to see twelve minutes of Sesame Street programming-either with multicultural inserts or without the inserts. The children were then shown two sets of four photographs that were taken from the inserts. One set featured Caucasian children, and the other set featured children from other ethnic and racial backgrounds. The participants in the study then chose which of the photographed children should be brought to the nursery school the next day. The control group that did not see the inserts showed a marked preference for playing with the Caucasian children (67%). Among children who saw the multiracial inserts, this was reversed, with a marked preference for the non-Caucasian playmates (71%) over the Caucasian playmates (29%). However, in one of the very few prosocial projects that involved delayed testing, Goldberg and Gorn (1979) expanded their earlier study and found that children who were tested a day after viewing the multicultural inserts were no longer significantly more willing to play with non-Caucasian playmates than those who had not seen the inserts.

Early studies of *Sesame Street* confirmed that the message of tolerance in *Sesame Street* took time to extract. Gerry Ann Bogatz and Samuel Ball (1971) conducted longitudinal studies of children who were exposed to *Sesame Street*. They reported that viewing *Sesame Street* was positively related to tolerant racial attitudes, but only after two years of exposure. Measures at the end of the first year had found no such relationship.

Mixing Prosocial and Antisocial Content

A final point worth noting is the particularly harmful effect of combining prosocial and antisocial content. As Wiegman, Kuttschreuter, and Baarda (1992) pointed out, not only do heavy prosocial viewers also tend to be heavy viewers of violence, but many of the prosocial acts shown on television are actually presented in the context of violence, as when a "good" group of people fights a "bad" group. When Mares and Woodard (2000) conducted their meta-analysis, they found stronger negative effects of aggressive-prosocial content than of aggressive content that was unadulterated by any prosocial themes. Perhaps having antisocial acts within the context of positive behaviors actually lends legitimacy to the antisocial acts.

The research suggests that prosocial content can have positive effects that are as strong as the negative effects of antisocial content. However, prosocial content may require repetition as well as related adult commentary and activities for longterm positive effects to occur. Moreover, prosocial content may have different effects on different populations, occasionally causing a backlash among groups that feel threatened by themes such as gender equality.

See also: Advertising Effects; Arousal Processes and Media Effects; Children and Advertising; Children's Attention to Television; Children's Comprehension of Television; Children's Preferences for Media Content; Gender and the Media; Interpersonal Communication; Parental Mediation of Media Effects; Public Broadcasting; Public Health Campaigns; Sesame Street; Social Change and the Media; Society and the Media; Television, Educational; Violence in the Media, Attraction to; Violence in the Media, History of Research on.

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MARIE-LOUISE MARES

SOCIETY, INFORMATION

See: Information Society, Description of

SOCIETY AND THE MEDIA

The relationship between society and the mass media in the United States has been at the center of attention for media theorists and researchers ever since the end of the nineteenth century and the first decades of the twentieth. Several forms of new media-mass circulation newspapers and magazines, movies, sound films, and radio-came on the scene at the same time that industrialization and urbanization, great population shifts within the country, and heavy immigration wrought profound change in the nature of U.S. society. The traditional rural character of America was slipping further into history, replaced by a boiling brew of new and different people with strange and different habits crowded into rapidly growing cities. Crime rose. Social and political unrest spread. Workers agitated for greater rights, safety, and security. Magazine muckrakers used their popular publications to challenge the abuses of business and the privileged.

Many cultural, political, educational, and religious leaders saw a connection between the new forms of communication and the social upheaval that threatened their positions in the status quo. Events overseas offered additional proof of the media's might, as powerful European nation-states made effective use of propaganda to mobilize their people for World War I. The elites recognized the need to understand better the effect of the media on society, and they recognized the necessity to control it.

The result was a macroscopic theory (it presumed to explain society-wide effects of the media) that came to be called mass society theory. Mass society theory viewed the media as corrupting influences that undermined the social order. The media wielded this pernicious power simply because "average" people (that is, those who did not share the supposed superior tastes and values of the elites) were psychologically, socially, and morally defenseless against their corrupting influence. Mass society theory was often expressed as the hypodermic needle or magic bullet theory. That is, the media are a dangerous drug or a killing force that directly and immediately penetrated a person's system.

Despite the worst fears of the threatened elites, not all "average" people were defenselessly influenced by the corrupting mass media. People selected, consumed, and interpreted media content, often in personally important and interesting ways. The media did have effects, but these were beneficial as well as problematic. Since mass society theory could not explain this variety of media use and effects, it eventually collapsed under its own weight.

The Limited Effects of the Media

Paradigm shifts (movement from one overarching theoretical perspective to another) usually occur slowly, and this is true of the move away from mass society theory. However, media researchers traditionally mark the beginning of the end for this perspective as Halloween Eve 1938, when actor and director Orson Welles broadcast a dramatized version of H. G. Wells's science fiction classic *The War of the Worlds* on the CBS radio network. This realistically presented radio play, in which the Earth came under deadly Martian attack, frightened thousands of people who fled their homes in panic.

Elite media critics argued that this event was proof of mass society theory. However, researchers from Princeton University demonstrated that, yes, one million people had been frightened enough by the broadcast to take some action, but the other five million people who heard the show had not, despite what might have been predicted by mass society theory. More important, these scientists discovered that there were different factors that led some people to be influenced and others not.

If not all "average" people were helplessly influenced by the mass media, new media theories were needed to explain the media and society relationship, theories that could identify those individual and social characteristics that did or did not lead to effects. What emerged was the view that the influence of the media was limited by individual differences (e.g., intelligence and education), social categories (e.g., religious and political affiliation), and personal relationships (e.g., the influence of friends and family). The theories that were developed were the first systematic and scientific study of media effects. Taken together they are called limited effects theory. This paradigm shift represented more than a move from mass society to limited effects theory. There was also a shift from interest in macroscopic theory to microscopic theory, that is, theory that focuses on the media-individual relationship rather than the media-society, relationship. This was in part the natural product of the research methods that were then being developed and applied to media studies, because empirically based, objective research methods such as surveys and experiments focus on media use by individuals and the effect of the media on individuals.

Typical of ideas that gained support under the limited effects rubric is two-step flow theory of mass media and personal influence. Research on the 1940 presidential election in the United States indicated that the influence of the media on the voting behavior of people was limited by opinion leaders—people who initially consumed media content on topics of particular interest to them, interpreted it in light of their own values and beliefs, and then passed it on to opinion followers.

During and after World War II, the limited effects paradigm and several theories that it supported became entrenched, dominating research and thinking about the media until well into the 1960s. It was the war itself that was crucial to the development of mass communication theory during this era.

At the beginning of World War II, media theorists were challenged by important barriers as they sought to develop public information campaigns. Memories of World War I were still very much alive, and many Americans were unenthused about entering another distant world conflict. Those who joined or were drafted into the armed forces knew little about their comrades-in-arms from different regions of the country and from different backgrounds. The Office of War Information (OWI), therefore, set out to change public opinion about the wisdom of entering the war and to educate military people about their fellow soldiers and sailors. Speeches, lectures, and pamphlets failed. The OWI then turned to filmmakers such as Frank Capra and radio personalities such as Kate Smith for their audience appeal and looked to social scientists to measure the effectiveness of these new media campaigns.

The U.S. Army established the Experimental Section inside its Information and Education Division, staffing it with psychologists who were expert in issues of attitude change. Led by Carl Hovland, this group of researchers tested the effectiveness of the government's media campaigns. Continuing its work at Yale University after the war, it produced some of the most influential communication research of the twentieth century, which led to the development of attitude change theory, explaining how people's attitudes are formed, shaped, and changed through communication, and how those attitudes influence behavior.

Among the most important attitude change theories are the related ideas of dissonance and selective processes. Dissonance theory argues that, when confronted by new information, people experience a mental discomfort, a dissonance. As a result, they consciously and subconsciously work to limit or reduce that discomfort through three interrelated processes that help them "select" what information they consume, remember, and interpret in personally important and idiosyncratic ways. Selective exposure is the process by which people expose themselves to or attend to only those messages that are consistent with their preexisting attitudes and beliefs. Selective retention assumes that people remember best and longest those messages that are consistent with their preexisting attitudes and beliefs. Selective perception predicts that people will interpret messages in a manner consistent with their preexisting attitudes and beliefs.

Because limited effects theory was the dominant paradigm at the time of the development of dissonance theory, the selective processes were seen as limiting the effect of the media because content is selectively filtered to produce as little attitude change as possible. More important, however, the selective processes formed the core of the influential book *The Effects of Mass Communication* (1960). In it, Joseph Klapper, an eminent scientist and the head of social research for CBS broadcasting, articulated firmly and clearly the core of the limited effects paradigm:
- 1. Mass communication ordinarily does not serve as a necessary and sufficient cause of audience effects, but rather functions among and through a nexus (a web) of mediating factors and influences.
- 2. These mediating factors are such that they typically render mass communication as a contributory agent, but not the sole cause, in the process of reinforcing existing conditions [p. 8].

Klapper's theory, based on social science evidence developed prior to 1960, is often called reinforcement theory. It was very persuasive at a time when the nation's social fabric had yet to feel the full effect of the change brought about by the war. In addition, the public, flush with enthusiasm and optimism for the technology and science that had helped the United States defeat the Axis powers, could see little but good coming from the media technologies, and they trusted the work of Klapper and other scientists. If the media had little effect other than reinforcement on individuals, they could have little effect on society as a whole.

The Paradigm Begins to Shift

In retrospect, the value of reinforcement theory may have passed with its 1960 publication date. With rapid postwar urbanization, industrialization, and the entry of women into the workplace, Klapper's "nexus of mediating factors and influences"-church, family, and school-began to lose its traditional socializing role for many people. During the 1960s, a decade of profound social and cultural change, it became increasingly difficult to ignore the effect of the media. Most important, however, the research that Klapper studied in preparation for his book had been conducted before 1960, the year in which it is generally accepted that television became a mass medium. Almost none of the science that he examined in developing his reinforcement theory examined television.

During the era of limited effects, a number of important ideas were developed that began to question the assumption of limited media influence on people and cultures. They are still respected and examined. Among the most influential is agenda setting, a theory that argues that the media may not tell people what to think, but through specific journalistic practices, they tell people what to think about. The agenda-setting power of the media resides not only in factors such as the amount of space or time devoted to a story and its placement in the broadcast or on the page. Also lending strength to the agenda-setting power of the media is the fact that there is great consistency between media sources across all media in the choice and type of coverage they give an issue or event. This consistency and repetition signal to people the importance of an issue or event.

In their 1975 book *Theories of Mass Communication*, Melvin DeFleur and Sandra Ball-Rokeach offered another view of potentially powerful mass media, tying that power to the dependency of audience members on the media and their content. This media systems dependency theory is composed of several assertions:

- The basis of the influence of the media resides in the "relationship between the larger social system, the media's role in that system, and audience relationships to the media."
- The degree of people's dependence on the media and their content is the "key variable in understanding when and why media messages alter audience beliefs, feelings, or behavior."
- In the modern industrial society, people are increasingly dependent on the media (a) to understand the social world, (b) to act meaningfully and effectively in society, and (c) to find fantasy and escape or diversion.
- People's level of dependency is related to (a) "the number and centrality (importance) of the specific information-delivery functions served by a medium" and (b) the degree of change and conflict present in society.

It is clear that limited effects theory is being left behind here. Dependency theory argues that, especially in a complex and changing society, people become increasingly dependent on the media and media content to understand what is going on around them, to learn how to behave meaningfully, and to escape.

At the same time that some media researchers were challenging the limited effects paradigm with ideas such as agenda setting and dependency theory, psychologists were expanding on their social cognitive theory—the idea that people learn through observation—and applying it to mass media, especially television. Social cognitive theory argues that people model (copy) the behaviors they see and that modeling happens in two ways. The first is imitation, the direct replication of an observed behavior. For example, a child might see a cartoon cat hit a cartoon mouse with a stick and then hit his sister with a stick. The second form of modeling is identification, a special form of imitation in which observers do not copy exactly what they see but make a more generalized, still-related response. For example, the child might still be aggressive to his sister, but dump water on her head rather than hit her.

The idea of identification was of particular value to mass communication theorists. Obviously, people can imitate what they see on television, but not all do. When imitation does occur in dramatic instances—for example, when someone hijacks a plane after seeing it done on television it is so outrageous that it is considered an aberration. Identification however, although harder to see and study, is the more likely way that television influences behavior.

Return to Macroscopic Theory

Some of the obvious and observable effects that television has on society include increased sophistication of the media industries and media consumers, entrenched social problems such as racial strife, the apparent cheapening of the political process, and the emergence of calls for controls on new technologies such as cable, satellites, and computer networks. These are only a few of the many factors that forced mass communication theorists to rethink the influence of media—and to attempt once again to understand the media—society relationship in macroscopic terms.

The theories that have gained the most support among media researchers and theorists are those that accept the potential for powerful media effects, a potential that is either enhanced or thwarted by the involvement of audience members in the mass communication process. One such theory is symbolic interaction. This is the idea that the meaning of symbols is learned through interaction and then mediates that interaction. In other words, people give things meaning, and that meaning controls their behavior. The American flag is an example. Americans have decided that an array of red, white, and blue cloth, assembled in a particular way, represents not only the nation but its values and beliefs. The flag has meaning because Americans have given it meaning, and now that meaning governs certain behavior. For example, Americans are not free to remain seated when a color guard carries the flag into a room. Symbolic interaction is frequently used when studying the influence of advertising, because advertisers often succeed by encouraging consumers to perceive products as symbols that have meaning beyond their actual function. This is called product positioning.

Another macroscopic view of the societal role of the media is social construction of reality, developed by sociologists Peter Berger and Thomas Luckmann. Their 1966 book, *The Social Construction of Reality*, although never mentioning mass communication, offered an explanation of how, using signs and symbols, societies construct and maintain the realities that allow them to function.

Social construction of reality theory argues that people who live in a society share "an ongoing correspondence" of meaning. Things generally mean the same to all members. A stop sign, for example, has just about the same meaning for everyone. Things that have "objective" meaning are symbols—people routinely interpret them in the usual way. However, there are other things in the environment to which people assign "subjective" meaning. These things are signs. In social construction of reality, then, a car is a symbol of mobility, but a Cadillac is a sign of wealth or success. In either case, the meaning is negotiated, but for signs the negotiation is a bit more complex.

Through interaction in and with the culture of a given society over time, people bring together what they have learned about their society's signs and symbols to form typification schemes-collections of meanings assigned to some phenomenon or situation. These typification schemes form a natural backdrop for people's interpretation ofand therefore the way they behave in-"the major routines of everyday life, not only the typification of others . . . but typifications of all sorts of events and experiences" (Berger and Luckmann, 1966, p. 43). When people enter a room, they automatically recall the meaning they have given to its elements-desks in rows, chalkboard, and lectern. They recognize this as a classroom and automatically impose their "classroom typification scheme." They know automatically how to behave-to address the person standing at the front of the room with courtesy, to raise their

hands when asking a question, to talk to neighbors in whispers. These "rules of behavior" are not published on the classroom door.

Social construction of reality is widely applied to the study of how the media, especially news, shape people's political realities. Crime offers one example. What do politicians mean when they say they are "tough on crime"? What is their (and people's) reality of crime? It is likely that "crime" signifies (is a sign for) gangs, drugs, and violence. The statistical, rather than the socially constructed, reality of crime is that there is ten times more whitecollar crime in the United States than there is violent crime. Social construction theorists argue that the "building blocks" for the construction of this "reality" come primarily from the mass media.

Symbolic interaction and social construction of reality provide a strong foundation for another macroscopic theory of the relationship between society and the media. Cultivation analysis says that television "cultivates" or constructs a reality of the world that, although possibly inaccurate, becomes the accepted reality simply because people believe it to be true. They then base their judgments about and their actions in the world on this television-cultivated reality.

Although cultivation analysis was developed by George Gerbner out of concern over the effects of television violence, it has been applied to countless other television-cultivated realities, such as beauty, sex roles, religion, the judicial and political processes, and marriage. In all cases, its assumptions are the same—television cultivates its own realities, especially for heavy viewers.

Cultivation analysis is based on five assumptions:

- 1. Television is essentially and fundamentally different from the other mass media. Unlike books, newspapers, and magazines, viewing requires no reading ability. Unlike the movies, it requires no mobility or money; it is in the home and it is free. Unlike radio, it combines pictures and sound. It is the first and only medium that can be consumed from people's very earliest to their last years of life.
- 2. Television is the "central cultural arm" of U.S. society. Gerbner and his colleagues (1978, p. 178)) wrote that television, as culture's primary storyteller, is "the chief creator of synthetic cultural patterns (entertainment

and information) for the most heterogeneous mass publics in history, including large groups that have never shared in any common public message systems." The product of this sharing of messages is the mainstreaming of reality, moving people toward a shared, television-created understanding of how things are.

- 3. The realities cultivated by television are not necessarily specific attitudes and opinions but rather more basic assumptions about the "facts" of life. By the choices the producers make, television news and entertainment programs present a broad picture of "reality" with little regard for how their "reality" matches that of their audiences.
- 4. The major cultural function of television is to stabilize social patterns, that is, maintain the existing power relationships of the society. Because the media industries have a stake in the political, social, and economic structures as they exist, their stories rarely challenge the system that has enriched them.
- 5. The observable, measurable, independent contributions of television to the culture are relatively small. This is not a restatement of limited effect theory. Instead, Gerbner explained its meaning with his Ice-Age analogy, arguing that just as a change in temperature of just a few degrees over centuries brought about the Ice Age, a relatively small but pervasive degree of media influence can produce important social change. In other words, the size of the media's influence on society is not as important as its steady direction.

Critical Cultural Theory

A major influence on contemporary understanding of the relationship between the media and society comes from European scholarship on media effects. Critical cultural theory—the idea that the media operate primarily to justify and support the status quo at the expense of ordinary people—is rooted in neo-Marxism. Traditional Marxists believed that people were oppressed by those who owned the means of production—the base—that is, the factories and the land. Modern neo-Marxist theorists believe that people are oppressed by those who control the culture—the superstructure—in other words, the mass media.

Modern critical cultural theory encompasses a number of different conceptions of the relationship between the media and society, but all share a number of identifying characteristics. They are macroscopic in scope. They are openly and specifically political. Based in neo-Marxism, their orientation is from the political left. Their goal is at the least to instigate change in the media policies of governments; at the most, their goal is to effect wholesale change in the media and societal systems. Critical cultural theories assume that the superstructure, which favors those in power, must be altered. Finally, they investigate and explain how elites use the media to maintain their positions of privilege and power. Issues such as media ownership, government-media relations, and corporate media representations of labor and disenfranchised groups are typical topics of study for critical cultural theory.

The critical cultural perspective arrived in the United States during the 1930s, when media scholars Max Horkheimer and Theodor Adorno of the University of Frankfurt escaped Adolf Hitler's Germany. Their approach valued serious art—literature, symphonic music, theater—and saw its consumption as a means to elevate people toward a better life. Typical media fare—popular music, slapstick radio and movie comedies, newspapers full of soft-news—pacified ordinary people while assisting in their repression.

The influence of Horkheimer and Adorno on U.S. media theory was minimal during their lifetimes. The limited effects paradigm was about to blossom, neo-Marxism was not well received in the United States, and their ideas echoed claims by the mass society theory of a debasing popular media. More recently, though, the Frankfurt School has been "rediscovered," and its influence can be seen, for example, in the British cultural theory.

There was significant class tension in England after World War II. During the 1950s and 1960s, working-class people who had fought for their country were unwilling to return to England's traditional notions of nobility and privilege. Many saw the British media supporting long-standing class distinctions and divisions. This environment of class conflict produced theorists such as Stuart Hall, who first developed the idea of the media as a public forum where various forces fight to shape perceptions of everyday reality. Hall trusted that the media could serve all people, but that the forum was dominated by the reigning elite because of factors such as ownership patterns, the commercial orientation of the media, and sympathetic government policies toward the media. In other words, the loudest voice in the cultural forum's give-and-take belonged to those who were already well entrenched in the power structure. British cultural studies theory provides a home for much feminist research, as well as on popular culture both in Europe and in the United States.

Contemporary Theories

Modern theories of the relationship between the media and society have to contend with a mass-mediated world, which was not a factor in the creation of the perspectives discussed above. Digitalization, especially in the form of the Internet and the World Wide Web, poses a significant challenge to much of what is known and understood about the relationship between the media and society. For example, many theorists go as far as to reject the term "mass communication," preferring instead the term "mediated communication." They do this because not only are the "traditional" media prospering by serving smaller fragments of what was once a mass audience, but the Internet can make a single individual a mass communicator or allow a giant media company to reach individuals one person at a time. Clearly, new conceptions of how the media and society interact will be called for. Communication science and the media literacy movement are two such examples.

Many empirical media researchers concluded that the constant debate about competing ideas and research methods was impeding the development of a meaningful understanding of how the media and society interact. They proposed communication science, a perspective that integrates approaches grounded in quantitative, empirical, behavioral research methods. It unites limited effects research with some of the beliefs of culture theory in a potentially active audience, and with research on interpersonal communication. Communication science is as an effort to rebuild the empirical media research tradition by breaking its association with limited effects and broadening it to address a larger range of research questions and issues. It is an effort to be inclusive rather than exclusive, to reject many of the outdated assumptions of the limited effects paradigm while retaining the strong empirical focus of that approach to unify under a single banner empirical researchers working in all areas of communication. In this way, communication scientists hope their microscopic research can lead to macroscopic theories about the relationship between the media and society.

Cultural and critical cultural theories, because of their assertion that meaning and, therefore, reality are mutually created by the participants in a culture or society, provide the impetus for the media literacy movement. The arguments are straightforward. If a society debates and defines itself in a forum provided by the mass media, the society (and the democracy that supports and sustains it) will benefit from greater numbers of people being able to function appropriately and effectively in that forum. If a society knows itself through the stories it tells about itself, people who understand how those stories are created, who can interpret them in personally important and relevant ways, or even who can create those stories themselves can best know and participate in that society. Media literacy, then, is the ability to use mass communication effectively and efficiently.

- See also: Advertising Effects; Arousal
 - PROCESSES AND MEDIA EFFECTS; BROADCASTING, GOVERNMENT REGULATION OF; CABLE TELEVI-SION, REGULATION OF; CATHARSIS THEORY AND MEDIA EFFECTS: CULTIVATION THEORY AND MEDIA EFFECTS; CULTURAL STUDIES; CULTURE AND COMMUNICATION; CULTURE INDUSTRIES, MEDIA AS; CUMULATIVE MEDIA EFFECTS; DESEN-SITIZATION AND MEDIA EFFECTS; ELECTION CAM-PAIGNS AND MEDIA EFFECTS; INTERNET AND THE WORLD WIDE WEB; MEAD, GEORGE HERBERT; NEWS EFFECTS; NEWS PRODUCTION THEORIES; PARENTAL MEDIATION OF MEDIA EFFECTS; POLITI-CAL ECONOMY; PROPAGANDA; SCHRAMM, WILBUR; SOCIAL CHANGE AND THE MEDIA; SOCIAL COGNI-TIVE THEORY AND MEDIA EFFECTS; SOCIAL GOALS AND THE MEDIA; SYMBOLS; WELLES, ORSON.

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SOCIOLINGUISTICS

Sociolinguistics is the study of the relationships between language use and social structure. It investigates the correlation between linguistic (i.e., phonological, lexical, and grammatical) variables and social (i.e., gender, age, status, and ethnicity) variables. Since sociolinguistics is concerned with both linguistic and social aspects of language, researchers identify two main distinctions in sociolinguistic inquiry. Micro-sociolinguistics focuses on the social aspects of language, while macro-sociolinguistics examines how linguistic features can provide explanations for certain social phenomena. In other words, micro-sociolinguistics investigates how society influences the way people communicate, while macro-sociolinguistics studies society in relation to language.

Sociolinguistics is a relatively new branch of linguistics. Despite a long tradition of dialect research dating back to the nineteenth century, it was not until the 1960s that sociolinguistics became a recognized area of language research. This came about as a result of the projects that were carried out by William Labov (1966, 1972) in the United States and Peter Trudgill (1983) in the United Kingdom. Laboy, in his studies in New York and Martha's Vineyard, investigated linguistic change and variation as social phenomena. For example, he found that in New York, people who were less secure about their social status were more likely to pronounce the "r" in words such as "car" and "fourth." He found that such pronunciation was treated as newer and more prestigious. Trudgill, in his study of Norwich, England, found that women used more "correct" and prestigious forms of language than did men. He attributed this difference to the differences in the roles and expectations that society placed on men and women. In society, it is "normal" for women to speak "better" than men. Both Labov and Trudgill found evidence of the interconnectedness of language and society and demonstrated that it is possible to find social explanations for linguistic structure and change.

Sociolinguists do not seek to find and prescribe the "correct" or "standard" variant of a language. Rather, they aim to describe the variety in language against a systematic correlation between linguistic and social variables. Labov, for example, in his influential study of black English, argued that African-American Vernacular English (AAVE) is not a poor or illogical way of talking but a rich variant of English that is governed by specific rules.

Unlike theoretical linguists (e.g., Noam Chomsky), who disregard "real-life" conversations and instead study language in terms of ideal speakers who are situated in a homogeneous community, sociolinguists find it difficult and artificial to separate language from the rest of society. Thus, sociolinguistics, without necessarily rejecting the main premises of theoretical linguistics, looks beyond prescribed phonological and grammatical rules at language that is produced by real speakers in a real world.

Regional Dialects

A native speaker of a language in many instances can identify where his or her conversational partner grew up or is currently living. Such identification is based on pronunciation, grammar, and vocabulary. A variation of language spoken in a specific geographical area is a dialect; more specifically, it is a regional dialect. A dialect should not be confused with an accent, which is usually associated with the speech of a nonnative speaker whose native language phonetics penetrates into the target language.

Mutual intelligibility is often used as a criterion to distinguish between a language and a dialect. For example, if a person who is speaking Spanish cannot understand a person who is speaking French, they are said to speak different languages. However, if a person from the southern part of the United States can understand a person from the northern part of the United States, they are said to speak different dialects of the same language. The distinction between language and dialect is not always so clear-cut. For example, Danes and Norwegians understand each other well, but Danish and Norwegian are considered to be two different languages. At the same time, a speaker of Cantonese would not understand a speaker of Mandarin, but Cantonese and Mandarin are both recognized as being dialects of Chinese. Thus, the distinction between a language and a dialect does not lie in mere intelligibility. The distinction is also related to political, historical, social, and cultural factors. Furthermore, Richard Hudson (1998) argues that mutual intelligibility is not between linguistic varieties but between people who are either motivated or not motivated to understand each other. Motivation can be said to be the speakers' attempt to minimize cultural differences and stress similarities.

Social Dialects, Style, and Register

Dialect varieties are not limited to geography; they are also related to the age, social class, and gender of the speakers. All play a significant role in the way people speak. The term "social dialect" is used to describe a speech variety that is associated with a certain social group. For example, Standard American English is a social dialect that is associated with the educated middle- and upper-class population, so it is, therefore, considered to be more prestigious. A nonstandard or vernacular language is usually ascribed less societal prestige. For example, the form "getting" (which is associated with the standard variant) is generally considered to be more prestigious than "gettin" (which is associated with the nonstandard variant). However, "lower-class" speech, especially that of men, has what Labov called "covert prestige," which is different from the standard or "overt prestige" and is associated with group solidarity. Trudgill (1983), in his study of Norwich, found that women are more status conscious and concerned with overt prestige, while men are more concerned with acquiring covert prestige.

Language variety plays an important role in conveying information about a speaker. A person's identity is created, to a large extent, in and by conversation. Identity, however, is not fixed and static; it is fluid and dynamic. Its fluidity depends on the context in which communication is taking place and the social relations between the communicants. For example, the same person can demonstrate different linguistic styles as well as extralinguistic behavior when speaking to a subordinate, a boss, a relative, or a neighbor. Thus, a person can express approximately the same meaning using different language styles that depend on the relationship between the communicants and the level of formality of the situation. Consider the phrases "I have purchased some refreshments" and "I got something to drink." In both cases, the meaning is more or less the same, while the level of formality is different. Where the first is formal and appropriate for official conversation, the second is informal and appropriate for a conversation among friends.

Charles Ferguson (1994, p. 20) states that groups of people who share common interests or jobs develop "similar vocabularies, similar features of intonation, and characteristic bits of syntax and phonology that they use in these situations." This shared language variant is a register. While some researchers do not distinguish between register and style, others see the difference as being essential when examining the language of a particular group of people who are united by interest or occupation. Style, register, and dialect are not mutually exclusive. For example, a person can speak as a doctor to another doctor in informal style and with pronunciation characteristic of her or his dialect. Moreover, a given person can use a variety of registers, such as being a carpenter and a musician. With all of the complexity that is created by dialect, style, and register, it is amazing that people are still so skillful at using speech to identify other people's status, profession, class, and so on.

Multilingualism, Bilingualism, and Diglossia

A person who has the ability to use more than two languages is a multilingual; a person who can use two languages is a bilingual; and a person who uses only one language is a monolingual. The number of bilinguals and multilinguals in a given country depends on many factors, such as proximity to other countries, the language policy in the country, and patterns of immigration. However, it has been estimated that half of the population in the world is bilingual.

People who are bilingual or multilingual do not necessarily have equal linguistic ability in all of the languages that they use; however, people whose competence in two or more languages is approximately equal are balanced bilinguals or multilinguals. As the result of the limited use of a language or languages for an extended period of time, some people may become dormant bilinguals or multilinguals; that is their linguistic competence in that language or languages "gets rusty." (Dormant bilinguals or multilinguals usually can restore their linguistic competence by placing themselves in an environment where their subordinate language or languages are used constantly.)

Another interesting aspect of bilingualism and multilingualism is code-switching. A language or its variant is often called a "code"; thus, codeswitching refers to the situation when a person switches from one language or dialect to another in the same utterance or conversation. For example, a professor from France delivers a lecture in English at one of the universities in the United States; however, during the informal meeting after the lecture this professor may switch back and forth from English to French in conversations with Frenchspeaking colleagues and students. Bilinguals or monolinguals turn to code-switching to establish solidarity and rapport with their conversational partners; moreover, code-switching helps them to maximize their linguistic expressiveness. In codeswitching, bilinguals and multilinguals preserve the rules of all of the languages that are being used. In code-mixing, a person uses elements of one language in a conversation that is being carried on for the most part in another language. Nancy Bonvillain (1993) has identified examples of code-mixing in Kannada, a Dravidian language in South India. For example, some speakers incorporate English words in conversations in Kannada by adding the Kannada suffixes to English words, such as "educated-u," "control-ma," and "sacred occasionnalli." Bonvillain states that such code-mixing has a social function. People who make use of English words in Kannada try to associate themselves with

a more prestigious group of the population because, in India, English is perceived as being the language of those who are more educated and refined than the general population.

Another situation where people use different linguistic codes in different social contexts is diglossia. The term "diglossia" was introduced in 1959 by Charles Ferguson to indicate situations where two varieties of the same language exist in the society and are employed in different sets of social circumstances. Moreover, one of the two varieties is a more prestigious "high" variety (H), while the other is a less prestigious "low" variety (L). For example, Classical Arabic (H) is used in delivering official speeches, while colloquial Arabic (L) is used in everyday communication. Joshua Fishman (1970) extended the concept of diglossia to include not only two varieties of the same language but bilingual and multilingual situations as well. The linguistic situation in Paraguay, where diglossia exists between Spanish (H) and Guaraní (L), can serve as an illustration. In most of the situations, high form (H) is appropriated through formal education and in public domains, while low form (L) is acquired before formal education and is practiced in private domains. Ronald Wardhaugh (1998) suggests that in contrast to code-switching, which reduces differences, diglossia reinforces them. He explains that code-switching often happens on the subconscious level (when a person is unaware of a switch), while diglossia involves speakers who are aware of the switches that are being made from one variant to the other. Overall, choosing a code is not a matter of linguistic preference per se; rather, it is a social act because the code that is chosen creates and re-creates one's social identity.

Lingua Franca, Pidgins, and Creoles

When people who speak different languages have to communicate with each other, they must find a language that they all know, a *lingua franca*. Any language can become a *lingua franca*. For example, in the former Soviet Union, Russian was used as a *lingua franca* in the interactions between non-Russian speakers of the country. In East Africa, Swahili helps people from different tribes to trade with each other; thus, it is "a trade language" between people who do not otherwise share a common language. Due to globalization, and to globalization of the media in particular, English has become an international language—a *lingua franca* for much of the world.

People from different cultures and with different native languages, when they are in contact with each other over an extended period of time, often develop some common, often simplified code that they use as a medium of communication. This code is a pidgin, or a "reduced" language. Therefore, a pidgin is a contact language. Trade and colonization are considered main reasons for the development of pidgin languages. Thus, many pidgins are based on the languages of people who were involved in travel and trade (e.g., English, French, Dutch, Spanish, Portuguese) and are influenced by the languages of people with whom they came into contact. For example, there are more than sixty varieties of English-based pidgin languages; Tok Pisin, a pidgin English spoken in Papua New Guinea, is among them. It should be noted that pidgins are not "bad" or "inferior" languages. Though simplified or "reduced," they are not languages without structure; they are rule governed.

When a pidgin is widely used by the community and serves as a native language for second and future generations, it becomes a creole. Thus, while a pidgin has no native speakers, a creole is the mother tongue—the first language that is acquired by the community of speakers. For example, French creoles are spoken by people in the Caribbean and in some parts of Louisiana. It is estimated that from seven million to seventeen million people in the world speak creole languages. Pidgins and creoles have certain typical characteristics, such as multifunctionality of words, semantic broadening, little or no inflectional morphology, and polysemy.

Researchers of pidgins and creoles do not have a unified theory of the origin of pidgins and creoles. The fact that pidgins and creoles demonstrate certain similarities among them is explained differently by two main theories. Monogenesis (one origin) theory argues that the source of the similarities lies in the development of pidgins and creoles from a single source. Polygenesis theory, or relexification, views these similarities as the result of similar circumstances of their origin. There are, however, theories that explain the development of pidgins and creoles by the inability of non-Europeans to acquire European languages. Extensive studies of pidgins and creoles indicate that they are not deviations from other languages caused by inferiority of their speakers; they are languages with their own rules and systems. According to Suzanne Romaine (1988), many countries experience the phenomenon of recreolization, which is the conscious effort of teenagers who spoke standard English in childhood to speak creole and to listen to songs in creole.

Language and Culture

One of the areas of sociolinguistic research is concerned with the relationship between language and culture. The word "culture" in this context does not mean art, music, or literature of a particular time or society; rather, it is used to describe "any of the customs, world views, language, kinship system, social organization, and other taken-forgranted day-to-day practices of a people which set that group apart as a distinctive group" (Scollon and Scollon, 1996, p. 126). There is no agreement, however, among researchers about whether language determines or at least influences the way in which people experience the surrounding world, or if language merely reflects people's experiences.

The claim that language and its structure influence the way in which people who use it view the world goes back to the beginning of the twentieth century, to the work that Edward Sapir and Benjamin Whorf did in relation to Native American languages. This influence of language on perceptions of the world is known as the Sapir-Whorf hypothesis. It should be noted that similar ideas were expressed by William Humbolt, a prominent linguist of the nineteenth century. The Sapir-Whorf hypothesis is also called the principle of cultural relativity. That is to say, people are influenced by their native languages in the process of perception of the surrounding world. Sapir (1949a, p. 162) states, "human beings do not live in the objective world alone, not alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society."

Sapir, in his study of the language of Paiute (in Arizona, Nevada, and Utah), noticed that for some geographical terms the English language does not have comparable words, so a descriptive translation is required. For example, English does not have words that directly correspond to "canyon without water, plain valley surrounded by mountains, rolling country intersected by several small hillridges" (Sapir, 1949b). Whorf's studies of Hopi, the language of Native American people in Arizona, demonstrate that the notion of time in Hopi does not correspond to the notion of time in English and any other Standard Average European (SAE) language. Thus, while in English, time is a three-tiered division of past, present, and future, in Hopi, time is more indicative of the manner in which the events occur. The focus is on the events in the world as a continuous process where fixed distinctions between tenses are minimized (Whorf, 1956). Though the ideas put forward by Sapir and Whorf have been criticized for their deterministic view on language, their studies have inspired extensive research on the interrelationship between language and culture.

Different kinship systems and color terminology are just a few fascinating areas of research on language and culture. Every language has ways of expressing kinship relationships; however, some kinship systems are more detailed than others. For example, in English, the word "mother-in-law" is used by both wife and husband to identify the mother of the spouse, while in Russian, the husband calls his wife's mother tioshcha and the wife calls her husband's mother svekrov'. Some languages have separate linguistic terms for older and younger siblings, for maternal and paternal relatives, and so on. Kinship systems reflect social relations within the family. In general, the more extensive the social contact is between the family members, the more detailed is the related kinship terminology.

According to Brent Berlin and Paul Kay (1969), who put forward a universal principle of color classification, most but not all languages have a term for each of the following colors: white, black, red, green, yellow, blue, brown, purple, pink, and gray. Berlin and Kay noted that there are no languages with only one color term. However, they also pointed out that the more cultural and technological changes that a society undergoes, the more detailed the color terminology tends to become. For example, Jale (New Guinea) has two terms (black and white); Tarascan (Mexico) has five (white, black, red, yellow, green); and Javanese has seven (white, black, red, yellow, green, blue, brown). Thus, if a language uses only two terms to identify colors, they are white and black; other colors are added systematically. This finding supports

the view of many sociolinguists that color naming in all languages and cultures is a systematic, rulegoverned process.

Power and Solidarity

Every language has a system of expressing power and solidarity relations between people. When people speak, they make choices among different linguistic markers to signal their social distance or closeness with their communicants. Social distance may indicate a difference is status, rank, education, or age. While distance often establishes power relations between the speakers, closeness tends to establish solidarity. Address forms are among the most distinct linguistic choices that reflect power or solidarity relations. When someone is addressed by his or her first name, the addresser usually signals solidarity. The use of titles such as "Mr.," "Ms.," and "Dr." demonstrates that the addresser recognizes the addressee as deserving more respect. An important element in the choice of an address form is the level of formality of a given situation. For example, students in many U.S. colleges can often call their professor by his or her first name during class discussion, but most of those same students would likely address the professor with a formal title during an official ceremony.

Languages differ in their familiar versus polite distinctions. Many languages differentiate between "familiar you" (T) and "polite you" (V). In English, for example, a person who wants to get somebody's attention can say, "Excuse me, you forgot your book," while many languages with familiar versus polite (T/V) distinction are less flexible. Unlike English, which has no T/V distinction, Tu/Vous in French, Ty/Vy in Russian, and Du/Ni in Swedish make a speaker choose the form that is appropriate for the addressee and the situation. The T form is usually reserved for symmetrical relations and indicates solidarity, while the V form usually signals asymmetry and power. However, the relationship between symmetrical/asymmetrical and power/solidarity cannot be reduced to a simple formula where asymmetry indicates power and symmetry indicates solidarity. Power and solidarity are often expressed by the same form; that is, people who are close can address each other using the V form, including their titles, as an indication of solidarity. For example, two professors who happen to be friends might address each other using "professor" and the V form during a conference. However, when an employer addresses an employee by first name and the T form while the employee uses "Mr." or "Ms." and the V form in return, it is a signal of power imbalance and asymmetry. Therefore, the reciprocity is one of the most important markers of solidarity.

The choice of an address form and/or T/V form is influenced by sociocultural norms. For example, after the October Revolution in Russia, people addressed each other as "comrade" to indicate solidarity. However, even before the collapse of the former Soviet Union, the address form "comrade" ceased to exist, which was as an indication of changes in society. Thus, different address forms and the T/V form are not a static category; rather, they change in accordance with social changes.

Politeness

While social closeness and distance are factors in people's choices of formal or informal forms of address, politeness is the decisive factor in degree of friendliness and amount of imposition in communication. Social psychologist Erving Goffman (1956, 1967) and linguists Penelope Brown and Stephen Levinson (1987) worked extensively on the phenomena of politeness. Goffman introduced the notion of "face," an image that is produced by a person in social contacts with other people. Goffman differentiated between a "positive face" (i.e., the need to be appreciated) and a "negative face" (i.e., the need to be not disturbed). Brown and Levinson identified positive and negative politeness, where "positive politeness" is a warm friendly behavior toward others and "negative politeness" is the avoidance of imposition. Both negative and positive politeness, thus, can be understood as consideration for another person's face.

Any demand, request, and even advice can be seen as a face-threatening act (FTA), which threatens a person's public image, or face. For example, if a speaker issues a direct command to the listener, "Send this letter immediately," this directive might threaten the listener's face. Politeness repairs the damage that is inflicted by FTAs. Polite people try to avoid FTAs or minimize their effect. For example, they soften commands by making them less direct, "Could you send this letter immediately"; they use compliments and stress solidarity between them and their listeners, "I really appreciate your work." Thus, politeness explains the indirectness of human communication as people's desire to save their communicants' and their own face in interactions; moreover, politeness helps to understand presequencing, or the preparation to a request, question, and so on. For example, some speakers, instead of directly requesting something from a listener, start with a prerequest:

Prerequest by A: Do you have a minute?

"Go ahead" signal by B: Sure.

Request by A: Could you send this itinerary to Green?

Accept by B: Okay.

In the interchange above, the prerequest by A is a face-saving maneuver for both A and B. If B indicates that she or he is busy, it eliminates the request and accept stages, and A does not receive a refusal to the main request, which would have caused A to lose face. Speakers use similar strategies in preannouncing ("You will never guess what happened today") or preinvitations ("Are you busy this weekend?"). Politeness is analyzed in a greater detail in pragmatics, the study of the relationship between language and its users. Pragmatics is concerned with how meaning is communicated by the speaker and is interpreted by the listener.

Language and Gender

While the term "sex" refers to the biological differences of women and men, the term "gender" indicates the psychological and sociocultural significance that is attached to those differences. Since ancient times, scientists from different fields of human research have been interested in determining if men and women think, act, and speak differently or alike. It has been reported that only male and female Carib Indians from the West Indies speak different languages, whereas in other parts of the world, women and men are reported to speak the same languages with some differences, mainly in vocabulary. It should be noted that research on gender and language is not limited to male-female interactions; it also studies gay, lesbian, and other gender communication.

Robin Lakoff (1973) noted that it is more typical of women to use such color words as mauve, beige, and lavender and more emphatic expressions such as adorable, lovely, and divine. Lakoff

also claimed that in word pairs (gentleman-lady, bachelor-spinster, master-mistress), female parts acquire a more negative meaning. Research on language and gender has contributed to uncovering sexism in language. For example, as recently as the early 1970s, it was normal in English to use the pronoun "he" and words such as "chairman," "policeman," and "mankind" in a generic manner or to address women as "Miss" or "Mrs.," but these have all subsequently come to be known as elements of sexist language. Researchers have also found differences in covert and overt prestige in language use between women and men. Gerhard Leitner (1997) has discussed the dynamic role of media in creating awareness of gender-specific language. According to Leitner, the ABC network's pioneering ruling in 1984 on the avoidance of gender-specific (sexist) language was unfavorably met by both the audience and the media, but ABC adhered to its new policy.

The main division of the study of gender can be classified as either culture/difference or power/dominance theories. According to the first approach, the clear-cut division of labor and, consequently, same-sex socializing promoted the development of different communicative strategies and, more broadly, different cultures. To achieve understanding, women and men have to learn and respect the cultures of each other. The second, focuses more on the power imbalance in society. According to this critical feminist approach, the language in a male-dominated society is created by and for men. In general, these researchers view power imbalance as the key impediment that prevents women and men from successful communication both at work and in private relationships.

Ethnography of Communication

Because of their common interest in human communication, the ethnography of communication unites linguistic and anthropological studies. This framework stresses the mutual responsibility of the speaker and the listener for successful communication. Dell Hymes (1974), the founder of this approach, proposed the acronym SPEAKING, where each letter stands for an important component of communication:

S = Setting or Scene P = Participants E = Ends

A = Act Sequence

- K = Key
- I = Instrumentalities
- N = Norms of Interaction and Interpretation

G = Genre.

"Setting" refers to the physical circumstances (time and place of the event), while "scene" refers to the subjective definition of the event (psychological or cultural). "Participants" refers to the speaker-sender-addresser and hearer-receiveraudience-addressee. "Ends" refers to the outcome (both conventional and personal). "Act sequence" refers to the form and content of the message (i.e., what is said and how in relationship to the actual topic). "Key" refers to the tone and manner (e.g., serious, light-hearted) of the delivery. "Instrumentalities" refers to the channel (e.g., oral, written, telegraphic, and so on). "Norms of interaction and interpretation" refers to the specific behavior and properties that are attached to speaking (e.g., formal, casual). "Genre" refers to the types of texts (e.g., poems, prayers, lectures, editorials, and so on).

Each component of SPEAKING is important in communication. To be a competent communicant, a person must know when and in what setting it is appropriate to speak and when to be silent, how to issue a request and accept an apology, and how to address a person of the same or different status and age. The ethnography of communication is closely connected with social and cultural norms and rules, which are different in different societies. Thus, to prevent the failure of cross-cultural communication, a person should not limit himself or herself to the rules of his or her society but instead should take into consideration the rules of the society of his or her communicant.

Language and Media

According to Allan Bell (1991), media are dominating presenters of language in society. Advertisers use language to persuade people, and news organizations attempt to influence the attitudes of people. Thus, the media use language as a tool in shaping and reflecting people's values and people's perceptions of themselves and others. In presenting information, the media target the audience, their tastes, and beliefs. Bell argued that instead of targeting the individual, media cater to a social group-specifically, to a stereotypical social group. This means that the language of presentation reflects linguistic features that are stereotypically associated with a certain social group. For example, a program that targets women would use a "typical" female linguistic variant to establish rapport with its audience. Traditionally, the relationship between media and audience is presented as unidirectional, where media send messages to the target audience. Joshua Fishman (1974, p. 1644) stated that the standard language is the most appropriate variant for the media, government, legal, and educational networks because this variety is "the 'safest' for those communications in which the speaker cannot know his diversified and numerous listeners." However, with the development of new interactive media such as the Internet, the diversity of the target audience cannot be disregarded.

Bell (1991) indicated that research on the linguistic styles of several British newspapers showed that upmarket papers (e.g., *The Times*, *Financial Times*, *Guardian*) operate on distance and negative politeness, while the downmarket papers (e.g., *Daily Mirror*, *Star*, *Sun*) dwell on solidarity and positive politeness. In other words, linguistic choices reflect social stratification of society, as well as its values and beliefs.

Advertisers use a multilingual approach to present the quality of their products. For example, stereotypically, French has been associated with elegance and refinement. Therefore, numerous cosmetics and fashion-goods commercials employ French and/or French-accented messages. Torben Vestergaard and Kim Schroder (1985) found that in many commercials, the advertisers avoid using the word "buy" in the imperative clause to avoid direct imposition; instead, they call on the audience to act with the words "try," "ask," "get," "take," "use," "call," "make," and so on. Advertisers rely on more indirect ways of attracting the attention of prospective buyers because telling the audience what to do is considered to be a facethreatening strategy.

In media, every linguistic element, from the headline and structure of the lead paragraph to the choice of words in indirect speech, is important in creating information that is aimed at the target audience. Thus, research on media language uncovers the techniques of creating the information for the target audience. It provides insights on language, media, and society in general.

Conclusion

From a new subdiscipline within linguistics, sociolinguistics has developed into an elaborated area of interdisciplinary research on the dynamic relationship that exists between language and society. As the study of language in relation to society, sociolinguistics is closely connected with other areas of human research, such as anthropology, sociology, psychology, education, and media studies. Sociolinguistics not only incorporates the insights from these disciplines into its research but also feeds back to these other disciplines, thereby promoting knowledge and awareness of certain linguistic varieties that are spoken by different groups in relation to the value systems and social structures of society.

See also: Culture and Communication; Culture Industries, Media As; Gender and the Media; Globalization of Culture Through the Media; Intercultural Communication, Adaptation and; Interpersonal Communication; Language Acquisition; Language and Communication; Language Structure; Society and the Media.

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SOFTWARE

See: Computer Software; Computer Software, Educational; Computing

SPORTS AND MEDIA EFFECTS

Since the dawn of civilization, people have enjoyed viewing sports. From the time that there was gladiatorial combat in Rome and frenetic ball games in the land of the Aztecs, there have been avid sport spectators (for an excellent review of the history of sport spectators, see Guttman, 1986). A sport spectator is defined herein as someone who regularly watches, listens to, or reads about sporting events. Spectators can be further subdivided into two classifications: direct sport consumers and indirect sport consumers (Wann, 1997). Direct sport consumers are individuals who are actually in attendance at the sporting event. Indirect sport consumers are individuals who view the event on television, listen to it on the radio, or read about it in the newspaper or on the Internet. This entry focuses primarily on the reasons why indirect sport consumership is so ubiquitous and discusses the effects that sport fanship has on people.

The prevalence of sport spectatorship in Western society is undeniable. Consider that in 1986, American viewers reported a preference for watching televised sports over watching newscasts, documentaries, sitcoms, and every other category of televised entertainment except movies (Guttmann, 1986). Major events such as the Super Bowl regularly top 100 million viewers, while the World Cup is reported to have drawn more than 2 billion viewers internationally. There are more than half a dozen cable channels in the United States devoted exclusively to sports programming, and numerous other sports-related subscription packages are available from cable providers, so the sport spectator has greater access to sporting events than ever before. But what is it that draws so many people to watch sports?

To begin to answer this question, it is important to note the unique features involved in watching sporting events compared to watching other forms of entertainment. Lawrence Wenner and Walter Gantz (1989, p. 242) outline these fundamental differences:

Most nonsport entertainment programs are prerecorded, scripted stories with actors

playing roles. Plot outcomes are rarely in doubt, protagonists tend to survive, and actors "bloodied" in action show no scars off the set. Most televised sport is live and unrehearsed, and "bloodied" athletes carry scars off the field. Athletes' careers hinge on their performances, and outcomes are uncertain.

Thus, it appears that the inherent uncertainty of sporting events is firmly linked to the enjoyment of viewing them. Indeed, Dolf Zillmann, Jennings Bryant, and Barry Sapolsky (1989) point out that the uncommon, unexpected, and surprising events "hold greater promise for being appreciated" due to their novelty. The unthinkable upset can happen (e.g., the victory of the U.S. Hockey Team over the heavily favored Soviet National Team in the 1980 Winter Olympics) and thus an individual has the chance to see something never seen before (e.g., fantastic finishes, amazingly acrobatic defensive plays, dominating performances).

Motives of Indirect Sport Spectators

Several motives of both direct and indirect sport spectators have been theorized or identified by researchers. These motives include, but are not limited to, catharsis, stimulation seeking, social needs, escapism, entertainment needs, aesthetics, and self-esteem management. Although each of these motives will be discussed in turn, it is important to point out that these different motives are in no way mutually exclusive; it is likely that for many individuals, sport spectating serves a number of different motives. A consideration of the range of different motivations provides a fuller picture of the widespread appeal of sport spectatorship in Western society.

Catharsis

The first of the motives, catharsis, is a theory invoked by Sigmund Freud in 1920 and which later gained popularity through the work of Konrad Lorenz (1966). The theory of catharsis is based on Freud's belief that aggressiveness and hostility are unavoidably inherited traits or predispositions, rather than characteristics gained through learning or experience. Freud (1955) believed that an inherent need to act aggressively was evolutionarily adaptive and served people well until laws and societies were formed wherein aggressive behavior was frowned upon. In such a society, other outlets would be necessary to vent the natural predisposition toward aggressiveness. Hence, the theory of catharsis, wherein individuals seek to view aggressive acts as a vicarious way of satisfying their need to act aggressively (Bryant and Zillmann, 1983). This theory has been used to explain the popularity of many of the kinds of violent sports. It is proposed that by watching others engage in brutal and violent actions, one can vicariously release pent-up aggressive impulses and feelings.

This "hydraulic" model of aggression has been widely accepted in contemporary society, and many people subscribe to the view that participating in or watching violent sports or movies is an effective way to reduce aggressive inclinations. Although it makes intuitive sense that an individual might achieve some sort of "release" through watching violent or highly competitive sports, this theory has not been substantiated by research. In fact, the findings of almost all related studies show that the aggressiveness and hostility levels of spectators actually increase as they watch a competitive or aggressive sporting event (Goldstein and Arms, 1971). The work of social psychologist Leonard Berkowitz (1969) and others have shown that exposure to violence and aggression "primes" people to think, feel, and act more aggressively. Sociallearning theorists such as Albert Bandura (1971) have demonstrated that people exposed to others who are rewarded for acting violently are more likely to display violent behavior in their own behavior. Both of these findings have been used to explain the increase in fan violence often observed during and after the viewing of sporting events. Thus, there seems to be little evidence for the cathartic effect of sports; instead, watching violent sports seems to fuel aggressiveness in spectators.

Stimulation Seeking

The second motive, stimulation seeking, is almost the exact reverse of catharsis theory. Researchers Jennings Bryant and Dolf Zillmann propose that individuals, whether consciously or not, seek out stimulation to achieve an increased level of arousal or excitation (Guttmann, 1998; Bryant and Zillmann, 1983). This view stems from the perspective that humans, similar to other organisms, seek stimulation and novelty in their environment. Participating in or watching sports is one avenue toward alleviating boredom and achieving an optimal level of arousal. This line of research has shown that subjects tend to rate more violent and aggressive plays in football and other sports as more fun to watch. Anecdotally, it is known that many individuals enjoy the fights in hockey games or the crashes at auto races, presumably because these events add to the excitement of the contest. In their fittingly titled 1970 essay "The Quest for Excitement in Unexciting Societies," Norbert Elias and Eric Dunning propose a direct relationship between decreasing opportunities for overt excitement and thrill in society, and an increase in the prevalence of violent sports (Guttmann, 1998). Thus, there seems to be converging evidence that people find the vicarious experience of violence and aggression to be stimulating and enjoyable.

It should be borne in mind that catharsis and stimulation-seeking motives can serve as explanations only for the spectating of violent sports. Wenner and Gantz (1989) found that stimulationseeking motives applied most strongly to spectators of fast-paced and contact sports. Because not all sports are violent, it is clear that other motives must underlie the attraction for spectating nonviolent as well as violent sports.

Social Needs

The third motive for sport spectating, social needs, applies to nonviolent and violent sports alike. This motive is based on a proposed desire of spectators to spend time with their family or others that they socialize with, such as friends or coworkers. The work of Wenner and Gantz (1989) has shown that spectators will often cite social involvement and companionship as motives for their spectating of sports on television. Zillmann, Bryant, and Sapolsky (1989) discuss the possibility that indirect spectatorship of sports with others should create bonds between people who affiliate themselves with the same teams. Spectators who root for teams together share the joys of victory with each other, as well as the humiliation or anguish of defeat. Though intuition suggests that the sharing of such experiences surely creates a lasting bond between people, these researchers are quick to point out that the actual social effects of spectatorship have received little empirical examination.

Roy Baumeister and Mark Leary (1995) have discussed the "need to belong" as a fundamental human motivation. This belongingness need is satisfied when individuals feel strong, stable social attachments to others. These social attachments



Participation in group viewing of a sports event can fulfill some of the social needs of the individuals, especially when they are cheering for a local hero, which is what these people in Austin, Texas, were doing when they watched Lance Armstrong win his second consecutive Tour de France on July 23, 2000. (Reuters NewMedia Inc./Corbis)

may be derived through connections with family or friends, but they can also be satisfied by the groups to which individuals belong. Bonds formed by individuals sharing a common allegiance (to a hometown team, for example), like the bonds between members of a church or other social group, serve the important purpose of satisfying the belongingness need and helping an individual to feel a part of a community. Indeed, in many communities and social circles, following the local sports team is part of the cultural norm; those who do not follow the team are considered social outcasts. Moreover, in the company of fellow spectators, an individual is able to feel accepted and can share his or her feelings, thoughts, and emotions freely. Thus, fundamental affiliative and emotional needs can be satisfied through watching and following sports with fellow spectators.

However, given that there are many other ways that people can satisfy basic belongingness needs, there is still a question as to why so many choose sports. In Western society, sport has some unique features that make it a particularly desirable and attractive avenue to achieve a sense of belonging. Sports are an extremely popular conversational topic, and many people often spend hours talking about past, present, or future sporting events with friends and acquaintances. Sports events can also be conversational topics that help establish social contacts with others; people can promote good relations with colleagues and coworkers by discussing last-night's game and can initiate conversations with strangers on buses and planes by "talking sports" with them. Zillmann, Bryant, and Sapolsky (1989) theorize that this popularity is due in no small part to the low risk of sports topics in conversation. They postulate that, while most opinions on music, movies, and politics are extremely open to argument, great performances in sports are rarely refutable. One person may think a movie actor is fantastic while another considers him terrible, but few people would disagree with the opinion that Michael Jordan was a great basketball player, that Mark McGwire is a great power hitter, or that the U.S. Women's National Soccer Team had a great season in winning the 1999 World Cup. Thus, watching and following sports may be one of the easiest and most societally acceptable ways to create social bonds with others and satisfy basic social needs.

Escapism

The fourth motive, escapism, applies quite broadly to many varieties of entertainment. People will often go to a movie or watch a television drama to escape momentarily their everyday humdrum. Sport spectating, however, seems to be an extraordinarily effective escape as evidenced by the following examples. During World War II, President Franklin D. Roosevelt made a decision to let the professional baseball seasons continue. In spite of the burden on the teams, players, and families, he hoped that it would provide Americans with an escape from their trying times (Wann, 1997). This, combined with the creation of the All-American Girls Professional Baseball League in 1943 (immortalized in the 1988 film A League of Their Own), at a time when a large number of male ballplayers were drafted for military service, points to the particular salience of sport spectatorship as an effective route for escape from worries.

Entertainment

The fifth motive, entertainment, is relatively self-explanatory. Spectators seek to be entertained by watching or listening to sporting events. According to sport psychologist Daniel Wann (1997), this motive may play heavily into the spectating of pseudosports. Pseudosports are athletic contests that are scripted and staged; for example, roller derby or professional wrestling. Sport researcher George P. Stone found in 1971 that although there is no surprise in the rigged outcome of these events—which is one of the factors that differentiates sports from other entertainment—spectators were still attracted to them for their sheer entertainment value.

The seemingly paradoxical enjoyment of even these highly predictable sporting events may be due in part to the two basic tenets of disposition theory in sport fanship. These are laid out simply by Zillmann, Bryant, and Sapolsky (1989) as follows: (1) positive feelings for a party (i.e., a team or player) will increase the enjoyment of witnessing the victory of that party and (2) negative feelings toward a party will increase the enjoyment of witnessing the defeat of that party. These simple propositions are easy to apply to a sport where the victory of the proverbial "good guy" over the "bad guy" is doubtlessly written into the script. However, such a view would also predict that the entertainment value should be magnified when the outcome is uncertain, making victory sweeter and defeat more devastating. Indeed, Zillmann, Bryant, and Sapolsky (1989) reported that factors that accentuate the human drama of sports (e.g., announcers that present the players as embittered rivals or the fierce competitive spirit of the participants in a contest) enhance the enjoyment of the sporting event.

Aesthetics

The sixth motive for sport spectatorship, and one closely related to entertainment, is aesthetics. By the motive of aesthetics, it is meant that spectators are drawn to certain types of sports for the qualities of beauty, grace, and skill inherent in them. Sports such as figure skating, synchronized swimming, or gymnastics lend themselves for obvious reasons to aesthetic appreciation. American football, baseball, and hockey might not seem such likely candidates for this motive, but one need only talk with a devotee of hockey or pay notice to the title of Robert Mayer's 1984 book The Grace of Shortstops to realize that this is not necessarily the case. People marvel at the athletic ability of these skilled individuals who make difficult, unbelievable plays. In fact, the cable sports network ESPN has begun to give out awards known as ESPYs to plays that are recognized as the most outstanding ones of the year.

Although relatively little research has been devoted to investigating the particular role of aesthetics in sport spectatorship, there is some evidence that people appreciate and enjoy more complicated and difficult plays. However, it is often hard to separate the effects of the riskiness of a play from the success of the play. Risky or difficult plays that are successful lead to greater enjoyment ("great call"), but unsuccessful risky plays often result in the greatest disappointment. Nonetheless, there is sufficient evidence to this point that spectators derive enjoyment from an aesthetic appreciation of the skill and agility, as well as the competitiveness and intensity, of the players.

Self-Esteem Management

The last motive that will be discussed in this entry, self-esteem management, is one of the more thoroughly researched and complex motives of sport spectators. Several researchers have found that sport spectators derive self-esteem enhancement from identifying with a successful team. Robert Cialdini and his colleagues (1976) denoted a phenomenon known as "basking-inreflected-glory" (or BIRGing), which refers to the tendency for individuals to proclaim their association with a successful other. For example, Cialdini and his colleagues found that fans of a university's college football team were more likely to wear school-identifying apparel on the Mondays following team victories than on Mondays following team defeats. Moreover, in describing the outcome of team games, university students used the pronoun "we" to describe team victories (e.g., "We won that game, 20-17") but used the pronoun "they" to describe team losses (e.g., "They lost, 38-14"). This research demonstrated that sports fans are more likely to illustrate their connection with a team when that team is successful. Conversely, sports fans tend to distance themselves from a team when that team is unsuccessful, a phenomenon that has been labeled "cutting-off-reflected-failure" (or CORFing). Cialdini and his colleagues argued that by BIRGing, an individual can derive positive esteem from their association with a successful other. Indeed, people often state their association (e.g., from the same hometown, attended the same school) with a famous celebrity or personality. Similarly, identifying with a successful sports team can be a way to derive self-esteem from the success of the team. Team success becomes a personal success, and one can take pride in the accomplishment of one's team.

But do people really feel greater self-esteem when a team is successful? Cialdini and Kenneth Richardson (1980) found that people whose selfesteem had previously been threatened (by failure on a social-skills task) were more likely to bask in the success of their school's teams (as well as its other assets). Moreover, these same individuals experiencing a self-esteem threat were most likely to blast their school's rival. Thus, it appears that self-esteem needs are indeed involved in the BIRGing phenomenon. Furthermore, Edward Hirt and his colleagues (1992) directly measured the selfesteem of fans after team victories and defeats and found that fans showed some elevation in mood and self-esteem after team wins, but reported lower mood and self-esteem following team losses. Indeed, in one study (Hirt et al., 1992; study 2), the reactions of fans to team success and failure were compared to a personal success and failure (i.e., doing well or poorly on a test of general intellectual ability). The results indicated that the mood and self-esteem of fans were as high after team success as after personal success, and as low after team failure as after personal failure.

These data strongly suggest that fans ally themselves so closely to their team that they view team success as a personal success and team failure as a personal failure. Moreover, the outcome of a team had profound effects on the predictions by fans of their own future performance. Hirt and his colleagues (1992) had fans predict how well they would do at a series of tasks following the game. It was found that after wins, fans were much more optimistic about their performance at these different tasks than they were after losses. After wins, fans viewed themselves as winners and predicted that they would be more successful in their future endeavors; after losses, they viewed themselves as losers and were much more pessimistic about the future. The most interesting implication of these findings is that, at least for highly allegiant fans, following their team is a precarious proposition. Fans can derive greater self-esteem when their team is successful but suffer self-esteem decrements when their team is unsuccessful.

It is important to note that not all sport spectators are highly allegiant fans. Many spectators may have little or no allegiance to the teams playing or may be best characterized as "fair weather fans" who jump on the bandwagon of teams who are successful and can bask in their reflected glory (BIRG). When these teams are no longer successful, these spectators lose interest in the team and can cut off reflected failure (CORF). However, for fans who strongly identify with a team, they maintain their allegiance to the team through thick and thin. They suffer through the poor seasons and hard times, but relish the successful seasons and good times. The sense of loyalty that these individuals feel to their team becomes a critical part of their identity and they steadfastly maintain their allegiance to the team (case in point, the long-suffering Chicago Cubs fans).

An intriguing aspect of the BIRGing phenomenon is that the spectators feel justified in taking some credit for the success of the team. While many people acknowledge the "home-field advantage" in sports and view this advantage as at least partially due to the support and cheering of the fans in the audience during home games, it is more difficult to imagine how spectators watching the game on television can believe that they had a causal effect on the game. However irrational this belief may appear to be, psychological research has shown that individuals merely associated with positive or desirable events are liked, whereas individuals associated with negative or undesirable events are disliked (cf. Zajonc, 1980). Thus, associating with a winner or a team of winners will elevate the esteem of an individual in the eyes of others and is an avenue for improving an individual's self-evaluation.

Research has attempted to understand other bases for the desire of fans to affiliate themselves with sports teams. Mark Dechesne, Jeff Greenberg, and their colleagues (2000) argued that one source may be a fear of death. In their research, they compared the reactions of people who are first asked to consider their own death (a mortality salient condition) to a control condition wherein people are not asked to ponder their own mortality. They found that fans who were reminded of their own death showed stronger affiliation and identification with their team, suggesting that allegiance to a successful team may help individuals cope with and transcend mortality concerns. These conclusions also fit in nicely with the notion that identifying with sports teams serves social needs for belongingness: individuals who feel connected to and identify with a successful other or group may feel better about themselves and the meaningfulness of their existence.

Dispositional Approaches

As has been discussed, there are a variety of different theories about what motivates people to be sport spectators. It is likely that, for many individuals, multiple goals and motives are being satisfied while watching sports. Sport spectating may serve as a source of highly stimulating and captivating entertainment, while simultaneously satisfying social and self-esteem needs. Indeed, the pervasiveness of sport spectatorship in Western society almost requires that this is so, since its appeal extends to so many different types of people.

This is not to say that there are not individual differences in the kinds of people who are the most avid sport spectators. A good deal of research has attempted to identify a personality profile of the sports fan. The word "fan," short for "fanatic," implies an individual with an undying devotion to their team. Indeed, the behavior of these highly devoted fans (whose rituals before and during games are legendary) is often bewildering to those individuals who are not fans. A dispositional approach to sport fanship has yielded some interesting findings, but its greatest contribution appears to be demonstrating how individual differences moderate the strength of the various motives underlying sport spectatorship. For example, individuals differ in their degree of sensation seeking (Zuckerman, 1979). High-sensation seekers crave excitement and are easily bored; these individuals tend to prefer high-risk sports and activities. Lowsensation seekers, on the other hand, tend to prefer the safety and predictability of routine. Thus, the extent to which stimulation motives underlie sport fanship should be greater for high-sensationseeking individuals. Similarly, individuals with low self-esteem have been shown to be likely to engage in indirect forms of self-enhancement, such as basking in reflected glory (Brown, Collins, and Schmidt, 1988). Individuals with high self-esteem prefer to derive their esteem from their own accomplishments as opposed to the accomplishments of others with whom they are associated. As a result, the self-esteem management function of sport fanship is likely to play a greater role for individuals with low self-esteem. These results underscore the value in considering that certain types of individuals may be more prone to be attracted to sports and to become sport spectators precisely because salient motives in their lives can be satisfied through sport fanship.

Conclusions and Future Directions

It is clear at the beginning of the twentieth century that sport spectatorship is growing to unprecedented proportions. Further research is needed in order to understand the bases for this phenomenon. Although the theories and research reviewed in this entry have provided some insights to the reasons and motives that may be associated with sport spectatorship, the work has been generally descriptive in nature and has not fully elaborated the factors underlying these motives or the ways in which watching sports satisfies these fundamental needs and motives. One potential fruitful avenue for future research is an examination of the biological bases for these motives. Indeed, some of the work on individual differences has focused on the biological differences between individuals who are high or low in sensation seeking. People who have a high level of sensation seeking have a lower baseline level of arousal than people who have a low level of sensation seeking-which may account for their greater need to seek arousing stimuli in their environment. Work by Paul Bernhardt, James Dabbs, and their colleagues (1998) has found changes in the testosterone levels of fans in response to the winning and losing of their sports teams, changes that seem to parallel the psychological changes to winning and losing that were documented earlier in this entry. Increases in testosterone levels were associated with watching winning performances, implying that physiological changes may underscore psychological phenomena such as basking in reflected glory. Furthermore, changes in testosterone levels have been shown to be associated with expressions of dominance and aggressive behavior, which may provide some links to understanding achievement-seeking motives in sport spectating as well as the increases in violent behavior often associated with sport spectating. When combined with the solid foundation in research and theory outlined in this article, results such as these provide some exciting future directions for the study and understanding of sport spectatorship and all its many facets.

See also: Arousal Processes and Media Effects; Catharsis Theory and Media Effects; Social Cognitive Theory and Media Effects.

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EDWARD R. HIRT NATHAN L. STEELE

STANDARDS AND INFORMATION

It is a tribute to the power and effectiveness of information processing standards that people benefit from so many of them without noticing. Standards allow computers and computer programs to share information, even when the hardware or software has been designed by different individuals or companies. When a new expansion card or peripheral works in a computer without any problems, it is because the device has been designed to conform to standards. When software is able to read a data file sent to a user by a friend, it is because the data is written and read according to a standard format. Information processing is only one of many areas of daily life in which standards are important. For example, automobile parts and the voltage of household electrical current are standardized, and money is a standard medium of exchange.

When a person refers to an information or data processing "standard," he or she may mean any of the following:

- 1. A method, protocol, or system for accomplishing a particular task, such as encoding information in a file or sharing it over a network.
- 2. Hardware or software that employs or executes that method or protocol (e.g., a wordprocessing program).

- 3. A document that specifies the method or protocol in very detailed, precise technical language.
- 4. An agreement that such a document represents among organizations or individuals.

For the purposes of this entry, an adequate definition of "information processing standards" is that they are precisely documented agreements about methods or protocols for information processing that are realized in the operation of computer hardware and software.

Standards as Solutions

The impetus for the creation of any standard is to address a particular problem. As indicated by Martin Libicki (1995), the goal of standardization is almost always to make a process more efficient or reliable, or to define a single consistent interface that allows unlike systems or applications to interoperate.

Consider the problem of representing the content of documents in computer files. The most basic problem is how to represent individual text characters as sequences of binary digits (ones and zeros). Solutions to this problem in the 1960s eventually culminated in one of the most successful and widely used data interchange standards: ASCII (the American National Standard Code for Information Interchange). For many computer users, the term "ASCII" is synonymous with "plain text," but all computer files consist of binary data, and an ASCII file is simply a binary file with contents that are meaningful when interpreted according to the ASCII standard. An application that represents text using the ASCII code can exchange information with other programs that read and write ASCII files.

ASCII is very limited as a solution to the problem of representing document content. The code consists of only 128 characters, each represented by a sequence of seven bits. That is not even enough for every European alphabet, let alone the many alphabets and other forms of writing in the world. A number of extended, ASCII-based character sets have been proposed for the representation of non-Roman alphabets such as the Arabic and Hebrew alphabets. Some have become standards, like the eight-bit ISO 8859 family of character sets (approved by the International Organization for Standardization). The Unicode standard (created by the Unicode Consortium) uses a sixteen-bit encoding system and aims to include every major script in the world and every technical symbol in common use.

Another limitation of ASCII and other plaintext formats is that documents contain forms of information other than alphanumeric characters, punctuation, and blank space. The software industry has produced many technologies for the representation of images, multimedia data, specifications for presentation and formatting, and hypertext links. Some of these technologies have also become standards.

Standards as Documents

Standards documents are notoriously difficult to read. This reputation is deserved, but largely due to factors that are unavoidable. Almost all standards emerge from the work and consensus of many people, and they therefore represent solutions that are general enough to address a variety of problems. For example, the Standard Generalized Markup Language, or SGML (ISO 8879), is a successful and influential standard that enables the structure of a document to be encoded separately from its presentation. Invented by Charles Goldfarb in the 1970s, SGML would be much easier for novices to understand if it defined a single character set (such as ASCII or Unicode) for all conforming documents. But SGML is flexible enough to accept any number of different character sets, and for that reason, SGML syntax must be described at more than one level of abstraction. This is only one example of how the generality and flexibility of standards makes them difficult documents to read. On the other hand, adopting a general solution to a problem often forces one to think more broadly and deeply about an application. That can help avoid additional work and expense in the long run.

There are other reasons why standards documents can be problematic for newcomers. As the adoption of a standard becomes more widespread and formalized, the same solution (or nearly the same) may be published by different organizations under different names. For example, the original ASCII standard was published in 1968 by the American National Standards Institute as ANSI X3.4. When ASCII was adopted as an international standard, the same encoding was published by the International Organization for Standardization as ISO 646. Each of the eight-bit character sets in the ISO 8859 family subsumes ASCII and is in turn subsumed within Unicode. Finally, Unicode is nearly identical with the ISO 10646 standard.

Standards as Agreements

There are various criteria for what counts as a standard, and the same person may use different criteria depending on the context in which they are writing or speaking. When a person refers to a particular technology as "standard," the term is usually used in one of three senses:

- 1. A *de facto* standard is a solution that has become widely adopted and is considered standard by virtue of its popularity.
- 2. A *de jure* standard has been reviewed and formally approved by a standards developing organization such as the International Organization for Standardization or one of its member organizations (e.g., the American National Standards Institute in the United States).
- 3. There are public specifications that are similar to *de jure* standards but are authorized by industry consortia. These consortia operate according to somewhat different rules than standards developing organizations.

Each of the three kinds of standards can be understood in how they vary along four key dimensions: acceptance, openness, stability, and consensus.

Acceptance is the key to the success of any standard, and some technologies are deemed standards solely by virtue of their wide acceptance and popularity. Native file formats for popular word-processing software are examples of these *de facto* standards. If a person receives such a file on diskette or as an attachment to an e-mail message, the ability to read the file requires that the recipient have access to the word processor that reads and writes that format. Problems of compatibility and interoperability are avoided if most people adopt exactly the same solution (i.e., use the same software).

A *de facto* information processing standard need not be a commercial product, nor must its popularity extend to the general community of computer users. For example, the file format for the (nonproprietary) TeX typesetting system, designed by Donald Knuth in the late 1970s, has been widely adopted for mathematics and engineering documents, but it is not popular for office documents. The hallmark of any *de jure* standard or public specification is its openness. Formal information processing standards are designed and documented with the aim of making every detail public. They are written with the expectation that engineers will develop hardware and software to implement the solutions that the standard represents. For that reason they are documented in exhaustive detail.

Specifications for de facto information standards vary in their degrees of openness. An organization controlling a de facto standard may publish a reference manual in paper and/or electronic form. For example, Adobe Systems Incorporated publishes both digital and paper references for their PostScript and Portable Document Format technologies. Knuth's published documentation for the TeX typesetting system includes both a reference and the complete annotated source code for TeX itself. In contrast, the publishers of popular office and productivity software (such as word processors) keep their source code secret in the interests of protecting their copyright. The native file formats and communications protocols used by such programs may be proprietary, and their full specifications unpublished.

Potential adopters of a standard may perceive a tug-of-war between the stability of strict adherence and the freedom to innovate. If a developer limits his or her application to those functions covered by a standard, then users of the technology enjoy stability in its interoperability with other systems. However, standards are slow to change and may not accommodate new functions and capabilities that could improve a system. For that reason, developers may introduce nonstandard extensions to a method, protocol, or format. Such extensions come at the cost of stability, since deploying them involves making changes to the format or protocol.

Finally, standards differ in the type of consensus they represent. *De facto* information standards represent a consensus among users that an existing application or protocol is worth adopting because it meets particular needs, is judged better than competing technologies, or simply because so many other people have already adopted it. However, *de jure* standards are designed from the beginning to address as wide a range of needs as possible. Standards developing organizations such as the International Organization for Standardization and its member organizations represent many different stakeholders and interested parties in coordinating the development of a standard. Industry consortia need not be as inclusive, but they often are inclusive in practice. For example, the Unicode Consortium includes churches, libraries, and individual specialists among its members, in addition to corporations. Closer cooperation between consortia and standards developing organizations (as exists between the International Organization for Standardization and the Unicode Consortium) bodes well for the future role of standards in improving information management and information processing.

See also: Alphabets and Writing; Computer Software; Computing; Digital Communication.

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STATION OPERATION

See: Radio Broadcasting, Station Programming and; Television Broadcasting, Station Operations and

STORYTELLERS

Storytellers are a significant voice of culture, and their storytelling takes myriad forms, from anecdote to ballad, film, and novel. The focus of this entry is on the storyteller as oral narrator and on the unique practice of oral craft. Unlike the processes of writing and image-making, which result in tangible or virtual formats that are saleable as products in commercial/professional venues, the greatest work of a storyteller often seems to evaporate into the ether of oral tradition. The words of storytellers may permeate the minds and hearts of listeners-or, through repetition, entire cultures-without leaving physical traces. Yet the intellectual and emotional impact of effective storytellers is undeniable, whether they perform at home, on stage, in classrooms, libraries, corporate boardrooms, or in a broad range of other locales. Some people make a living as professional storytellers; many more use storytelling, consciously or unconsciously, to enhance other activities. The stories of a teacher, for instance, can make a point more effectively than long, less interesting explanations and may be the only thing a student remembers from the lecture. Good stories are by nature memorable-therefore told, remembered, and retold. Making the best of a good story is up to the teller, who improves through experience with word choice, pace, tonal variation, physical expression, and interaction with listeners.

Although most tellers have spun their stories informally as a respected but unpaid part of domestic and community activities, the profession of storyteller is an old one with many names: minstrel, troubadour, jongleur, trouvère, minnesinger, scald, scop, skaziteli, seanachie, pinkerrd, and griot, to name a few. Before common usage of the printing press, storytellers were a primary means of circulating news and preserving historical, cultural, and literary records, which required feats of memory. Homeric poet/singers had a store of 25,000 epic formula. Irish bards had to learn a minimum of 178 historical tales during their training, with 1,000 at the highest level. So great was their power to sway people that Edward I of England ordered all Irish bards to be killed in 1284 lest they foment a revolt against his rule.

Even as oral modes were replaced by a print tradition, storytellers continued to adapt their tales to new settings. A good example is the U.S. public library movement, where, at the beginning of the twentieth century, librarians specializing in children's literature established story hours as an important part of the early learning experience of children, especially among immigrant youths struggling to bridge different languages and folk traditions. Marie Shedlock, Sara Cone Bryant, Güdrun Thorne-Thompsen, Anna Cogswell Tyler, Mary Gould Davis, Eileen Colwell, Ruth Tooze, Augusta Baker, and others were not only great storytellers in their own right, but also influential in shaping children's librarianship to include the training of children's librarians as storytellers and the establishment of story hour programs.

A U.S. storytelling revival in the 1970s centered on the annual festival at Jonesborough, Tennessee, which soon spawned other regional festivals. The National Association for the Perpetuation and Preservation of Storytelling, founded in 1973-1974 and now known as The National Storytelling Association, serves to represent many interests of contemporary U.S. storytellers, but storytellers thrive outside such organizations as well. Although some folklorists are good storytellers, a degree in folklore grounds one in the scholarship rather than the practice of storytelling. As in the case of creative writers, the best preparation for a storyteller is experience: immersion in stories by listening, reading, and telling. Some storytellers specialize in folktales, others in personal narrative or original stories. The ethics of adaptation and appropriation from other cultures or tellers have been controversial, especially where commercial interests such as recording and publishing are involved. The prevailing code is for storytellers to cite the source of a story they have incorporated from any other source, oral or print, into their own repertoire. Aside from the question of ownership, it is in the best interests of a storyteller to research the background of an unfamiliar tale for purposes of deeper understanding. Exploring folktale variants, for instance, can greatly enhance one's grasp of structural elements that have defied change across time, despite differences in detail.

Some storytellers use props, puppets, costumes, and other accoutrements to enhance their presentations, but these can be distracting if the storyteller does not possess the central power of personality required to project a story or does not have faith in the story alone to hold attention. Most storytellers learn by absorbing rather than memorizing a tale. A story truly absorbed and honed through repeated retellings survives stage fright. Though storytelling in the oral tradition is different from dramatic performance, it nevertheless requires confidence and preparation. The tools of a storyteller are selection, visualization, practice, concentration, projection, and invention. Every storyteller must find the kind of story that individual is suited to tell. Finding the right story is where the good storyteller begins. The next stage is visualizing the story as if one were walking through it until each step of the way is familiar, and then relating one's journey aloud. Just as a good writer must show rather than tell, a good storyteller provides not a description but an experience. Telling the story to others requires great concentration to the exclusion of concern with one's image, effects, interruptions, or anything else besides the story itself and the bond it forms with listeners. Indeed, the interchange between teller and listeners-whether vocal or communicated through eye contact, facial expression, or physical gesture-creates an intense sense of community that is greater than the separate elements of story, teller, and audience. Participation in this alternative world is perhaps the greatest reward for the storyteller.

Like musicians, artists, writers, and actors, few professional storytellers can make a living without supplementary income from other employment. Training and experience in storytelling may begin through education for professions such as librarianship, teaching, or ministry; through academic programs in folklore and anthropology; or simply through independent observation and practice. Certainly, no degree is necessary to become a storyteller. Selection of a good story, skill in telling it, and sense of audience are the only three requirements for success. Anyone who has experienced the successful merging of these three elements is in danger of becoming a storyteller.

See also: BAKER, AUGUSTA; STORYTELLING; WRITERS.

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BETSY HEARNE

STORYTELLING

Storytelling is a universal human activity that involves kaleidoscopic variations across time, culture, form, and personality. From prehistoric pictograms to current computer networks, people have cast their stories in countless ways: as verbal narrative in the oral, print, and electronic traditions; as music, dance, and graphic image; and as film, television, and theater productions. Stories that one absorbs as a child imprint patterns of language, literature, and social values; stories that one chooses to remember and pass on reflect the elements most important in a lifetime. Stories shape both individuals and groups. This significance makes storytelling a subject of study in numerous fields, including folklore, anthropology, sociology, psychology, speech/communication, library and information science, education, religion, literature, and theater. Each of these domains emphasizes different aspects, but almost any exploration of storytelling involves an interdisciplinary approach in dealing with the complexities of story and society, the interaction of text and context.

The Nature of Storytelling

Most courses in storytelling emphasize the oral tradition, past and present. Students work with selection, absorption, and narration of folklore for a broad range of age groups, from cumulative tales for preschool children to oral history among the elderly. Fieldwork and practical experience in col-



A group of young Native American children gather around a storyteller on the Barona Indian Reservation in Lakeside, California, to participate in the continuation of an oral tradition of passing on cultural values through stories. (Bob Rowan; Progressive Image/Corbis)

lecting and swapping stories leads to a deeper theoretical understanding of the nature of story and its place in society. Background in folklore and its dissemination, awareness of ongoing controversies about the meaning and interpretation of narratives, and practice in oral interpretation and planning programs are all essential. Most important is an appreciation of the enormous range and depth of story-from myth, epic, ballad, legend, folktale, literary tale, and family narrative to personal anecdote-and the confidence that each person is already a storyteller with the potential to become a better one. The stage for storytelling "performances" can include homes, schools, workplaces, and all kinds of social and recreational situations. Listening to stories acculturates individuals, while telling stories reveals who they are.

Although storytelling is an activity for all ages, children are often considered a natural audience because stories are a memorable way to communicate knowledge. Storytelling in educational settings increases concentration span, expands vocabulary, enriches cultural literacy, transmits patterns of language and narrative, and bonds children with literature. Folktales make an especially valuable story foundation for young listeners because characters fall into archetypes such as hero, villain, trickster, helper; plots often assume the form of a journey or quest with a clear beginning, middle, and end; style is clean and simple; and settings and details are spare and symbolic. Experts disagree on the meaning and effects of such tales. Bruno Bettelheim, for instance, argues from a Freudian perspective in The Uses of Enchantment (1976) that fairy tales represent crucial stages of psychological development. Many folklorists, however, see Bettelheim as universalizing from a few specific European sources, and Jack Zipes in Breaking the Magic Spell (1979) argues from a Marxist-feminist position that Bettelheim neglects the sociopolitical implications of fairy tales. Folklorist Max Lüthi in The Fairytale as Art Form and Portrait of Man (1984) interprets the aesthetic characteristics of folktale. Robert Darnton asserts, from the viewpoint of a cultural anthropologist in *The Great Cat Massacre* (1984), that many fairy tales depict actual conditions during historical periods of common child abuse and abandonment.

Since many folktales fall into patterns that seem to repeat themselves in various times and cultures, folklorists have categorized and numbered them by tale type. Cinderella, for instance, is classified as Tale Type 510A and has hundreds of variants, each with a similar structure but different details. Another classification system involves motifs, or story elements that appear in different tale types. These are useful in studying stories but have come under fire as oversimplifying stories and taking them out of context. While structuralists find common characteristics of stories to reveal global patterns, contextualists maintain that the real meaning of a story depends on the values and belief systems of its particular culture. Joseph Campbell, famous for his identification of a universal myth pattern in The Hero With a Thousand Faces (1949), has been accused of reducing all stories to one ur-tale or "model" in a way that uproots their meaning in different social contexts.

Other controversies center on the ownership of stories. Does a European American, for instance, have the right to adapt a Native American story, make changes, and tell or publish it without tribal consent? Does copyright law favor an outsider's private authorship of materials that were in fact generated over a long period of time by a group of people who have no control over or share in profits from their cultural heritage? Equally problematic is the clash of values in a multicultural society exposed to stories that potentially offend conflicting segments of a community. Storytellers have been challenged in schools and libraries for introducing tales that some parents consider violent, sexist, or otherwise offensive. Mass media storytelling, too, has raised issues of selection and adaptation; Disney's films have been both celebrated and censured for representing changes in classic fairy tales.

Nineteenth-century folklore collections reflected a concurrent rise of nationalism. Jacob and Wilhelm Grimm are by far the most famous collectors of German tales; Peter Asbjornsen and Jorgen Moe, of Scandinavian; Aleksandr Afanas'ef, of Russian; and Joseph Jacobs, of British. Charles Perrault is famous for his earlier (1698) collection

of French fairy tales. In the United States, collectors have often concentrated on regions or genres, with Richard Chase, for example, collecting and retelling Appalachian tales, and Jan Harold Brunvand specializing in urban legends. As definitions of folklore have expanded to include storytelling in factories, corporations, therapy groups, nursing homes, urban gangs, and other contemporary settings, informal storytelling has become a common subject for ethnographers analyzing organizations of all kinds. Stories about the founding partner of a law firm, for instance, may be the truest indicators of the culture of that firm. Similarly, the stories passed around a class of students in a long-distance education program can reflect the value system of an electronic community as well as the legendary aspects of the effects of computer technology on the individual, for better or for worse. Long before people become adults, however, stories permeate their lives.

The Storied Life

Humans are immersed in stories even before birth. A fetus floats in a dark, warm world of its own. It cannot see, but it can sense the beat of a heart. Whatever else intrudes on its senses, that beat is basic, rhythmic, and sure, organizing the baby's sensibilities into a predictable pattern. Heartbeat is the first storyteller. The baby also hears, in its underwater world, bumps and thumps from far away and one other sound, steady, up and down, silent, and steady again. The voice of the baby's mother moves in patterns even as the baby's brain is formed. With the rhythm of those patterns is born the baby's story self: its sense of emphasis, continuity, and-above allthe rise and fall of sounds that lead to expected patterns. Patterns elicit order from disorder; stories, which are patterns of sound and narrative, also elicit order from disorder. Even submerged, the baby is exposed to the very elements of story. After it is born, the child's story self develops with the acquisition of language, interacts with stories that it hears informally, extends into literacy, intertwines with literature, and embraces social culture. From lullabies to nursery rhymes to finger games to folktales to fairy tales to family lore, children absorb patterns of language and narrative from hearing stories.

From hearing stories, children learn to tell stories, progressing from unformed efforts at description to clearly articulated realistic accounts to expressive flights of imagination. There are many theories about this development. Arthur Applebee, in his book The Child's Concept of Story: Ages Two to Seventeen (1978), says that children organize stories in increasingly sophisticated arrangements, beginning with a first primitive level called "heaps," or stories containing no obvious means of organization, and progressing through a second level he identifies as "sequences," or stories with a particular idea that associates their elements. The third level is "primitive narrative," in which elements are associated by complementary relations, with the consequences of certain actions becoming important. The fourth level consists of "unfocused chains" organized into chunks that bear some relation to each other; the fifth level involves "focused chains," with one central character maintained throughout; and the last is "narrative," in which events are organized to form a coherent whole. A study by developmental psychologist Peggy Miller has shown adults and children narrating or co-narrating from four to thirteen personal stories every hour among families of African-American, Anglo-American, and Chinese backgrounds.

As an effective form of socialization and acculturation, storytelling helps integrate the old and the new. One tells old stories to new children to help integrate them into society. One tells old stories about new events to enlist the wisdom of those who have gone before. Even new stories reveal old patterns, because stories symbolize human experience. This balance of the old with the new is something everyone seeks, on both an individual and an international level. Every nation, industrialized or developing, has a common need to balance the preservation of unique traditions with the incorporation of global changes. Every community struggles to maintain self-identity while merging with an increasingly diffuse world community.

Storytelling allows people to strike this balance: While vastly different cultures share common motifs and tale types, each tale carries its own cultural flavor. When people share traditional stories, they are not only passing along their own cultural values, but also sharing a universal tradition. As the world has moved from oral to printed to electronic modes of communication, the interpersonal sometimes seems lost to the impersonal, but storytelling is an irrepressible activity. The Internet carries a frequent exchange of urban legends, which are often variants of older rural legends making themselves at home in the city. Traditional stories travel well, but, paradoxically, they also root easily.

Most people are familiar with a variant of the persecuted heroine, often called Cinderella, and can identify with the child abandoned in a wilderness. This is one of the most common motifs in folklore precisely because abandonment is the child's-and many an adult's -deepest fear. From Ishmael or Moses, to Aladdin, to Hansel and Gretel, to Babar the Elephant, to E.T., the generations recast this fear and resolve it in story form. Each community shapes the problem according to its own landscape: Ishmael survives a desert; Moses, a river; Aladdin, a cave; Hansel and Gretel, a forest; Babar, a journey to the city; and E.T., an odyssey among modern scientific earthlings. In "The Story of Two Jealous Sisters" from The Arabian Nights, all three of the sultan's children-Bahman, Perviz, and Parizade-are abandoned to a river before they win their rightful place. Anyone can identify with those children, especially with Parizade, who combines courage, virtue, and quick wit to save her brothers and fulfill her fate.

The same baby who was described earlier as being imprinted with the patterns of her mother's voice before the first breath was taken will move with bated breath through the patterns of "The Story of Two Jealous Sisters" and learn from it the value of courage, virtue, and quick wit. Stories teach the art of survival, and they offer hope for the small, the vulnerable, and the powerless. Humans of all ages have within them the elements of hero and of villain. Stories help to distinguish one element from the other and to make decisions about which role to choose. By communicating social experience through archetypal characters and symbolic conflict, traditional stories help pattern people's lives in a socially thoughtful way. The more confused and threatening a situation becomes, the more need there is to understand stories that have cast light on the pathways of the past. The generations living at the beginning of the twenty-first century, who must formulate peaceful alternatives to nuclear extinction, can find inspiration in the epic of Gilgamesh, where the wild man Enkido leads a king to be more humane, offering friendship to end their battle for supremacy.

Each community and nation abounds in story. Paradoxically, the poorest communities are sometimes the richest in story wealth. It is of national and, ultimately, of global importance that each community glean its stories and preserve them by passing them on. Old people, who are often the unsung heroes of tradition in a modern world that undervalues traditional wisdom, can add their store of the traditional stories they heard as children, along with the personal stories that have patterned and made sense of their lives. In the nineteenth century, Scandinavian folklorists established an invaluable archive in Ireland and organized the collection of Irish tales just in time to preserve a tradition changing almost too fast to record. Increasingly, however, collection within a community by members of the community is emphasized when anthropologists view their informants as collaborators rather than subjects. Through storytelling, people can heighten their own awareness, increase support for the collection and preservation of their cultural heritage, and reach out to others. The exchange, comparison, and contrast of people's separate stories can only underscore their common humanity.

Why sing lullabies to a baby? Why say nursery rhymes? Why chant along with the games played on a toddler's fingers and toes? Why tell children stories of what happened to grownups in their own youth? Why pass on tales of the African trickster Anansi or the Greek trickster Odysseus in a library story hour? Why read poetry aloud in a classroom? Why lead students to read literature or view art at all? Why spin extraordinary tales of ordinary events during coffee break? Why encourage the elderly to exchange stories about their lives? The answer to the first question is the answer to them all, for they are inextricably connected. Storytelling offers to a listener patterns that give comfort through rhythm and repetition, patterns that identify shapes of human behavior, patterns that lead to understanding a random world, and, ultimately, patterns that lead to understanding oneself. At a time when miraculous technologies often convey words devoid of deep meaning, people can renew themselves with old patterns of story.

Folklorist Howard Norman (1985) quotes the Cree Indians of North America as saying that stories wander through the world looking for a person, inhabit that person for a while, and then are told back out into the world again. A symbiotic relationship exists: If people nourish a story properly, it tells them useful things about life. Humans need to nourish their stories, collect them, and release them back into the world for the sake of the future.

See also: COPYRIGHT; STORYTELLERS; WRITERS.

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SUBLIMINAL ADVERTISING

See: Advertising, Subliminal

SUBSTANCE ABUSE

See: Alcohol Abuse and College Students; Alcohol in the Media

SYMBOLS

Symbols are characters, letters, numbers, icons, objects, people, actions, or places that stand for or represent something other than themselves. In the most general sense, a symbolic language (or system) is a set of symbols combined with the rules for their use in relation to one another. Human language is the most familiar and important symbol system. Beginning in childhood, individuals are taught how to use oral and written symbols (e.g., letters, numbers, words) and how to use these symbols to create messages that make human communication possible.

Systems of Symbols

Typically, a speaker or writer selects and uses specific symbols to create a message that will bring about a particular response among listeners or readers. Consider a simple communicative situation, such as when one person says, "Pass the sugar." Here, the letters "p," "a," "s," and "s," as well as the other letters in the phrase, are selected and combined with the goal of conveying a particular meaning and accomplishing a specific task. The letters-which are symbols-have been grouped together to form words, which are also symbols. Effective communication depends on the extent to which the listener and the speaker attach more or less the same meaning to the symbols. If the listener does not speak English, for example, or if the listener is unfamiliar with the symbols "pass" or "sugar," effective communication is unlikely.

While spoken and written languages are the most familiar examples of a symbol system, computer languages, Morse code, Braille, and the genetic code are also symbol systems. Money is another fundamental symbol system. Little conscious attention is given to how this symbol system operates, but as Brent Ruben and Lea Stewart (1998, pp. 93–94) describe, the process is very much a communication event that involves symbolic language:

We think little about the communication process that occurs when we go into a store, pick out an item priced at \$15, go to the cashier, hand over a ten- and a five-dollar bill, and leave the store with a "thank you" and the item in a bag. . . . When we give the clerk a ten- and a five-dollar bill, in effect, we are only handing over two pieces of high-quality paper. They have no inherent value, other than the expense of the paper and ink. They are symbols.

Besides alphanumeric language and money, there are many, many other symbols that play an essential role in human communication. The green–yellow–red light at a street intersection is a symbol, as are the White House, a Mercedes automobile, an "A" on an exam, a handshake, and a wedding ring.

People live, quite literally, in an environment that is filled with symbols, thus requiring the use of symbolic language. Symbolic language allows individuals to code and transmit messages from one point—in space or time—to another point using one or more communication modes. Oral and other acoustically coded languages make use of the auditory mode. Written or light-based languages use the visual channel.

Most human symbols have the potential for portability and permanence. Communication technology and mass media allow symbols to be copied, stored, duplicated, amplified, and transmitted. For example, spoken words can be stored in recorded form before being broadcast across space and preserved across time. Similarly, something that originates as personal correspondence can be captured on paper, stored on a computer, printed in a book, posted online, archived in a library, and transmitted across time and space.

Meaning

Humans create symbols, and they also create the meanings of those symbols. There is no necessary or natural connection between a symbol and the idea or object to which it refers. For example, there is no particular reason why the color red must mean "stop," or why the symbol "5" should be equivalent to "1" + "1" + "1" + "1" + "1." Each of these symbols has a meaning that is arbitrary and invented by humans. As another example, consider a word such as "encyclopedia." "Encyclopedia" has no inherent, intrinsic meaning or significance. When spoken, the word is nothing more than a particular pattern of auditory vibrations that an individual creates through the manipulation of the vocal cords, lips, tongue, and mouth. In its written form, "encyclopedia" is nothing more than a particular configuration of ink on paper.

While humans invent the meanings of symbols, this invention process is not a solitary activity. Rather, it is a collective and ongoing activity of humanity, and it is the essence of social communication. In order for symbols to function as communication, all parties involved must associate more or less the same meaning with the symbols. For example, if most drivers and pedestrians (and police officers) did not attach more or less the same meaning to "red" lights at street intersections, the variations in interpretation would have dire consequences. Perhaps less dire, but no less frustrating, are the consequences of communication efforts where there are language, cultural, or interpretive differences between the interactants. It is important to remember that even among those people who have similar cultural backgrounds and linguistic competencies, variations in meaning are frequent. For example, the symbol "love" means many things to many different people, and this variation on such a "simple" symbol can cause a great deal of complication within relationships.

Humans do not inherit their knowledge of what particular symbols mean. They learn these meanings through interaction-through communication-with others. Beyond certain basic message-responding tendencies (i.e., reflexive responses) with which humans are born, most of the meanings that people need in order to function as humans have to be learned through social interaction. Reflexive responses, such as the reaction to the sensation of being burned by a flame, can be thought of as first-order information processing events. They consist of natural and automatic responses to nonsymbolic signals. The majority of human responses are connected to symbols, and these responses represent what may be thought of as second-order information processing events (Ruben and Stewart, 1998). Second-order information processing involves symbolic communication. From family, friends, and peers, individuals become literate and able to use written and spoken language, monetary symbols, and the other symbols systems that will be necessary in order to function as adults.

The learning process and the social shaping of symbols and their meanings are imperfect, as has been noted above. Individuals do not all learn the same things in the same ways, which helps to explain the variation and complexity of human communication. This imperfection is a major factor in explaining the complexity and challenges of human communication. On the one hand, interpretative variation of symbols is the source of frustration, misunderstanding, and anxiety in human communication. On the other hand, it is the basis for creativity, personal change, and social change.

Nonetheless, the effectiveness of symbols and people's proficiency in their use are quite remarkable. Whether one thinks of verbal exchanges, the Internet, intimate interactions with loved ones, a casual walk through a street intersection, or shopping at the store, communication works. None of this social interaction or predictability would be possible were it not for the existence of symbols and the human capacity for teaching and learning how to use them.

See also: Animal Communication; Culture and Communication; Intercultural Communication, Adaptation and; Interpersonal Communication; Language Acquisition; Language and Communication; Language Structure; Nonverbal Communication.

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BRENT D. RUBEN

SYSTEMS DESIGNERS

Systems designers are the people who are responsible for the analysis and design of information systems that are involved in the operation of organizations. They study business, scientific, or engineering data-processing problems, use their knowledge and skills to solve problems, design new solutions, and enable computer technology to meet the individual needs of the organizations. Systems designers may design entirely new information systems, including both hardware and software, or they may add a single new software application to an existing system.

Roles

Systems designers have to assume a variety of roles throughout the design process. Among these roles are (1) analyst in order to study the existing system in detail, paying meticulous attention to understanding and distinguishing between users' problems and users' viewpoints, (2) designer in order to propose new procedures for information flow, reporting, and computer processing, (3) technical writer in order to document the results of the design effort, (4) consultant in order to provide advice on options that are available to users and indicate the implications that each of these options has for the performance of the system, (5) team member in order to be able to work with other computer specialists and user representatives toward achieving a common goal, and (6) behavioral scientist in order to design an interface between the system's users and the computer so that the design itself and its method of implementation result in users being satisfied with the final result.

Problem Solving

Most systems designers use some variation of a system problem-solving approach called a "systems development life cycle" to build information systems. A systems development life cycle consists of a set of iterative activities and usually incorporates the following general problem-solving steps: planning, analysis, design, creation, test, implementation, and maintenance. The planning step involves identifying the problem, determining the cause, scope, and boundary of the problem, and planning the development strategy and goals. The analysis step involves studying and analyzing the problems, causes, and effects and then identifying and analyzing the requirements that must be fulfilled by any successful solution. Typically, the logical elements of a system are defined during analysis. The design step involves determining

how the problem will be solved. The designer's focus shifts from the logical to the physical. Processes are converted to manual procedures or computer programs. Data elements are grouped to form physical data structures, screens, reports, files, and databases. The hardware components that support the programs and the data are defined. The creation step involves coding, debugging, documenting, and testing programs, selecting and ordering new hardware, writing and testing procedures, preparing end-user documentation, initializing databases, and training users. The test step involves ensuring that the system does what it was designed to do. The implementation step involves implementing the physical system into the normal business operation. The maintenance step involves keeping the system functioning at an acceptable level, analyzing the implemented system, refining the design, and implementing improvements to the system. Different support situations can thread back into the previous steps.

The problem-solving steps for design can be simplified to three phases: analysis, design, and development. The systems analysis phase focuses on what the system is required to do. These specifications are then converted to a hierarchy of increasingly detailed components. These components define the data that are required and decompose the processes to be carried out on data to a level at which they can be expressed as instructions for a computer program. The systems development phase consists of writing and testing computer software and of developing data input and output forms and conventions.

Requirements

Modern information systems are increasingly used by individuals who have little or no previous experience with information technology but who possess a perception about what this technology should accomplish in their professional and personal environments. Systems designers must correctly understand the information needs, the tasks and activities accomplished in meeting the needs, the requirements preferences, and informationuse patterns of their end users.

Successful systems designers must possess a wide range of talents. They may work in many different environments or functional units (e.g., finance, marketing) of various organizations, including management and systems consulting firms. Any description of their work is destined to fall short in some way; but there are qualities that most systems designers seem to display.

Above all, designers are problem solvers. They must be able to take a large organizational problem, break down that problem into its component parts, analyze the various aspects of the problem, and then assemble an improved system to solve the problem through skillful application of tools, techniques, and experience.

Systems designers must be experts in the area of information systems and technology. They must have a working knowledge of database management systems, telecommunications and networking, client/server and distributed computing architecture, object technology, rapid application development technology, graphical user interfaces, the Internet, and programming, including operating systems and utilities and application development tools.

Systems designers must be adaptable. No two systems development projects encountered by a system designer are identical, and many organizations have standards that dictate specific approaches, tools, and techniques that must be adhered to when developing a system. Systems designers must be able to communicate, both orally and in writing, and they must relate well to other people over extended periods of time.

Systems designers must also be self-disciplined and self-motivated as individuals. They must also

be able to manage and coordinate innumerable project resources, including other people. Systems analysis and design is demanding, but the compensation is that it is an ever-changing and always challenging occupation.

There is no universally accepted way to prepare for a job as a systems designer because the preferences of employers depend on the work to be done. A bachelor's degree in computer science, electrical engineering, or information science is virtually a prerequisite for most employers. For some of the more complex jobs, people who have graduate degrees are preferred. Relevant work experience is also very important. People who are looking for entry-level positions may enhance their employment opportunities by participating in internship or co-op programs offered through their schools.

See also: Community Networks; Computer Software; Computing; Database Design; Internet and the World Wide Web.

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Hong Xu

Т

TALK SHOWS ON TELEVISION

The number of daytime television talk shows increased rapidly during the 1990s. In the late 1980s, there were only three national daytime talk show personalities (Phil Donahue, Oprah Winfrey, and Sally Jessy Raphael). By 1995, there were almost twenty daytime syndicated talk shows watched by an estimated ten million viewers each day.

Controversies over Talk Shows

As talk shows proliferated, so did criticism by politicians such as U.S. Senator Joseph Lieberman (D-CT) and U.S. Department of Health and Human Services Secretary Donna Shalala, who refer to these programs as "trash TV." Part of the concern arises from reports that children and adolescents often watch these programs. In a national survey conducted by the Annenberg Public Policy Center in 1996, children were more likely than their parents to say they watched shows such as *Ricki Lake*, *Jenny Jones, Montel Williams*, or *Geraldo*. According to this survey, 39 percent of the parents, more than 50 percent of the twelve- to seventeen-year-olds, and nearly 30 percent of the ten- and eleven-yearolds reported watching those talk shows.

A number of distinct criticisms have been put forward, mostly focusing on the probability that the viewers' perceptions of reality become distorted as a result of watching talk shows. One such criticism is that talk shows give viewers a warped sense of reality in which dysfunctional relationships and bizarre problems seem typical of life in the United States. As the viewers' perceptions of society change, those people become more tolerant of deviant behaviors and possibly more willing to try such behaviors themselves. A second criticism is that viewers who watch talk shows on a regular basis become desensitized to the graphic discussions and emotional outbursts of the participants and subsequently develop a callous attitude toward misfortune even outside the realm of talk shows. A third criticism is that talk shows, by using personal exemplars and by offering simplistic advice such as "love conquers all" or "race shouldn't matter" as solutions to problems, cause viewers to trivialize complex social issues. Finally, talk shows have been charged by authors such as Elaine Showalter (1997) and Jeanne Heaton and Nona Wilson (1998) with contributing to hysteria and misinformation on issues such as repressed memory, satanic ritual abuse, and alien abduction.

In contrast, a number of advocates such as Patricia Priest (1996) and Joshua Gamson (1998) have argued that talk shows provide a valuable source of celebrity and self-esteem for the marginalized individuals who appear as guests. In addition, Gamson has suggested that talk shows give much needed, high-impact public visibility to outgroups such as sexual nonconformists, moving previously taboo topics into public awareness and changing the norms of what can be presented on television. Patricia Priest and Joseph Dominick (1994) reported that informants who had appeared on Phil Donahue to discuss sensitive topics viewed talk shows as a pragmatic way to reach both the mainstream public and members of their own outgroup.



Oprah Winfrey, who spoke with Al Gore on her talk show on September 11, 2000, has transformed her talk show success into a media empire that includes publishing a magazine, producing movies, and continuing her talk show. (Reuters NewMedia Inc./Corbis)

The Content of Talk Shows

What evidence is there for this set of criticisms in the content of talk shows? Bradley Greenberg, Sandi Smith, and their associates analyzed ten episodes of each of the eleven most highly rated daytime television talk shows of 1994 (see Greenberg and Smith, 2000). They reported that, contrary to public perception, talk shows most frequently focused on parenting and marriage problems, as well as dating. Sexual issues, such as frequency of intercourse, cheating, and sexual orientation, were raised in this context, but they were not the only focus. Other common topics included victims and perpetrators of criminal activities, physical health problems, and physical appearance. Despite the image of talk shows as a hotbed of verbal and physical conflict, yelling and shouting occurred no more often than laughing among the guests, and the positive affect suggested by hugging or holding hands was found twice as often as the negative affect suggested by shouting. Verbal statements of denial, rejection, shame, and anger were common, but so were statements of affection.

Greenberg and Smith (2000) reported that, in the majority of cases, they could identify a clear theme for the program that reflected rather conservative perspectives (e.g., "pornography is not ok," "transsexuality is not acceptable," "people should not have multiple sex partners"). In other cases, the theme of the program reflected basic societal standards (e.g., "adults should not rape minors").

Greenberg and Smith also coded the first two reactions of a talk show host to a guest's disclosure. Typically, these were simple requests for further information or noncommittal sounds that encouraged further communication. However, 11 percent of the first two reactions by hosts were moralizing questions (e.g., "You knew that was wrong, didn't you?"), and 10 percent were questions or statements emphasizing the severity of the event (e.g., "He hit you with a baseball bat?"). The reactions of others on the show (other guests or the studio audience) included character attacks and name-calling. Overall, almost one-quarter of the time, studio audiences and hosts reacted with disapproval to the guests' disclosures. In summary, when talk shows cover behaviors that can be considered dangerous or inappropriate, they are often met with disapproval rather than presented as normal or desirable.

What about the argument that talk shows oversimplify complex issues? Greenberg and Smith were able to identify a clear, simplistic theme such as "prostitution should not be done" in the majority of episodes that were coded. The host of the show often stated a theme or title of the show for that day and then repeated it after returning from a commercial break. On some programs, such as *Ricki Lake*, the theme of the show was often printed on the screen as advice from one guest to another (e.g., "Dump that guy before I dump you."). In addition, the focus of each program is clearly on the individuals rather than the implications of issues for society as a whole.

Research on the Effects of Talk Shows

Do talk shows alter the viewers' perceptions of reality and subsequently affect their behaviors and policy judgments? John Hill and Dolf Zillmann (1999) focused on arguments that Oprah Winfrey increases sympathy for perpetrators rather than victims of crime as a result of the emphasis on the nearly irresistible forces (e.g., childhood trauma) that drive people to commit violent and illegal acts. Undergraduate students who watched segments of Oprah Winfrey with such mitigating information present gave lighter prison sentences to criminals depicted in the segments than did those who saw the segments without the mitigating information. Those who viewed the mitigating information also gave lighter sentences in a seemingly unrelated exercise in which they were asked to give sentences for six violent and nonviolent crimes that were not depicted in the segments.

As a test of some of the other popular criticisms of talk shows, Stacy Davis and Marie-Louise Mares (1998) surveyed 292 high school students in North Carolina. Consistent with the hypothesis that talk shows alter perceptions of what is typical, subjects who were heavy viewers of talk shows gave significantly higher estimates of the frequency of behaviors depicted on talk shows (e.g., bringing guns to school) than did subjects who were light viewers of talk shows. This was still true even after statistically controlling for overall television viewing and background demographic variables such as parental education. However, when subjects who were heavy viewers of talk shows were asked to rate the harm done to victims in a series of scenarios, their responses showed no sign that they were becoming desensitized to the sufferings of others. Finally, there was no evidence that talk shows led viewers to believe that serious issues such as drug abuse or teen pregnancy were trivial. In fact, talk show viewing was positively related, among people between fifteen and eighteen years of age, to perceived importance of social issues.

Conclusion

Talk shows have been a focus of considerable controversy. The little evidence that is available suggests that talk shows may be less sensational and less harmful than is often suggested.

See also: Sex and the Media; Television Industry; Violence in the Media, Attraction to.

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MARIE-LOUISE MARES

TECHNOLOGY

See: Cable Television, System Technology of; Film Industry, Technology of; Radio Broadcasting, Technology of; Recording Industry, Technology of; Satellites, Technology of; Technology, Adoption and Diffusion of; Technology, Philosophy of; Telephone Industry, Technology of; Television Broadcasting, Technology of

TECHNOLOGY, ADOPTION AND DIFFUSION OF

Although not originally designed as such, diffusion of innovations has proven to be an important theory for explaining the dynamics of communication. Diffusion of innovations is a theory originally designed to explain how change agents influence social processes. It has become a theory used to address how a technology or technological artifact becomes adopted, what forces affect the adoption process, and how proponents of a given technology or artifact may better influence the adoption process. The theory addresses how new ideas and technologies are communicated, evaluated, adopted, and reevaluated.

Foundations of Diffusion Theory

Diffusion of innovations is important to the study of communication because of its focus on process and what factors influence the process of communication. Specifically, diffusion is conceptualized as the process by which an innovation is communicated through channels over time among the members of a particular audience. Innovations are ideas, practices, or objects perceived as new by members of that particular audience. Thus, the theory addresses how knowledge is strategically managed to create specific effects on particular audiences.

While not using the terms of the theory as they are known today, Gabriel de Tarde (a French sociologist and legal scholar of the late nineteenth and early twentieth centuries) has been credited with the initial conceptualization of diffusion of innovations. Tarde (1903) observed many of the key factors of the theory, including the influence of public-opinion leaders as change agents upon social systems, the role of socioeconomic status as a factor affecting interpersonal diffusion, and the basic S-shaped model of innovation adoption over time. Anthropologists recognized the significance of this model and began to use it in attempts to explain processes of social change.

The Iowa hybrid seed corn study conducted by Bryce Ryan and Neal Gross (1943), however, is considered to be the event that clarified the practicality of diffusion of innovations for explaining the process of large-scale social influence. The initial Ryan and Gross study was designed to explain why hybrid seed corn was readily adopted by some farmers while many others were much slower to adopt the product. The foundation of diffusion of innovations as it is presently known is a by-product of this study, and the theory retains the basic components of that foundation in modern, diverse applications.

Preindustrial society in the United States was very slow to change. As people moved to cities from rural America and as diverse international populations immigrated to the United States, pockets of innovative ideas began to emerge. Modern industrial society provided technological advantages in production that aided in the establishment of an infrastructure for further technological development. Technological advancements became very evident in agriculture, particularly in the United States, during the period preceding World War II. Technological growth coupled with the concerns of an economic depression encouraged the development of a hybrid of corn that was particularly resistant to the harsh agricultural climate of the 1930s. While resistant to drought and disease, however, the hybrid corn did have a drawback; it could not reproduce. Therefore, farmers would have to buy new seed for each planting season. Why, then, would farmers invest in what many perceived to be such a risky venture when the stakes were already so high during the Great Depression?

Why and how the innovative seed was adopted was the concern of agricultural researchers who were supported by the government and backed by land grants. Did farmers respond to the pitches of company salespeople, the brochures produced by early cooperative extension agents, information provided in print and radio broadcasts, or their neighbors? As it turns out, farmers responded to all of these channels. Although initial information tended to be provided by individual seed company salespeople, most influence tended to come from within the farming community. In other words, in the early stages of hybrid seed corn (innovation) adoption, many attempts to influence the adoption process affected only a few farmers. As a few farmers became successful and endorsed the use of the hybrid seed corn, they became opinion leaders who influenced even larger numbers of their neighbors in the adoption process (diffusion). Mass communicated messages proved effective in influencing the early stages of adoption, but interpersonally communicated messages proved more effective during the widest range of diffusion. Thus, what was learned from the Ryan and Gross study is that the mass media helped to draw attention to the innovation, create a deeper awareness of the potential of the seed corn, and define the product as important to particular opinion leaders who would act as change agents for their communities. Diffusion of the hybrid seed corn would not work, however, without an ordered structure of social and media contacts that work together in establishing clear patterns of interaction among salespersons and neighbors.

What has been learned as a result of the Iowa hybrid seed corn study and subsequent research into diffusion of innovations is that those innovations that are actually adopted tend to follow a very distinctive pattern as their use in society increases. That pattern of adoption develops as an S-shaped curve. The shape of the curve represents the tendency of a few individuals within society to adopt the innovation initially. These individuals have a low threshold of resistance to the potential innovation. In other words, those people who are involved in the earliest stages of the process require little persuasion to consider adoption of a potential innovation. The mass media and interpersonal contacts may make relevant important information concerning the potential innovation for these earliest adopters. Therefore, under the assumptions of diffusion of innovations, awareness of the product or idea does not occur incidentally. The innovation is intentionally brought before an audience for consideration. If the product or idea maintains the interest of these individuals, they then must evaluate it for its potential usefulness. Adoption increases rapidly as those who adopt early are successful in persuading others to do so. The rapid rise of adoption begins to decline as the adoption process reaches a "critical mass," or a point when the diffusion process becomes self-regulating.

A second basic curve consistently appears in the diffusion process. According to researcher Everett Rogers (1995), those who play a role in the adoption process fall relatively neatly into a normally distributed bell-shaped curve. True "innovators" are those who make up approximately 2.5 percent of the population of adopters, and they fall beyond the earliest second standard deviation of the curve. Those who may be considered "early adopters" comprise about 13.5 percent of the population, and they fall between the second and first standard deviation of the curve. The widest range of those who take part in the diffusion of an innovation fall within the first standard of deviation above and below the mean or average phase of adoption; these are the "early majority" and "late majority" of adopters. This segment is approximately 68 percent of the population of adopters. All remaining participants in the adoption process, about 16 percent of the population, are the "laggards."

Application of Diffusion Theory

Rural sociologists maintained an interest in the application of the diffusion of innovations for explaining why and how agricultural innovations are adopted. Those interested in communication research, however, not only apply this theoretical framework to the adoption of the technology itself; they also are interested in the diffusion process as a form of communication independent of the types of innovations that may be adopted. The three general areas of interest include (1) the innovation-decision process, or first knowledge of and confirmation of the innovation, (2) innovativeness, or the degree to which an individual is relatively early as an adopter of a potential innovation, and (3) the actual rate of adoption by early adopters as compared with other members of a social system. The diffusion process is considered to be defined by communication among similar individuals because diffusion is conceptualized as depending on a social system. Thus, many are interested in the types of people who adopt at different times along the diffusion process. Furthermore, diffusion occurs at different rates due to the interests of different social systems in a potential innovation. Because different innovations are adopted at different rates, unique groups or families of S-curves representing the rate of adoption have emerged. For example, the rate at which the telephone initially was adopted was much slower than the rate at which present-day personal telecommunication devices are adopted.

Another key assumption of diffusion of innovations is that it is not the actual innovativeness of an idea, product, or process that is important, but it is the perception of innovativeness that matters for members of the social system. Even perceived innovativeness may be insufficient to encourage adoption and diffusion. The trial stage in which the potential innovation is actually used is very important to the diffusion process. The diffusion process will end at this stage if the benefits of the innovation do not outweigh the costs. As noted previously, the adoption process must reach the stage of critical mass for many technologies to prove successful for all adopters. If initial adopters do not perceive the utility of the innovation for both the self and for the wider social system, the practicality of the innovation may be called into question and the adoption process will be terminated. Beta personal video products were not as successfully marketed in the United States as were VHS products; thus, VHS established the critical mass necessary to encourage diffusion via the movie rental market. While Apple computers were marketed successfully to U.S. school systems, and thus began to establish a critical mass of individuals who would grow up using and buying Apple computers, Microsoft has been much more successful in establishing the critical mass of software users worldwide to control much of the computing innovations market. The potential for telecommunications via the personal computer has further justified the diffusion of computing innovations. The commercial utility of the Internet, a relatively old technological process in relation to present-day telecommunications, has created the need for the establishment of a critical mass for various new social systems for the diffusion of new communication products and processes. Just as with the initial adoption of the telephone, the practical utility of communication technologies is nonexistent without the acceptance of a wider audience of adopters. Thus, social systems are persuaded to accept social change and encouraged to adopt potential innovations for the benefit of those who have perceived that making the initial investments in a given technology are worth the risks.

The nature of merging technologies, and thus merging social systems, confounds simple assessment of the diffusion of innovations. Early research indicated that social systems concentrated in cities were more likely to rely on mass media in the diffusion process than those who lived in rural areas, who would rely more on interpersonally communicated information in deciding to accept an innovation. The capabilities of modern telecommunications have blurred the lines of geography, as well as the lines separating massmediated and interpersonally communicated information; therefore, identifying specific social systems becomes much more problematic. Furthermore, the layering of the utility of technologies within technologies confounds the ability to determine the rate of adoption for communication systems. Nevertheless, the diffusion of innovations has become an important and useful theoretical perspective for analyzing the effect of communication technologies.

Broad Scope and Appeal of Diffusion Theory

Diffusion of innovations research continues to be a diverse endeavor. Recognizing that diffusion theory is used primarily to explain what has already occurred, some researchers have attempted to create modifications of the theory that would allow its use as a tool for predicting the process of innovation adoption. Thus, diffusion of innovations may provide predictive as well as descriptive analyses of communication events.

Evidence of the effect of diffusion of innovations may be found in a variety of research contexts and disciplines. Diffusion of innovations is a theoretical perspective that has been widely accepted in marketing research. For example, some have noted that marketing research may be ignoring the difference in the adoption of "continuous" innovations versus the adoption of "discontinuous" products. Other contexts where diffusion of innovations theory is represented in research literature include the adoption of health and social services.

In general, the major effect of diffusion of innovations is due to its focus on process. Diffusion of innovations allows communication scholars to focus on the effect of specific channels of communication. The effect of channels influences the process of diffusion and subsequent degrees of adoption of an innovation.

Three important characteristics of the theory appear evident. First, diffusion of innovations truly is a multidisciplinary theory. Second, the theory is pragmatic by definition. In other words, the theory responds well to different research contexts. In fact, the theory, in addition to adapting well to context, depends on context-which is the third characteristic in the contextual nature of the theory. These characteristics may be at once benefits and deficiencies for communication scholars. Diffusion of innovations, as a theoretical perspective, does not belong to communication researchers. The identity of the theory necessarily is diffused into a myriad of specialties. Yet while diffusion of innovations enjoys great popularity beyond the realm of communication research, those interested in the study of communication should find the application of this theoretical perspective practical for the analysis of mass-mediated and interpersonally oriented social systems.

See also: Diffusion of Innovations and Communication; Internet and the World Wide Web; Marketing Research, Careers in; Public Health Campaigns; Social Change and the Media.

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MARTIN L. HATTON

TECHNOLOGY, PHILOSOPHY OF

As communication technology is invented and adopted, inventors and users alike ponder its meaning and value. Communication technology is very useful but its effect can also trigger both questions and problems. Philosophy provides tools to explore those questions and to solve those problems. Gary Percesepe, in *Philosophy: An Introduction to the Labor of Reason* (1991), states that the tasks of philosophy are to identify, clarify, classify and analyze problems that seem to resist common sense or scientific resolution.

Communication technology is an appropriate area for philosophical exploration. Some philosophers have pondered and even warned of the dangers of scientific and technological developments that ignore or fail to consider human values and the human spirit. Others have pondered the enhancements to the human spirit brought about by science and technology. This entry will apply the four branches of philosophy—logic, epistemology, metaphysics, and axiology—to concerns about communication technology.

Logic

Logic is concerned with thought itself. As a discipline, logic scrutinizes and classifies thought and establishes rules of correct thinking. According to Percesepe, it is indispensable where truth and conceptual clarity are sought. It is an abstract science that people use to think correctly and evaluate their thinking. It is essential to the pursuit of a philosophy of communication technology. Whether the concern is, for example, about the meaning of film editing sequences or gathering evidence about the credibility of a news source, logic and the philosophical questions it invites are relevant to these and many other communication activities. Communication technology must wrestle with the challenges that are involved in assembling content in logical form and then appropriately and logically conveying to audiences the meanings that are contained within that content.

Epistemology

Epistemology examines the nature of knowledge, where knowledge comes from, and the validity and limits of knowledge. This branch of philosophy can be used to explore many aspects of communication technology. For example, computer technology provides the means for generating and collecting knowledge, sending and receiving knowledge, interpreting and applying knowledge, sorting and storing knowledge, and judging whether to save or delete it. A philosophy of communication technology invites many epistemological questions. The techno-skeptic thrives in this realm of exploration. For example, communication technology makes possible the generating of vast amounts of prose and data of all kinds. However, when critical thinking of a philosophical nature is applied by the techno-skeptic to this ever-growing volume of electronically generated information, some of it is considered to have value only as one person's individual expression and is otherwise useless, while other computergenerated information may be of value not just to its creator but to other people as well.

Metaphysics

Metaphysics addresses the nature of reality. Metaphysics can be divided into the philosophy of being (ontology), the philosophy of mind (philosophical anthropology) and the philosophy of religion. One of the questions that metaphysics deals with is the nature of the human person. A philosophy of communication technology could explore such a question since communication and its technical use are unavoidable features of human experience. In addition to the many benefits of communication technology, some undesirable effects can also occur. For example, technology can threaten financial security, eliminate jobs, undermine the skill and dignity of work and the worker, and isolate workers from each other so that it is more difficult to exert collective pressure on employers to improve pay and working conditions. Communication technology can make possible the use of a temporary work force that has little job security and few if any fringe benefits.

Another metaphysical issue is the contrast between freedom and determinism. Marshall McLuhan's "technological determinism" is a prominent example of metaphysical exploration about communication technology. Inventions change culture, he asserted. He pondered the communication inventions of the alphabet, movable type, the telegraph, television, and computers. Changes in communication technology shape human experience, McLuhan asserted through his famous statement, "We shape our tools and they in turn shape us." He believed that people's experience of life is largely a function of how they process information. His perspective included another famous phrase, "the medium is the message." Instead of pondering only the content of a medium, McLuhan challenged individuals to consider the effect of the medium itself. His thinking was that content is influential, but so is the technology that distributes that content.

In the historical aspects of his philosophy, McLuhan's "tribal age" consisted of oral cultures, in which hearing was the dominant reception mode of communication. In his "literate age" the phonetic alphabet changed communication to a more visual experience and made it more linear than holistic, because printed text occurs line by line and the eye follows the text in a straight line across the page. This ear-to-eye switch detaches the person from the tribe/community, yet that person can still participate in a flow of information, a visual flow. Printed communication brought about a shift from collective tribal involvement to private detachment. McLuhan argued that literacy also fostered independent thinking and revolutions, among them the Protestant Reformation and political upheaval in colonial Africa.

McLuhan also posed questions about relationships. He argued that the mass production of books fragmented society and fostered the isolation of readers from one another. Electronic communication. he predicted. would return humankind to a pre-alphabetic oral tradition in which sound and touch dominate in the communication process and foster community. McLuhan envisioned a "global village" of instantaneous electronic connections between people. According to McLuhan devotees, the Internet brings his vision to reality. The Internet can connect individuals with one another, but critics point out that it also can fragment and isolate. The metaphysical debate is just beginning about the changes that the Internet causes in human experience.

Axiology

Axiology pertains to values. Its traditional subdivisions within philosophy are ethics, social and political philosophy, and aesthetics. Ethics is the philosophical discipline that explores the rational grounds for making normative statements (i.e., evaluative judgments of right and wrong). Many questions about the effects of mass media technologies, for example, revolve around ethical questions of good or bad, right or wrong, and healthy or unhealthy.

Social and political philosophy concerns value judgments that are relevant to the relation between the individual and the state. It examines questions such as what justifies the restricting of personal liberties and the difference between moral and legal justice. Communication technologies play a role here as well and generate controversy. For example, a frequently debated philosophical theme is the tension between freedom of expression and attempts at restriction of that expression. The communication technology of the Internet often generates such concerns.

Aesthetics asks questions about beauty and art. Judgments of beauty and art reveal aesthetic values. Aesthetics explores the underlying criteria that inform the normative claims of art as being good or bad or that deem all art to be a relative matter of judgment independent of criteria. Aesthetics also examines the activity of making judgments about art and the role of artists in society. This is relevant to a philosophy of communication technology because communication media are used to produce art, alter it, deliver it, and evaluate it.

Uses of communication technology are not value free. Therefore, a philosophy of technology can help in the exploration of the values on which these technological capabilities are based. Explorations might be in the form of questions such as "Are individuals in the society communally responsible for the good or evil effects of such technology?" or "If technological inventions are the work of powerful elites, then how can a society determine which technological advances to embrace and which paths to follow?"

Another example of philosophical exploration of communication technology comes from the social and political philosopher Jacques Ellul. In pondering the phenomenon of propaganda, Ellul, in The Technological Society (1973), examines the role of "psychoanalytic mass techniques" as instruments in the "suppression of the critical faculty, the formation of a good social conscience and the creation of a sphere of the sacred" (p. 370). Propaganda's social effects indicate that a collective experience, a mass experience, is occurring and that "a unifying psychism has come into being" (p. 370). In other words, Ellul contended that many people are persuaded, through a sort of mind control by communication technology, to think the same way about someone or something.

Using both logic and axiology, Ellul's writing offers a critique of advertising. His social and political philosophy offers an ethical judgment and a warning. He considered advertising to be a part of the manifestation of "mass man" and its creation of psychological collectivization that is designed not for "man's welfare" but "just as well for his exploitation" (p. 409). "When psychological techniques, in close cooperation with material techniques, have at last succeeded in creating unity, all possible diversity will have disappeared and the human race will have become a bloc of complete and irrational solidarity" (p. 410).

Conclusion

When communication technologies are introduced and become a part of human experience, they pose many questions and problems that need to be pondered. When people seek understanding about such matters, they are philosophizing. Philosophy can help when a standard or obvious answer does not seem readily available. Communication technologies pose challenging and novel questions that are not easily answered. The four branches of philosophy—logic, epistemology, metaphysics, and axiology—provide tools with which inventors and users alike can explore the benefits, detriments, consequences, and implications of communication technologies that have become vital and inextricably woven into the human condition. Greater understanding of this ubiquitous and influential facet of daily life is in order in the message-saturated world, and the methods of philosophy contribute to that understanding.

See also: Alphabets and Writing; Diffusion of Innovations and Communication; Internet and the World Wide Web; Literacy; McLuhan, Herbert Marshall; Printing, History and Methods of; Propaganda; Technology, Adoption and Diffusion of.

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CHARLES F. AUST

TELECOMMUNICATIONS, WIRELESS

The explosion of digital technology in the late 1990s began what came to be known as the information age. An important change that was made possible by digital technology was the switching of many kinds of communication from wired devices to wireless devices. Two types of wireless devices have come to the forefront during the digital age: radio-frequency (RF) devices and infrared-emitting (IR) devices. IR devices are used mainly for indoor applications. In order for an IR device to work, both the transmitter and receiver must "see" each other. The television remote controls that most Americans have in their homes are IR devices. Several companies developed IR devices that do more than change the channel of the television. IR devices can transport video, audio, and data, and they can control functions at amazing speeds.

The infrared light that IR devices use to transport data is long-wavelength light that is beyond the range of human vision. These devices work by sending the digital data, the 1s and 0s, via flashes of light. A flash within a digital word is "on" or "yes," whereas no flash within the same word is "off" or "no." By counting the flashes and nonflashes within a prescribed amount of time, the 8-, 16-, or 24-bit "word" (i.e., byte) can be created. The microprocessor within the receiving device sets the clock speed and decodes the flashes to determine what the user wishes to happen. Computer keyboards, computer mice, digital cameras, and other input devices can use IR to accomplish their mission.

Using RF allows one to travel outside the confines of the home or office. RF signals pass through most walls, work while in motion, deliver more bits per second than IR, and are available almost worldwide. RF can be delivered through transmission towers, satellites, portable transmitter–receivers, and even through the leakage from cable television wires. As more and more ways are thought of to transport information, and the importance of people continuously moving from place to place is acknowledged, RF devices will become more prevalent—while IR will supplement other devices.

Traditionally, these services (e.g., audio, video, data, and control functions) were contained in the wired universe. Coaxial cable was the wire of choice for transporting video (e.g., cable television). Twisted-pair copper wire carried voice traffic and fax traffic over the traditional telephone system. Serial cable carried instructions between computers and their peripheral devices. "Firewire" came into being in the late 1990s; this hybrid of coaxial and serial cable allows faster transfer of data than either coaxial or serial. Designed for Apple computers, the PC clone computers soon became able to use Fire-wire to operate. Fire-wire found its first niche in the profes-



To accommodate the need for an increasing variety of wireless telecommunications devices, Ericsson produced in November 2000 a cell telephone (R380) that can also be used as a personal digital assistant (PDA) to send e-mail and SMS (short message service) messages when the number pad is opened to reveal a touch screen. (Reuters NewMedia Inc./Corbis)

sional audio–video industry. Fire-wire allowed those that edited music and video on their desktops to speed up the transfer from the hard drive to the final storage medium.

Soon thereafter, web-streaming electronics and programs allowed those creative artists to send their creations to others via the World Wide Web. Compression increased the speed of the process and provided a whole new way for listeners and viewers to find their favorite music and video. Just point and click, download, and save, and an individuals could have their favorite music or movie right there on the computer hard drive. One never had to leave home again to purchase entertainment. It was all there, just a mouse-click away.

The computer went wireless too. Wireless modems let web surfers take their laptops with them where they roamed. No more did they have to be connected to a telephone line. All they had to do was power up their modems, dial the number, and they were on the Internet. The wireless computer uses the same technology as the cell telephone. The cell telephone uses spread-spectrum technology to switch from cell to cell while simultaneously transmitting and receiving.

"Spread-spectrum technology" means that the same device can operate on more than one frequency at the same time. This technology came into being in the 1940s as a way to prevent enemies from jamming the homing mechanisms on U.S. Navy torpedoes. Because the homing device used more than one radio frequency to find its target, the enemy could not confuse the torpedo by flooding one frequency with RE In order to stop a torpedo, the enemy would have to know all of the frequencies that were being used by the torpedo, in what order the torpedo used those frequencies, and how long the torpedo used each frequency. This was next to impossible.

Cell telephones used the same idea—not to jam enemy torpedoes but to allow a user to travel

from one cell to another without losing the telephone call. A cell is just the geographical area that a particular cell tower covers with its three-watt signal. As the user moves beyond the range of one tower, the tower "hands off" the call to the next tower in line that has the strongest signal from the cell telephone. The cells can be thought of as giant invisible circles. If a person stands in one circle, then one tower is used. If the person moves beyond the edge of the circle and enters another circle, then the second tower is used.

The personal communications system (PCS) uses the same technology, only instead of using towers, PCS uses cable television wires and shorter, less powerful one-watt towers to carry a telephone conversation. Digital cable television systems allow many telephone calls to be carried with digital television within the spectrum that is not used by the cable company to carry television. At the cable company office, the call is switched to the traditional telephone company's wires to complete the call.

Satellite telephones work like cell telephones in that they use spread-spectrum technology. Instead of handing off to another tower, the satellite telephone hands off to another satellite. Satellite telephones use low-Earth-orbiting satellites to give the user a dial tone anywhere on the planet. Both the user and the satellites move. As a satellite passes over the horizon, out of "sight" of the telephone, the call is handed off to the next satellite in line. If no satellite is available, then the call is routed through the nearest available cell network. The downside to satellite telephones, at least in the beginning, was the high cost of satellite time. It is expensive to launch and maintain satellites, and this cost was passed on to the user. However, satellite telephones allow one to make calls or to log on to the Internet anytime and anywhere.

All of these devices that had formerly been restricted to wire carriers were liberated by the use of the radio spectrum. However, since the spectrum is used for other purposes, there is less available spectrum for new services. Nicholas Negroponte addressed this new problem with what he called the "Negroponte switch."

The Negroponte switch is the change from wired technology to wireless technology and vice versa. Traditional wired services found their way onto the RF spectrum and RF devices went to wires. The Negroponte switch works on one basic principle: "bits are bits." The computer or television or telephone or any other device does not care, nor does it know, what the bits are meant to represent. Any device that can pass digital bits and bytes can pass them along. Only at the final destination do the bits get turned into what they are supposed to be. The most important bits, according to Negroponte, are the "header bits." These are bits about bits. These bits tell the output device what they are supposed to be.

The Negroponte switch deals with voice and data, as well as with the way in which people interface with their devices. "Intellisense" is the word that Negroponte created to describe how all household, workplace, and personal devices will communicate with each other to better serve the needs of people. For example, say that an individual wants to get up thirty minutes later than usual. All that person would have to do is set his or her alarm clock. Intellisense would then tell the coffeemaker, the computer, the water heater, the furnace or air-conditioner, the car, and the telephone that the person will be sleeping for an additional thirty minutes. Once this is done, the telephone will not ring during the additional thirty minutes, the coffeemaker will make coffee thirty minutes later than usual, the computer will download any important information that the person might have missed by sleeping late, and the hot water and room temperature will be at their optimum level thirty minutes later than usual. All of this saves the person both trouble and money. A person does not need a warm house or hot water until he or she is ready to get up and shower. If the person is low on milk, the refrigerator will tell the car to remind the person to get some milk on the way home. Or, if the refrigerator is in need of service, it will call the repair service before it breaks down.

When the person goes to work, Intellisense will know where to route incoming telephone calls and e-mail messages. Instruction manuals will be obsolete. Intellisense will tell people how to operate devices. A person will tell the computer/television (according to Negroponte, there will soon be no difference) what news is important, and the device will "filter" the content to suit the viewer's tastes. People will no longer have to remember to program the video recorder or read the television listings to know when to watch a favorite program. People will be able to watch anything, anytime. When the Negroponte switch becomes the norm, extremely targeted advertising will come directly to individuals through the program content, but they will not know it is advertising; it will be seamless with the program. An individual will become part of the machine. Electronics will be woven into people's clothing. Dick Tracy's twoway wrist television will become reality. A person's belt will contain the batteries to operate all of his or her gear. An individual will be able to access the telephone, the Internet, e-mail, call home, and program home devices from a distance. The only question is how will those signals be passed along to the chosen destination.

Because bits are bits, all of this is possible. The Negroponte switch will allow those media that were once sent over wires (e.g., the telephone) to be sent over the air. Those media that used to be sent through the air (e.g., radio and television) will soon be sent over wires, similar to cable television.

The problem will show itself soon after the switch begins—there is only so much open spectrum that is available to use for all these devices. One day, the usable spectrum will be exhausted. What then? Negroponte suggests that those things that can use wires should continue to do so and that those things that can only use the spectrum should go wireless.

Spectrum saturation was a problem with early cell telephones, which were analog devices that operated in the 800-megahertz (MHz) range. People who had programmable scanners regularly listened in on conversations that took place over cell telephones. The cell telephone industry went to the U.S. Congress to get laws passed to make it illegal to intercept and eavesdrop on cell telephone conversations. That did not do much for those who already had scanners, nor did it stop others from listening to conversations. In the mid-1990s, the cell telephone industry came out with digital cell telephones. These telephones, which sounded clearer than their analog cousins did, were also harder to intercept. Digital cell telephones use header bits to tell the cell telephone tower who the telephone belongs to, who they are calling, and what is going to be traveling over the signal. Voice, data, or other media can be sent over digital cell telephones with a greater degree of privacy than is available with analog cell telephones because the potential interceptor has to be able to know what "channel" and tower the digital cell



Nicholas Negroponte, creator of the Negroponte Switch, spoke with reporters during a press conference in Singapore on November 13, 2000, and said that developing nations are likely to become the dominant players on the Internet as they are pushed by necessity to leap the economic divide. (AFP/Corbis)

telephone is on, along with what the header code is when the conversation is started. Without that information, the scanner is useless. All the listener hears is the digital bits traveling back and forth, not what those bits represent.

Negroponte has stated that as the limited spectrum is taken up by cell telephones, satellite telephones, wireless computers, wireless body wear, and other peripherals, some of these devices will go back to using wires to communicate with each other. Already, the spectrum for pagers and twoway communication (e.g., police, fire, and emergency services radio) is getting squeezed by commercial digital broadcasting and the other users of RF energy. Soon, society will have to find ways to go back to the wired world for those devices that do not need to travel.

These wireless devices give users the freedom to travel about without worrying about missing an

important call or message. As with all freedom, a price comes with it. That price is the overflowing river that is the RF spectrum. With the Negroponte switch, all wired services will become wireless and vice versa. The television and the computer will be intertwined into one box. Those individuals who need to be in communication with others all the time will have that opportunity, and they will still be able to roam about outside the home or office. While the "modern" devices will quickly become obsolete, the new ways to communicate and stay in the know have not been thought of yet. One's house and office will know whether one is at home or at work. The building will know where an individual is, where the nearest telephone is located, and what calls an individual must receive. People will program these devices with their voices. The content does not matter. Bits are bits. Only how those bits are moved will change. From an economic standpoint, only those devices that are cheap and easy to operate will survive in this new information age. Consumers will not tolerate anything that is merely an improvement over preexisting technology. Merely redesigning a graphic interface without making it easier or more efficient to operate will not be enough.

Digital devices that bring people information have to be inexpensive, easy to operate, and, ultimately, useful if their creators want to survive in the world of business. Until then, people will use pencil and paper because it is easy. In general, people will watch a fuzzy television and listen to a radio that is full of static because they are more inexpensive than high-definition television and compact disc players. Until the above conditions for digital devices are met, the Negroponte switch will not become a reality.

See also: Cable Television, System Technology of; Digital Communication; Digital Media Systems; Internet and the World Wide Web; Radio Broadcasting, Technology of; Satellites, Communication; Satellites, Technology of; Telephone Industry, Technology of; Television Broadcasting, Technology of.

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ERIC E. HARLAN

TELECOMMUNICATIONS ACT OF 1996

The Communications Act of 1934 brought the telephone, telegraph, and the then-fledgling broadcasting industry under the control of the newly created Federal Communications Commission (FCC). The U.S. Congress reasoned that because the radio spectrum was a permanent resource, owned by the citizens of the United States, representatives of the federal government should regulate those that sought to exploit this resource for profit. The 1934 act governed the licensing, operation, and conduct of the broadcast industry for more than sixty-two years.

History

The FCC and its predecessor, the Federal Radio Commission, designed and enforced a system of frequency allocation and transmission regulation to assure the maximum availability of radio service to Americans. When the 1934 act was passed, AM (amplitude modulation) radio was king. Over the years, various amendments were added to the 1934 act as Congress tried to keep up with newly discovered radio spectrum, new transmitting and receiving devices, and the tastes of the American people. For example, when FM (frequency modulation) radio came into being in the 1940s, the FCC attempted to regulate the new service in a manner that would be in the public interest.

Beginning in 1947, the television industry slowly usurped radio's dominance of the American public's in-home entertainment. To make sure that all Americans could have equal access to television signals, the FCC asked Congress to amend the 1934 act to create a broadcast standard for television, and, later, for color television. When color television became the norm, the FCC required stations to continue to broadcast a "compatible" signal that could be viewed on a monochrome (black-and-white) television—a rule that is still in effect. The 1960s and 1970s saw the FCC move into the Equal Employment Opportunity Act arena with its regulation of broadcast stations. The commission's equal employment opportunity rules said that the workforce of a television or radio station had to reflect the percentage of minorities located within the city of license. At least 50 percent of the full-time workers and 25 percent of the part-time staff had to reflect this ethnic diversity.

The Communications Act of 1934 also delved into the programming area, with limited regulations that dealt with the content of broadcasts. Obscene and indecent material was banned from the airwaves at times when children could be viewing or listening. A "safe-harbor" was created during the late-night and early-morning hours, when children were less likely to be viewing or listening, so that stations could broadcast their more adult-oriented programs.

In the early 1990s, it became clear to Congress and the FCC that the 1934 act was inadequate to regulate the new technologies that were changing the role of broadcasting and other media. There were wireless devices (e.g., cell phones), cable television, satellite television, the Internet, and other new digital ways to communicate that were not even in the realm of science-fiction in 1934. Thus, the FCC, with the help of Congress, drafted the Telecommunications Act of 1996. This act is supposed to work with the newly emerging technologies in the same way that the Communications Act of 1934 worked with the early radio and television technologies.

Regulations and Deregulations

The Telecommunications Act of 1996, which amends the Communications Act of 1934 to reflect technological change, is an omnibus law that regulates most of the electronic communication technologies that are in existence, as well as others that are still in development. The following is a list of new regulations and deregulations that are present in the act as it was formulated by the FCC and by Congress and as it pertains to the broadcasting industry. They are presented in the order in which the FCC implemented the key portions of the act.

Access by People with Disabilities

As mandated by the Americans with Disabilities Act, the FCC becomes the sole arbitrator of disputes that deal with disabled people and their access to telecommunications. Broadcast stations are required to give access to disabled people, making any required physical changes to their facilities to allow disabled people to use the facilities. The act created the Architectural and Transportation Board to mediate disputes of this nature.

Market Entry Barriers

The FCC is required under the act to identify and eliminate barriers that prevent entrepreneurs and other small businesses from participating in the ownership of telecommunications services and information services or the provision of parts of those services. Every three years, the FCC is required to report to Congress on the outcome of their review of regulations that are to eliminate barriers, and they must recommend statutory remedies for those barriers.

Broadcast Spectrum Flexibility

The biggest news in television broadcasting is the change from the National Television Standards Committee (NTSC) television standard to digital television. The 1996 act gives existing television stations a timetable in which to convert their broadcast facilities to digital, and this timetable depends on the market size. The act also gives television stations another channel for their digital broadcasts until a certain percentage of their market purchases digital television receiving equipment. After that threshold is reached, the stations must give back their old analog channel. The old channel will then be used for other services, such as two-way communication and wireless phones.

One of the advantages of digital broadcasting for broadcasters is the ability to operate more than one service within the new channel. If the television station does not broadcast in high-definition television (HDTV), then that leaves spectrum for other, or ancillary, services. These ancillary services can take the form of other television programs, Internet access, or subscription services. The 1996 act allows stations to use these ancillary services; however, if they choose to use them, the act states that the stations must pay a user fee to the FCC for the use of the public spectrum for profitable services other than advertisements. This fee can amount to what the FCC could have collected had the agency charged a licensure fee for those services in the first place. This provision is being challenged by the broadcasting industry.

Broadcast Ownership

Depending on the size of the market that a broadcast group serves, the number of radio stations one group can own has greatly increased. Before, to ensure a "diversity of voices," broadcasters were severely limited in the number of stations that they could own. Under the 1996 act, this has changed. In large markets, an entity can own up to eight stations, so long as no more than five are of the same service (AM or FM). In medium markets, up to seven stations can be owned so long as no more than four are of the same service. In small markets, five stations can be owned so long as no more than three are of the same service. However, no entity can own more than 50 percent of the stations in any given market. In addition, the FCC may permit an entity to maintain interest in a broadcast station, so long as the station will increase the number of radio stations in operation in a market (as long as the new stations have the room in the spectrum to broadcast without interfering with an existing broadcaster). In other words, if an entity is in danger of exceeding the limits, it is in the entity's best interest to encourage another station to enter the market—if there is room in the spectrum.

Television Ownership Limitation

An entity can own as many television stations as it wants, so long as the total audience served does not exceed 35 percent of the national audience. Still to be resolved is whether or not the same entity can own more than one television station in a single market that is not among the top fifty markets. The one-to-a-market rule has been waived in the top fifty markets. The prohibition of crossownership of a television station and a cable system that serve the same market has been dropped.

Over-the-Air Reception Devices

The FCC has preempted local zoning regulations of satellite Earth stations. That means that local governments can no longer prohibit residents from putting up satellite dishes in their yards or on their houses.

Cable Reform

The act established so-called uniform rate structures that apply to cable systems that are not subject to competition from other cable, or wireless cable, systems. However, this structure does not apply to pay-per-view or subscription channels. It makes the FCC the arbitrator of complaints that deal with rate structure, declaring "predatory pricing" illegal. Predatory pricing is the offering of discounts on some aspects of cable service to entice potential customers from a competing cable company and then raising the rates after the customer has switched cable services. In franchise areas of fifty thousand subscribers or less, the basic service pricing rules do not apply. The act's cable reform also requires that cable equipment be compatible with televisions and video recorders that are owned by the consumer. Also, the equipment that makes the televisions and video recorders compatible should not interfere with features of other electronic equipment. One other aspect of the cable reform portion of the act permits cable franchises to pass aggregation of equipment costs along to subscribers to help pay for upgrades to the cable system—so long as people who subscribe to only the "basic tier" service are not charged for the equipment used to view that service. The cable box that is used by the viewer to navigate the cable channels can be purchased at vendors that are not affiliated with the cable company, so long as such devices have not been altered to allow the home viewer to watch subscription services without paying for that service.

The 1996 act also requires broadcasters and cable channels to include closed captioning for hearing-impaired viewers. The FCC will eventually require a separate video description channel, within the digital channels, for those viewers who are blind.

The most publicized television portion of the Telecommunications Act of 1996 deals with the "Vchip" requirements for manufacturers and broadcasters. The first part of the act required broadcasters and cable casters to place a rating in the upper left-hand corner of the television screen to alert the viewer about the content of each program. The Vchip, or violence chip, is to be included in the electronics of the set. Broadcasters and cable casters are required to send an encoded, invisible, and inaudible signal with the beginning of each program. This signal communicates with the V-chip and tells it what the program rating is. Parents can then program the television set to not display programs that have ratings beyond a preselected threshold. That way, absent parents can control what their children watch without being in the room. The V-chip is to be included in all sets that have a measurement of thirteen inches or larger.

Beyond broadcasting, the act gives the FCC exclusive jurisdiction to regulate the direct-to-home satellite industry. The FCC has given the direct-tohome satellite industry permission to rebroadcast local stations into television markets where before they were forbidden. The act also contains numerous changes in the regulation of the telephone industry. These changes are designed to allow greater competition among local telephone services, long-distance services, and cable services in providing their customers with Internet access and new kinds of digital voice and video transmission.

Conclusion

As with the Communications Act of 1934, the Telecommunications Act of 1996 was intended to be flexible, so that the FCC and other regulatory agencies can keep up with communications technology that changes every day. The Telecommunications Act of 1996 will allow consumers the freedom to choose the source of their entertainment and information, and it ensures that the broadcasting, cable, and satellite industries will remain viable and competitive well into the twenty-first century.

See also: Broadcasting, Government Regulation of; Communications Act of 1934; Federal Communications Commission; Ratings for Television Programs; Telecommunications, Wireless; V-Chip.

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TELEPHONE INDUSTRY

From 1877 to 1984, the public switched telephone network (PSTN) in the United States was operated as a virtual monopoly by American Telephone & Telegraph (AT&T). Since 1984, the industry has experienced tremendous change as technology and government policy have combined to introduce competition and to expand the scope of the industry beyond the provision of local and long-distance telephone service. During its second century, the telephone industry will continue to evolve into a full-service information utility, capable of delivering telephone, data, and interactive video among other services—part of what David Goff (2000, p. 242) characterizes as "a massive transformation of global information and communication facilities."

The First Telephone Century

Alexander Graham Bell launched the first Bell Telephone Company in 1877, and the firm quickly established local telephone exchanges on the East Coast from Washington, D.C., northward. In order to connect the growing number of local exchanges, a system of "long lines" was established under a subsidiary called the American Telephone & Telegraph Company. Throughout most of the twentieth century, the Bell System built the national telephone network by creating a system of local-exchange carriers operated by twenty-two Bell operating companies and interconnected by AT&T's long-distance service. At first, independent (non-AT&T) local telephone operations were denied access to AT&T's long lines, and the company used its powerful position to acquire attractive independents to become new regional Bell operating companies. David Atkin (1998) notes that the U.S. Department of Justice threatened antitrust action against AT&T in 1913, resulting in the Kingsberry Commitment (named for the company vice-president who drafted it), whereby AT&T pledged to interconnect independent telephone companies.

The 1920s saw the emergence of radio broadcasting, and AT&T entered this new communications industry for a time. However, a series of legal disputes with other broadcasting firms distracted AT&T from its core business and once again attracted unwanted government scrutiny. As a result, AT&T sold its broadcasting properties, but continued to serve the new industry profitably by providing leased lines from the Long Lines Division for networking. The Communications Act of 1934 placed regulation of the common-carrier telephone industry and broadcasting under the same agency, the Federal Communications Commission (FCC). The administration of President Franklin D. Roosevelt set the goal of providing universal telephone service in the United States and promised AT&T immunity from antitrust action in order to achieve this goal.

AT&T was able to provide near-universal telephone service through a system of cross-subsidies. Business and long-distance customers were charged at a rate higher than the cost of service, while residential customers were generally charged at rates lower than the cost of service. In addition, urban customers were overcharged for their service, while rural customers were undercharged. Government seemed to view these cross-subsidies as a fair exchange for universal service and considered AT&T to be a "natural monopoly." Nonetheless, the U.S. Department of Justice sought to break up the company in the 1940s, but the effort was ended with a negotiated final judgment in 1956. AT&T aggressively resisted the attachment to its network of any device not approved (manufactured) by AT&T. Between 1956 and 1969, AT&T lost several legal battles against firms with new or competing technologies, including a 1969 case that gave upstart long-distance service MCI the authority to connect to the AT&T network.

The Breakup of AT&T

By the mid-1970s, AT&T, the largest company in the world, was increasingly regarded as inefficient and anticompetitive, and its once-protected monopoly status was seen as a detriment to the future of the telephone network. In 1974, the U.S. Department of Justice determined to break apart this corporate giant. In 1982, AT&T and the Department of Justice reached a negotiated settlement, technically a modification of final judgment (MFJ) from the 1956 proceeding.

Under the terms of the MFJ, the twenty-two Bell operating companies were reorganized into seven regional Bell operating companies (RBOCs): Bell Atlantic, NYNEX, BellSouth, Ameritech, US West, Pacific Telesis, and Southwestern Bell. These RBOCs, or "Baby Bells," were authorized to operate local-exchange carriers, but they could not provide long-distance service beyond the markets within each firm's territory. In addition, the RBOCs were prohibited from offering video (cable) or information services. AT&T retained its long-distance franchise, subject to competition, and was forbidden to enter the local services market.

In the aftermath of the AT&T divestiture, the cost of long-distance service has declined, initially due to the ending of cross-subsidies, and later due to aggressive competition in this sector. Generally, the cost of local service increased immediately after the divestiture, with the largest increases experienced by rural customers. Competition in local telephone service remains limited.

Convergence, the Internet, and the Telecommunications Act of 1996

By the 1990s, a shift from analog to digital communication technologies was well under way within the telephone industry. With digital technology, all information takes the same form, a code composed of bits or binary digits (0 or 1). Nicolas Negroponte (1995, p. 18) describes this phenomenon elegantly with the phrase "bits are bits." Any technology that can process or transfer digital data can handle digital representations of text, graphics, sounds, video, or other computer data. "Convergence" is the term used to describe the digital-era erosion of the technical boundaries that used to define and separate communications and media technologies and industries.

Digital signals are considered to be technically superior because they are less subject to electrical interference and signal loss than the analog variety. Both AT&T and the Baby Bells developed and employed digital technology from the 1950s onward. However, the legacy that PSTN built during AT&T's first century remains a substantially analog network designed to optimize voice traffic. In the digital era, the telephone industry has found it both necessary and profitable to adapt its vast national and global infrastructure to carry both digital data and analog voice signals. This process of change is both a cause and effect of a large-scale restructuring of the telephone industry.

The euphoric vision of an "information superhighway" emerged in the United States in the early 1990s as politicians and others began to consider the potential of digital information technologies. The emergence and growth of the public Internet after 1994 gave substance to the vision. The desire of government to enable the development of advanced information technologies and the skill of corporate and industry lobbyists combined to create the Telecommunications Act of 1996. As Wilson Dizard (1997, p. 132) describes it, "the law drastically reduced, and in many cases eliminated, the regulatory barriers between telephony, cable TV, satellites, and broadcasting in ways that permitted open competition among all digitally based services." For the telephone industry, the net effect of convergence, the Internet, and the Telecommunications Act of 1996 has been a major transformation, as firms attempt to become full-service information utilities and as new competitors enter the fray.

In the aftermath of the AT&T divestiture and the Telecommunications Act of 1996, wireline telephone services are currently provided by firms from two sectors of the telephone industry: the incumbent local-exchange carriers (ILECs) and the competitive local-exchange carriers (CLECs).

The Telephone Industry Transformed

In *Trends in Telephone Service*, the Federal Communications Commission (1999) reported \$246 billion in U.S. telephone industry revenue for 1998. Local service generated \$104.6 billion plus another \$10.6 billion for toll (long-distance) calls handled within local-service areas. Long-distance services generated \$94 billion, and wireless had grown to \$36.8 billion. In the United States, 104.8 million households (94%) subscribe to telephone service, with each household spending an average of \$809 annually (in 1997).

The ILECs, generally the RBOCs, remain a dominant force in the telephone industry. Atkin (1998) reports that the Baby Bells control 98 percent of local telephone service in the United States. A hands-off regulatory approach by the government since 1996 allowed mergers and acquisitions to reduce the number of RBOCs to four: Bell Atlantic, SBC Communications, Bell-South, and US West. In 1999, Bell Atlantic acquired the largest non-Bell local carrier, GTE, and renamed the company Verizon. US West was acquired by Qwest Communications in 2000. Despite the intent of the Telecommunications Act of 1996 to open all telephone markets to competition, the ILECs have maintained control over their core businesses, creating what both competitors and regulators call "the last mile bottleneck."

Within their local strongholds, the ILECs operate with a mixture of digital and analog technology. The consolidation that reduced the number of major ILECs has contributed to economies of scale and scope that facilitate the rebuilding of networks with optical fiber and other advanced technologies that these firms will require to become full-service information utilities, offering telephone, Internet, business data services, and video to subscribers. Sequential digital improvements in the local loop have generated new revenues for local-service providers from such services as caller ID, call waiting, three-way calling, call return, and repeat dialing. However, much of the local loop is composed of twisted-pair copper wire, an analog transmission medium that dates back to the beginning of the industry.

Prior to the 1990s, the incumbents were the only option available to businesses needing data networking services. The ILECs initiated integrated services digital network (ISDN) service for smaller businesses, and faster (and more expensive) T-1 lines to meet the needs of larger institutions. However, the data needs of businesses grew exponentially during the 1990s, and the emergence and growth of the Internet meant that a growing number of residential and small-business subscribers would need digital data connections as well. Goff (2000) reports that the existing network of the ILECs represents a \$250 billion investment. Rebuilding this infrastructure to digital standards will take years. As a result, a new, second-generation type of telephone company, the CLEC, has emerged.

While most indeed offer local (and long-distance) telephone services, CLECs emerged in the digital era to provide modern data services at competitive prices. As Goff (2000, p. 248) describes them, "CLECs are free to pursue markets opportunistically and typically target businesses (the traditional cash cows of the ILECs) in high-tech markets and larger cities where faster return on investment can be found." Firms such as World-Com, Nextlink, Qwest, Williams, and ICG are building new, broadband, high-speed, packetswitched fiber networks, the "fat pipes" that are capable of carrying the growing volume of data traffic generated by businesses. These firms are also developing and operating the fiber backbone networks that speed huge volumes of digital data (including Internet data) between domestic and international business capitals.

Because the business market is so lucrative, the large-data CLECs have shown very little interest in residential telephone services. However, the tight



In November 1999, MCI/Worldcom President and CEO Bernard Ebbers (left) and Sprint Chairman and CEO William Esery testified before the Senate Judiciary Committee because U.S. lawmakers who were examining a proposed merger between the companies expressed strong fears that the proposed combination would harm consumers by reducing long-distance telephone competition. (Reuters NewMedia Inc./Corbis)

control of the residential market by the ILECs is being challenged by competing technologies.

The cable television industry has strong potential to develop competitive telephone services and to play a role as a CLEC. Cable systems are wired with coaxial cable, a transmission medium with a large signal-carrying capacity, and cable "passes" 97 percent of U.S. households. However, cable systems were built to send signals in only one direction, and like the ILECs, the cable industry must replace analog technology with digital. Still, the per-household cost of rebuilding cable systems to function as fullservice information utilities is substantially less than the cost of rebuilding the PSTN to an equivalent level of technology. Many of the leading cable firms (including Cox Communications, MediaOne, and Time-Warner) offer telephone services in selected markets. AT&T, the nation's largest longdistance company, purchased Tele-Communications Inc., the nation's largest cable multiple system owner, in 1998. This acquisition will enable AT&T

to offer local telephone service in many parts of the United States and reduce its payment of access fees to local telephone companies for their role in completing long-distance calls.

The greatest challenge to the dominance of local wireline telephone service is posed by the wireless telephone industry. This new service began as (analog) cellular telephone service in 1984. Initially, two cellular franchises were awarded in each market area with one reserved for the local wireline company. Digital wireless service was initiated in 1994 with the introduction of personal communications services (PCS), a higher frequency variant of cellular technology. By late 1999, there were eighty-three million wireless subscribers in the United States, and wireless revenue was near the \$50 billion level.

Portability helped this technology catch on quickly in the business community, particularly among business people on the move. Many also recognized the value of a wireless telephone as an emergency link from the car, briefcase, purse, or backpack. As the price of wireless service declined and wireless telephones became smaller, they began to appear everywhere. Despite the rapid growth of wireless services in United States, America still lags behind European countries in the percentage of wireless users. One major reason is that in the United States, wireless subscribers pay to both send and receive calls, whereas in Europe the cost of a wireless call is borne by the sender. In addition, roaming charges, additional fees that are assessed when wireless subscribers venture outside of their service provider's territory, represent a cost that is not incurred with wireline service.

In many U.S. markets, wireless telephony is very competitive, with two cellular and as many as six PCS firms vying for market share. Some of the nation's largest wireless operators, major long-distance services (e.g., AT&T, Sprint, Nextel), offer flat-rate pricing plans for local and long-distance service without roaming fees. In this way, wireless services escape franchise territories and become national in scope. In the competitive wireless market, flat-rate pricing and the elimination of roaming charges are practices that are expected to spread.

The introduction of digital PCS technology had a positive effect on the older, analog cellular services. Rather than fading away, the cellular systems converted to digital technology and developed the ability to offer basically the same range of services as digital PCS, including advanced telephone services, paging, fax, and data (even Internet) services. Increasingly, additional devices such as laptop computers and personal digital assistants (PDAs) are being interfaced with wireless technology. As the range of wireless services continues to improve and the cost continues to become more competitive with wireline rates, it is expected that a growing number of telephone users will disconnect from wireline systems and use wireless to meet all of their telephone service needs.

As the twenty-first century began, the oftenchaotic transformation of the telephone industry was continuing. Several trends were clear, however. First, the packet-switching technology of the Internet will increasingly become the preferred switching technology of the industry. The CLECs have exploited this technology, and the ILECs must continue to integrate packet switching within networks designed for a different approach (circuit switching). Second, an increasing share of telephone-related services will migrate to wireless technologies and wireless will challenge wireline businesses for market share. Residential consumers should have more choices of both technologies and providers. The predicted information utility, a single two-way connection carrying telephone, video, and data, will become a reality, but the likely provider is yet to be determined, with telephone companies, cable firms, wireless providers, satellite systems, and even electric utilities competing in this sector.

See also: Bell, Alexander Graham; Cable Television; Communications Act of 1934; Digital Communication; Federal Communications Commission; Internet and the World Wide Web; Telecommunications, Wireless; Telecommunications Act of 1996; Telephone Industry, History of; Telephone Industry, Regulation of; Telephone Industry, Technology of.

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TELEPHONE INDUSTRY, HISTORY OF

One of the greatest factors in shaping the modern age may well have been the evolution of the telephone industry. The roots of the communication age are found in the history of that evolution, primarily in the United States, and particularly in developments created by one company: American Telephone & Telegraph (AT&T).

Early Organization

The telephone industry was not the first to use electricity as the fundamental basis of a communication medium. Telegraphy had been firmly established in the United States and much of the industrialized world before efforts began in the late 1870s to develop telephony as the primary telecommunications industry in the United States. Furthermore, Alexander Graham Bell's technical innovations and U.S. patents in telephony should not overshadow the fact that others deserve as much or more credit for invention of the telephone. Although Europe was slow to adopt the telephone, Germany deserves more credit for its invention than the United States, due to Philip Reis's efforts in 1861. Nevertheless, most subsequent technological innovations that have led to the modern state of the telecommunications industry have been the by-product of Bell's vision and organization. While technological developments and regulatory processes have been key influences in the evolution of the telephone industry, the pivotal force motivating this history has always been economics.

AT&T's history, which has provided the context for all other developments in the telecommunications industry, can easily be divided into two distinct periods. The first period extends from the founding of Bell's company in 1877 to its legally mandated divestiture in 1982 (in spite of its claims to be a natural monopoly). The second period involves the post-1982 history of the company.

The first period in the history of the Bell System may be divided further into three separate periods leading to the establishment of the AT&T monopoly. The first is the period from 1877 to 1900, which may be best identified in terms of the Bell System's effort to control all aspects of the telephone product. The second is the period from 1900 to 1925, which involves the evolution of AT&T, the company's focus on an expanding infrastructure, and the original meaning of universal service. The third period, from 1925 to 1982, is related to the events that eventually challenged the company's identity as a natural monopoly.

The origin of the telephone industry is best explained through the Bell System's progression throughout North America via control of product development. Bell received four of his U.S. patents between 1875 and 1877. One of Bell's original financial supporters for development of the telephone was Gardiner Hubbard, who eventually became Bell's father-in-law and was one of the founding members and the first trustee of the Bell System. The original Bell System was designed to protect Bell's telephone patents and to control the use of all patented equipment. The first commercial organization of the Bell System was an agreement signed by Bell, Hubbard, and George Sanders on February 27, 1875, called the "Bell Patent Association." Hubbard's business experience influenced the concept of the Bell organization. Before he became associated with Bell, Hubbard had worked as an attorney for the Gordon-McKay Shoe Machinery Company. Hubbard applied the shoe company's practice of leasing equipment and receiving royalties for products created by that equipment to the business strategy of the Bell Telephone Company (formally established on August 4, 1877). In other words, each telephone service provider in a local market would pay fees to the company for use of the Bell telephone patents. Telephone customers would buy only service from providers. Bell essentially owned and controlled the hardware. Thus, the first phase in the establishment of a Bell telephone monopoly through vertical integration had begun.

The need to continue product innovation was recognized during this early phase of organization. Thomas Watson, essential to Bell for product development during the original patent applications, had been brought into the organization exclusively for product development. Yet Bell's greatest rival for patent rights and the evolving telephone industry, Western Union Telegraph Company, had strong ties to the Western Electric Manufacturing Company, the largest producer of electronic products in the United States. It was through Western Electric that Western Union chal-



Alexander Graham Bell obtained a patent for his telephone transmitter and receiver in 1876. (Underwood & Underwood/Corbis)

lenged Bell's patents and exclusive rights to the telephone. Elisha Gray, who applied for a caveat as a precursor to a telephone patent on the same day as Bell's patent was filed, was an employee of Western Electric. Western Union formed the American Speaking Telephone Company on December 6, 1877, using the associated talents of innovators such as Gray and Thomas Edison and the production capabilities of Western Electric.

The eventual confrontation between Bell and Western Union concerning exclusive rights to telephone licensing and production led to an outof-court settlement in 1879. Bell had opened the first U.S. commercial exchange in New Haven, Connecticut, in 1878, and by 1879, he had established several more local exchanges throughout the United States and Canada. The Bell System reorganized under the name American Bell Telephone on March 20, 1880. The company barely had survived with little working capital during its first years of operation, yet the philosophy of competition through product development and control remained firmly rooted in the Bell business strategy. American Bell began to recognize the value in interexchange, or "long distance," telephony during the 1880s, and it formed a subsidiary company on February 28, 1885, the American

Telephone & Telegraph Company, to develop long-distance service. The acquisition of Western Electric from Western Union, however, gave the Bell System the foundation it needed to maintain control over product innovation. On November 26, 1881, the newly named Western Electric Company took over the research and product manufacturing unit of the Bell System under the supervision of Watson. Most essential technological developments leading to the modern telecommunications infrastructure have their origins in Bell System's acquisition of Western Electric. Subsequently, Bell System's research and development helped to establish the financial base that the company would need for further expansion.

The financial benefits of owning its own product development unit allowed the Bell System to focus on widening its market influence in one other way. Western Union had given the Bell System a part of its customer base in the 1879 settlement. The Bell System was based on the control of several exchanges throughout the North American continent. Bell attempted to gain European control for his company, but Edison beat Bell by establishing the Edison Telephone Company of Great Britain, Ltd., in 1878. Furthermore, Western Union controlled most of the wired infrastructure throughout the United States, essentially isolating the local exchanges that were controlled by the Bell System. Ironically, while Bell's vision for the telephone was the point-to-point use by the average customer, Edison and others thought that the device would be too expensive and complicated for an international, or even a national, telephone system to evolve. As in Europe, many in the United States thought that the telegraph would remain the only true communication network. Hubbard actually refused to finance much of Bell's early development of the telephone, believing instead that telegraphy would remain more profitable. Nevertheless, from 1880 to 1884, the Bell System began establishing long-distance lines that connected major cities throughout the New England area. While intercity telephony grew relatively slowly throughout the 1880s, perhaps due to the initially slow expansion of urbanization, the apparent financial benefits of connecting local exchanges through "long lines" motivated another change in strategy and corporate restructuring of the Bell System.

The AT&T Monopoly and Technical Advances in Telephony

AT&T became the parent company and long distance became the focus of the Bell System in 1900 due to several factors, including public fears that the company practiced unfair business practices in the local exchange market, technological advances that allowed for greater interconnectivity, and the leadership of Theodore Vail. Vail, related to Samuel Morse's associate Alfred Vail, accepted the position of general manager of the Bell Telephone Company in 1878. Vail was put in charge of AT&T in 1885 but resigned as the company's president in 1887. Vail's return to AT&T in 1907 is considered the true origin of the modern telecommunications industry. While Vail's conception of universal service at affordable rates proved to be a great marketing strategy with the public, it also would continue to redefine the logical progression of the entire industry. AT&T's interests in Western Electric were reorganized, and that division was renamed Bell Telephone Laboratories in 1925. Also in 1925, Vail's vision for AT&T's complete control of a national infrastructure was generally accepted throughout the Bell System. Frequently challenged but essentially unchanged until 1982, the corporate structure of AT&T was well established by 1925. AT&T led a corporate structure that included the original Bell operating companies and Bell Laboratories. AT&T became the world's largest business enterprise, a fact that led to the U.S. Department of Justice (DOJ) challenging its operation as a highly integrated corporate monopoly.

Many technological advances by AT&T and others improved the marketability and led to expansion of the telephone industry between 1925 and 1982. In 1951, Bell competitor General Telephone and Electronics Corporation (GTE) developed direct distance dialing (DDD), which gave telephone customers the ability to dial a long-distance number directly without the facilitation of a switchboard operator. However, directdialing technology was not widely accepted throughout the telephone industry until the late 1960s. Commercial international telephony between Europe and North America began in 1927 via radio telephony service established by the British Post Office and AT&T. The first intercontinental submarine telephone cable between Europe and North America was opened for service in 1956. In 1962, Arthur C. Clark's vision of the communication satellite was realized when *Telstar* became operational. Telstar, developed by Bell Laboratories, was nothing more than a microwave relay device. It is therefore ironic that microwave technology and the transistor, also developed by Bell Laboratories, indirectly put an end to AT&T's monopoly over the telephone industry. Other important technological firsts that were essential to the evolution of the telephone industry include Intelsat 1, which was a communication satellite that linked Europe with North America in 1965.

AT&T helped to establish almost all of the advances in telecommunications technology and used the strategy of monopoly to control the implementation of each innovation by the telephone infrastructure. Yet these technology-driven innovations pushed reconsideration of the industry's structure and viability as a natural monopoly. Competitive forces increased pressure to destroy the Bell System's control over the industry with each wave of technological advances. In 1949, the DOJ filed suit against AT&T for its dominance over product development. The suit was settled in 1956 with AT&T's agreement to stay out of new product developments and sales that included innovations such as computer technology. Also in



In Atlanta, Georgia, on April 20, 1983, American Telephone & Telegraph held its 98th and last annual meeting before the company's divestiture. (Bettmann/Corbis)

1965, the U.S. government, through the Federal Communications Commission (FCC), ordered AT&T to allow customers the right to attach non-AT&T electronic, devices to their telephones as long as these devices would not interfere with the telephone system. The FCC, which was established as the U.S. telecommunications regulatory agency through the enactment of the Communications Act of 1934, tended to approach telephone industry regulation based on a concept of universal service not necessarily intended by Vail in 1907. For the FCC, universal service meant universal access. In other words, instead of taking the perspective of AT&T's drive for expansion and total interconnectivity, the FCC tended to address universal service as the consumer's need for access to an essential facility for daily living.

By 1966, the U.S. government and the FCC began looking into possibilities of merging telecommunications and computer technology in the "Computer Inquiry I" review. While the benefits of merging the technologies became clear, the FCC realized that encouraging the unregulated development of computer-based services with regulated telecommunications services would be difficult. The FCC's 1968 Carterfone decision extended the 1965 ruling, allowing electronic equipment not produced by Bell Laboratories, including devices such as computers, answering machines, and facsimile (fax) machines, to be attached to AT&T lines. The Carterfone decision of 1968, which allowed non-AT&T electronic equipment to be attached to existing networks, relaxed U.S. federal regulations and was intended to encourage further technological innovation and competition.

Competition was again the central debate of the telephone industry in 1974. The DOJ, extending concerns originally raised in its 1949 suit, intervened in AT&T's monopoly once again in 1974. The DOJ attacked AT&T's right to maintain a highly integrated corporate structure, arguing that the control over local exchanges, long-distance services, and product development gave the company an unfair business advantage. The concern of

the DOJ was that AT&T's corporate structure and massive capital base discouraged others from entering the telephone market, thus discouraging both competition and further technological innovation. Adding to the DOJ's complaint was the Execunet case concerning Microwave Communications, Inc. (MCI). In 1975, MCI petitioned for approval of Execunet, which was an interconnected, switched network. While the FCC did not originally support MCI's petition to use microwave technology to bypass AT&T lines, a federal court overturned the FCC decision in 1978. MCI's Execunet appeal, along with the DOJ's 1974 suit and its eventual outof-court settlement in 1982 (in which AT&T agreed to divest its operating companies), have been the most important influences on the modern structure of the telecommunications industry.

After Divestiture

The Bell System completed the process of divestiture in 1984. AT&T became a long-distance services provider exclusively, and Bell's operating companies were divided among seven regional organizations that were commonly known as Regional Bell Operating Companies (RBOCs), or Baby Bells. The RBOCs were being considered for entry into interstate long-distance service almost immediately after divestiture. They, along with AT&T, had been banned from entry into new unregulated lines of business since 1956. While competition in the long-distance market did increase, the level of competition in the U.S. market had not reached industry expectations by 1996. Just three major long-distance carriers, AT&T, MCI, and Sprint, and the incumbent RBOCs, controlled most of the national market. The Telecommunications Act of 1996 was enacted partly to increase competition in the telecommunications industry by allowing the RBOCs to enter new markets. What the 1996 act has served to do, however, is to allow any company in the industry to enter any other telecommunications market. Thus, where previously there were clear lines of separation between industries such as telephone and cable, barriers to cross-ownership essentially were removed by the 1996 act.

Not only have diverse technologies been allowed to merge, but the individual corporations that own these technologies have also begun to merge. While the industry's organization has been manipulated in order to create competition, the capital bases of many of the competing companies grant each a particular advantage by blocking the entry of smaller competitors into the marketplace. The merging of corporations grants each more competitive power. International mergers provide corporate giants with the power to dominate the telecommunications industry on a global scale. While the 1996 act was designed to create competition in the United States, it may be facilitating the creation of new telecommunications monopolies reminiscent of the system that Bell envisioned and helped to create in the late 1880s. Thus, AT&T's legacy of marketplace control continues to influence the structure of the modern telecommunications industry.

See also: Bell, Alexander Graham; Communications Act of 1934; Morse, Samuel F. B.; Telecommunications Act of 1996; Telephone Industry; Telephone Industry, Regulation of; Telephone Industry, Technology of.

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MARTIN L. HATTON

TELEPHONE INDUSTRY, REGULATION OF

Commercial telephone service began in the United States in 1877. Recognizing the advantage of monopolistic control over the industry, the fledgling Bell Telephone Company sought regulation as protection from "aggressive competition" during the period from 1877 to 1910. The U.S. Congress responded with the Mann-Elkins Act of 1910, which effectively brought interstate telecommunications traffic within the regulatory jurisdiction of the Interstate Commerce Commission (ICC). The ICC, however, maintained a focus on interstate rail traffic more than on interstate telecommunications. Nevertheless, the ICC, along with the U.S. Department of Justice (DOJ), became concerned with the rapid growth of Bell Telephone. The two agencies attempted, in 1913, to force Bell Telephone into the Kingsbury Commitment, which was a decision designed to limit monopolistic growth by requiring Bell Telephone to provide interconnection to independent telephone companies and to refrain from further acquisitions. The Willis-Graham Act, however, overturned the Kingsbury Commitment, so after 1921, the ICC was authorized to approve telecommunications consolidations, and the agency approved almost all of them.

The ICC regulated interstate telecommunications, but individual states controlled intrastate telecommunications. The distinction between interstate and intrastate communication, however, has been a vague one. Two cases, the *Shreveport Rate Case* (1914) and *Smith v. Illinois Bell Telephone Co.* (1930), broadened federal authority at the expense of state power due to the often unclear distinction between intrastate and interstate telephone service. This power, later transferred to the Federal Communications Commission (FCC), facilitated the breakup of the Bell System in the 1980s and allowed for the reentry of the individual Regional Bell Operating Companies (RBOCs) into interstate service in the 1990s.

The ICC actually did little to regulate consolidations and the monopolistic growth of Bell. While the commission was given this authority in 1921, the ICC was not powerful enough to regulate the growth of the industry. The Willis-Graham Act indicated that telecommunications regulation was an imperfect and inadequate adaptation of railroad regulation to the communication field; the ICC lacked significant broad statutory authority under such ambiguously applied policies. However, the ICC did prove to have the power to preempt state regulation. The stage was now set for the development of a new federal agency with broader statutory authority than the ICC and a mandate to encourage the development of a telecommunications infrastructure designed for adoption by all U.S. citizens.

By the early 1930s, 98 percent of all calls still did not cross state lines. Therefore, at some level, there remained a distinct geographic division in the regulation of state and federal telecommunication services. Furthermore, the potential of telephone services was not being exploited. The main objective of the Communications Act of 1934, then, was to make available to all U.S. citizens wire and radio communication service at reasonable charges in order to support the expansion of the communication infrastructure. The act addressed telecommunications services generally, but it specifically addressed in subchapter two the regulation of common carriers, or those entities whose services are open to public hire for handling interstate or international communications by electrical means.

The FCC was created by the Communications Act of 1934 as the primary regulatory agency of the telecommunications industry. Among other duties, the FCC was created to oversee common carriers. While the distinction between intrastate and interstate telecommunications services has always been a tenuous one, individual states were granted authority over most matters of intrastate services, terminal equipment, and intercity services. The FCC does, however, influence the economics of intrastate communication through local exchange carriers (LECs)—to the extent that it prescribes a uniform system of accounting to be followed by all providers, prescribes the depreciation practices to be followed by providers, and has the authority to set the value of communications property used in providing services.

Established as the primary regulatory authority over U.S. telecommunications services, the FCC carried the mandate to enforce the Communications Act of 1934. The FCC has relied on its serving of the public interest as the root of its power as a regulatory authority. As is obvious in section 201(a) of the 1934 act, public interest was implicitly defined by consumer access, traditionally referred to as universal service. Thus, while the industry faced little competition until the 1970s and sought regulation as a form of protection from competition, section 201(a) clearly establishes the requirement for interconnection with other companies and services if the FCC deems such interconnection necessary for the advancement of the public interest.

Competition, in service of the public interest, is the implicit guiding principle for regulation under Title II of the Communications Act of 1934. Therefore, since 1959, federal regulators began to view telephony less as a natural monopoly and adopted and implemented a consistent policy that encouraged competitive entry into the telecommunications market. Furthermore, beyond the shifting attitudes concerning competition and monopoly-based pricing, technology-driven changes began to affect the rules of entry for new companies and services.

Refusal to interconnect with new technology and face potential competition is what led to the eventual dissolution of the Bell telephone monopoly. The FCC made its "Above 890" decision in 1959, which allowed companies other than American Telephone & Telegraph (AT&T) to provide long-distance services using microwave frequencies. The FCC allowed Microwave Communications, Inc. (MCI) to enter the telecommunications market in 1969. This decision effectively destroyed Bell Telephone's monopoly and opened commoncarrier services to competition. The aggressive defense taken by AT&T/Bell drew the attention of the DOJ, which brought a major antitrust suit against the company in 1974. This federal action against the Bell System was actually a carryover from an earlier 1956 consent decree between the DOJ and AT&T to settle a 1949 lawsuit. In 1949, the DOJ determined that AT&T had violated the Sherman Antitrust Act of 1890 by monopolizing manufacturing, distribution, sales, and installation of telephone equipment. The DOJ determined that the lack of competition in the telephony market inhibited the growth of universal service. The DOJ requested that AT&T relinquish Western Electric, which was the manufacturing unit of AT&T. AT&T signed a consent decree in 1956 that prohibited the company from engaging in any business other than common-carrier service.

The 1974 antitrust suit against AT&T was settled after several years in what has become known as the 1982 Consent Decree. AT&T agreed to divestiture of its operating companies under this agreement so long as it could enter other unregulated markets. The parent company became three distinct entities after completion of divestiture in 1984: (1) AT&T provided common-carrier service, (2) the company's products division eventually became Lucent Technologies, and (3) the company's LECs produced seven RBOCs. The Modified Final Judgment governing the process produced a change in how exchanges were conceptualized. Exchanges were no longer defined by state boundaries but were now defined by much larger local access and transport areas (LATAs). Thus, the RBOCs were not responsible for intrastate communication but intraLATA services; AT&T and the other interexchange carriers were now responsible for interLATA telecommunications.

This attempt to dissolve the power of a telecommunications monopoly seems, ironically, to have facilitated later attempts at reconsolidation of the industry. LATAs further blurred the distinction between intrastate controls over telecommunications and federal interstate controls. It is important to note that the Communications Act of 1934 did not specify the regulatory jurisdiction for any matter that did not divide neatly along intrastate and interstate boundaries. Also, by the time the Modified Final Judgment was implemented, technology, not the states, was driving policy. Technology-driven innovations further facilitated the evolution of the industry from monopoly to competition. The FCC is granted power by section 154(i) of Title 47 of the Communications Act of 1934 to expand its authority with changes in technology as long as such changes are necessary for performance of its functions. Under authority of the 1934 act, the FCC began in 1966 to look into the possibilities of merging telecommunications and computer technology. While the benefits of merging the technologies became clear, the FCC realized that encouraging the unregulated development of computer services with regulated telecommunications services would be difficult. The FCC made its Carterfone decision in 1968, allowing non-AT&T equipment to be attached to existing networks, thus relaxing regulations to encourage such technological innovation.

Because the Communications Act of 1934 encouraged increased public access, and because lower costs to the consumer encouraged wider adoption of telecommunication services, technological innovations were encouraged for furthering the expansion of the infrastructure. Federal regulators' allowance, after the 1982 Consent Decree, of AT&T and other common carriers into unregulated markets encouraged exploration into the potentials of merging telephony with other technologies, such as cable and computer technology. The use of unregulated technologies, such as fiber optics, have allowed telephone companies to bypass regulation altogether because alternative services fall outside the realm of "common carrier" as technically defined by the 1934 act.

The FCC had broad discretion in the enforcement of the 1934 act; section 401(a) gave federal district courts jurisdiction over FCC enforcement actions that failed to comply with any provision of the act. The U.S. Court of Appeals for the District of Columbia, in fact, did challenge a major FCC decision in 1978 concerning MCI. In 1975, MCI petitioned for approval of Execunet, which was an interconnected, switched network. The FCC determined that the network was not a private system and therefore was not allowable under the 1970 Specialized Common Carrier decision. While not disagreeing with the FCC, the court insisted that the commission had not presented evidence illustrating that Execunet would harm the telecommunications infrastructure. The Execunet appeal was the major turning point in the FCC's stance on competition and was possibly as significant as the divestiture of AT&T for telecommunications deregulation.

Telecommunications regulation falls under the control of the individual states and under the FCC. Nevertheless, the U.S. telephone industry appears to have been shaped more by antitrust law than any aspect of federal or state regulation. While the FCC may address unfair business practices leading to potential monopolies, antitrust violations fall primarily under the jurisdiction of the DOJ. Antitrust policy typically is brought to bear upon perceived monopolies under the Sherman Antitrust Act, this being an act originally targeted at the U.S. rail system. One important doctrine of antitrust policy relates to the notion of "essential facilities." The principle behind this doctrine is that one firm may control a market, thus blocking competitors from entering or punishing those already in the system, through the control of facilities necessary for operation in that market. The doctrine does not mandate the absolute equality of access for all, but is often used to enforce a reasonable and feasible attempt at fair competition.

The FCC began to support antitrust-based regulation once its philosophy toward telephony evolved from that of natural monopoly to one of competition. In retrospect, it is evident that the period from the mid-1950s to the early 1970s would lead to an eventual confrontation between the key players in telephony, AT&T/Bell and the FCC. Furthermore, the FCC has always had individual states with which to contend in telecommunications regulation, since the 1934 act that established the commission also created the tenuous divide between state and federal lines of communication. With the major exception of Louisiana Public Service Commission v. FCC in 1986, the courts have traditionally held that the FCC has jurisdiction over all facilities except those that clearly belong to intrastate networks, and the U.S. Court of Appeals for the Fourth Circuit effectively established a presumption that all facilities are interstate facilities. Also important in the enforcement of telecommunications policy is the DOJ, which is the agency responsible for the enforcement of fair U.S. trade practices.

The RBOCs were being considered for entry into interstate long-distance service almost immediately after divestiture. In fact, the RBOCs requested waivers for entry into new unregulated lines of business from the point of their genesis in the 1982 Consent Decree. The basic policy debate at the time, of course, was between fears of rising anticompetitive behavior on the part of the RBOCs versus fears of lost competitive benefits by restricting their entry into markets beyond intraLATA telecommunications service. A particular antitrust concern that remains is the "bottleneck" dilemma. The concern has been that monopoly control over essential facilities, the LECs, was inevitably created by restricting the RBOCs to intraLATA telephony. Beyond this basic antitrust issue, the courts were also worried that the rush of the RBOCs to diversify just weeks after divestiture represented their lack of concern for universal service.

Nevertheless, the mood toward telecommunications in the United States after divestiture was one that supported competition. In a proposal that foreshadowed the Telecommunications Act of 1996, the Danforth Amendment (1986) attempted to define the primary objective of the FCC as the preservation of universal availability of affordable telephone service while maintaining a particular emphasis on competition rather than regulation for the future development of telecommunications services. If any one individual illustrated the competitive tone concerning telecommunications deregulation leading up the 1996 act, however, it was none other than the then-chairman of the FCC, Mark Fowler. From his appointment in 1981, Fowler's reconception of "public interest," the guiding principle of the FCC in most matters of telecommunications regulation including merger review, demonstrated his push for marketplace principles. Fowler considered marketplace principles to be the best means for access for the poorest segments of the U.S. population. Therefore, competition, not protection, was clearly established as being synonymous with the public interest.

One principle seems to have defined telecommunications policy in the mid-1980s: uncertainty. The principle regulatory authority was pushing for competition, not regulation. It was clear that, with the exception of the 1986 *Louisiana* decision, the states had little say in the future of regulation of telecommunications. Most would agree that technological advancement guided regulatory decisions by the time the FCC proceeding known as the Third Computer Inquiry (Computer III) was settled in 1987. The deregulatory context leading into the 1990s indicated that there was a need for an updated policy with regard to regulating telecommunications. Furthermore, in retrospect, it appears evident that it would be only a matter of time before monopoly would once again dominate U.S. telecommunications. Many predicted that once the RBOCs were allowed to enter the long-distance market, bundled services and "one-stop shopping" would again be available. It seemed that almost everyone anticipated the marketplace approach to regulation as the means to serve the public interest the best. Fowler insisted that the local-exchange market would become competitive with the inclusion of services such as cable and cellular radio providers and called for a reexamination of the government's regulation of the U.S. telecommunications industry. Fowler, essentially, called for implementation of the Telecommunications Act of 1996.

See also: Bell, Alexander Graham; Communications Act of 1934; Telecommunications Act of 1996; Telephone Industry; Telephone Industry, History of; Telephone Industry, Technology of.

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MARTIN L. HATTON

TELEPHONE INDUSTRY, TECHNOLOGY OF

The public switched telephone network (PSTN) in the United States operated as a virtual monopoly from 1877 until the government-sanctioned breakup of American Telephone & Telegraph (AT&T) in 1984. Since that time, deregulation and technological advances have given rise to an array of competing wired and wireless telephone technologies. The most significant factor driving these changes has been the shift from analog to digital technologies.

On a March evening in 1876, Alexander Graham Bell learned in his Boston laboratory that his idea for conveying sounds through a wire worked. Bell's crude system harnessed the acoustical energy of speech by using sound waves to vibrate a thin diaphragm attached to an electrically charged wire that was dipped into an acidic solution. As the vibrations caused the depth of the wire to vary, the electrical resistance of the wire varied in proportion to the wire's depth. At the other end of the wire, the process was reversed. The changing electrical current caused a diaphragm to vibrate, enabling the telephone receiver to replicate the sounds of human speech. Bell's words, "Mr. Watson, come here, I want you," were heard in another room by his assistant. In July 1877, the first Bell Telephone Company was formed, launching a new industry and a new communication technology. By the turn of the century (only twenty-three years later), the company had been renamed American Telephone & Telegraph

(AT&T), and almost every element that would be important during the first one hundred years of telephone technology had already been developed by AT&T's Bell System.

The Telephone Network

The basic telephone technology of the United States, despite many refinements, is still known by the acronym POTS (plain old telephone service). The telephone instrument combines a microphone, a speaker or earphone, a ringer, and a touch-tone keypad or rotary dial (on older devices). A call is initiated when the handset (combining the microphone and earphone) is lifted, thereby activating the circuit. The destination telephone number is "dialed" by pressing a sequence of numbers on the keypad, thereby generating distinct tones for each number pressed. The older rotary-dial device generated a series of electrical pulses that corresponded to each number that was dialed.

At the local level, telephone subscribers (residential and business) are served by a localexchange carrier (LEC). Each telephone in "the local loop" is served by a separate line that is connected to the central office of the LEC, giving the local telephone network a star configuration. When a subscriber "dials" the number of another local customer, the signal travels from the originating location to the central office, where it is switched (connected) to the line that is serving the second customer. An electrical signal is sent through the line to activate the ringer at that location. The talking path is created when the called party answers. In the early days of telephone service, switching was done manually by plugging and unplugging wire connectors. By the 1920s, mechanical switches were in use, and by the 1950s, electromechanical switches were standard. Modern switching uses computer technology. Local exchanges are arranged by sets of telephone numbers that are designated by three-digit prefixes. Each exchange includes up to ten thousand separate lines, and a central office can handle the calls of several exchanges.

Calls to another community are routed from the local central office through a series of higherorder central offices. Technically, the central office that serves individual subscribers is known as a class 5 "end office." Class 5 offices are connected by high-capacity trunk lines to class 4 offices, and

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A telephone operator works an early switchboard, which was necessary for connecting the various elements of the telephone networks. (Bettmann/Corbis)

most of the telephone traffic above the local class 5 end-office level is carried by long distance, or interexchange carriers (IXCs). Long-distance calls (initiated by dialing 0 or 1) are routed by the central office switch to the trunk line that is connected to the chosen IXC's point-of-presence (POP), from which the call is further routed to the central office that serves the receiving customer. The territory of each LEC is divided into local access and transport areas (LATAs) and includes a number of local-exchange central offices. Long-distance calls within the LATA (intra-LATA calls) may be carried by the LEC. However, an increasing percentage of intra-LATA traffic, and all inter-LATA calls, are carried by interexchange carriers.

The same computer technology that routes telephone calls also handles the complicated process of measuring the length (in time) of calls and determining both the charges to the customer and the amount of payment to the local and interexchange carriers that were involved in completing the call.

Transmission Technologies

According to the Federal Communications Commission (1999), 82 percent of telephone subscribers are still linked to the PSTN by a twistedpair copper wire, the oldest form of wireline telephone interconnection. At one time, almost all telephone lines consisted of bundles of copper pairs, and the capacity of a circuit was limited to the number of pairs. As the telephone network and the amount of long-distance telephone traffic grew, Bell Labs perfected improved signal-carrying technologies. Coaxial cable, developed in the 1940s, is composed of a single strand of copper wire (which carries the signals) surrounded by foam insulation with a conductive outer shield that prevents signal leakage. The three concentric layers of the cable are wrapped in an insulating material. "Coax" enabled tremendous increases in the capacity of terrestrial and undersea cables. In 1947, AT&T began using microwave radio transmission technology to connect distant points in its network and operated a coast-to-coast microwave link by 1951.

By the 1960s, digital compression technologies enabled telephone engineers to multiplex (i.e., send) increasing numbers of calls over a single wired or wireless circuit. By 1970, geostationary satellites had become important elements of the telephone network infrastructure. The first generation of communications satellites could carry 240 separate telephone calls, but by 1998, capacity was 22,500 voice circuits that digital compression boosted to the equivalent of 112,500 circuits. Yet, as important as coaxial cable and satellites have been, the most significant transmission technology for the future appears to be optical fiber.

Optical fiber cable is composed of bundles of flexible hair-thin strands of glass. The signals in an optical fiber are light waves generated by laser light, which provides a transmission medium with incredible speed (the speed of light) and signalcarrying capacity. In addition, fiber is immune to electrical interference. The telephone network has been undergoing a steady conversion to optical fiber since the early 1980s. Debate continues with regard to the extension of optical fiber from trunk lines into the local loop. The cost of providing fiber to every home is considered to be prohibitive, and alternative approaches such as fiber-to-the-neighborhood or fiber-to-the-curb (with subscribers being connected by copper wire) are more likely.

The Digital Revolution

A shift from analog to digital technologies has been the strongest force behind changes in electronic communications. Analog audio signals vary continuously in frequency (pitch) and amplitude (loudness). For example, in Bell's first telephone, the electrical signal varied continuously in response to the movement of a wire attached to a diaphragm that was vibrated by sound waves. The sounds heard through the receiver were analogous to Bell's original speech. A digital signal processes sound discontinuously by sampling or measuring the source thousands of times per second. Each discrete measurement is in the form of binary code that can have only two values, 0 or 1, corresponding to the presence or absence of some quantity. Digital signals retain greater fidelity to the original sound because they are less subject to interference and other forms of signal degradation that are common to analog technologies. Starting with the development of electronic computers in the 1940s, all forms of information have become

digital. Furthermore, since all digital signals are alike, computer data, digital audio, and digital video signals exist in the same binary code. The superiority of digital technology over analog technology provided a strong incentive to convert the telephone network to digital. However, competitive forces unleashed by the breakup of the Bell System in 1984 and the Telecommunications Act of 1996 greatly accelerated the process.

By the 1970s, computer technology had diffused from large institutions to small businesses and even households, generating increasing volumes of computer data. With its vast network, the telephone industry was positioned to play a key role in the movement of data and began offering separate leased lines optimized to carry digital data at high speeds. As Wilson Dizard (1989) explains, telephone companies first provided integrated services digital network (ISDN) lines that combined voice, data, and other services within one circuit at 64 kbs. (A bit, or binary digit, is the smallest unit of digital data. A kilobit is 1,000 bits, and 64 kbs is a data rate of 64,000 bits per second.) Even faster and more expensive, leased T-1 lines could speed data at 1.5 Mbs (million bits per second).

The growth of the Internet after 1994 expanded the volume of data as small businesses and individuals went online in increasing numbers. By the late 1990s, data traffic was increasing faster than voice, and it began to exceed the volume of voice traffic on telecommunication networks. This trend posed both competitive and technological challenges to the PSTN that was built and optimized to carry a limited range of the frequencies of human speech, not data.

The most significant network technology to emerge in the digital era has been packet switching. The PSTN largely uses circuit switching, a technology that causes each call to use the full capacity of a telephone circuit for the entire duration of the call. Even during pauses, the full circuit is in use, although no information is being transferred. With packet switching, digital data is packaged into packets of data that also contain information identifying their destination, source, order, and size. At their intended destination, computer software extracts the data from the packets and reconverts it into the original form (sound, text, graphics, or even video). Packet switching uses networks more efficiently because data packets from many different sources can be sent through

the same circuit at the same time, using the entire bandwidth (data capacity) of that circuit.

In the competitive environment of the 1990s, a new type of telephone company emerged. Competitive local-exchange carriers (CLECs) began to offer services to businesses using a combination of technologies. Initially, CLECs leased telephone lines from older telephone companies, now called incumbent local-exchange carriers (ILECs). According to Thomas Baldwin, D. Stevens McVoy, and Charles Steinfeld (1996), the ISDN service offered by ILECs was too slow for large businesses, and T-1 lines were too expensive for all but the biggest firms. CLECs were able to capitalize on the explosive growth in data traffic and build both new high-speed, high-capacity, packetswitched networks to meet the data needs of businesses and broadband data backbone services capable of speeds of 155 Mbs to 2.4 Gbs (billion bits per second).

Competition and technology, then, have added a public switched data network (PSDN) that now operates alongside the traditional public switched telephone network (PSTN). Data networks typically use packet-switching technology, but the technologies of the PSTN and PSDN do overlap.



Wireless cell telephones revolutionized the telephone industry, and the Matsushita Communication Industrial Co. Ltd. produced in January 2001 the P503i, which has installed JAVA script computer language that allows it to be used as a handy computer terminal as well as a telephone. (AFP/Corbis)

For example, asynchronous transfer mode (ATM), a high-performance switching and multiplexing technology, is used by both. ATM employs data packets of fixed length so that time-critical data (such as voice or video) is not delayed as large data packets are processed. The ILECs are attempting to retain a share of the data market by offering digital subscriber line (DSL) service. DSL technologies use copper wire, providing highspeed data services to residences and small businesses. However, the technology is limited to a three and one-half mile radius of the telephone company's central office.

The cable television industry is also developing CLEC status. Although cable technology was designed to carry one-way signals from a central location to a customer's residence, cable systems use coaxial cable, a connection with substantial signal-carrying capacity. Similar to telephone companies, cable franchises are rebuilding their networks with optical fiber in addition to coax, as they reengineer their systems to carry two-way signals in order to provide telephone service and Internet access in addition to traditional cable television.

Wireless Telephony

Wireless telephony uses low-power ultrahighfrequency (UHF) radio signals within small areas (cells) that may be as small as a few city blocks or as large as a twenty-mile radius in rural areas. At the center of each cell is a base-station tower, which transmits/receives the signals of up to four hundred separate voice channels. As users of wireless telephones move from one cell to another, a central switching computer "hands off" the calls of roaming subscribers to the tower in the next cell. A key device in wireless telephony is the mobile telephone switching office (MTSO), which detects calls placed by subscribers, assigns each call to a voice channel, and facilitates the hand-off of calls between cells. In addition, the MTSO interconnects all of the towers in the service area and links the wireless system to the terrestrial PSTN.

Modern wireless telephone service began with analog cellular telephony in the early 1980s and experienced explosive growth in the 1990s, when digital PCS (personal communication services) emerged. Cellular services operate at 800 MHz, while digital PCS technology uses a frequency of 1.9 GHz. In the United States, policymakers mandated that each market would be served by two cellular franchises (with one awarded to the local wireline service) and up to six PCS franchises. Competition quickly reduced the prices of both telephones and service, and in many markets, the price of wireless service is comparable to that of wireline service

As Susan O'Keefe (1998) notes, after the introduction of digital PCS, most analog cellular systems converted to digital technology, enabling cellular firms to offer most of the services provided by PCS. Increasingly, all wireless services integrate voice and data (including Internet) services, in addition to providing voice mail, fax, encryption, and advanced paging and telephony services. A remaining technical issue for wireless telephony is to resolve the presence of four different technical standards in use by wireless firms around the world.

The desire to provide a global "anywhere, anytime" telecommunications service has led several entrepreneurs to offer mobile satellite services (MSS) using low Earth orbit (LEO), medium Earth orbit (MEO), and geostationary (GEO) communications satellites. LEOs and MEOs orbit faster than Earth rotates, necessitating a network of as many as 288 satellites distributed around the globe. The technology is somewhat like that of cellular telephony, except that for MSS services, the network grid moves instead of the subscriber. As the satellite handling a call begins to move out of range of the user's satellite telephone, the circuit is passed to another, closer satellite.

The Future

There will be continuing competition among telecommunication technologies in the twentyfirst century. Sam Masud (1999) reports that telephone industry seers predict the eventual shift of most voice traffic to the newer data networks, as networks continue to develop increased bandwidth and speed. Future telecommunications networks will be broadband in nature, and they will carry voice, data, and video. Wireless services are also expected to develop broadband capabilities and become increasingly competitive in the full range of services that are offered by their terrestrial competitors.

See also: Bell, Alexander Graham; Cable Television; Digital Communication; Federal Communications Commission; Internet and the World Wide Web; Satellites, Communication; Telecommunications, Wireless; Telecommunications Act of 1996; Telephone Industry; Telephone Industry, History of; Telephone Industry, Regulation of.

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DAVID H. GOFF

TELEVISION, EDUCATIONAL

Since the beginnings of television, educators have endeavored to harness its power to educate a mass audience. This entry examines educational television programs with a particular focus on how to maximize their effectiveness. Much of the research reported here has also been summarized in Sandra Calvert's 1999 book *Children's Journeys through the Information Age*.

Researchers have generally defined educational television programs as those programs that focused on academic content areas that are taught in schools, such as reading, mathematics, science, and social studies. In contrast, prosocial television programs have been considered to be those that taught positive social interaction skills, selfcontrol and achievement behaviors, and creative fantasy and imaginative play. Some researchers, however, have defined educational content broadly to include both educational and prosocial programs.

Research on Educational Television Programs

Early educational television typically consisted of instructional programs that were intended for classroom use. Lessons traditionally presented by a verbal lecture were simply moved to the audiovisual medium of television. These "talking heads" presentations were often directed at adult college students and focused on some kind of academic lesson. Presentations were most effective when concrete visual depictions emphasized the verbal message.

Sesame Street was the first academically oriented television program to enjoy wide success in attracting a young viewing audience while teaching important academic lessons. This program, which was created by the Children's Television Workshop (now known as Sesame Workshop), was initially organized around an academic curriculum. Much research has revealed the educational benefits of *Sesame Street*.

Comprehensible language was one key to the educational success of *Sesame Street*. According to the comprehensibility model advanced by Daniel Anderson, children pay attention to a program when they think they will understand its content. For example, Anderson and his colleagues (1981) have shown that children are more attentive to program vignettes when the language is concrete than when it is abstract. Moreover, manipulations that make the vignettes incomprehensible, such as speaking a foreign language, reduced children's attention.

The magazine format of *Sesame Street*—in which short vignettes repeatedly emphasize academic messages—was adapted to other educational television programs produced by the Children's Television Workshop. Although the programs directed to older viewing audiences were effective teaching tools, they were not as effective as *Sesame Street*. Researchers documented that pro-

grams such as *The Electric Company* and *Square One* were effective in teaching reading and math skills, respectively, but only when the children viewed it at school. Other programs, such as 3-2-1 *Contact*, taught children science, but that particular program was not effective in maintaining a large enough viewing audience to sustain its production.

Nickelodeon, a cable television network, followed the lead of the Children's Television Workshop by carefully constructing and analyzing the effects of their educational television programs. Research showed that preschool children who viewed educational Nickelodeon programs such as *Gullah Gullah Island* and *Allegra's Window* improved in flexible thinking, problem solving, and prosocial behaviors, particularly when they were encouraged to view these programs. Similar cognitive benefits were found for preschoolers who viewed *Blue's Clues*, an educational program that promotes problem-solving skills through an interactive program format that repeats the same episode for five consecutive days.

At times, commercial broadcasters have also focused on teaching children academically oriented content. For example, School House Rock, which originally aired during the 1970s, was a series of three-minute vignettes that used songs to present lessons on English, science, mathematics, and history. According to research, repeatedly viewing the vignettes improved verbatim memory of the content. However, learning appears to have been superficial and rote rather than facilitating comprehension of important program messages. In other words, children and adults could recite program content well after viewing the series, but prose presentations of the same content were more effective in promoting viewers' understanding of the central program concepts.

Children can also benefit from prosocial television programs that are designed to promote positive social skills, achievement behaviors, and imagination and creativity. Research has shown that, when preschoolers viewed *Mister Rogers' Neighborhood*, there was an increase in task persistence, toleration of delays, and rule obedience, which are facets of achievement behaviors. Children who viewed *Mister Rogers' Neighborhood* also showed an increase in the display of prosocial interpersonal behaviors such as cooperation, nurturance, and verbalizing feelings. Although they



Bill Cosby was involved in many popular educational programs of the 1970s, including Sesame Street, The Electric Company (shown here), and Fat Albert and the Cosby Kids. (Bettmann/Corbis)

occurred for children from all income levels, these effects were most pronounced for children who came from low-income families.

During viewing, learning can be enhanced when programs include advance organizers that preview the important content that will be included, summaries that review important program themes, and replays of key program events. After viewing, prosocial outcomes are enhanced when rehearsal activities, such as verbal labeling of program themes and role playing of key program actions, take place in the children's viewing environments. Verbal labeling is especially useful for promoting children's learning of content, whereas role playing works best when behavioral performance is the objective.

Production techniques can be used selectively to improve children's learning of prosocial program content. A study by Calvert and her colleagues (1982) of *Fat Albert and the Cosby Kids* demonstrated the utility of using sound effects as signals or markers of important content, thereby increasing children's attention to, and subsequent memory of, the contiguously presented, plot-relevant content. In addition, essential program content that was presented with both moderate action and child dialogue was well understood, in part because both visual and verbal modes were used to present content that children could then use to represent that information. Visual features such as action provide a developmentally appropriate mode that young children often use when thinking about content.

Longitudinal research demonstrates long-term benefits for children who view educational television programs. For example, in a study conducted by Aletha Huston and her colleagues (2001), adolescents who had viewed more educational television programs as children had better grades, better academic self-concepts, better values about academic success, higher levels of achievement, and higher levels of creativity when in high school than those who had viewed less educational television. The demonstrated contribution of educational television to children's academic success has led to a current Public Broadcasting System (PBS) initiative called "Ready to Learn," in which a block of educational programs teaches preschool-aged children the skills that they will need when they begin formal schooling.

Research has demonstrated that well-designed television programs that focus on academic or prosocial content can enhance children's learning and performance of academic and prosocial behaviors, respectively. Repetition of key program concepts, rehearsal activities in the actual viewing environment or embedded in the program, the use of comprehensible language, and the use of interesting production techniques have been shown to improve children's learning of targeted content.

Newer technologies are enhancing the effectiveness of educational television. The videocassette recorder allows children to view repeatedly the content that they do not understand. As television becomes a more interactive medium in the twentyfirst century, it will be in a position to answer children's questions or provide new information that is contingent upon children's earlier responses.

Children's Television Act of 1990

Because of the well-documented beneficial effects of educational television on children's development, Congress passed the Children's Television Act of 1990. This law required commercial broadcasters to provide educational and informational television programs for the child audience as a condition for license renewal. In 1991, the Federal Communications Commission (FCC), the government agency charged with implementing that law, broadly defined educational television programs. An educational program simply had to meet any educational or informal need of children who were sixteen years of age or younger. Television programs addressing social and emotional needs, as well as cognitive and intellectual ones, were acceptable, by definition, for broadcaster license renewals.

The guidelines developed by the FCC initially left considerable flexibility in the types of programs broadcasters could count as educational and informational, in the times that such programs could be broadcast, and in the amount of programming that was required. Consequently, programs of questionable educational value, such as *GI Joe* and *DuckTales*, were offered as evidence of compliance by some commercial broadcasters. A gap emerged between what commercial broadcasters labeled as educational and informational and what researchers considered educational and informational.

Based on the accumulating evidence of poor broadcaster compliance, the FCC implemented more stringent rules for the Children's Television Act in 1996. In order to receive an expedited license renewal, each broadcaster was required to present a minimum of three hours of educational and informational programs each week. This change was known as the three-hour rule. Another requirement involved broadcasting core educational programming. Core programs were defined as those that met the educational and informational needs of children aged sixteen and under, aired between 7 A.M. AND 10 P.M. (when children were likely to be in the viewing audience), were scheduled on a weekly basis, and lasted a minimum of thirty minutes.

Content analyses conducted by Amy Jordan and Emory Woodard (1998) revealed an increase in the number of commercially broadcast educational and informational television programs since the changes in these rules were made. Nonetheless, about one-fifth of such programs continue to be weak in educational quality. Most of the commercial programs also focused on social and emotional lessons rather than academic ones. PBS continues to broadcast the most programs that contain an academic lesson and are high in educational strength.

Conclusions

Educational television programs are designed to promote the cognitive and prosocial development of children. Research finds that children benefit from viewing well-designed programs in both of these areas. Children who frequently view academically oriented television programs are better prepared for school and are more successful through the high school years. Similarly, children who view prosocial television programs learn achievement behaviors and prosocial skills. Beneficial effects are enhanced by the use of specific production techniques, comprehensible language, previews and reviews, and by repetition, role playing, and verbal labeling of key program content. Social policy initiatives, such as the passage and implementation of the Children's Television Act of 1990, have increased the number of educational and informational programs on commercial stations. However, ongoing research is needed to measure the quality and the effectiveness of these programs.

See also: Academic Achievement and Children's Television Use; Children's Attention to Television; Children's Comprehension of Television; Children's Creativity and Television Use; Children's Preference for Media Content; Educational Media Producers; Federal Communications Commission; Public Broadcasting; Sesame Street; Television Broadcasting, Programming and.

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SANDRA L. CALVERT

TELEVISION, FAMILIES AND

See: Families and Television

TELEVISION BROADCASTING

Almost everyone in the United States watches television. About 99 percent of homes have at least one television set, and, on average, the set stays on for slightly more than seven hours each day. Most viewers have favorite television programs, and they may even have favorite channels. What most viewers may not think about is how the channels and programs get to the set.

Television broadcasting is still the most prevalent form of television in the United States—compared to cable television, for example, which reaches around 70 percent of U.S. homes. Broadcasters also transmit the television programs that reach the largest audiences. Even though their share of the television audience has been decreasing since the 1980s, broadcasters still stand at the center of the television industry.

The Television Broadcasting System

About fifteen hundred television stations make up the core of the television broadcasting system. Each is licensed by the Federal Communications Commission (FCC), a U.S. government agency, to operate in a particular area. The FCC gives out licenses to operate on frequencies in one of two bands of the electromagnetic spectrum: the veryhigh frequency (VHF) band and the ultrahigh frequency (UHF) band. VHF stations are more valuable than UHF stations because they have a
greater geographical reach and thus can be seen and heard by more people.

It is quite possible for a television station to scramble its signal so that only members of the public who pay the broadcaster for a descrambler will be able to view it. This way of getting revenue is not how television broadcasting developed in the United States. Anyone who owns a television set and lives within range of a broadcast transmitter can receive its signals without charge. As a result, stations must make money through other means.

Most stations make money by selling time on their airwaves to advertisers; these broadcasters are called "commercial" stations. "Noncommercial" stations receive support in other ways, such as viewer donations as well as donations from private foundations, government agencies, and commercial firms in return for mentions at the start and end of programs.

More than 80 percent of the local stations link up with television networks for at least part of their broadcast day. A television network is an organization that distributes programs, typically by satellite and microwave relay, to all of its linked stations so that the programs can be broadcast at the same time. The American Broadcasting Company (ABC), the Columbia Broadcasting System (CBS), the National Broadcasting Company (NBC), and Fox are the broadcast networks that regularly reach the largest number of people. Known as the "big four," they are advertiser-supported networks, as are three smaller networks, the Warner Brothers (WB) network, the United Paramount Network (UPN), and Paxnet. The Public Broadcasting Service (PBS) is the network for noncommercial stations.

The commercial networks, particularly the big four, are the giants of the broadcast television business, primarily because of their role in coordinating the distribution of shows to hundreds of local stations, which then transmit the shows to viewers' homes. However, ABC, CBS, Fox, and NBC, especially, are more than distributors. Each company is also involved in production of programs and their exhibition through broadcast stations. That is, the networks produce news, sports, situation comedies, dramas, and other types of programs for use on their networks. They also own stations (sometimes called "exhibition outlets") in the largest cities.

In the television industry, the local stations are called network O&Os (i.e., owned and operated). The federal government regulates the number of O&Os that a broadcast network can own. It does this primarily by prohibiting a network from owning stations that in total reach more than 35 percent of the U.S. population. The aim of the rule is to hinder networks from gaining too much power over the entire broadcast system. Federal rules also prohibit a company from owning more than one broadcast network. In 2000, executives from the newly merged Viacom-CBS were hoping to convince lawmakers to eliminate or modify this rule, because it would force them to sell UPN. NBC, which has a station management agreement with Paxnet, was also lobbying for the law's death. Both corporations argued that strong competition from cable and the weak state of UPN and Paxnet justified their ownership of two networks.

Local stations that are not owned by broadcast networks and yet transmit the network signals are called network affiliates. A network affiliate transmits the network's program feed on a daily basis. Traditionally, the network has agreed to return the favor by giving the affiliate a portion of the revenues that are received from advertisers that buy time on the network. Many affiliates are part of station groups, which are companies that own several local television stations. In the wealthiest of the groups, such as Allbritton Communications, each station is an affiliate of one of the major networks. A broadcast station that is not affiliated with one of the big four networks is called an independent. (Industry executives often consider WB, UPN, and Paxnet affiliates to be independent because they air relatively few hours of network programming per week.) Practically speaking, independents must find all (or almost all) of their programming themselves. Actually, even network affiliates and O&Os must look to sources other than ABC, CBS, Fox, and NBC for some programming because the big four do not distribute enough shows to fill a full period of twenty-four hours. Fortunately for the local stations, the broadcast industry has no shortage of companies that produce programming to sell to the independents, affiliates, and O&Os.

Advertisers are another set of key industry players. With the help of advertising agencies, advertisers pay for time between programs and segments of programs. In return, broadcasters allow advertisers to air commercials, which call attention to their products. A lot of money changes hands in this activity. In 1998, advertisers spent approximately \$37 billion on television broadcast advertising.

Unlike cable or satellite television, viewers of broadcast television do not have to pay to receive the programming. As a result, there are few nonadvertising revenue sources for television broadcasters. This situation suits local stations, because they are doing quite well with four sources of advertising money: their share of national network advertising, their sale of advertising time during their own programming (mostly local news), their sale of advertising time during programming that they purchase from nonnetwork sources (e.g., reruns of *Seinfeld* or new episodes of *Oprah Winfrey*), and their sale of local commercials during some pauses in network programming.

Broadcast networks have only one source of advertising revenue, national commercials. Although that source yields a lot of moneyapproximately \$14 billion in 1998-the expenses of running a network are such that only one or two broadcast networks have typically been profitable. A major reason for this is that the cost of the programming exceeds the advertising money that the networks are able to get when they air the shows. In an important sense, then, broadcast networks have been "loss leaders" for their O&Os. That is, although they operate at a loss, they provide their company's O&Os with programming and shared advertising monies so that the stations (which do not pay for the network programming) can make huge profit margins from their four commercial revenue streams.

Network executives do not enjoy operating at a loss, however, and they have been searching for new sources of revenue. They have tried three major ways. One involves owning more of the programming that they distribute. A second involves trying to change the standard affiliate agreement, asking affiliates to share some of the network programming costs. The third involves branching into new distribution venues, most notably cable television and the Internet.

Production

From the standpoint of a broadcast executive, the word "production" actually has two meanings.

Perhaps the most obvious is the creation of individual programs. The other, equally important, meaning is the creation of a lineup of programs to be aired on a broadcast channel or network.

The task of producing a channel is huge. Imagine having twenty-four hours of air time to fill every day of the year. How can it be accomplished in a way that will make money for the owners of the channel? That is the challenge that confronts programmers, the people who are in charge of operations as different as WWOR (Channel 9) in New York, an independent station; Channel 4 in Los Angeles, an NBC O&O; and the NBC-TV network.

The most basic challenge that confronts a local or network programming executive is to choose programming that attracts the intended audience. In some cities, where the FCC added several UHF stations and increased audience competition, a few stations have decided to pursue Spanishspeaking viewers, or non-English-speaking viewers generally, to maximize their profits. Because they reach virtually everyone in their area, however, broadcast stations do not generally aim at the narrow audience slices that cable or satellite networks often try to attract. They typically try to create schedules that reach large population segments that interest advertisers-men and/or women who are between eighteen and forty-nine years of age-because they tend to have families and spend a lot of money.

In the television industry, audits of people's viewing behavior (i.e., ratings) help to determine where much of the advertising money goes. The size of a program's audience helps to determine the amount of money a station or network can charge an advertiser for time during that program. Ratings are consequently always on the minds of the programmers who produce schedules for their stations or networks. Many programmers break down their work into creating discrete schedules for different parts of the day. The most prominent of these dayparts is 8 P.M. TO 11 P.M. eastern standard time, when the largest numbers of people are viewing. These are the prime-time hours when the major broadcast networks put on their most expensive programs and charge advertisers the most money for commercial time.

The building block of a television schedule is a series. A series is a set of programs that revolve around the same ideas or characters. Series are useful to programmers because they lend predictability to a schedule. Programmers can schedule a series in a particular time slot with the hope that it will solve the problem of attracting viewers to that slot on a regular basis.

Programmers generally aim to bring viewers to more than just one show on their station or network. Keeping people tuned to more than one series also means keeping them around for the commercials between the series. In televisionindustry lingo, the challenge is to maximize the audience flow across programs in the daypart. Over the decades, programmers have developed a number of tactics with which they try to do that.

The key to audience carryover involves finding shows that attract the desired audience in large numbers. Every spring, network programming executives meet with creators from several production companies. Based on these meetings, the executives choose a large number of program ideas that they like. These ideas are then submitted in polls to see which ones the "audiences" are most interested in seeing. Once an idea passes the polling stage, a pilot (or sample) program is created. All of the pilots are then shown to sample audiences to get reactions. The pilots that get the strongest reactions are given a place on the next season's schedule. Once this has happened, the network executives typically sign contracts with the respective production companies to create thirteen episodes of each series. The contractcalled a "license"-give the network permission to air each episode a certain number of times.

One might think that with such a deal in hand, the executives of the production companies would be ecstatic, sure that the show will enrich the company. This is not necessarily the case. For one thing, the show may not last long because of low ratings. In addition, network licensing agreements typically do not agree to pay the full costs of each episode. A production company may find itself millions of dollars in debt as a result of producing thirteen episodes of a series.

Why would any company want to create shows while losing money? The answer is that production companies see network broadcasts as only the first step of a series of television domains in which they can make money from their series. They can make it from local stations, from cable networks, and from broadcasters outside the United States.

Distribution

As suggested earlier, not all television programs are distributed through networks. The reason is that not all broadcast television stations affiliate with networks, and these independents need to get their programming from somewhere. Another reason is that even network stations do not broadcast the network feed all of the time. Certain hours in the morning, afternoon, earlier evening, and late night (past 1:00 A.M.) belong to the stations. Therefore, they can take for themselves all the advertising revenue that they bring in during those periods. However, they must first find programs that attract an audience at a reasonable price.

Many nonnetwork distributors are very willing to help local stations find attractive shows. Their business, syndication, involves licensing programs to individual outlets on a market-by-market basis. One way to attract audiences "off network" is with programs that are newly created for syndication. Examples include the talk show Oprah Winfrey, the entertainment news program Entertainment Tonight, the game show Wheel of Fortune, and the action-adventure series Xena, Warrior Princess. Another major method through which stations get programming is off-network syndication. In offnetwork syndication, a distributor takes a program that has already been shown on network television and rents episodes to television stations for local airing. Off-network syndication enables the distributor to make back money that it lost when it delivered the program to the network at a deficit.

If producers fail to place their reruns on local stations, there are other venues. Cable and satellite networks have become voracious users of programs that have already been seen on broadcast networks. This interest results in part because such programs are less expensive than new shows and in part because they have shown (in their network run) that they can reliably attract certain categories of viewers. Foreign countries have also been useful markets for certain types of reruns. Broadcasters around the world purchase U.S.made series as components for their schedules, though in most cases homegrown programming gets better ratings than the U.S. material.

Broadcast network executives, suffering from monetary losses even when the license fees they pay do not fully cover the costs of program production, have been looking at these postbroadcast network distribution venues with envy. From 1970 to 1996, federal law prohibited broadcast networks from owning or distributing most of the programming that they aired. Government regulators feared that allowing them to both own and distribute programming would give them too much power over the television system. With the rise of a new spectrum of program distribution routes beginning the 1980s—cable, satellite, videocassette recorders, and even the Internet—the broadcast networks were able to convince the U.S. Congress that the prohibition had outlived its usefulness.

The new right to own and syndicate the programs that they air has meant that broadcast network executives have placed great emphasis on trying to improve their bottom line by making money through more than advertising. By licensing their own made-for-broadcast series and their own made-for-television movies to local stations, cable networks, and foreign television firms, executives hope to make their broadcast networks more predictably profitable. Another part of their plan for increasing revenues goes beyond new sources of distribution to new ideas about exhibition.

Exhibition

Local stations act as exhibitors when they broadcast material directly to viewers. However, the broadcast television exhibition system is in the midst of a major upheaval. Local broadcasters, the bedrock of the medium since its commercial introduction in the late 1940s, face ever-escalating competition from cable, satellite, and even telephone businesses. Local stations still make money, but observers wonder how the situation will change in the twenty-first century, as hundreds of channels race into American homes.

For the near term, network executives would like Congress to change the rule that prevents them from reaching 35 percent of U.S. homes. They reason that more revenues from local stations would flow back to their companies, rather than to affiliates that they do not own, thus better justifying the expenses of program creation. At the same time, the broadcast affiliates that are not owned and operated by the networks have begun to worry that the networks may at times be acting against their interests. Local television executives are concerned about the strong, increasing participation that the networks have in the cable, satellite, and Internet worlds. Disney-owned ABC, for example, controls cable/satellite networks ESPN, ESPN2, The Disney Channel, Lifetime, and A&E. NBC participates in MSNBC and CNBC, as well as other channels. Viacom-CBS runs MTV, Nickelodeon, Country Music Television, and The Nashville Network. Local broadcast affiliates worry that these channels chip away at the audiences that might otherwise be viewing their stations.

Some local station executives also worry that huge growth in the number of video channels in cable or broadband Internet will encourage the networks to send their feeds directly to homes, instead of, or in addition to, local stations. Or, even if they continue to send local stations the daily feed, the networks will give people the opportunity to view (for a small fee) previous network programming that they missed on their local stations. That might still lead substantial numbers of viewers away from local stations.

Another impending change in exhibition involves the conversion to digital television. This conversion essentially will give every network and broadcast station the capability of sending out either one high-definition television signal or a number of regular-definition signals. What will the stations broadcast on the extra channels if they choose to go the regular-definition route? Will some of the channels require a decoder to allow the local stations to tap into subscription as well as advertising revenue? What will be the relationship between local and network broadcasters in this environment? Only time will tell. What seems clear, though, is that the broadcast television system will change dramatically in the twenty-first century.

See also: Broadcasting, Government Regulation of; Broadcasting, Self Regulation of; Cable Television; Digital Communication; Federal Communications Commission; Public Broadcasting; Satellites, Communication; Television, Educational; Television Broadcasting, Careers in; Television Broadcasting, History of; Television Broadcasting, Production of; Television Broadcasting, Production of; Television Broadcasting, Station Operations and; Television Broadcasting, Technology of:

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TELEVISION BROADCASTING, CAREERS IN

Careers in television broadcasting range from studio production to newsgathering to administration and sales. Likewise, the necessary educational training and experience differ according to position, as well as according to the size of the market that a television station serves. Market size further influences the staff size, and, consequently, the breadth of positions that are available at a given station. However, several positions remain staples of the typical television station, including the general manager, the controller, the account executive, the program director, the master control operator, the chief engineer, and the news and production personnel.

The general manager, who holds the highest position in a local television unit, works long hours overseeing a station's financial management and budgeting, short-range and long-range planning, administration and morale, and compliance with Federal Communications Commission (FCC) regulations. The typical general manager usually has a bachelor's or master's degree in a field such as communication or business, although the overall college experience is generally well rounded. The typical career path for most general managers can usually be traced through television advertising sales, although a few general managers are appointed from managerial positions in programming, news, or production. In addition, most general managers are selected from inside a television company, although some are lured from management positions at different broadcasting stations or from other business arenas in sales or marketing.

The controller is in charge of administration, budgeting, accounting, and forecasting the financial future of a station. Duties include the management of accounting personnel, general administrative staff, administrative operations, and office equipment. Controllers typically hold a bachelor's degree in a business-related field and have prior experience in sales. Consequently, most controllers are promoted to their positions from the accounting department within a television station.

The accountants at a television station are responsible for the bookkeeping, billing, and

other logging of financial transactions. Furthermore, the accountants keep records of unused facilities and equipment, FCC-related correspondence, insurance claims, and tax-related reports. The typical accountant holds a bachelor's degree in accounting and obtains accounting experience either from other fields or from a communications operation.

The general sales manager manages the advertising accounts that a station has with local businesses and supervises the practices of the account executives. The general sales manager also monitors the activities of local competitors and creates rate cards, an airtime pricing schedule by which the account executives will sell airtime. General sales managers usually hold degrees in business-related fields and are former television station account executives. Many also have previous experience in retail or door-todoor sales, which provides a good background for selling airtime.

Much of the account executive's long day is in dealing with local businesses or advertising agencies and negotiating the sale of airtime. At some stations, the account executive will also help create a client's advertisement or promotional spot. For these positions, the account executive needs production or writing experience as well as sales experience. However, most account executives have retail or door-to-door experience only and some also hold academic degrees in business.

The duties of the program director range from the acquisition and scheduling of programs to the supervision of locally produced programming and promotional spots. In addition, program directors in small stations may also be responsible for creating daily logs, which detail the day's programming minute-by-minute. Job requirements for the program director usually include academic training in a business-related or media-related field. Adequate job experience is also needed and is usually gained from previous employment as an assistant programming director, programming staff member, or, less frequently, as a syndicator or network employee.

Master control operators put the programs on the air according to the daily logs, monitor the transmission quality, and record incoming program feeds. Master control operators do not necessarily need prior experience or academic degrees. In fact, all operators receive on-the-job training. However, competitive positions do require prior experience or academic training in a technical field.

The chief engineer purchases, maintains, and repairs the transmission, master control, studio, and other station equipment. The chief engineer also ensures the compliance of a station with FCC rules and keeps abreast of technological developments in the industry. Beyond these duties, the chief engineer supervises the broadcast technicians and master control operators. Almost all chief engineers have a degree in engineering or technology. Most chief engineers also have prior engineering experience and hold a broadcast engineering certification. A few engineers have additional training in business administration or a related field.

The news director directs the news programs and supervises the various actions of the news personnel. Assignment editors assign stories to the various news reporters, who create news packages with the help of the photographers. The packages, edited by editors, are presented with other scripted stories by the news anchors. For news or other locally produced programs, the production manager will assign and monitor a production crew. The crew consists of camera operators, audio operators, videotape operators, technical directors or video switchers, floor managers, videotape editors, computer graphics operators, teleprompter operators, and editors. A crew will produce the local programs, and it may also create promotional spots or client commercials. Directorial, managerial, and news positions are usually won with prior experience and perseverance in job advancement. Academic training in a media-related field can be attractive in securing these positions. However, a résumé tape and references usually have more weight in this competitive area than does a degree without experience. Crew positions require moderate to no experience depending on the market size and competition, and all provide on-the-job training.

Outside of the local station, several employment possibilities exist. For example, national sales managers are needed to win advertising contracts from national or regional companies for local stations. These salespeople usually begin as account executives, local sales managers, or as advertising representatives. Another option is syn-



Most television news reporters must do location work, while the news anchors work mainly in the studio. (AFP/Corbis)

dication, in which programs are obtained from networks or production companies and are then contracted out to local stations. The obvious alternative providers of employment, however, are the networks, who have job opportunities that both encompass and expand the offerings of the local television station.

See also: CABLE TELEVISION; CABLE TELEVISION, CAREERS IN; TELEVISION BROADCASTING.

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FRANCESCA DILLMAN CARPENTIER

TELEVISION BROADCASTING, EDUCATIONAL

See: Educational Media Producers; Researchers for Educational Television Programs; Television, Educational

TELEVISION BROADCASTING, HISTORY OF

The first flickering shadows of television were already in the ether before radio was well established. In 1923, Vladimir K. Zworykin, an employee of Westinghouse, patented the iconoscope television picture tube. Four years later, at about the time when NBC was organizing its radio network, Philo Farnsworth improved the system and patented the dissector tube. While others had experimented with ways to broadcast an image, these two independent inventors share credit for the birth of all-electronic television transmission.

The Great Depression of the 1930s slowed down television development, but the 1939 World's Fair in New York gave Americans their first look at the medium that would dominate the second half of the twentieth century. The Radio Corporation of America (RCA), owner of the National Broadcasting Company (NBC) and its radio networks, sponsored a Hall of Television that gave fairgoers a glimpse of the future. Franklin D. Roosevelt became the first president to appear on television when NBC broadcast the opening of the fair. The only viewers were the lucky few who gathered around a handful of sets in the New York area. A few weeks later, the first sports event was telecast when a New York station showed the Princeton-Columbia baseball game.

These historic broadcasts were among the first regularly scheduled television broadcasts in the United States, but other countries had already been on the air for years. Germany began broadcasting its nonexperimental national television service in 1935, while England's British Broadcasting Corporation (BBC) began broadcasting the following year. The first U.S. commercial television licenses were issued in 1941, when WCBW (later WCBS-TV) and WNBT (later WNBC-TV) began broadcasting to the New York City market.

Before television became a firmly established medium, however, the United States entered World War II, and television set production halted. In 1946, television sets went on sale again, and network television began to provide programming, although there were only ten licensed television stations in the country. At the time, radio was the dominant broadcast medium, already in almost thirty-four million homes, but it would soon experience a mass exodus of its audience. By 1948, only two years later, almost one million homes had televisions, and there were 108 licensed television stations. Later that year, the Federal Communications Commission (FCC) ordered a licensing freeze to address interference issues. With the Korean War taking much of the country's resources, the ban lasted until 1952. During this time, some cities had only one or two stations, and reception was often poor. Other cities, including Denver, Austin, and Little Rock, had no television. Dozens of areas established community antenna television (CATV) systems to receive and distribute distant television signals. These CATV systems would eventually develop into the extensive cable television business.

In the 1950s, the new medium of television was replacing the old medium of radio. Attendance dropped at movies and sporting events, and once-popular radio shows saw their ratings plummet. In 1950, movie attendance among adults dropped 72 percent. Radio use fell from 3 hours and 42 minutes each night to just 24 minutes. By the time President Dwight D. Eisenhower took office in 1953, about one-half of the homes in the United States had television sets, and American mass media was changing forever.

By 1965, 94 percent of American homes had television sets; by 1990, more than 98 percent had televisions, and more than one-half of all U.S. homes had more than one set. While professional sports, the movie industry, and radio have regained popularity, television continues to dominate home entertainment.

Programming

By 1952, television broadcasts were reaching 15 million television sets in 64 cities. the American Broadcasting Company (ABC), the Columbia Broadcasting System (CBS), NBC, and DuMont offered a wide variety of programming choices, though DuMont ceased operations in August 1956. Although programming was in its infancy, the 1950s were considered to be the "golden age" of television. Some of the earliest entertainment programming on television came directly from radio, including such popular programs as *Amos 'n' Andy, The Adventures of Superman, The Lone Ranger,* and a number of soap operas.

Original variety shows such as *Your Show of Shows* with Sid Caesar and Imogene Coca, *Texaco Star Theater* with Milton "Mr. Television" Berle,



The New York World's Fair was part of the first television broadcast, which took place in April 1939. (Bettmann/Corbis)

and *Toast of the Town* with Ed Sullivan (later *The Ed Sullivan Show*) were popular draws. Programming also included dramas and westerns, such as *Playhouse 90* and *Gunsmoke*, respectively. Situation comedies, led by the still popular *I Love Lucy*, and quiz shows, such as *The \$64,000 Question*, attracted large audiences. Children watched *Kukla*, *Fran*, *and Ollie* and, later, *Captain Kangaroo* and *Howdy Doody*.

While many shows were broadcast live during the golden age, *I Love Lucy* was produced with a new technique. Three cameras caught the action, which reduced interruptions and retakes. The filmed episodes could then be rerun by the network and sold into syndication for extended profitable runs. This and other similar production techniques continue to be used.

In the 1960s and 1970s, as color televisions became more prominent, westerns declined in popularity, but medical dramas thrived and realistic police dramas such as *Police Story* found audiences. Even the science fiction and fantasy genre carved out a niche audience with programs such as *Star Trek*. Feature films were popular, and by 1966, the networks were airing their own made-for-television movies. In the early 1970s, the networks also began producing "event" programming in the form of limited-run series. Following the success of *Roots* in 1977, the miniseries became a mainstay of prime-time ratings sweep weeks (the periods that are key to the determination of the amounts that can be charged for commercial time).

By the 1980s, the audience for network television was diminishing as cable networks and prerecorded home video began to lure viewers. In addition, a new television network, the Fox Broadcast Network (Fox), debuted in 1986 and found success in the 1990s by targeting young audiences with shows such as *Beverly Hills 90210* and *The Simpsons*.

The television programming landscape has changed much since the golden age. Variety shows, so prevalent in the early days of television, were all but extinct by the 1990s. Prime-time network programming maintained its sitcoms and dramas (including the seemingly ever-popular police and medical shows), but it also showcased a number of reality-based programs. ABC, CBS, and NBC increased their newsmagazine offerings by 1993 and with good economic reason-a newsmagazine show is cheaper to produce than an hour-long drama, and the network does not have to share profits. By the end of the 1990s, quiz shows had even made a successful return to prime-time network schedules. The 1990s also saw increased competition from new broadcasters, as the United Paramount Network (UPN) and the Warner Bros. Network (WB) debuted in January 1995. Paxson Communications' PAX-TV debuted in 1998.

Television News

As television was coming of age, so was television news. Just as the first programs came from radio, so did the first newscasters. Edward R. Murrow, who gained his reputation as a "newsman's newsman" for his coverage of Europe on CBS Radio during World War II, took his talent, and many of his colleagues, to television in the 1950s. His See It Now, which started as a radio news special titled Hear It Now, was the forerunner of many of the magazine shows that appear on television. Murrow was the first television reporter to take on Joseph McCarthy, the Wisconsin senator who falsely accused many people of having Communist sympathies (giving rise to the expression "McCarthyism"). Many people credit Murrow with helping to expose McCarthy.

Murrow also hosted *Person to Person*, which featured celebrity interviews rather than hard news. Murrow, in a New York studio, would be linked with people in their homes for a casual conversation. Among the celebrities who appeared on this program were Elizabeth Taylor, Marilyn Monroe, and John F. Kennedy when he was the newly elected senator from Massachusetts.

Television newscasts were short and lacking in much film coverage in the early days. In September 1963, CBS expanded the network newscast from fifteen to thirty minutes, with Walter Cronkite as the anchor. NBC, with Chet Huntley and David Brinkley, followed one week later. ABC did not expand its newscast to thirty minutes until January 1967. The basic formula for the modern nightly network newscast is little changed from those days.

When President Kennedy was assassinated about two months after CBS and NBC went to a thirty-minute newscast, television devoted the next four days to live coverage of the nation in mourning. This brought television into a new age. People no longer relied on their newspapers; instead, they turned to television for information in a crisis. Television news would further mature during the Vietnam War, which some have dubbed "the living room war," since it brought the war home to Americans each night as they ate dinner and watched the news. Antiwar demonstrations and the civil rights movement also gained wide exposure on television. The nation again found itself glued to the television in the summer of 1969 as live pictures were beamed back from the surface of the moon.

In the 1970s, television broadcast the Watergate hearings. "What did the president know and when did he know it?" and "smoking gun" became household expressions. Americans watched as President Richard Nixon resigned and as Gerald Ford assumed the office, assuring Americans that "our long national nightmare is over." By the end of the 1970s, Americans were held hostage in Iran and a popular news program was born. ABC started out counterprogramming The Tonight Show with Johnny Carson on NBC and old movies on CBS with a twenty-minute nightly news special called The Iran Crisis: America Held Hostage. U.S. State Department correspondent Ted Koppel soon became anchor of the program. When Ronald Reagan defeated Jimmy Carter and assumed the presidency in January 1981, the fiftytwo hostages were released, and the program became Nightline.

Satellite technology started to come into frequent use by the news networks in the 1980s, allowing live or same-day recorded broadcasts from remote parts of the country and the world. In 1986, the U.S. Senate joined the U.S. House of Representatives in allowing broadcast coverage of floor debate. By the 1990s, satellite technology allowed live coverage of missile attacks and fighting during the Gulf War. Portable satellite dishes allowed transmission from Kuwait before the first liberation troops arrived. In 1994, the nation and the world watched the slow-speed chase of O. J. Simpson on a Los Angeles freeway. The subsequent live coverage of the Simpson murder trial attracted large ratings and a loyal following.

Technology

Much of the immediacy of the modern broadcast news environment can be attributed to advances in videotape technology. The first magnetic videotape recorder (VTR) was demonstrated by Bing Crosby Productions in 1951. Five years later, Ampex introduced the first commercial VTR, a 900-pound machine that recorded blackand-white images on two-inch tape housed on fourteen-inch reels (at a cost of \$75,000 per unit). As technology progressed, VTRs became more portable, videotape became smaller while providing better resolution, and equipment prices dropped sufficiently to make video a viable alternative to film.

Sony debuted its U-Matic videocassette recorder (VCR) in 1972. The new format used a 3/4-inch tape in a \$1,600 deck and soon became the industry standard. It continues to be used by some broadcasters, though Sony's Betamax SP format dominates the news industry. More recent digital tape formats, including Sony's DVCAM and Panasonic's DVCPRO, are also being integrated into electronic newsgathering (ENG) and other video productions. The new tape formats provide portability.

Videotape also found a prominent place in U.S. homes. Though earlier attempts at home video had flopped, Sony introduced its Betamax "video time-shift machine" in 1976. VHS, a rival system from JVC, debuted the next year, boasting longer recording times at a lower price. Television set manufacturers were divided in their support of the two formats, but VHS dominated the market within a few years. By 1983, VHS had more than 80 percent of the market. Sony finally withdrew Betamax from the United States in 1986 and began selling VHS VCRs in 1988. Despite several homevideo formats on the market, consumers have remained loyal to VHS. According to the Consumer Electronics Association (CEA), VCRs were in 91 percent of U.S. homes by June 1998, and 40 percent of all households have at least two VCRs.

Audio, often considered an afterthought of television broadcasting, has also been improved. Stations began stereo broadcasts in 1985. In the 1990s, as stereo television, stereo VCR, and home theater sound system sales continued to increase, stereo surround sound became common for network programming. CBS, for example, broadcast all of its college and professional football games in



The growing use of satellite coverage allows for much more diversity in the reporting of major news stories, such as the O. J. Simpson murder trial in Los Angeles in the mid-1990s. (Joseph Sohm; ChromoSohm Inc./Corbis)

stereo surround sound for the first time during the 1999–2000 season.

Television began as a black-and-white medium. Color television technology had been demonstrated in 1929, and equipment had been developed as early as the 1940s, but the legal battle over color television took several years. Originally, the FCC approved a CBS-sponsored system in 1950. The National Television Standards Committee (NTSC), which included many companies with a financial interest in the decision, then researched the system, and in mid-1953, the committee recommended that the CBS system should be rejected. In December 1953, the FCC reversed its decision and approved RCA's color system, which was supported by rival network NBC. This NTSC transmission standard, which broadcasters adopted in January 1954, remains in use, though color sets did not see extensive U.S. household penetration for more than a decade. By the 1990s, almost every

home in the United States had at least one color television set.

Looking Ahead

The future of television broadcasting is already here. Digital television (DTV) is nothing less than a revolutionary new way to broadcast television, replacing the NTSC analog standard that has been in place since 1953. The FCC adopted the new system in 1996, following more than a decade of development. Dozens of stations across the country are already broadcasting digital signals (in addition to their regular NTSC signals) in accordance with the FCC mandate. The FCC, which mandated the move to DTV and set 2006 as the date for completion of the transition from NTSC to DTV broadcasting, does have the option of reviewing and changing the DTV timetable, if necessary.

DTV promises improved pictures and sound for viewers, as well as greater flexibility in signal distribution for broadcasters. Stations will have the option of broadcasting more than one programming feed over the same channel simultaneously through a process called multicasting. Highspeed data services will also be possible. High-definition television (HDTV), which provides outstanding picture resolution and a wider aspect ratio (an HDTV screen is 16:9, compared to NTSC screen, which is 4:3), is another potential service. All four major networks, ABC, CBS, Fox, and NBC, have already committed to prime-time HD programming. On April 26, 1999, NBC became the first network to provide regularly scheduled HD programming when it began to simulcast The Tonight Show with Jay Leno in both NTSC and HDTV.

See also: Cable Television, History of; Digital Communication; Farnsworth, Philo Taylor; Federal Communications Commission; Murrow, Edward R.; Radio Broadcasting, History of; Satellites, History of; Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, Production of; Television Broadcasting, Programming and; Television Broadcasting, Station Operations and; Television Broadcasting, Technology of

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RICHARD LANDESBERG MARK J. PESCATORE

TELEVISION BROADCASTING, PRODUCTION OF

Television production, whether it is a sitcom episode, a feature-length movie, a corporate training video, an educational program, or a newscast, must complete four basic phases before it is realized. These phases are the conceptualization phase, the preproduction phase, the production phase, and the postproduction phase. Completion of these phases may take months or years depending on the type, length, and complexity of the production, and, in fact, some programs such as a daily newscast may only allow for a single day to follow these phases on a loose basis. However, a good, tight production will usually execute each these four phases to some degree.

Conceptualization

The conceptualization phase of production is where the bulk of the creative work is completed. This phase begins with the generation of ideas. These ideas can be brainstormed by one or more creators, or in the case of a corporate video or other production that must meet certain objectives, several different people may be assigned to a specific area for which they will generate a creative concept. If needed, research via computer databases, interviews, or other sources may be performed to supplement the concepts that will be brought to the table for organization.

The second major part of the conceptualization phase is the organization of ideas. While there are many ways in which to organize concepts, some successful methods are worth mentioning. These are outlines, word trees, and the similar word webs. However the production group attempts this organization, it is helpful to at least think of the ideas as weaving together into an executable production process.

From here, two roads can be taken to turn the organized ideas into a scriptable proposal. The first option is the content avenue, which focuses solely on the content irrespective of the medium, in this case, television. A chosen person selects from the organized ideas the concept that best fits the desired program content. This content is then massaged into a workable script that is given to a television producer, who tries to make this content as compatible with the medium as possible. This avenue, though perhaps more accurate to the artist's vision, may ultimately fail when trying to translate a concept to the restrictive television screen. Distortion, crowding, and other problems may arise, thus diminishing the desired effect on the target audience. Therefore, the second option may elicit a better product.

This second option is the effect avenue, which takes into account the desired audience effect and molds the chosen concept accordingly. First, a concept coordinator chooses a concept from the pool of organized ideas. Next, the coordinator defines a desired audience effect or viewer experience, such as an emotion or a given amount of learning. The coordinator then tests the concept against the desired effect to see if the couple is compatible. If the coordinator determines that the concept has a successful chance at delivering the desired effect through the chosen medium, then the production chain continues. If the concept does not appear to be able to deliver given the medium, then the coordinator must go back to the pool of ideas and test another concept.

After an organized concept is chosen, it is time to write a program proposal. This is where a production team solidifies in writing its chosen title, objective, target audience, treatment, medium, and proposed budget. The title, of course, must be "catchy," but it must also serve as a good identifier of the proposed production. The objective may be simply to tell a story, or in the case of a corporate or educational video, it may be to teach a given set of topics. The target audience may be fairly general. However, every production has an optimal audience as defined by specific demographics (i.e., age, economic status, and gender), and, at times, by specific psychographics (i.e., likes and dislikes). The treatment answers the "what" and the "how" of the production, meaning the plot, the genre, and other identifying features. This can be answered via a brief descriptive of the proposed program or an illustrated storyboard of the various events or scenes. The medium is generally a type of technology such as television, radio, or print. However, medium can also be further specified into broadcast television, cable, satellite, and so forth. Finally, a proposed budget must be formulated. This budget will include above-the-line costs, which include creative personnel such as writers, directors, and artistic designers. The other part of the budget will consist of below-the-line costs such as the production crew, production equipment and rentals, and any other tangibles needed to produce the program. Once the budget is estimated, the proposal can be submitted for acceptance. Acceptance begins the second production phase.

Preproduction

Preproduction, which encompasses everything from the writing of the script to the gathering of props and costumes, begins with the gathering of personnel. These personnel may include writers, script editors, directors, art designers, costume designers, makeup artists, actors, production assistants, musicians, camera operators, audio operators, lighting directors, videotape operators, character generator or computer graphics operators, videotape editors, and other crew and support depending on the scope of the project. In other words, the number of people who are involved in preproduction of a given program can range from a small handful of people to a small army. Once the personnel are hired and money has changed hands, a writer is given the chosen concept and the desired effect and begins to work on a script. This script, which may experience several revisions depending on feedback by the producers and clients (if applicable), will then be given to a director, who will block the script, translating each scene into a workable audiovisual image. An art director will then take the blocked script and create a storyboard that illustrates each image and suggests locations, sets, graphics, costumes, or other aesthetic elements that will complete the director's vision. Once again, the producers and other interested parties will review this material. Once the overall vision for the project has been finalized, each image will be planned using several criteria.

The first criterion asks whether the program would best serve as a live production or as a recorded production. This decision will most likely dictate the fate of the other criteria, in that live productions by definition will require all shots to be executed in sequence, whereas recorded programs have the luxury of being edited.

The second criterion involves location. If the image is to be shot in a studio, then studio equipment and facilities will need to be acquired. If the image is to be shot in the field, then the producer must choose whether a single-camcorder setup is sufficient, or if a more sophisticated remote studio setup is necessary.

The third criterion involves camerawork. If a single camera is desired, then production will need to be stopped for each change in camera angle. If the more expensive multicamera effect is wanted, then multiple camera angles and shots can be recorded and manipulated simultaneously. This decision is partially affected by the earlier choice of location. For example, it may be desirable to use two cameras in a studio setting, whereas it may be more feasible to shoot singlecamera style in the field. However, both camera options require efficient planning and direction of each shot and shot sequence.

The final criterion involves sequencing. Depending on the previous choices, the director may want to record shots in-sequence or out-ofsequence. For example, single-camera work is executed best when shots are planned out-ofsequence and according to which images share the same or similar backdrops. This, consequently, will require considerable editing during postproduction. Conversely, studio work lends itself well to in-sequence shooting, which requires little to no editing upon completion of the shooting.

Once each image is planned, a production schedule must be made that maximizes the use of time and money. Shots, therefore, are organized according to location as well as according to the featured actors. Equipment, props, scenery, costumes, makeup, and other electrical and mechanical necessities are also identified for each shot and location. Finally, the schedule is approved and the project goes into production.

Production

The production phase is perhaps the most exciting and most exhausting phase for the entire crew. This phase begins with long rehearsals amidst the creation of the setting. Only when the producers and directors are satisfied, or when the production schedule demands it, rehearsals become shoots and each scene is recorded. During this time, the various shots are recorded, reviewed, revised, and/or re-recorded as the production crew try to capture a good product within the confines of the production schedule. Also during this time, each shot is carefully logged according to position on the videotape or film, date and time of recording, content of the footage, and any other necessary information that will enable the editors to locate and identify it during postproduction. Without this log, hundreds of hours may be wasted trying to find certain footage for key scenes or needed filler. Therefore, it is imperative that every shot be logged and every tape be labeled so that the postproduction phase can be efficiently executed.

Postproduction

Postproduction involves the actual constructing of the envisioned program. It is the culmination of the long hours spent conceptualizing, planning, and recording the various program elements. Unfortunately, unless the program is a live program, postproduction usually takes longer than expected and therefore may stretch the estimated budget to its limits.

The main component of postproduction is the editing. Editors use either old-fashioned linear editing or nonlinear computer editing programs to put shots together in their designated order. However, not only do the editors follow the script, but they also take creative license in selecting the best shots, adding filler sequences, and even changing the sequence of certain scripted shots if deemed necessary. This means that they use the logs to find the desired footage to realize their own envisioned effect.

Meanwhile, graphic artists create any graphics, credits, or other computer-generated content. This content, along with any special audio tracks, is delivered to the editors, who incorporate the additions into the rough-cut. A review and revision process follows until the program is satisfactorily completed. The production is almost ready for release.

Other components of postproduction include publicity. This may mean the creation of advertisements, flyers, or other notices that attract the target audience to the program. This may also mean entering the project into a contest, a circuit, or other venue in which the project will be publicized and shown. Client feedback, if applicable, is also necessary to determine if the client's goals were obtained as well as if the client may be open to a future production contract. A final component of postproduction is record keeping. A record of personnel, production schedules, footage, and final cuts are good for reference both in planning and hiring for new projects and for winning new production contracts. In addition to creating a memorable project, the ultimate goal of a production should include the creation of a memorable résumé.

Production Differences for News Programming

News programming differs fundamentally from other production processes in several ways. For example, news programming is usually produced under the umbrella of a television station, which means that on-staff personnel are available to gather and compile the day's content. However, the production schedule of a news program spans just a single day, and its content depends on available news stories. The environment surrounding the production of news, therefore, can be quite hurried and intense.

Several news employees contribute to the surveillance and research of the local, regional, national, and international landscapes in order to find potential news stories. However, the assignment editors ultimately select the specific stories for the various reporters to pursue. As evident in the local news, many stories are written and read by news anchors with or without accompanying footage or graphics. Other news stories allow for the creation of a news package, in which a reporter will go into the field with a videographer and record stand-ups or narratives, interviews, and other footage over which the reporter will further narrate the story. This footage will then be brought back to the station and will be edited together into a succinct package. Final stories and packages will then be timed and arranged in order to create a twenty-two-minute newscast that runs twenty-two minutes and has designated breaks for commercial. Scripts are entered into a TelePrompTer from which the news anchors will read, graphics are rendered that will be used for names and other visuals, and the news director readies the crew for live broadcast. The culmination of this production, which can be altered at any time during the broadcast, is realized at the production phase, where the program is disseminated to the television audience.

In television news, some aspects of postproduction occur before production. Editing, for example, occurs when videotape editors put together news packages, and publicity occurs throughout the day whenever the station advertises its newscasts. However, the four phases of production are still present.

Other Considerations

In a simple world, all the producer needs to think about is the idea and the realization of that idea. However, several legal considerations need to be kept in mind when producing a program. For example, copyright clearance needs to be obtained if proprietary music, reproductions of paintings, or content from books or other items are to be used in the set, the script, or some other part of the production. Related to this are the rights of unionized personnel. Many creative and



The time pressures involved in news production are crucial because reports, such as those issued by reporters in the middle of the Kosovar refugee crisis in 1999, must be filed on a daily basis under less-than-ideal circumstances. (Howard Davies/Corbis)

technical personnel, such as directors, actors, camera operators, and engineers, belong to unions or guilds that may dictate minimum salaries, fees, or working conditions in exchange for employment. Authorization may also be needed to hire nonunion personnel if the production is being originated from a unionized organization.

Regarding program content, there may be certain content requirements, depending on the categorization of the program. The Federal Communications Commission lists eight mutually exclusive groups of programs: agricultural (A); entertainment (E); instructional (I); news (N); public affairs (PA); religious (R); sports (S); and other (O). If a program is considered to be educational, it may have to comply with various children's programming regulations. Furthermore, a program originating from, created by, or in cooperation with a certain organization, such as an educational institution, may automatically fall under a certain category, such as education, despite the program content. Finally, all program content must be suitable, both legally and socially, for its target audience. In the legal realm, matters such as libel or slander must be considered when profiling or commenting on the life of a real person. In addition, lawyers or other legal counsel may help tackle the murky issues of right of privacy, indecency, and obscenity in a media production. Social guidelines for acceptability, however, will change with time and culture. However, broadcast standards and practices departments, media professors, and other counseling sources are available to aid in the ultimate conception of the television production.

See also: Cable Television, Programming of; Film Industry, Production Processes of; Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, History of; Television Broadcasting, Programming and; Television Broadcasting, Station Operations and; Television Broadcasting, Technology of.

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FRANCESCA DILLMAN CARPENTIER

TELEVISION BROADCASTING, PROGRAMMING AND

While the television set and the radio receiver are considered to be "hardware," programming is the essential "software" that actually tempts people to use these devices. The primary function of the station or network is to provide programming content that will appeal to some segment of the audience. The ability of a station to reach its desired audience will determine its success. Its programming mission and strategy are critical to its viability. As such, programming is the most visible and most vital commodity of television.

Programming Sources

There are some basic programming strategies that are common to both radio and television. A station or network must analyze the audiences that is available during a given time of day, examine its own schedule as well as that of the competition, determine the budget and revenues that are available for that time, and-with its ultimate goals in mind-make programming decisions. The programming day is broken into several dayparts, which (in the eastern time zone) are early morning (6:00 A.M. to 9:00 A.M.); daytime (9:00 A.M. to 4:00 P.M.); early fringe (4:00 P.M. to 6:00 P.M.); early evening (6:00 P.M. to 7:00 P.M.); prime access (7:00 P.M. to 8:00 P.M.); prime time (8:00 P.M. to 11:00 P.M.); late fringe (11:00 P.M. to 11:35 P.M.); late night (11:35 P.M. to 2:05 A.M.); and overnight (2:05 A.M. to 6:00 A.M.). The general manager, program director, and/or sales manager must determine the best type of program that is available for a given daypart and determine the source of the program. There are five primary sources for programming: network-fed, syndicator-delivered, independently produced, locally produced and in-house, and paid programming.

Network-Fed Programming

In the earliest days of radio broadcasting, each station produced all of its own content locally. However, the production effort and programming costs were too great for most stations to bear this. Between 1923 and 1928, stations banded together to receive programming from a single, originating station. This innovative practice of networking decreased the production effort and spread the programming costs over a number of stations. Stations that affiliated with the networks (e.g., NBC and CBS) had the option of carrying local programming or the network-fed shows. This basic model is still alive and well in the broadcast television industry.

Local television stations are generally affiliated with one of the broadcast networks. Broadcast networks include ABC, CBS, NBC, Fox, WB, UPN, Pax TV, Univision, and Telemundo. An affiliated station, or affiliate, can choose to carry the programming that is fed by its network. The affiliate's agreement to broadcast the network program is a clearance, and the affiliate's decision not to broadcast a program is a preemption.

Upon clearing the show, the station airs both the show and all commercials that are sold by the network. The local station makes money on the arrangement by selling local commercial time during breaks in the network feed. These breaks are referred to as "availabilities." Generally, broadcast networks do not feed programming twenty-four hours a day. When the local station has no network feed available or decides to preempt network programming, it relies on one of the remaining sources of programming. The most common source in this situation is program syndication.

Syndicator-Delivered Programming

A syndicator is a company that makes contractual arrangements to place programs or movies on television stations and cable networks. Syndicators make a wide variety of programming available to each broadcast market and/or to cable networks. The shows range from *Oprah Winfrey* to *The Flintstones* to individual college football games. Station and cable network executives are usually responsible for examining the syndicated programming options and for conducting negotiations to obtain the rights to the programs that are best suited to their needs. Some negotiations occur at the annual National Association of Television Programming Executives convention. It is a "shopping mall" of syndicated programming options, and it is attended by syndicators and television executives.

The three most common types of syndicated packages are referred to as "first run," "off network," and "feature film packages." Feature film packages are groups of movies that are put together by a syndicator and offered to a local station. The local station negotiates the number of runs it gets for each film title, the amount of money that it may have to pay for airing the movies, and the dates and/or daypart(s) in which the film may air. Feature film packages may come with a mixture of box office hits and critical misfires. The station must determine the best way to use the titles to meet its programming goals.

Off-network programming refers to episodes of series that have previously played on a broadcast or cable outlets. Local stations negotiate with syndicators for episodes of series ranging from *The Andy Griffith Show* to *Buffy, the Vampire Slayer.* For the majority of successful network sitcoms and dramas, syndication is their major source of revenue. This is not surprising when one considers that off-network contractual agreements are made at virtually every television station in the United States and in many international stations and networks as well. Some successful series such as *Cheers, Home Improvement,* and *Seinfeld* have each generated hundreds of millions of dollars in syndication sales.

First-run programs are those series that have had no previous network exposure. The majority of syndicated fare is considered first run. Included in the category of first-run series are talk shows such as Oprah Winfrey and Jerry Springer, court shows including Judge Judy and Divorce Court, game shows such as Wheel of Fortune and Jeopardy!, news/entertainment series including Entertainment Tonight and Inside Edition, and entertainment series including Xena, Warrior Princess and Hercules, the Legendary Journeys. Stations and cable networks contract with companies such as Paramount, King World, and Studios USA for the rights to syndicated series. Contractual negotiations for all syndicated programs fall into one of the following three categories: barter, cash, and cash-plus-barter.

The contract in barter syndication is the simplest. A station contracts for the rights to air a series or special. The station pays nothing for the program but must run all of the commercials that are sold by the syndicator. A one-hour program may contain fourteen minutes of commercial time or "inventory." The syndicator makes its money by selling about half of the commercial inventory in the show. The station makes its money by selling the remaining minutes of commercial availabilities in the show. Although economical, the station sacrifices a great deal of commercial inventory time in such arrangements. Barter programs are usually scheduled by frugal stations and/or in the less desirable time slots of a channel.

The contract for off-network series and some new programming is handled on a cash basis. In such cases, the station receives the series, as well as the entire commercial inventory, for a stated length of time. It attempts to turn a profit on the contract by selling advertisements. Cash deals can either be long-term contracts to run older series or short-term contracts to cover newer series with fewer numbers of episodes.

The most lucrative arrangement for the syndicator is one in which it can sell commercial inventory within a series and receive further compensation from individual stations. Such contractual agreements are called cash-plus-barter, or cashplus. The station or network pays a cash license fee and must air the commercials that are sold by the syndicator. Unlike the barter deal in which the station is generally left with just half of the commercial inventory, cash-plus contracts leave the station with the majority of the commercial inventory. The station must attempt to recoup its investment by selling the remaining commercial availabilities. Though the cash-plus appears to be the worst value for the buyer, almost every successful daily syndicated series is sold on a cash-plus basis. This includes Oprah Winfrey, Wheel of Fortune, and Entertainment Tonight.

Independently Produced Programming

An independently produced program is one in which a station or network makes an exclusive contract with an outside producer to deliver a series, telefilm, or special. Though rare in local television programming, it is a standard operating procedure for networks. Networks make series and film commitments to producers such as Steven Bochco (Steven Bochco Productions) and Marcy Carsey and Tom Werner (Carsey-Werner) for a portion of their prime-time programming. They agree to a set amount for a project and determine the number of episodes to be delivered. The networks attempt to make their investment back through commercial sales.

Locally Produced and In-House Programming

In the early days of television, locally produced television shows ranged from children's programs to sports to news programs. Since that time, however, local productions in television have largely been limited to newscasts that air in the early morning, early evening, and late fringe time periods. Local newscasts can be the most profitable programs of a station, and they are used to establish an identity in the station's local community. Because of the heavy reliance on network and syndicated fare, some stations are returning to the concept of regularly scheduled local programs in an attempt to regain the notion of localism. Despite their relative rarity, local productions can be the most important programs of a station because they connect the station to its core audience.

For the major television networks and many cable networks, in-house programming is commonplace. NBC produces the *Today Show*, the *Tonight Show*, and others on a daily basis. The cable network E! produces *Talk Soup*, *Mysteries & Scandals*, and many other series and specials. The networks can air these shows whenever they wish and can syndicate them for added revenues.

Paid Programming

Another source of material for television outlets is that of paid programming. There are three types of paid programming: program-length commercials (i.e., infomercials), paid religion, and program-length political advertisements. In each type, the station or network sells an entire block of time to an entity in exchange for a cash payment. Through paid programs, the station lowers its programming costs and does not have to concern itself with selling commercial time. Paid programs are economically sound, but they generally deliver poor ratings and can interrupt the station's regular flow of programming. The use of any program source, including paid programming, is largely dependent on the goals of a station.



Local news programming is the area in which local television stations are able to exert the most control over what specific content they air, including which people are the best subjects for in-depth interviews. (Reuters NewMedia Inc./Corbis)

Programming Goals

Every broadcaster-commercial or noncommercial-must fulfil at least one goal: to serve the "public interest" as mandated by the Federal Communications Commission (FCC). To stay viable, broadcast licensees and networks watch their profit and loss statements closely. However, not everyone's programming goal is to be number one in the ratings. For the majority of stations and networks, this is unrealistic. Each broadcaster must have a set of specifically worded goals to see if it is meeting the needs of the public and the owner. These programming goals may include one or more of the following concepts: reaching a stated audience, conserving programming target resources, creating a positioning statement, branding of programming, and integrating technology.

Reaching a Stated Target Audience

Targeting the "mass audience" and striving for the top spot in the market or nation may be the goal of a station or network. Given the dizzying array of program options, most stations prefer to focus on a subset of the television audience. Stations that are affiliated with Univision and Telemundo (the Spanish-language networks) attempt to reach a significant portion of the local Hispanic audience. Other stations, such as ESPN, work to become the top sports source in the market. With that goal in mind, the station will combine live sporting events and shows that cater to the sportsminded audience. The notion of targeting specific audiences has long been associated with the magazine industry, with local and national radio, and with cable television. Since the 1980s, as programming options have continued to grow, targeting audiences has been refined and expanded to become the norm for all forms of television.

Conserving Programming Resources

Some stations or networks will sacrifice ratings to avoid the risk that is associated with high programming costs. These outlets have conserved programming costs by accepting barter programs, airing reruns, and/or allowing paid programming instead of pursuing superior programming alternatives that would involve a higher cost. As the concept of reaching a "mass audience" becomes less probable other than for major events (e.g., the Super Bowl), stations and networks will continue to lower programming risks by being very choosy in the area of high-budget programs and by relying on modest- to low-budget programs, reruns, and local and in-house productions.

Creating a Positioning Statement

A positioning statement is a one- or two-sentence description that distinguishes one business from another. In broadcasting, radio broadcasters have used positioning to help audience members make a link between the statement and the programming that is carried by the station. A statement such as "All Oldies, All the Time" can explain one's programming goal in a memorable manner. In television, the increased number of cable networks has encouraged both local stations and cable networks to adopt positioning statements. In cable, Lifetime uses "The Network for Women." In local television, "Family First" stations may make programming decisions to limit on-screen violence and offensive language, while a "Watch and Win" station may use promotional contests to call attention to its program lineup. As was the case in the magazine and radio industries, increased television outlets will result in more stations adopting program-based positioning statements.

Branding of Programming

Branding is a concept in which a show or, moreover, a block of shows is given its own unique identity. ABC uses this concept with its "TGIF" Friday night of situation comedies. This concept allows a network to target a specific audience for a portion of the day and to focus attention on that group of shows.

Integrating Technology

Stations and networks often use technological innovations to call attention to their programming, especially news and weather on local stations. Stations that are the first to adopt and actively promote digital technology, high-definition transmission, active Internet programming, and interactive television options are promoting their programs through technology. High-definition Monday Night Football games, Internet communities that are devoted to popular television shows, and interactive play-at-home versions of television games are just some of the concepts that have been successful. The convergence of digital television, Internet applications, and interactivity will be the fastest-growing area of television in the early part of the twenty-first century.

Audience Measurement

The Nielsen television ratings measure the percentage of the television audience that is watching a particular program. Most of commercial television's best programming and first-run episodes of series are shown during the major ratings periods called the "sweeps." The sweeps months of November, February, May, and July, are the only months that Nielsen gathers audience data for the entire nation. Families are selected to take part in the ratings process and fill out diaries about each show that is watched in the household for a stated ratings period. Nielsen tabulates the results both for the local stations that buy the ratings information and for the national networks.

Ratings data is also collected on a daily basis. For the national ratings estimates, five thousand selected households are sampled every day, and the results are published the next day. This quantitative data, known in the industry as the "overnights," is made possible because of the "People Meter" technology. The meter attaches to the television and sends instantaneous viewership data. These meters are also used in most of the fifty largest U.S. television markets and provide stations with daily statistics. As a result of this instant ratings data, stations and networks can quickly assess which programs are living up to expectations and which ones should be moved to a different time period or eliminated from their schedules altogether. The ratings information has a direct effect on what programming the audience sees—or does not see—on its television set.

Though programming maneuvers are made based primarily on the ratings numbers, the programmer also uses qualitative information. Viewers have mounted successful write-in campaigns to save quality programs and to have offensive programming either changed or removed from the schedule. Overwhelming critical praise of shows can also sway a programmer toward keeping an underperforming show on the schedule. Research departments often obtain information from test audiences (i.e., focus groups) that screen or prescreen television programs. A focus group may give the program producers critical insights concerning program elements that may need adjusting. Viewers, therefore, have a direct and indirect effect on the programming process from development to ultimate success or failure.

See also: Audience Researchers; Broadcasting, Government Regulation of; Broadcasting, Self-Regulation of; Cable Television, Programming of; Radio Broadcasting, Station Programming and; Ratings for Television Programs; Researchers for Educational Television Programs; Soap Operas; Talk Shows On Television; Television, Educational; Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, History of; Television Broadcasting, Production of; Television Broadcasting, Station Operations and; Television Broadcasting, Technology of.

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TELEVISION BROADCASTING, PUBLIC

See: Public Broadcasting; Public Service Media

TELEVISION BROADCASTING, RATINGS FOR

See: Ratings for Television Programs

TELEVISION BROADCASTING, REGULATION OF

See: Broadcasting, Government Regulation of; Broadcasting, Self-Regulation of; Cable Television, Regulation of

TELEVISION BROADCASTING, STATION OPERATIONS AND

The various operations of a television station revolve around the manufacturing and sale of a product, much like any industry; and like any industry, the various departments of the station work both independently and cooperatively to meet its production goals. In the case of the television station, however, that product is the programming airtime that is consumed by the public, and the sale of that product is advertising time. Therefore, the various departments of the television station can be categorized according to their tasks of creating the product, advertising the product, transmitting the product, selling the product, and managing the revenue from the product.

General Organization of a Television Station

The organization of a television station depends on the size of the market in which it

operates and the type of ownership under which it exists. For example, small-market television stations may only retain skeleton crews for each department whereas large-market stations may have as many as fifty employees on the payroll for a given department. In addition, larger stations may necessitate the division of departments into smaller branches in order to increase efficiency. Regarding ownership, stations under multiple ownership often have a higher-level organizational pyramid consisting of a manager that oversees the operations of all owned stations, managers that oversee regions of stations, and so on. However, the typical television station will contain the following seven operations: general administration, sales, programming, production, news, advertising, and engineering.

General Administration

General administration operations manage and distribute the revenue received from station sales of advertising time. This includes the appropriation of available funds to each department as well as the billing of supplies and services both interdepartmentally and externally to clients and advertising agencies. In short, the general administrative function supports and maintains the operations of the entire station.

Under the general administration division are the general manager or station manager, the business manager, the accountants, the secretaries, and other administrative and office staff. These employees serve various duties such as the payment of wages and salaries, membership fees and subscriptions for industry information, license and other government-imposed fees, taxes, insurance, legal and auditing fees, and contributions to charitable organizations. In addition, maintenance of the building and of equipment, utilities, office supplies, computers, station automobiles, and other administrative services and supplies are also provided by the general administrative department. It is not surprising, then, that this department consumes one-third of the total operating expenses of a station, although only about 13 percent of the total staff may be in administration.

Sales

The sales department at a television station is responsible for generating the revenue for the station to survive. A general sales manager leads a team that is comprised of a national/regional sales manager, a local sales manager, account executives, and at times, a traffic manager. In most cases, the national/regional sales manager will be a liaison from an outside organization that wins advertising contracts from regional and national advertisers. The local sales manager, then, is charged with securing advertising accounts with local businesses and organizations. A staff of account executives helps the local sales manager sell advertising time to local businesses employing solicitation tactics similar to other sales businesses. However, the salespeople of television must negotiate advertising sales using a rate card, a definitive list of airtime costs during the various time periods and television programs. Furthermore, the television account executive can also offer to create the advertisement for a client if the client so chooses, in which case the sales department cooperates with the production and programming departments for this venture.

A linking figure between the sales department and the programming department is traffic, which has traditionally fallen under programming but is increasingly becoming an arm of sales. Traffic prepares the daily log, which details to the second every program, promotional spot, and commercial that will air each day. Responsibilities for this position include staying well informed of new advertising accounts, ensuring that all slated commercials are available to air, and monitoring proposed programming schedules for commercial placement. For example, the traffic manager may want to ensure that two commercials advertising a similar product are not placed back-to-back or that a single commercial is not run twice in the same commercial block. A final duty of the traffic department is to maintain a careful record of every commercial and promotional spot that has run so that the accounting and sales departments can cooperate in the proper billing of the client.

In order to market a station effectively, the sales department must be intimately familiar with the ratings, viewer numbers, and the types of viewers that are watching during various programming periods. Therefore, the department must subscribe to ratings services and perform market research. In addition, the sales personnel, who account for about 17 percent of the total staff, receive wages, salaries, or commissions for every contract won, as well as expense accounts and benefits. However, the total cost of this department with respect to the total operating budget of a station is around 9 percent, a small price to pay considering that sales generates more than 95 percent of the revenue of a station.

Programming

The programming department, in conjunction with the production and news departments, acquires and schedules the product that the audience consumes, which in turn allows the sales department to create revenue, which in turn allows the general administration department to facilitate station operations. The programming department is responsible for filling the entire broadcast day with programming and is therefore saddled with arguably the most challenging job in television. Consequently, this department also works closely with the traffic department in structuring the daily programming schedule.

Programming is second only to general administration in terms of operating expenses. The department, if its station is affiliated with a network, needs almost 25 percent of the total budget of the station to function. However, an independent station may give as much as half of its total operating budget to the acquisition of programs.

Programming may consist of a program director, a videotape librarian, a ratings researcher, an acquisitions staff, a continuity standards staff, and on-camera personalities for use in locally originated programs. The program director, helped by the acquisitions personnel, may obtain the majority of the programming of a station from syndicators and other program suppliers. If a station is affiliated with a major television network, then programming will have the luxury of choosing how much programming it will schedule from the network. In a larger market, viewership research may be conducted to help the program director select a programming plan that will attract a substantial audience. Community feedback also aids in planning decisions. However, all decisions concerning program acquisition are ultimately controlled by the amount of revenue gained from sales and the resulting budget allotted the programming division.

Another responsibility of programming besides program acquisition is program creation. Many stations produce public-affairs programming in order to meet their public-interest obligations. The programming department is usually given the job of preparing and producing these programs. Therefore, on-camera talent may be employed to create these public-affairs programs. In addition, the programming department may also be solicited to help the sales department create an advertisement for a client. In this situation, the continuity standards staff may write the advertising script, revise a script given to the station by a client or advertising agency, and/or review a script against government and station standards and policies. However, in any case where programming must produce a program, the production department is there to bring the program to its culmination.

Production

The production department works closely with the programming, news, engineering, and sales divisions. Its sole responsibility is to produce the various programs, be they news packages, newscasts, public-affairs programs, station promotional spots, client commercials, or other productions that a station may require. Because of its close relationship with the other departments, much of the production department's costs are absorbed into the other departments. As a result, it is difficult to say how much production really costs a station, although production in conjunction with programming takes approximately 31 percent of the total budget and production in conjunction with news takes approximately 12 percent.

Production usually consists of a production manager, producers, directors, and studio and remote crews. The studio crews operate the cameras, the audio board, the videotape recorders, the TelePrompTer, the video switcher, the computer or character generator, and any other equipment needed to complete the in-house production. In contrast, the remote crews operate the ENG (electronic newsgathering) or more sophisticated EFP (electronic field production) cameras and other equipment to produce programs or packages outside the television studio. Once footage is obtained, editors edit the programs together and insert any computer graphics and audio tracks until the product is satisfactorily completed. Then, the program may be given to the programming department to review and schedule, and then to the traffic manager to enter into a daily log. In the case of news, programs are prescheduled and the production is completed via live broadcast. In the case of any production, the engi-

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The control board is the center of operations for in-house production and editing of television programs. (Shelley Gazin/Corbis)

neering crew monitors the equipment and, ultimately, the transmission of the program.

News

The news department is primarily responsible for creating news programming such as newscasts and news interview shows, although sometimes members of the news team will participate in the production of public-affairs programs. The news department is headed by the news director, who oversees all news operations and produces the final program. Assignment editors coordinate with the news director and assign stories to available reporters. Copy editors may also be employed to review and edit the written stories, and videotape editors may be employed to edit footage together. The remaining staff may consist of news anchors and reporters, sports anchors and reporters, and meteorologists.

Naturally, news must work closely with both the production and engineering departments. Production crews are needed to run the studio production of newscasts and other programming. In smaller stations, videographers (or photographers) from the production team will accompany reporters when gathering stories in the field, and the production department editors will put these packages together. Similarly, engineering will be present during studio recordings, live studio broadcasts, and, at times, field shoots to ensure that all equipment is calibrated correctly and that transmission of the signal is of broadcast quality.

Although not as costly as the average programming department, news can command as much as 20 percent of the budget of a station. In fact, news personnel in a medium-sized market may comprise almost one-fourth of the total staff of a station, as well as consume a generous amount of resources such as videotape, office materials, and power. For these reasons, perhaps, many independent stations choose not to produce many newscasts, which can cut this expenditure down to around 5 percent of the total budget. The irony of this situation, however, is that many television stations are able to sell more advertising because their stations produce news, making news a profit center for the station.

Advertising and Promotions

Advertising and promotions is where a station creates its own promotional spots and advertisements in an attempt to gain more viewership, and therefore more advertising dollars from local, regional, and national companies. This division is often combined into sales, although it may make an appearance in programming. This varying categorization of advertising and promotions makes it difficult to get an average number of staff or percentage of operating budget required. However, a fairly accurate estimation is that an average station may spend up to 5 percent of the budget on promotional and advertising activity.

Advertising and promotions works in close conjunction with the sales, production, and engineering departments. Often, it will also cooperate with the news department to create promotional spots for the various newscasts and news programming that the station produces. Other promotional spots may advertise specific shows that the station offers, or they may inform the audience of some community service or event that will be taking place in the near future. Usually, sales looks to the programming and promotions departments to increase the number of viewers that the sales department can then "sell" to an advertiser. Programming may then conduct audience research to determine the main attractions, or selling points, of a station. This information will then be synthesized into content that production will turn into a ten-, fifteen-, or thirty-second spot highlighting the chosen station asset. The ultimate goal is to advertise and promote the product in a way that maximizes the audience and revenues from advertising sales.

Engineering

The linchpin of a television station is the engineering department. It is the duty of this department to transmit the programming product of a station to its audience. An average of twenty employees may have the responsibility of ensuring that a station transmits properly. These employees include the chief engineer, who oversees all technical operations, the broadcast technicians, who help maintain the equipment, and the master control operators, who actually put the programming on air.

The two main areas of responsibility for engineering are master control and technical supervision. Master control plays and transmits the programs, commercials, and live broadcasts according to the daily log created by traffic. In addition, master control also monitors the video and audio signals being transmitted, records incoming satellite feeds, and airs emergency broadcast announcements when necessary.

Technical supervision encompasses everything from maintenance to surveillance of industry developments. Broadcast engineers, for example, are responsible for fixing a broken videotape machine, but they also monitor the signals coming from cameras, microphones, and other studio and field equipment to ensure the best possible quality. In addition, engineering must perform necessary equipment upgrades, both to maintain the competitive strength of a station and to ensure compliance with the technical requirements of the Federal Communications Commission. Engineering and its various acquisitions of parts, supplies, and equipment typically require only 6 percent of the total budget of a station. However, when new technologies evolve, stations find it necessary to allocate more funds to incorporate these technologies into their operation.

The Evolution of Station Operations

Two general and inevitable trends identified in television must be considered when evaluating the potential future of station operations. The first trend is that of the shrinking local market. Television traditionally enjoyed increases in audience reach and influence. However, individual stations must continually fight for a shrinking piece of the advertising pie. The development and adoption of new media offer consumers more choices, which splits the potential audience and reduces the potential advertising revenue that any one medium may capture. Therefore, sales departments are becoming more creative and other departments more efficient for stations to respond to the changes in their competitive environment.

The second trend is the development of new technologies. As analog television technology makes way for digital, competitive concerns as well as government mandates are compelling stations to upgrade their entire production and transmission equipment. This very expensive alteration is not new. Television went through a similar change when it adopted color, and doubtlessly, television will need to adjust to other technical changes in the future. Therefore, as new and competing technologies develop, and as industry and government implement standards to adopt new technologies, stations will continue to evolve to meet the challenge and expense.

See also: Cable Television; Cable Television, Careers in; Cable Television, Programming of; Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, History of; Television Broadcasting, Production of; Television Broadcasting, Programming and; Television Broadcasting, Technology of.

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TELEVISION BROADCASTING, TECHNOLOGY OF

Television production and postproduction require an extensive array of equipment, but the most important element for television production is patience. Before any equipment has been turned on, before the lights have been focused, before the director has called his or her first shot, creative personnel must take the time to plan the production. Despite the best intentions of the production team, poor planning or a weak premise will only result in a feeble finished product.

Cameras and Accessories

Central to television is the use of cameras, which provide most of the visual elements that the audience sees. Basically, the camera is the visual acquisition tool that uses a lens to project an image (technically, the light reflected from the subject) onto the camera's pickup element, either an electron tube or a solid-state imager. The tube encodes the image into thousands of dots, and then an electron gun "reads" the dots and outputs the signal. Most cameras have replaced the tube system with a "chip" system (solid-state imager) that uses one or several charge-coupled devices (CCDs), which are smaller, more durable, and use less power than tubes.

Camera operators can control various elements of the image through lens selection and camera features. For example, electronic shutter speed can vary, video signals can be amplified through gain control, the aperture can be opened or closed to adjust for lighting conditions, and the field of view can be changed without physically moving the camera (provided that the camera is equipped with a zoom lens). Most professional cameras also have built-in white balance control, which compensates for light temperature and adjusts the picture to reflect optimal color rendition.

Generally, cameras are configured as either studio cameras or portable cameras. Portable cameras, often called handheld cameras, are often used for electronic newsgathering (ENG). Most professional portable cameras are designed to rest on the right shoulder of the operator, with camera controls within reach and the viewfinder resting in front of the operator's right eye. Handheld cameras are designed to run using battery power. Either the battery is attached to the rear of the camera or the camera is connected to a battery belt pack. Modern ENG cameras, often called camcorders, also have a built-in videotape recorder (VTR) and microphone, and they often sport a removable mini-light for better closeups.

In contrast, the studio camera does not have a built-in VTR or microphone. In addition, studio cameras use conventional power instead of batteries because they are in a studio environment. Studio cameras often feature more sophisticated lens systems (a box-type lens) than ENG cameras. Some high-end cameras feature swappable components, so they can be configured as a studio or remote camera.

The camera pedestal provides a large, stable mount with wheels for studio cameras. Pedestals allow camera operators to change easily the position of the camera on the studio floor, as well as the camera height and angle. They are also built to accommodate studio-configured camera controls, often called "configs." Rather than making adjustments directly on the camera, studio configs allow the camera operator to control focus and zoom from remote controls on rods that are attached to the pedestal. The operator can also view the picture on a monitor that is attached to the top of the camera, rather than through the ENG camera's



The technology for cameras is continually being refined to accommodate digital advancements, and one of the results was Sony's 2000 release of its professional-use digital video camcorder DSR-PD150, which features three 380,000-pixel CCDs (light-sensitive picture elements) on its image sensor, a 6.0-72.0 mm zoom lens, and a 200,000-pixel 2.5-inch color LCD (liquid crystal display) on its monitor. (AFP/Corbis)

smaller and less convenient viewfinder. Studio configs also incorporate a headset microphone, which allows the camera operator to communicate with the director in the control room.

For remote shoots, tripods are often the preferred camera-mounting equipment, due to their compact size and lighter weight. Tripods allow remote cameras to be configured like studio cameras and save operators from constant handheld shooting. Tripods support the camera on three legs but do not have wheels, so the camera is physically fixed in one position. Camera operators can attach wheels to the bottom of a tripod with a dolly, but movement is not as smooth and predictable as when a pedestal is used.

In special production circumstances, cameras are mounted in a fixed position, though camera operators can maintain camera control remotely. Network football game coverage, for example, routinely includes a camera mounted on the goal post, while cooking programs will often mount a camera above the talent to provide a better view of the work area. Cameras can also be attached to counterweighted jib or crane arms or suspended on a wire for smooth, moving shots. Cameras can even be mounted to the body of the camera operator for more stable handheld shots.

Video Switcher

The technical director (TD) sits at the heart of the control room, the video switcher, which has rows of buttons that are used to select which video source will be recorded or broadcast. Each row is called a bus or bank. The program bus controls which image is recorded on a VTR or is broadcast. The preview (or preset) bus, which usually has its own monitor, provides the TD (who is sometimes referred to as the "switcher") the opportunity to check images that are not on-screen before switching to them on the live program bus. TDs can also "key" one source, such as graphics, over another source, such as a camera. For example, if there are five cameras covering a football game, each camera will have its own button on the program bus and preview bus. When a camera is "hot," or on-the-air, the TD can use the preview bus to preview an effect. Other video sources, such as the graphics station and slowmotion replay, will have buttons on the switcher as well. If a reporter interviews a coach on the sideline, the TD can key the coach's name (using the character generator) over the camera image.

Using the switcher, the TD can switch between cameras and other video sources in a variety of ways. A cut, an instantaneous change, is the least obtrusive transition between images. A fade transitions gradually from a color (usually black) to another image or vice versa. Dissolves simultaneously fade-in one image while fading-out another, and they are often used to illustrate the passage of time. Finally, wipes and digital video effects (DVE), which can be created using external equipment, are the most noticeable transitions, as one image literally wipes across another to replace it, often in a dynamic pattern that attracts attention. Fades, wipes, and DVE moves are controlled manually with a fader bar, though some switchers offer preset controls as well.

All video switchers essentially do the same job, but not all video switchers are created equal. More advanced switchers can include a number of additional functions and effects. Some switchers can handle dozens of inputs and have multiple input buses, while others have limited sources and only preview and program buses. Other switchers have downstream keyers, which allow key inserts just before the program source leaves the switcher without using a switcher's mixing or effects systems. Some switchers even have chroma key, which inserts one image over another to create a composite image (often used for weather reports where meteorologists stand in front of live satellite footage).

Graphics

The graphics station is the home of the character generator (CG), often called the Chyron, based on the name of the dominant CG manufacturer. The graphics operator is responsible for providing pages of text and other graphic images that will be used during a production, from opening titles to the closing credits. Improvements in technology have made graphics more dominant on television than ever, with more detailed and visually energetic images. Digital paint systems can create three-dimensional and animated images, while even simpler PC-based CG programs can manipulate and animate text efficiently.

Most graphics are built in preproduction so that access is simple during production. At a football game, for example, player names would be typed in before the game, and introductory graphic images, such as the starting lineups, would be ready for broadcast before kickoff. Game statistics, however, would be composed on the CG as the game progressed.

Audio

Different audio performances require different audio acquisition tools, some of which are visible to the audience. On-camera microphones include (1) the handheld microphone, which is used extensively for interviews, (2) the desk microphone, which remains in a fixed position on a small stand, (3) the stand microphone, which can be adjusted to match the height of the performer, (4) the headset microphone, which is used by sportscasters to keep the microphone close to the mouth and provide program audio and directions in a noisy environment, and (5) the lavalier microphone, which is an unobtrusive microphone that is clipped to the front of the talent's clothing.

When productions call for microphones that are not visible to the audience, highly directional boom microphones are positioned out-of-frame above or below the action, often using a collapsible aluminum pole (i.e., a fishpole). Comments from a roundtable of panelists can be recorded using a pressure-zone microphone (PZM), which captures sound from a variety of sources but equalizes the volume of all sounds (so shuffling papers sound as loud as a person speaking). Other types of microphones can be concealed throughout a set, though wires must also be hidden and talent must be positioned near the microphones for optimal effectiveness.

Microphones also vary in their audio pickup patterns, or the way in which they capture audio. The omnidirectional microphone, for example, provides equal audio pickup from all sides. It is useful for capturing crowd noise in a stadium during a football game. During that same game, however, a sideline commentator may want to interview a coach. The commentator will use a handheld unidirectional microphone, which features a much more narrow pickup pattern, to isolate the coach's comments from the noisy stadium around him. For isolating the sounds of football players on the field, an audio assistant will hold a microphone in a parabolic reflector, which resembles a shallow dish and increases microphone sensitivity and direction. Other audio pickup patterns include the cardioid, which maintains a heart-shaped pattern; the supercardioid, which features a more narrow, directional pattern with limited pickup behind the microphone; and the bidirectional, which picks up sound in front of and behind the microphone but is deaf to noise on the sides.

Production sound is coordinated through the audio board (though some remote shoots use smaller but less flexible portable audio mixers). Prerecorded music, videotape roll-ins, and live sound are all input into the audio board as electrical signals. Each audio source is given its own channel, and the operator sets the volume for each channel using rotating knobs called potentiometers (pots) or sliding bars (faders). Each signal can also be manipulated through equalizers to improve sound quality. The board operator monitors the intensity of the sound level using a volume unit (VU) meter, which indicates the volume in terms of decibels and percentage of modulation. Overmodulation, which occurs when the audio signal is stronger than the maximum percentage of 100 percent modulation, can lead to distortion, especially in digital audio situations. The master output from the audio board provides the audio mix for the program.

The audio board is not set once and forgotten for the rest of the shoot; it needs to be constantly monitored, or ridden. Also, audio levels vary during a telecast, so the board operator must "ride" the levels of the inputs. During a football game, for example, if a commentator gets excited and begins to shout, the board operator must be ready to bring down the volume of the signal or risk distortion. Also, the sideline commentator's microphone only needs to be open or "hot" during interviews. The board operator must be ready to close or "kill" the microphone when it is not in use to avoid broadcasting comments that are not supposed to be on the air.

Editing

For live programming, the show is usually over when the director declares the production a "wrap" and the crew strikes the set and equipment. However, most productions are followed with some kind of postproduction work. Even when a program is shot live-to-tape, so the production is recorded as it happens and without stopping, directors may want to insert video or graphics over bad shots, clean up or add sound effects, or add other special effects.

During production, when mistakes are made, the director often says, "We'll fix it in post." Postproduction usually corresponds with a trip to the editing suite. Editing is a process that is used to put shots in different chronological order, vary shot selection, alter the timing of shots to improve pacing, and add transitions between shots. Editing is a tool to help the director tell his or her story better, and different programs will use different editing strategies. A promotional video for a sports event, for example, may edit action shots together in a furious frenzy of short clips to create excitement. A music video for a romantic ballad, in contrast, may use slow dissolves and far fewer cuts so that a more relaxed mood is created.

Traditionally, video editing has been a linear process, where the editor works with videotape and other inputs to build a program in chronological order (assemble editing) or replace sections of video and/or audio in an existing project (insert editing). The main advantage to linear editing is speed; an experienced editor can literally cut together a news package or other short, basic projects in minutes. Advanced editing systems also can incorporate graphics and other digital video effects (DVE). However, there are several limitations. Editing with analog videotape results in loss of video quality with each generation; in other words, an edited package that contains video copied from original video will not look as good as the original footage. A copy or "dub" of that edited footage will look even worse. Some tape formats show minimal loss during the first few generations, but loss of video quality cannot be avoided entirely. Excessive use can also wear down videotape and equipment. Also, it is troublesome to return to a completed project and make changes, because then the rest of the project must either be re-edited to accommodate the change, or it must be dubbed to a new tape and attached to the changed footage, which results in a generation loss.

Nonlinear editing became an affordable alternative to linear editing in the 1990s. Footage is digitized, or fed into the computer and turned into data. Editors can then manipulate graphics, audio, video, and transitional effects in any order. The advantages of nonlinear editing are numerous. First, there is less tape and equipment wear; once footage is digitized, tape is not needed for the editing process. Because there is no tape, there is also no generation loss. Digitized video maintains its quality no matter how much or how little it is used, although compression can affect quality. Editors can also "jump around" in the nonlinear world; pieces can be edited and re-edited without concern for the timeline. This opens the door to much more creative experimentation and flexibility. The major drawback to nonlinear editing is digitizing time. Footage must be digitized in real time for most systems, so editing has to wait until the footage has been loaded into the computer. For projects with tight deadline constraints, this can be impractical.

See also: Cable Television, System Technology of; Digital Communication; Film Industry, Technology of; Television Broadcasting; Television Broadcasting, Careers in; Television Broadcasting, History of; Television Broadcasting, Production of; Television Broadcasting, Station Operations and.

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TOBACCO AND MEDIA EFFECTS

Although cigarette smoking by adults has declined steadily since the 1960s, smoking by adolescents has risen sharply since 1992. In 1999, the Centers for Disease Control (CDC, 2000a) reported that teenage daily smoking increased 73 percent between 1988 and 1996. Coincidentally (or not), 1988 was the first full year, and 1996 the

last, that R. J. Reynolds featured the "Joe Camel" cartoon-advertisement campaign (which had considerable appeal among children). The increase in adolescent smoking in the 1990s has been attributed to a variety of factors, including the targeting of youths by tobacco companies, teen emulation of media celebrities, and the ineffective healthbased antismoking efforts of the 1980s and 1990s.

In light of the upsurge in teen smoking in the 1990s and the highly addictive nature of tobacco, smoking prevention is considered to be particularly important. The 1994 U.S. Surgeon General's report, "Preventing Tobacco Use Among Young People," estimated that more than three thousand adolescents begin smoking each day, with 12.5 years being the average age of smoking initiation. The report urged that, for preventative efforts to be successful, they must reach adolescents at or before the transition from elementary to secondary school. It is at this age that youths are most vulnerable to the positive images of smokers depicted in movies and in cigarette advertisements.

Research demonstrates that cigarette advertising is an important contributor to adolescent smoking. Nicola Evans and her colleagues (1995) found that exposure of youths to tobacco advertising was more predictive of smoking than being exposed to family and friends who smoked. Indeed, evidence suggests that adolescents are uniquely susceptible to cigarette advertisements. During the period when Camel, Marlboro, and Newport were the three most heavily advertised cigarette brands, the three brands captured 86 percent of the adolescent smoking market but only 35 percent of the adult market. Cornelia Pechmann and Irvine S. Ratneshwar (1994) reported that more youths than adults recognized that Joe Camel promoted cigarettes.

Since it was barred in 1971 from using broadcast advertisements, the tobacco industry depends exclusively on magazine advertisements to associate cigarettes with images of independence, adventure, and youthfulness. According to Simmons Market Research Bureau (1990), tobacco advertisements typically appear in magazines read by teenagers, such as *Sports Illustrated* and *Glamour* (twelve- to nineteen-year-olds make up 33 percent and 28 percent, respectively, of the readership of these magazines). The research described above suggests that cigarette advertisements significantly influence children's decisions to take up smoking. The Surgeon General's 1994 report argued that these advertisements work by influencing the perceptions that youths have of the images associated with smoking. According to research by Dee Burton and her colleagues (1989), the images that adolescents link to smoking, such as sophistication and independence, are similar to the images that are portrayed in cigarette advertising.

Critics have claimed that tobacco companies target youths in order to replace dying smokers with new customers. This accusation, in part, motivated the tobacco master settlement agreement (MSA) between a coalition of attorneys general in forty-six states and the tobacco industry. The MSA of 1996, among other things, banned the tobacco industry from targeting eleven- to seventeen-year-olds with cartoon characters, brandname merchandise, free samples, and event sponsorship. The agreement also eliminated outdoor and transit advertising and paid product placement on television and in motion pictures. The intent was to reduce the exposure of adolescents to cigarette promotions.

Nonetheless, cigarettes are being promoted by new means. The incidence of smoking in movies that are popular with teenagers is on the rise, and the American Lung Association (1999) partially blames exposure to celebrity smokers for increased adolescent smoking. The association reviewed the fifty movies that had the top box-office sales in 1997 and found that 88 percent of the movies featured tobacco use and 74 percent showed the lead actors smoking. Furthermore, study sponsored by the Office of National Drug Control Policy (Roberts, Henriksen, and Christenson, 1999) found that tobacco was used in 79 percent of G- or PG-rated movies, with adverse consequences infrequently portrayed. In fact, Stanton Glantz (1997) claims that lead movie characters are three times more likely than the adult population to smoke. Similarly, Anna Hazan and her colleagues (1994) compared the incidence of smoking among high socioeconomic status movie characters and real people. They found that, whereas 57 percent of the movie characters smoke, only 19 percent of similarly situated real people smoke.

The prevalence of smoking in movies is considered problematic because, according to the Motion Picture Association of America (1999), 49 percent of twelve- to seventeen-year-olds are frequent



Joe Camel, the R. J. Reynolds cigarette advertising mascot shown here on a billboard, was controversial because, opponents said, he appealed to underage smokers. (Joel W. Rogers/Corbis)

moviegoers, and actors are often role models for adolescents. The use of tobacco by celebrities may encourage youths to smoke because youths often emulate the behavior of people they admire.

In recognition of the increased amount of smoking by youths, state health departments and consumer groups have devised methods to combat the effects of media exposure to smoking. For example, in 1998, Vice-President Al Gore unveiled the first nationwide advertising campaign since the 1960s to target adolescent smoking. The campaign, sponsored by the American Legacy Foundation, featured nine television advertisements involving celebrities, such as the musical group Boys II Men. These advertisements were designed to be hip, humorous, and fashionable. They focused on the adverse social effects, rather than the health effects, of smoking. The basis of these and other antismoking advertisements is that teenagers are more concerned with immediate, as opposed to intermediate or longterm, consequences of smoking.

Some states have been highly successful in decreasing the amount of smoking by adolescents. For example, in 1998, Florida launched a \$44 million, youth-designed campaign that mocks tobacco advertisements and accuses tobacco companies of manipulation. Partly as a result of this campaign, Florida has seen a 54 percent reduction in smoking by middle-school students. Massachusetts, California, and Oregon also have initiated aggressive campaigns for smoking prevention.

Another smoking prevention tool is the Internet. Smoke Screeners have created a media literacy website that is designed to deglamorize smoking in the movies, and the Centers for Disease Control and Prevention have created an online source for information related to kids, teens, and smoking. Teenagers have also taken the initiative by forming the organization Students Working Against Tobacco (SWAT), which has a website dedicated to getting "the whole truth" to other teenagers.

An impressive amount of research suggests that smoking prevention interventions can assist in curbing the onset of smoking. In particular, school-based programs that teach social influence resistance skills have been related to significant smoking reductions among adolescents. Also, programs that focus on the development of self-image through means other than smoking, and on media literacy and normative expectations regarding smoking, have also proven beneficial. For example, the Life Skills Program, developed by the CDC (2000b), achieved a 44 percent reduction in smoking onset six years following the program. Additionally, Project Toward No Tobacco Use (otherwise known as Project TNT), which was also developed by the CDC (2000c), reduced smoking initiation among middle-school students by 26 percent over a two-year period. Finally, inoculation, a resistance tactic intended to make youths aware of the vulnerability of their antismoking attitudes, has been employed successfully by Michael Pfau and his colleagues (1994) to reduce the risk of smoking onset among adolescents who are in transition from elementary to secondary school.

Pechmann (1997), who offers advice for the design of antismoking messages, stresses the importance of showing the negative social, monetary, and physical appearance consequences of smoking. Pechmann also suggests placing advertisements on network television, on cable television channels that show rock videos, and on contemporary rock radio stations. While exposure to smoking in movies and in advertising can be influential for youths, so too can exposure to antismoking advertisements. For example, with regard to the influence of movie characters who smoke, Pechmann and Chuan-Fong Shih (1999) found that exposure to an antismoking advertisement before a movie encouraged youths to formulate negative thoughts about the subsequent movie characters who smoked.

See also: Advertising Effects; Alcohol Abuse and College Students; Alcohol in the Media; Social Change and the Media.

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USE OF INFORMATION

"Information use" is concerned with understanding what information sources people choose and the ways in which people apply information to make sense of their lives and situations. This use can be instrumental (e.g., when a decision-maker uses financial data to inform a budget decision), or it can be affective, influencing how people feel (e.g., a person may use information gathered during a conversation with a friend to feel more motivated or better satisfied about a career choice). Information is defined as data (drawn from all five senses and thought) that is used by people to make sense of the world. Indeed, Brenda Dervin (1992) contends that information is only such when it is used by somebody.

The reasons for why people create information may not be the same as the reasons for why people use information. Information is interpreted and used differently (and often in unintended ways) by different individuals and groups. For example, the information that is provided in a radio broadcast may, in the view of the show's producer, have the primary purpose of influencing voters' decisions. However, that information may be used in an unanticipated or unwanted way; it may be used as a source of humorous commentary by a comedian, or it may be used as fodder for an alternative political viewpoint. The uses to which people put information depend on such factors as their existing knowledge, their affective state (i.e., mood and motivation), their intellectual abilities, and their existing skills (e.g., literacy) or physical disabilities.

One of the most prolific researchers in information behavior (i.e., all aspects of people's interaction with information), Tom Wilson (1999), considers information use to include people's physical and mental acts to incorporate information into their existing base of knowledge. Use of information is conceived as the final stage of a process that begins with recognition of an information need. Once the need has been identified, people search for information to meet that need, and then they apply or use the information that is found. This process is iterative and complex, and it is influenced by a number of factors.

Information Uses

People use information to seek meaning in a variety of situations. Sometimes they use information instrumentally, to do something tangible (e.g., to acquire a skill or reach a goal). Other times, information is used cognitively (e.g., to generate ideas). Yet in other cases, information is used in an affective manner (e.g., when an individual uses information to feel supported or to derive pleasure). Some researchers believe that people use information to reduce uncertainty, so that the more information that is provided, the greater the reduction of uncertainty. While this is sometimes true. information can also increase uncertainty about a particular issue or problem (e.g., about what political party to vote for or what career path to pursue). The World Wide Web is a good example of this because contradictory information can occur on different websites. These contradictions can leave a person feeling quite uncertain about how to make sense out of the information that they find.

People also use information to confirm or verify something that they know, to predict what may happen, and to develop or maintain personal relationships. Regardless of the labels that are used to describe the variety of uses to which information can be put, it is clear that the possible uses are as diverse as the number of individual people who are living in individual contexts and facing individual questions, issues, or problems. Moreover, one person may use the same information in two different ways, depending on personal circumstances. This is not meant to imply that information use is not predictable to some degree; variables that are internal and external to individuals certainly influence information behavior, including information use.

Contextual variables (e.g., whether the physical environment is comfortable) and the relative importance of an information need also affect people's decisions to make use of or to ignore information. For example, information about the quality of a local public school system may be ignored completely by a given person until he or she has school-aged children. A parent who is struggling to feed several children may pay more attention to information about subsidized lunch programs than to information about the overall educational quality of the school. This phenomenon is known as selective attention. People constantly make decisions about what information to monitor in an ongoing but relatively passive way, what information to seek in an active sense, what information to ignore, and what information to use. People may attend to information in a minimal way, simply storing it in memory until it becomes useful in the construction of some meaning at a later date. The reasons that people use to select certain information include psychological variables (e.g., personality characteristics), contextual variables (e.g., work roles or way of life), and social variables (e.g., social expectations or social norms).

People in all situations tend to use information sources that are convenient, that have been found to be useful in past experience, and that are believed to be trustworthy. Judgements about what makes a source trustworthy depend on a person's individual values, the person's particular situation, and the question or problem that the person is facing. People therefore develop habits of information use. For example, many North Americans habitually turn to the Internet for information. In all cultures, most people are in the habit of asking their friends and family for information.

People also seek emotional support from information providers, and then the judge the value of the information partly on the manner in which it is delivered. Thus, if an adolescent is given careerrelated information from a guidance counselor, that information is much more likely to be trusted and used if the counselor is viewed as a trustworthy person and if the counselor demonstrates concern for the feelings of the adolescent.

The importance of affect or emotional factors in information use is a large reason why personal communication (either face-to-face or technologically mediated) remains a primary source of information for many people. In workplaces, in families, and within adolescent peer groups, people seek information from others whom they trust and with whom they wish to strengthen social relationships. Thus, people may turn to a trusted family member for advice, or they may ask a question of an acquaintance or work colleague with whom they seek a social bond. On the other hand, when an individual wishes to avoid potential embarrassment or to maintain privacy, information may be sought from a more formal, impersonal source. Thus, people tend to minimize personal risk in their information seeking and use, and they sometimes feel the need to deceive others with regard to their information use in order to protect their self-image or to enhance their status or reputation. Somebody who needs information about a venereal disease, for example, is more likely to seek that information from a formal, anonymous source than from a family member who may be shocked by such a request. In a workplace, a person may, in an attempt to avoid appearing ignorant, deceive colleagues about the source of the information that was used to inform a decision; for example, a person might do this by giving the impression of having consulted several formal sources of information when in fact that has not been done.

Much has been written about types of information needs (i.e., what sorts of people in what situations need what sorts of information), about what kinds of information people seek, and about the processes that people use to seek information. Much of the research into the process of information seeking has focused narrowly on how people search for information via computers (i.e., the retrieval of information). Successful retrieval is equated with relevance to the user. Because relevance is subjective, it is difficult to predict what information will be found to be relevant or useful to people, except under specific conditions. Individual variation in cognitive or information processing style and situational factors (e.g., time constraints) have also been related to information use. For example, the familiar problem of information overload can cause cognitive confusion and force people to limit the information they use.

How people use formal information systems such as libraries is another question, although that area of research focuses on information seeking rather than on the actual use of the information that is found.

The Importance of Context

One of the most important aspects of information use is the context in which people's questions or information-related problems arise, sometimes called the "information use environment" (IUE). IUEs can be characterized by the following four major factors:

- 1. the people or context (e.g., a particular professional or special interest group),
- 2. the type of problem criteria used to evaluate information pertaining to the problem,
- 3. where a person seeks information (which influences, for example, access to information, experience using various information channels, and cultural rules and values),
- 4. and the way in which the person resolves problems.

For example, in an organization where problems tend to be unstructured and where creativity is encouraged, spending considerable time in conversation with colleagues to generate new ideas may be rewarded, thus suggesting that colleagues would be a primary source of information. In another environment, workers may face wellstructured problems and find that particular online databases provide useful information. In that IUE, the use of the online information likely would be valued and rewarded. Those working in particular professions tend to use some information sources more than others; engineers and scientists rely heavily on print and electronic sources such as journals and books for their work, whereas organizational managers rely more on interpersonal sources such as colleagues and meetings. One cannot ignore the specifics of a situation, or the importance of specific work roles and their associated tasks, in determining the types of information that individuals will find useful.

The concept of IUEs and the importance of work roles and tasks fit well with what is known about information use by different professional groups. Health-care professionals have been found to use online information from Medline to make decisions related to patient-care, research, teaching, learning, administration, and consultationsall of which are task-related examples of information use. In all occupational groups, the factors that affect information use include perceived quality, availability, accessibility, and ease of use. Contextual factors that influence information use include an individual's seniority, experience, phase of work (or task), specialty, educational level, and professional orientation. For workrelated information, while convenience might be a primary fact in choosing a source, informational quality is a primary factor in the final decision to make use of information.

Information use in daily life (i.e., non-work situations) has social dimensions as well. Identification with a particular social group affects people's selection of information sources that are considered to be normal or appropriate. The small social worlds that people tend to inhabit work very much like IUEs, creating a context of socially acceptable information sources and creating norms of interaction with information. It is only by studying a particular social group closely that the informational norms of that group can be identified. For example, Elfreda Chatman (1991) conducted a study of a group of janitors and showed that their mutual distrust limited interpersonal information seeking and use, while information obtained from newspapers and television was identified as being more useful to this group.

A similar emphasis on the importance of social context in relation to information use has been proposed by Reijo Savolainen (1995), who suggests that habitus (a concept borrowed from Pierre Bourdieu) strongly influences information behavior and use. The term "habitus" refers to people's disposition to behave in particular ways according to their beliefs and attitudes, the material resources to which they have access, their social capital (e.g., contact networks, rights to control others' activities), their cultural and cognitive capital (e.g., knowledge, learning styles, attitudes), and their current life situations (e.g., health, lifecycle stage). While these ideas have yet to be applied fully to information use, it is clear that a person's contact networks, for example, would have a bearing on the range and quality of information sources that are available to that person. It is also clear that people's use of information sources varies according to their education level, because this variable affects their skills and abilities, as well as their experience and comfort with particular information sources (e.g., online sources).

Barriers to Information Use

The reasons why people do not use information are many and complex. Laura Brick (1999) conducted a study of the non-use of information that was available in a workplace business library. She found that non-users were unaware of the information that was available to them, that they tended to delegate information searching to subordinates (who may or may not use the library), and that they were not information conscious (i.e., they did not see the need to obtain information for their daily tasks and decisions).

Barriers to information use in organizational settings have been the focus of much study related to knowledge management. Thomas Davenport (1997) argues that organizations often emphasize access to information that is potentially useful, rather than conducting thorough needs assessments to determine what information and what sources the organizations' workers actually find useful. Formal information systems in organizations are often poorly designed, making them challenging and inconvenient to use. Frequently, organizations underestimate the time that is required to implement an information system, and most important, the time that is required to teach workers how to use the system effectively. As a result, many organizational information systems are not integrated into existing workflow, so they remain peripheral to the workers' decision making. Optimizing information use in organizations requires attention to organizational culture and politics, as well. If workers tend to seek information from superiors in order to ingratiate themselves, eliminating that need by introducing a formal information system may disrupt established patterns of social interaction. Additionally, formal information systems may clash with established organizational practices such as information hoarding or filtering—two techniques that are used to establish and maintain organizational power.

Many personal barriers to information use have also been identified. Among these are not knowing what information is needed or available (i.e., people do not know what they do not know). People may not know what question to ask (e.g., a person may lack the necessary mental model or context of a problem to know how to articulate a request for help). People often do not know where to look (i.e., a person may have a question or problem but not know where to turn for help). People often do not know that sources exist (e.g., many people are pleasantly surprised by the availability of useful information in public libraries). The information needed may not exist (e.g., somebody may need a particular aggregate of data in order to make a decision, but that data has never been collected). A person may lack communication skills (e.g., a person may not have the language skills required to ask for help, or a person may display unusual social behavior that gets in the way of communication). A person may lack confidence or ability (e.g., government information available only through online kiosks will be inaccessible to people who lack the confidence or the technical skills to use computers). People may be discouraged by sources that they approach (e.g., they may encounter frustrating delays in getting the help they need, and simply give up, or they may receive inaccurate or inappropriate information). Finally, a common barrier is information scatter, which is confronted particularly in the case of complex information needs (when needed information is available only by using several different sources).

A lack of trust in an information source may prevent somebody from making use of that source. For example, Yin Zhang (1999) conducted a study of a technically savvy set of people (i.e., academics in the field of library and information science) and showed that only a minority is satisfied with electronic sources for research purposes. This is true largely because there are few useful Internet websites for research purposes, websites are unstable (i.e., they tend to come and go), and websites are not sufficiently reliable. These scholars who took part in this study believe that there is little quality
control for web resources, and they feel the need to judge the authority and validity of these resources. They believe that the level of scholarship demonstrated in web resources is generally low and that the web is not well organized for retrieval (i.e., there is a need for better indexing and structuring, and there is a need for more standards). Furthermore, they point to a lack of social norms for using and citing electronic sources. Thus, for this group, these factors act as barriers to using the Internet for research purposes.

The Role of Information Literacy

More generally, people's use of information depends on their level of information literacy. Being information literate (i.e., having the ability to make efficient and effective use of information sources) implies a wide range of skills, and lacking any one of these could impede information use. To be information literate in the industrialized world in the twenty-first century, a person should have specific online searching skills (e.g., the ability to select appropriate search terminology, to construct a logical search strategy, and to evaluate information appropriately). In addition, people need to understand their needs in informational terms, know what information might help them, identify potentially appropriate sources, and understand how to evaluate the information that they find (i.e., on the basis of its authority and credibility, intended audience, quality or accuracy, objectivity, and scope). In order to be effective information users, people need to know how to organize and synthesize information logically (i.e., to construct meaning from it) and how to apply information to add value and create a quality product. In addition, people need to know how to share information appropriately and to use information and information technology responsibly and ethically.

All of these abilities require reasoning, the ability to use libraries and computers, critical thinking, creative thinking, communication, and social skills. Effective information use is also associated with self-efficacy (i.e., a belief that one can achieve a goal), an ethical stance, integrity, and trust. Thus, the three skill domains that are involved are the cognitive domain (e.g. skills in analysis, comprehension, synthesis, evaluation, explanation, and transformation), the affective domain (e.g., commitment, perseverance, confidence, curiosity, motivation), and the physical domain (e.g., operating tools such as computer hardware and software, and book indexes). When people are information literate, many of the barriers to effective information use may be overcome.

Making Information Useful

Barriers to information use also may be minimized by increasing the potential usefulness of the information itself. In addition to being relevant, information must ideally be accurate, precise, complete, reliable, communicated appropriately, timely, detailed, understandable, and consistent. However, even when information meets all of these criteria, there is still no guarantee that it will be used. Making use of information is an individual decision, and the use made of it may bear little resemblance to the information provider's intentions. It is apparent, for example, that regardless of efforts that are made to make information useful, people are more likely to use information that fits with their current understanding or point of view and to ignore information that challenges their closely held beliefs or values.

Information system designers have developed principles that are known to enhance the usefulness of information and to increase the probability of its being used. These principles include presenting information in a form and at a level that is familiar and comfortable to people. For example, consider attempts to dispense information about government programs and services to the inhabitants of a rural community in a developing country. Providing an Internet kiosk as a means of providing the information is less likely to lead to the use of that information by the local inhabitants than if local opinion leaders are used to relay the information in face-to-face encounters. If individuals or groups receive appropriate information via an appropriate channel, the chances of that information being useful are greatly increased.

Another way to enhance the usefulness of information (by increasing understanding) is to present the information frequently and in a variety of formats. For example, politicians use repeated advertising spots in a variety of media to increase the chances of people noticing them. Graphics are used in textual materials to enhance understanding, to provide additional information, and to increase interest. Appealing to different learning styles by using a variety of presentation methods will increase the probability of the information being used by the intended audience.

Summary

Information use has yet to be thoroughly researched. Nevertheless, it is generally accepted that information use is personal and therefore subjective and that it is naíve to assume that if people have access to information they will use it. People's use of various types of information sources varies according to individual factors such as their cognitive style and information literacy skills. Information use can be instrumental as in organizational decision-making, or affective, as when information is used to motivate. The importance of context and the specific task or question for which information is used are as important as individual factors in predicting information use. People's occupational or peer groups, their workplace settings and the tasks associated with those settings, and cultural norms and expectations all influence information use. People face a range of barriers to accessing and using information, including individual and structural barriers. However, attention to information provision and design of information systems can do much to ameliorate these obstacles.

See also: ECONOMICS OF INFORMATION;

HUMAN-COMPUTER INTERACTION; INTERNET AND THE WORLD WIDE WEB; KNOWLEDGE MANAGE-MENT; REFERENCE SERVICES AND INFORMATION ACCESS; RETRIEVAL OF INFORMATION.

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HEIDI JULIEN

V-CHIP

In an attempt to give parents more control over television content, the Telecommunications Act of 1996 mandated a change in the way new televisions sold in the United States would be manufactured. The act provided that within a specified time period (the deadline eventually becoming January 2000) all televisions with a diagonal screen size of thirteen inches or larger would contain technology permitting the blocking of programs on the basis of their ratings. This legislation was passed during a time when criticism of television content was increasing and there were several well-publicized incidents of youth violence that were variously attributed to the influence of television. Members of Congress, with leadership from Representative Edward Markey (D-MA), were seeking to provide parents with a way to deal with increasingly violent and sexual content without infringing on the First Amendment rights of the television industry.

Although devices permitting the blocking of television programs had been developed in the United States as early as the mid-1980s, the notion of television program blocking first entered the mainstream of public consciousness as the result of developments in Canada. In the early 1990s, Tim Collings, a professor of electrical engineering at Simon Fraser University, developed a television blocking device that he called the V-chip. Although the "V" in V-chip originally referred to "viewer" choice, the "V" has come to be associated in the United States with media violence in the minds of the general public.

The V-chip legislation did not mandate a specific rating system. However, it specified that if the television industry did not voluntarily produce its own rating system acceptable to the Federal Communications Commission (FCC), the FCC would appoint an advisory committee to recommend a Vchip rating system. The television industry developed the age-based "TV Parental Guidelines," which it released in December 1996. It then modified the system, as the result of public and political pressure, to add content indicators in July 1997. The rating system is designed to be applied to all forms of programming, with the exception of news and sports programs. The rating of a program is selected by that program's producers or distributors.

The V-chip works by reading a code that is embedded in the transmission of a program and is carried on line 21 of the vertical blanking interval (VBI), the same circuits that are also used to carry information for the closed captioning of programs. In addition to ruling on the acceptability of the rating system, the FCC had to approve a technical standard for the V-chip. Two issues regarding the design of the V-chip proved controversial.

The first issue was related to whether the Vchip would be mandated to read only the rating systems developed by the entertainment industry—the TV Parental Guidelines and the Motion Picture Association of America (MPAA) movie ratings—or whether it should be required to include other rating systems that might be developed by child advocacy groups, religious groups, or other organizations. Child advocacy groups favored the inclusion of more rating systems so that ratings might be based on criteria developed by child development experts, for example, and applied by people other than those who had a financial interest in the programs being rated. Some free-speech advocates also promoted the capability of reading multiple systems, arguing that providing a government-sanctioned rating system is more coercive than permitting viewers a choice among rating systems. The entertainment industry argued for limiting the V-chip to the two systems developed by the industry, saying that to do otherwise would render the device overly complicated and unworkable. The FCC ultimately ruled that only the TV Parental Guidelines and the MPAA ratings would be mandatory. It did require, however, that the technology permit parents to block programs by both the age-based and content-based categories of the revised TV Parental Guidelines.

The second issue was related to whether or not the V-chip would permit parents to block unrated programs as well as blocking programs on the basis of their ratings. Because news and sports are not rated, and because it was anticipated that some producers or channels might choose not to rate their programs, child advocacy groups argued that blocking of unrated programs should also be a feature of the V-chip. Advocates for the television industry argued that the ability to block unrated programs would make television ratings mandatory rather than optional and that it could, in effect, result in the blocking of entire channels that were devoted solely to news or sports. The FCC did not require the V-chip to have the ability to block unrated programs. In response to consumer sentiment, however, some manufacturers decided to include this feature in spite of the fact that it is not required.

New television sets are shipped with the V-chip in the "off" mode. Parents may decide to use the Vchip by selecting which ratings they want blocked. Programs with these ratings will subsequently not be seen or heard on the television, unless someone chooses to override the blocking. The override is typically accomplished by entering a secret code number. In many sets, the channels that were blocked prior to the override return to the blocked mode after the television set is turned off. Many television sets provide other blocking features, independent of the V-chip, including the blocking of specific channels or the blocking of programs that occur at specific dates and times. Some systems also allow programs to be blocked by title.

Although hailed as a breakthrough by politi-

cians and parenting organizations, the V-chip was not readily adopted by parents when it first became available. The slow adoption has been attributed to several factors. One is the lack of publicity for the V-chip and the understandable reluctance of the television industry to promote a product designed to limit its reach. Another factor is the complicated nature of the revised TV Parental Guidelines. Perhaps another impediment has been public perception that the V-chip is a crutch for lazy parents rather than a tool to help concerned parents more conveniently implement their decisions about what their children should watch.

In May 1999, the FCC set up a task force to ensure the effective implementation of the V-chip. This group has issued reports on the progress of the television industry with regard to the encoding of V-chip rating signals in programming and has encouraged publicity and promotion for the device.

See also: Antiviolence Interventions; Federal Communications Commission; Ratings for Television Programs; Telecommunications Act of 1996; Violence in the Media, Attraction to; Violence In the Media, History of Research On.

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JOANNE CANTOR

VIDEO AND COMPUTER GAMES AND THE INTERNET

Since the 1970s, video and computer games have developed into one of the favorite leisure activities among children and adolescents. However, the rapid rise in the popularity of video and computer games went together with a corresponding increase in the debate about their effects. Advocates usually view the games as a benign activity, with great potential to promote children's problem-solving capacities, their eye-hand coordination, and spatial abilities. Opponents are concerned that the games displace other, more valuable activities, such as homework and reading. They argue that the games hinder children's social interactions because they involve a solitary activity. Other critics believe that the games hinder children's creativity because the child player must follow preset rules to succeed. And finally, it is claimed that the games glorify violence and cause callousness and aggression in children.

In academic research, usually no distinction is made between a "video game" and a "computer game." A video game is played on hand-held machines, such as a Game Boy, or on dedicated systems that are plugged into the television, such as Nintendo or Sega. A computer game is played on a personal computer. Since the mid-1980s, however, most games are released for more than one system. Because the content, the quality of graphics, and the degree of realism in video and computer games are comparable, it has become irrelevant to consider them as separate media. In this entry, therefore, the term "computer games" is used to refer to both video and computer games.

Different Types of Computer Games

There are many different types of computer games, each of which may have their own distinctive qualities and effects. Some games have the potential to foster children's creativity and problem-solving skills, whereas other games can be harmful for young children. In order to understand the effects of computer games, it is necessary to have some insight to the different kinds of games that are available. The six most common game types are adventure, role-playing, platform, action, simulation, and puzzle.

Adventure games usually involve an elaborate quest for something valuable, such as a princess or

the Holy Grail. The player must solve various riddles and puzzles and overcome many traps in order to reach the final goal. Exploration plays a major role in this category, whereas reaction time is usually less important. Adventures for teenagers and adults may contain a great deal of violence. Some educational adventures aimed at very young children are especially designed to foster creativity.

In role-playing games, the player is required to take on the role of one of the central characters, for example, a wizard or a knight. If the player plays alone, the computer performs the other roles. If the game is played with other children, everyone has his or her own role. Role-playing games usually occur in a fantasy world. Like adventure games, success in role-playing games usually is affected by exploration and problemsolving skills rather than reaction time. *Dungeons and Dragons* is one example of the games that fall into this category.

Platform games are usually based on the principle of avoiding, chasing, or eliminating characters and objects while jumping onto platforms. Reaction time and eye-hand coordination are important requirements in these games, which usually contain a lot of action. Well-known examples of games in this category are *Mario* from Nintendo and *Sonic, The Hedgehog* from Sega.

The main aim of action games is to destroy as many characters and objects as possible. In a socalled beat-'em-up, the player uses his or her fighting skills to kill the enemies who appear on the screen. A well-known example in this category is the one-to-one fighting game Mortal Kombat. In a so-called shoot-'em-up, the player must shoot the characters or objects on the screen (Doom and Wolffenstein are examples of games that fall into this category). A modern beat-'em-up or shoot-'em-up is a journey through a virtual labyrinth with the aim of hitting a maximum number of targets, such as armored cars, dogs, or aliens. The latest generation games are three-dimensional. A player views the game from the viewpoint of the central character, which encourages involvement.

The aim of simulation games is to imitate reallife situations as well as possible while taking into account the problems and pitfalls that can occur in such situations. There are many types of simulations available, some of which involve complex planning and decision making. In flight simulators, the player flies an aircraft or attacks an enemy plane. In sports simulations, such as a soccer game, the player takes on the role of one of the soccer players, while the computer deals with the remaining characters. In a strategic war simulation (e.g., *Red Alert*), the player is in the military. Finally, in conceptual simulations (e.g., *Sim City* 2000), the player must build and govern a successful organization, city, or park.

Puzzle games are often quite challenging. In addition to requiring good eye-hand coordination, these games require the player to think quickly and use logic and reasoning to plan future moves. A well-known example in this category is *Tetris*.

The Macho World in Video and Computer Games

Most video and computer games are obviously made for boys. Mark Griffiths (1997) has pointed out that the majority of computer games are designed by males for males. Virtually all superheroes in computer games (especially the early ones) are forceful he-men with exaggerated macho characteristics. To the extent that females are present in the games, they consist of sweet princesses or helpless victims who must be protected or rescued from dangerous gorillas or other evil creatures. Females are usually depicted as a caricature: scantily dressed, with big breasts, curvaceous hips, and long legs.

In the more recent generation of games, females are more frequently portrayed in an active role. Some role-playing games for young children feature a female as the central character, for example, *Barbie Super Model* and *Belle and the Beast*. In some action games, players can choose a female warrior to act as their character. In the popular game *Tomb Raider*, for example, the merciless Lara Croft, a female archeologist, is the main character.

Does this shift to female macho fighters mean that girls feel comfortable with action games? There is no reason to believe that this is the case. The review by Griffiths (1997) of the literature on the demographics of video game use reports that males play video games significantly more often than females. According to Steven Schwartz and Janet Schwartz (1997), most games feature women in two extreme roles: victim or killer. Neither of these roles seems to attract girls.

Research on the playing of computer games suggests that until the age of eight years, boys and girls are equally attracted to computer games. This is understandable because many educational adventure games for young children are still "gender neutral." According to Jeanne Funk and her colleagues (1997), both boys and girls, as they mature, lose interest in these educational games. Boys then become interested in violent action games, and a much smaller number of girls start to play popular platform games and cartoon-like fantasy games. In fact, the time boys who are older than twelve years of age spend playing computer games is two to three times that spent by girls of the same age. Market research confirms these academic statistics. According to survey results published by Nintendo in 1992, 88 percent of the Super Nintendo players were males.

The considerable difference between boys and girls in their use of computer games has led to concerns among some researchers and educators. Patricia Greenfield (1984) has argued that, for most children, computer games are the entry point into the world of computers and technology. If children's computer literacy begins with playing computer games, it is a serious problem if girls get less opportunity to become familiar with these games. Therefore, Greenfield pointed out, there is an urgent need for computer games especially designed for girls. What kind of computer games would be appealing to girls? Research suggests that girls are less interested than boys in killing enemies. Girls are also less object oriented. They are less interested in devices, such as lasers, buttons, and futuristic weapons, which are common in computer games. According to Jack Sanger and his colleagues (1997), girls like real-life situations, and they are particularly interested in the development of relationships between characters. Girls are most interested in realistic, attractive characters, such as actresses, movie stars, male and female sports and music celebrities, and models. Games that take into account these preferences could stimulate girls to spend more time playing computer games.

The Effects of Video Games

Although there is still no consensus about the potential effects of computer games, many observers agree that the games might have both positive consequences (e.g., spatial ability, eye-hand coordination; creativity) and negative consequences (e.g., addiction, aggression).

Spatial ability refers to a child's competence in remembering the form of objects and understand-

ing how these objects match with other objects or spatial positions. In virtually every intelligence test, a measure of spatial ability is included. Several studies have demonstrated that children who often play computer games perform better on tests of spatial ability. In a study by Lynn Okagaki and Peter Frensch (1994), a group of teenagers played the puzzle game Tetris for a total of six hours (in twelve separate sessions). None of the teenagers had had any prior experience with Tetris. After six hours of playing, the spatial ability of both boys and girls had improved. This benefit is not unique to puzzle games. Greenfield and her colleagues (1994) have demonstrated that other types of games also stimulate the spatial skills of the player.

Eye-hand coordination is the ability to execute rapidly with the hands what the eyes see. Eyehand coordination is important for typewriting, but it is also important for operating a machine or navigating a plane. Some types of computer games, such as platform games and action games, require high levels of eye-hand coordination. The timing of the action is often a matter of split seconds. It is no surprise, therefore, that several studies have demonstrated that playing computer games improves children's eye-hand coordination.

Some parents and educators believe that computer games impair children's creativity because the games are played according to preset rules. They argue that children, who predominantly play rule games, do not get sufficient practice in "divergent" and "as if" experiences and that, as a result, their development of creative skills is impaired. Although it is important that children get the opportunity to practice divergent-thinking skills, it is wrong to suppose that all video and computer games have preset rules. In some computer games, children are given the opportunity to give free reign to their fantasies and ideas. They can draw, compose music, and create stories, and although nobody would recommend that parents should replace all real-life drawings and stories with computer-generated ones, there is little reason to assume that these computer games hinder children's creativity through lack of practice in divergent-thinking tasks. Many educational adventures or fantasy role-playing games are designed to foster imagination, and this is exactly what many game producers tell parents in their product information. Although no academic

research has tested whether such computer games actually do what their producers claim, it is possible that educational computer games designed to foster imagination have a potential to encourage children's creative capacities.

A common argument against the playing of computer games is that it is addictive. Computer game addiction consists of a compulsive involvement in the game, a lack of interest in other activities, and physical or mental symptoms when attempting to stop playing (e.g., restlessness or aggression). There is some evidence that computer games displace other activities, such as television viewing and reading. However, for the majority of children, these effects are short-lived. A study by Gary Creasey and Barbara Myers (1986), in which computer game users were compared with nonusers, demonstrated that a newly introduced video game computer in the home mainly displaced television viewing and movie attendance. The study also found that early decreases in other activities, such as television viewing, started to disappear after several weeks when the games were no longer new. However, for a small group of children, interest in computer games does not wane after a few weeks. According to Griffiths (1997), there is no doubt that a small minority of children becomes addicted to computer games. For these children, playing computer games can take up considerable time that would otherwise be used for all kinds of valuable activities. Although many researchers have observed computer addiction, there is as yet no consensus about the prevalence of such addiction among children and adolescents.

Violence is a common theme in most computer games. According to Eugene Provenzo (1991), more than 85 percent of the leading Nintendo games has violence as a main theme. Since the mid-1980s, increasingly more computer games contain realistic and explicit violence aimed at humans. In a game such as Night Trap, for example, it is the goal to hang female characters on a meat hook. In Carmageddon, the player must run over and kill as many pedestrians as possible to earn points and credits. Because the new generation of computer games uses more explicit representations of extreme violence, the issue of whether playing violent games leads to aggressive behavior is ever more important. In the past, media effects researchers have progressively



Microsoft further strengthened the link between video games and the Internet when they unveiled on March 10, 2000, the video game console X-Box, which includes a 600-megahertz processor and a 3D graphics processor and is capable of playing digital video discs (DVDs) and connecting to the Internet. (Reuters NewMedia Inc./Corbis)

reached the consensus that exposure to television violence can result in aggressive behavior. Although there are some obvious differences between television viewing and the playing of computer games, the violence portrayed in both media contains similar characteristics. For example, both television programs and computer games often portray violence that is rewarded, justified, and realistic. It is no surprise, therefore, that a meta-analysis by John Sherry (1997) has demonstrated that playing violent computer games indeed encourages aggressiveness among players. According to Sherry's results, the effect of violent computer games on aggressiveness is dependent on the type of violence portrayed. Violence directed at humans leads to a greater effect than fantasy or sports violence.

The Internet

The Internet is the fastest-growing medium among both children and adolescents. According to online industry research, 54 percent of teenagers were expected to be online by the end of the year 2000, and this percentage is expected to grow rapidly in subsequent years. In North America, more than 13.7 million children and teenagers were expected to be online by 2001, with an increase to 36.9 million by 2005 (Nua, 2000).

The arrival of each new medium has brought public concern about its influence on children. The debate about whether the Internet is beneficial or dangerous for children is a controversial topic, and it is not guided by any academic research. Many teachers and educators agree that the Internet can offer children many educational opportunities. Children can learn about virtually any topic. In a survey study among nine- to twelve-year-olds that Patti Valkenburg and Karen Soeters (2000) conducted, information-seeking proved to be the second most important reason for using the Internet. One hundred and ninety-four children who were already online were asked why they used the Internet. Children reported that they often use the Internet to learn something, or to search for information related to their homework, hobbies, and idols.

Unlike television and computer games, which only involve the risk of exposure to inappropriate material, the Internet has two additional risks: harassment online and harassment offline. Harassment online refers to frightening or demeaning messages directed at the child. Harassment offline can occur when children give out their telephone numbers, addresses, or credit card numbers. In the above-mentioned survey, children were asked how frequently they had been confronted with unpleasant situations on the Internet. Approximately 14 percent of the children responded that they had experienced something unpleasant while using the Internet; 8 percent mentioned that they had been confronted with shocking websites, including horror and pornography; 3 percent mentioned that they had been threatened online by other children or adults; but none of the Internet users in this sample had experienced offline harassment.

Conclusion

It is evident that computer games and the Internet have positive and negative consequences for children. Whether or not children will benefit from computer games and the Internet depends to a large extent on how they use these media and what type of content is involved. When used improperly, computer games and the Internet can be problematic. When used in the right way, both computer games and the Internet can have a great potential for entertainment and education. See also: Children's Creativity and Television Use; Computer Literacy; Computer Software, Educational; Dependence on Media; Gender and the Media; Internet and the World Wide Web; Ratings for Video Games, Software, and the Internet; Violence In the Media, Attraction to; Violence In the Media, History of Research On.

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VIDEO GAMES, RATINGS FOR

See: Ratings for Video Games, Software, and the Internet

VIOLENCE IN THE MEDIA, ATTRACTION TO

Movies and television programs routinely feature violence, including everything from relatively minor scuffles to gory and gruesome encounters. The violent images in the mass media can be highly disturbing—they are often vivid and can be quite realistic. Moreover, violent depictions may produce unwanted consequences among viewers. Nevertheless, when it comes to entertainment, violence sells. Why would people knowingly expose themselves to images that are so horrific? Although this question has not received a great deal of attention, a number of theories have been offered to explain why individuals are attracted to violence in the mass media.

It should be noted that some of the theorizing that is relevant to this question comes from research that was designed to address similar, but different, issues. In fact, relatively little work has been conducted to determine what draws viewers to violent mass media. However, research does exist concerning attraction to horror films. Because horror films often include violence, research that uncovers why individuals are attracted to this content can help us understand why they are drawn to violent depictions. Nevertheless, the reader must keep in mind that some of the material reported in this entry is drawn from research that has not explored the attraction of violence *per se*. These deviations will be noted as they are discussed.

Theories that explain the attraction that individuals have to violent media can be grouped into two major categories: (1) those that reference the social motivations for viewing violent media and (2) those that cite the psychological processes that are responsible for viewing. In general, social motivations include viewing to obtain some kind of reward from society, such as the rewards people receive from conforming to socially appropriate roles. Psychological processes refer to the cognitive or emotional activities that lead people to view violent mass media to satisfy the demands of individual psychological makeup, such as viewing violence to satisfy one's morbid curiosity.

Social Motivations for the Viewing of Mediated Violence

Individuals are rewarded when they behave in a manner that is consistent with what society expects of them. For example, males are traditionally rewarded when they act strong, confident, and fearless, while females are rewarded when they act helpless and dependent on men. Males and females, then, may be motivated to conform to their gender roles to achieve these rewards. Some theorists argue that horror viewing provides a context in which males and females can perform their gender roles and experience the social rewards that follow. For example, when viewing a frightening film, males can act as though they are not bothered by what they see and demonstrate that they have mastered their fear. Females, on the other hand, can seek protection and cling to their male viewing partners when frightened. Because horror films often contain violence, it is possible that males and females may seek similar social gratification from viewing violent media.

Males are usually more avid viewers of violent media than females, however. Perhaps, then, the explanation offered above can only explain the popularity of violent media among males. For females, the rewards that are experienced as a result of conforming to gender roles may not compensate for the negative emotions that they experience during the viewing. In fact, research indicates that males experience more enjoyment from viewing frightening films than females do. For example, a study by Glenn Sparks (1991) showed that the more males experienced distress while viewing a film, the better they felt after viewing. However, female positive affect after viewing the frightening film was not related to levels of distress that were experienced during the viewing. Researchers suggest that the arousal that is produced from experiencing negative emotions while viewing a horror film intensifies the positive emotions that males feel when they are able to demonstrate mastery of their fears after the viewing. As a result, violent mass media may be attractive to males because it provides them with an opportunity to experience the rewards that are associated with displaying masculine qualities.

A different explanation for the attraction of males to violent mass media that also relates to social motivations is that males are taught that violence is somewhat acceptable for them and that they need to learn more about it to function properly in society. Females, on the other hand, are socialized to believe that acting violently or aggressively is not feminine. If males are taught that violence is relevant to them, then they may, as children, begin using violent media to understand better what it means to be male and how to enact male roles. Similarly, female lack of interest in violent media may stem from the fact that society will not reward females for being aggressive.

Some research suggests that gender differences in the attraction to violent media is most prominent with certain types of depictions. Specifically, in a survey by Joanne Cantor and Amy Nathanson (1997), boys were more interested than girls in television programs that featured the use of violence for a purpose, such as the restoration of justice. However, gender differences were not evident in the case of humorous, slapstick depictions of violence, such as those found in classic cartoons. These findings suggest that violence per se may not be universally attractive to males. However, violence that is used to restore justice may serve some function for boys and even adult males. Perhaps males are socialized to believe that the use of violence is acceptable to achieve justice; hence, viewing media content that features this kind of theme may help males learn how to use violence in a socially acceptable manner.

Other researchers suggest that adolescents who are poor students in school seek out violent mass media to achieve the social recognition and acceptance that they cannot gain from school. Keith Roe (1995) has argued that these adolescents create subcultures that share an interest in deviant media. Adolescent members of these subcultures gain the group membership, support, and valued identity that they are denied in other contexts. Research shows that, within samples of adolescents, there does seem to be a relationship between having a low academic standing and having an interest in violent media. It is possible, then, that the viewing of violent media may serve a social function for adolescents who have been rejected by or are unsuccessful in mainstream institutions.

Psychological Processes that Underlie the Viewing of Mediated Violence

In addition to the social motivations for the viewing of violence, individuals may seek out violence in the mass media to satisfy certain psychological needs. For example, aggressive individuals may be attracted to violent content in order to justify or to understand better their own behaviors. There is much correlational data suggesting that this explanation is correct. That is, the bulk of survey research indicates that individuals who have aggressive attitudes or behaviors are especially likely to view violence in the mass media and to choose violent content over nonviolent content. However, these kinds of data cannot rule out the alternative explanation that viewing violent media increases aggression in viewers.

Fortunately, other kinds of research have been used to gain more clarity on this issue. For example, an experiment by Allan Fenigstein (1979) demonstrated that inducing aggressive thoughts or behaviors in college-age male participants produced an increased interest in viewing violent films. In addition, a longitudinal survey by Charles Atkin and his colleagues (1979) measured children's aggression and exposure to violent television programs at two different times (with a time-span of one year between the surveys). This allowed the researchers to determine whether there was a relationship between being aggressive during the first wave of data collection and viewing violent television at the second wave of data collection, while holding prior violence viewing levels constant. In fact, Atkin and his colleagues found that children who were more aggressive during the first part of the study were more likely to watch violent programs during the second part of the study, regardless of how much violent television they had watched during the wave-one data collection. Taken together, this research suggests that adults and children who have aggressive dispositions are especially likely to seek out violence in the mass media.

Another psychological process that may underlie exposure to violent media is the subconscious desire to master one's own fears. This notion stems from a process of "repetition-compulsion" (introduced by Sigmund Freud), whereby anxious individuals are believed to select frightening stimuli repeatedly with the hopes of mastering their fears. In the context of the attraction to violent media, viewers who are particularly concerned about becoming a victim of crime or who are fearful of violence in general may expose themselves to violent material to try to lessen the intensity of their negative emotions via desensitization.

Research seems to support the notion that more anxious and fearful individuals are attracted to violent media. However, these individuals may not be equally attracted to all kinds of violent depictions. In particular, violent programs that feature happy endings in which justice is restored may be especially appealing to fearful individuals because they suggest that violent situations do not have to end in tragedy. In fact, a study by Jennings Bryant and his colleagues (1981) revealed that college students who were classified as anxious became less anxious after viewing a heavy diet of "justice-restoring" action-adventure programs. The therapeutic value of these kinds of violent programs may ultimately lead anxious individuals to purposefully select them to soothe their fears by witnessing reassuring outcomes. Some researchers have even suggested that violent media that provide happy endings may teach anxious viewers strategies for coping with violent situations. Feeling that they have gained the knowledge and skills for dealing with violence, these anxious viewers may experience some relief after viewing violent media.

Another psychological process that may underlie attraction to violent media is what many refer to as "morbid curiosity," wherein the attention of individuals seems to be innately drawn to violence. Perhaps this has evolutionary significance in that those human ancestors who paid attention to violence were more likely to survive. It is possible, then, that humans are naturally curious when it comes to violence and death. In fact, some research on horror suggests that a sheer "gore watching" motivation may be a primary reason for why individuals select horror films. For example, a survey by Deirdre Johnston (1995) found that high school students who were heavy viewers of horror films and had a preference for graphic violence reported that they were more interested than others in the way people die. Unfortunately, there are few other studies that directly speak to the possibility that the attraction to violent media is a manifestation of individuals' morbid curiosity.

Other research suggests that a host of personality traits underlie the attraction to violence in the mass media. For example, research by Ron Tamborini and James Stiff (1987) has shown that individuals who desire high levels of stimulation (often called "sensation seekers") are more likely to view graphic horror (which presumably contains violence). The fright that these films produce may be experienced as pleasure by those who crave heightened levels of arousal and new sensations. Another personality trait that is relevant to viewing media violence is empathy. In another study, Tamborini, Stiff, and Carl Heidel (1990) found that nonempathic individuals are more likely to view media violence than are individuals who readily empathize with others. It could be that their tendency to avoid placing themselves in the position of others allows these viewers to enjoy the graphic violence. However, it has also been suggested that viewers who empathize or identify with the aggressors in media violence are attracted to this content. Johnston's 1995 survey revealed that adolescents who identified with the perpetrators of violence in horror films were more likely to have the gorewatching motivation that is associated with heavy viewing of these films. By seeing the violent situations from the perspective of the aggressor, these viewers avoid sharing the victim's negative emotions and may, in fact, vicariously participate in the aggressor's "triumph."

Conclusion

There are a variety of reasons why individuals may purposefully seek out violent content in the mass media. They might be attracted to this material to establish or fulfill specific social roles or to set in motion certain psychological processes that bring them comfort or pleasure. It is also possible that individuals are motivated by a variety of factors simultaneously. Given these possibilities, it is not surprising that violent content is attractive to so many different people and is such a staple of media entertainment.

See also: Catharsis Theory and Media Effects; Desensitization and Media Effects; Fear and the Media; Gender and the Media; Parental Mediation of Media Effects; Violence in the Media, History of Research on.

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VIOLENCE IN THE MEDIA, HISTORY OF RESEARCH ON

Public controversy about violent content in the media has a long history that extends as far back as the first decade of the twentieth century in the United States. The earliest controversies revolved around depictions of criminality in the movies, and the very first case of movie censorship occurred in 1908, when the police in Chicago refused to provide a permit for the public display of the movie *The James Boys in Missouri*. Authorities objected to the content of the film because it focused on violent lawbreaking (Hoberman, 1998). The scientific study of the effects of media violence may not extend as far back as 1908, but it was only a few years later that media violence became a focus of the first major investigation of the content and effects of movies.

The Payne Fund Studies

As the popularity of movies grew in the 1920s, so too did public pressure on the movie industry to do something about the widespread concerns that were being voiced about the effect that movie depictions of sex and violence had on children. In response to this pressure, William Short, the executive director of the Motion Picture Research Council (a private educational group), invited a number of the most prominent scholars across various disciplines to design and carry out a series of studies into how movies affect children. The U.S. government was not funding such research at the time, so the researchers turned to private funding sources. The Payne Fund, a privately funded philanthropic foundation, agreed to provide the needed funding, and the studies were conducted between 1929 and 1932.

The studies produced under the Payne Fund were designed to answer a variety of questions, only some of which pertained to the study of media violence. One of the studies that did pertain to media violence was a large-scale content analysis conducted by Edgar Dale (1935). The results revealed that most-more than 75 percent-of the fifteen hundred films that were studied could be categorized as dealing with crime, sex, or love. The emphasis on crime was no surprise to critics of the movie industry, and these results served to fuel the public debate over the effect that movies have on audience members. Another study conducted under the Payne Fund was even more inflammatory in terms of the public debate. Herbert Blumer (1933) asked nearly two thousand people from different demographic groups to answer questions about their own personal experiences as a result of watching movies. Blumer did not reduce this data

to any type of quantitative presentation; he simply presented what people wrote in response to the questions. In many cases, people reported having imitated movie characters and having integrated movie scenarios into their play behavior as children. By contemporary standards, the exclusive reliance on retrospective self-reports is a rather weak methodological technique. Nevertheless, Blumer's study had a significant effect on the controversy and helped keep the spotlight on the movie industry. That spotlight was also intensified with occasional news reports. For example, it was reported in 1931 that after viewing a violent movie, The Secret Six, a twelve-year-old boy in New Jersey shot another child in the head (Hoberman, 1998). According to the Motion Picture Association of America Production Code, put in place in the early 1930s, movies were not supposed to "lower the moral standards of viewers" or to encourage them to identify with criminals. However, the code was not enforced. When FBI Chief J. Edgar Hoover actually endorsed in the mid-1930s several movies that depicted gangsters and FBI agents, the controversy about movie violence tended to subside, but it reemerged again during the explosive growth of television. By the time the television age had arrived, research methods had matured and the U.S. government was more interested in providing funding for scientific studies. The controversy over media violence was about to enter a new era.

The Rise of Television

Television was introduced to the public in the late 1940s, but by 1950, only one in ten homes had a television set. As the proliferation of sets increased in the 1950s, another medium-comic books-was attracting attention for its violent content. In this case, a reputable psychiatrist, Frederic Wertham, wrote a book titled Seduction of the Innocent (1954), in which he reported the results of his study on the content and effects of comic books. His procedures for studying content lacked the rigor that is associated with modern scientific content analyses, and his conclusions about effects were not based on careful experimentation. Instead, the conclusions arose from Wertham's case studies of boys who had been referred to his psychiatric practice. Wertham's conclusions about the evils of violence in comic books were not necessarily shared widely among



Violence in the movies has long been a controversial issue, and this image represents the top ten "Thou Shall Nots" (including defeating the law and showing a dead man) issued by the Hays Office, the organization that was established in the 1930s to protect and uphold public morals through the creation of a production code. (Bettmann/Corbis)

scientists. Nevertheless, they elevated the media violence problem to national attention and caused changes in the comic book industry in terms of self-censorship. Rather than risk government intervention, the industry established its own review board to review comic book content prior to publication. The "seal of approval" from the review board was given only to those comic books that were deemed acceptable for children to read. Consequently, violent content decreased and parents came to rely heavily on the appearance of the seal of approval on a comic book's front cover to indicate that it was appropriate for children.

While the public was reading about Wertham's warnings of violence in comic books, they were also beginning to read regularly about "copycat" crimes that were reported in newspapers around the country. These reports seemed to suggest a disturbing capacity of television to stimulate imitative antisocial behavior. Wilbur Schramm, Jack Lyle, and Edwin Parker published a book, *Television in the Lives of Our Children* (1961), that argued that the apparent connections between tel-



Eric Hoffer, the "longshoreman philosopher," was a member of the National Commission on the Causes and Prevention of Violence. He was also the lead-off witness for the 1969 Senate Permanent Investigation Subcommittee hearings on campus disorders. (Bettmann/Corbis)

evision exposure and violence were not coincidental. Among other things, they documented the numerous examples of copycat violence that were reported in the news during the 1950s. Researchers were not the only ones to take note of these incidents.

In 1954, Senator Estes Kefauver, in his role as chairman of the U.S. Senate Subcommittee on Juvenile Delinquency, publicly questioned the need for violence on television. The National Association of Broadcasters (NAB) responded with a promise for research into the effects of violent content. It is not surprising that, since the NAB was not a research organization, it failed to deliver on this promise. Seven years later, not much had changed. The new chairman of the Senate subcommittee was Senator Thomas Dodd. Once again, the subcommittee raised the issue of television violence, but the broadcasting community showed little interest in contributing to any sustained research effort into the effects of media violence or in reducing violent content. In 1964, the Senate subcommittee strengthened its rhetoric and criticized the broadcasting community for the violence that was being disseminated. As the rhetoric grew hotter, the broadcast community grew even cooler to the idea of becoming involved in research. In 1969, the National Commission on the Causes and Prevention of Violence submitted a report that brought television violence under careful scrutiny. Data gathered by George Gerbner was prominently featured in this report. Unfortunately, while the commission report detailed the high prevalence of violent content and the negative attitudes of the public toward such content, little insight was offered about the actual effects that viewing violence had on subsequent attitudes and behavior.

The Report of the Surgeon General

Senator John Pastore was not satisfied with the conclusions that appeared in the report released by the National Commission on the Causes and Prevention of Violence. He bemoaned the fact that, although there was a surge in violence in the culture, there was still little data pertaining to the possible causal role that media violence was playing in fostering aggressive behavior. At Pastore's initiative, in his role as chairman of the U.S. Senate Commerce Committee's Subcommittee on Communications, the issue of media violence remained a top concern among lawmakers. In 1969, only a week after Pastore expressed his concerns in a letter to Robert Finch, the U.S. Secretary of Health, Education, and Welfare, the Surgeon General of the United States, William Stewart, was ordered by President Richard Nixon to initiate a new study into the effects of media violence. The project was facilitated by \$1 million from the National Institute of Mental Health.

One incident that functioned to blemish the Surgeon General's eventual report on media violence (1972) concerned the naming of the advisory committee that would oversee the report. In a move that many observers found to be outrageous, the Surgeon General sent a list of forty names to the three major television networks (ABC, CBS, and NBC) and to the NAB, asking them all to indicate who would not be appropriate to serve on this committee that was supposed to conduct an impartial scientific investigation. According to Robert Liebert, Joyce Sprafkin, and Emily Davidson (1982), the rationale for this procedure was apparently based on the same practice that had been employed in the earlier Surgeon General's Advisory Committee on Smoking and Health. In that case, the tobacco companies were asked to eliminate the names of individuals who they thought might not be appropriate; in this

way, the committee had hoped to prevent the possibility that the companies would later claim that the deck had been stacked against them from the beginning. In the case of the Advisory Committee on Television and Social Behavior, the opportunity to exclude researchers backfired and mired the final report in controversy. Although CBS did not suggest any names for elimination, the other networks did identify the names of seven researchers deemed inappropriate. Several of these names, including Albert Bandura and Leonard Berkowitz, were some of the leading scholars in the area of media effects and aggressive behavior.

The studies conducted under the auspices of the Surgeon General's effort were not coordinated or planned to cover the topic of television violence in any systematic way. Researchers who received grant money to study the problem were encouraged to take on their own research initiatives. Nevertheless, the final report, which included the results of twenty-three different projects, permitted the examination of a number of dimensions of the media violence question.

Content Analyses of Television

Gerbner (1972) contributed data from systematic content analyses of television to the Surgeon General's report. Using the definition that violence was "the overt expression of physical force against others or self, or the compelling of action against one's will on pain of being hurt or killed," Gerbner was able to compare the quantity of violence on network television in 1969. Quantities were provided by two earlier analyses that Gerbner had contributed to the report for the National Commission on the Causes and Prevention of Violence. The results of Gerbner's study indicated that violence on prime-time television occurred at the rate of about eight instances per hourunchanged from the figures of his earlier analysis. (This rate has proven to be relatively steady over time since the study was done.) One area of concern indicated by Gerbner's data was an increase in cartoon violence during the Saturday morning time period directed at children. In fact, the data indicated that this time slot was the most violent of any on television.

Experimental Studies

One of the most important experimental studies in the Surgeon General's report was conducted by Robert Liebert and Robert Baron (1971). The

purpose of the study was to investigate the potential for violent television to instigate aggressive behavior in children. Using children who ranged from five to nine years of age, the researchers randomly assigned the subjects to watch either a brief clip from a violent television show (The Untouchables) or an alternative clip of nonviolent sports programming. Following exposure to the television clip, the children were placed in a situation in which they could choose to help or hurt another child's progress at winning a game in an adjacent room. If they pressed a "help" button, they were told that it would make it easier for the child to turn a handle that would lead to success in the game. In contrast, if they pressed a "hurt" button, they were told that the handle would become hot for the other child in the adjacent room and would hinder progress toward winning. The results of the experiment revealed that children who had watched the segment from the violent show were significantly more likely to press the "hurt" button and to hold it down longer than were the children who had watched nonviolent sports program.

Aletha Huston Stein and Lynette Friedrich (1972) conducted another important experiment on young children who were from three to five years of age. In one of the relatively few longitudinal studies in the literature, these researchers observed children's free-play and classroom behavior during a two-week baseline period. They then randomly assigned children to watch either violent (Batman and Superman cartoons), prosocial (Mister Rogers' Neighborhood), or neutral programs for a period of four weeks. After the four-week treatment period, the behavior of all of the children was observed for two weeks. The major finding of the study was that children who had watched the violent cartoons were significantly more aggressive in their interactions than children in either of the other viewing groups. In a theme that resulted in much confusion in interpreting the overall findings of the Surgeon General's report, the authors reported that their result held only for children who had been rated above the median in aggressive behavior during the baseline observation period.

Reactions to the Report

The controversy that swirled around the release of the Surgeon General's report was started by the publication of a headline in *The New York*

Times on January 11, 1972, that declared that television violence was not harmful to youths. In the article that followed, the public was told that the Surgeon General's report had found evidence that the majority of young people were not adversely affected by television violence. Many of the researchers who were directly involved in the report's research took issue with the way in which the final conclusions were being communicated to the public. In view of the findings of many of the studies that showed that violence tended to increase aggressive behavior, even if the effects were sometimes limited to certain groups, the research community was upset because they thought the public was not learning what they needed to know in order to appreciate properly the risks associated with television violence. In the end, the Surgeon General's report functioned to draw close public attention to the television violence issue. It also motivated researchers to follow up on the report's findings and continue to study issues pertaining to the effects of media violence. In the decade following the publication of the report, significant progress was made in understanding the effects of media violence. As the science of media-effects research matured. there was a greater emphasis on understanding the particular theoretical mechanisms that might underlie the effects of violence.

Theories of Media Violence

The theories that have been applied to the study of violence in the media include catharsis, social learning, priming effects, arousal, desensitization, cultivation, and fear.

Catharsis

Even before the Surgeon General's report, Seymour Feshbach (1955) proposed a theory of media violence that, if supported, would have pleased Hollywood producers and set the public mind at rest concerning violent television. The idea of catharsis goes back to Aristotle, and Feshbach proposed that it might apply to the modern situation of watching violence on television. Just as Aristotle thought people could purge their feelings of grief by watching others grieve in a dramatic context, Feshbach thought that people could purge their feelings of anger and pent-up aggression by watching violence in a dramatic context. An early study by Alberta Siegel (1956), which used a *Woody Woodpecker* cartoon (as the example of a violent television show) to test the theory on nursery school children, failed to find any evidence for the catharsis hypothesis. The children who viewed violence tended to behave more aggressively, not less. Nevertheless, Feshbach and Robert Singer (1971) persisted with the catharsis idea and attempted to test it in a major field study that involved several institutional homes for boys. These authors accumulated some evidence that seemed to indicate that boys who were exposed to violent television programs behaved less aggressively than similar boys who watched nonviolent programs. Unfortunately for the catharsis hypothesis, this result was easily explained by noting that the boys who watched violent programs were also watching shows that they enjoyed; boys who watched nonviolent programs did not find these shows to be nearly so enjoyable and may have actually been provoked by the fact that their peers were permitted to see their favorite shows due to nothing more than the luck of the draw. Moreover, the internal validity of this experiment was also corrupted by the fact that some boys in the nonviolent program group protested so intensely about the elimination of one violent program (Batman) from their media diet that the investigators relented and permitted them to watch it. In the wake of these methodological problems, the catharsis theory was left floundering. Added to these problems was the accumulating evidence that exposure to violence was more likely to instigate violence than to diminish it.

Social Learning

Another early theory that was applied to the media violence controversy was Albert Bandura's theory of social learning (later referred to as social cognitive theory). Bandura (1963, 1965) emphasized that children learn behaviors from models in their environment who manage to capture a child's attention. Behaviors that the child attends to are "acquired" in the sense that children are able to reproduce these behaviors if they are motivated to do so. Not all acquired behaviors are eventually performed, however. Bandura drew upon the prevailing theory of the time and emphasized that the chief determining characteristic for the performance of a behavior was the extent to which the behavior was either rewarded or punished. In extending this notion to media violence, the theory predicted that aggressive behavior that was rewarded was much more likely to be copied or imitated than aggressive behavior that was punished. Bandura and his colleagues tested this formulation in several experiments. Children were typically exposed to a short film clip depicting aggressive behavior in a play context that was either rewarded or punished. Following exposure to the film clips, children were observed in freeplay situations. Findings from these studies supported the theory in that children who saw aggressive behavior rewarded were more likely to behave aggressively than children who saw aggressive behavior punished.

Bandura faced a number of methodological criticisms from his studies that revolved around the measurement of key concepts. First, some scholars argued that the film clips used in these studies featured highly contrived scenarios that failed to resemble the sort of violent content that children might view on commercial television. Second, Bandura's definition of aggressive behavior included the number of times a child punched a large inflatable "bobo doll." The bobo doll, it was argued, existed for the sole purpose of being hit. Moreover, because the doll was inanimate, Bandura's notion of aggression was only "play" aggression. One could not assume that children who hit the bobo doll were actually under the impression that they were inflicting real pain on anyone. These limitations were addressed and overcome in subsequent research that, like the early studies, tended to show that viewing televised violence in the context of rewards could make aggressive behavior more likely in children.

Priming Effects

A major contributor to the early literature on the effects of media violence was Leonard Berkowitz. His theoretical formulation emphasized that media violence contained "aggressive cues" that could combine with a viewer's state of anger or frustration and trigger an aggressive response. In the 1990s, Eunkyung Jo and Berkowitz revised the theoretical language of the theory of aggressive cues to take advantage of more contemporary cognitive theory. Relying on the notion of "priming," these researchers outlined a position in which media violence is seen as a stimulus that primes thoughts related to aggressive behavior. Stated succinctly, their 1994 essay clearly specifies what could happen after exposure to media violence: "Under certain conditions and

for a short period of time, there is an increased chance that the viewers will (a) have hostile thoughts that can color their interpretation of other people, (b) believe other forms of aggressive conduct are justified and/or will bring them benefits, and (c) be aggressively inclined" (p. 46).

Brad Bushman and Russell Geen (1990) demonstrated the priming effect of media violence when they randomly assigned viewers to watch a movie that contained either high, moderate, or low levels of violence. Following the movie, when viewers were asked to list their thoughts, the viewers who had watched a violent film had significantly more aggressive thoughts than viewers of nonviolent film. In another study, Craig Anderson (1983) found that when people imagined themselves carrying out a particular action, they subsequently reported that they felt much more motivated to carry it out than if they had imagined someone else carrying out the action. Consistent with the idea of priming, Jo and Berkowitz (1994) commented on this result: "It is as if the thought of the particular action had, to some degree, activated the motor program linked to this action" (p. 48). It should be noted that the idea of priming effects runs directly counter to the catharsis hypothesis. Feshbach had believed that fantasizing about acting aggressively would reduce the likelihood of carrying out aggressive behavior. The priming hypothesis suggests exactly the opposite. In general, the decline of the viability of catharsis theory was directly linked to the many studies conducted by Berkowitz and his colleagues, which showed evidence for the instigating effects of exposure to media violence as well as for the priming process as a likely theoretical mechanism for these effects.

Arousal

While Berkowitz focused on the violent content in media messages, another researcher, Dolf Zillmann, believed that the capacity for violence to induce heightened levels of physiological arousal was also very important. In his theory of excitation transfer, Zillmann (1991) reasoned that arousal from viewing violence could intensify emotional reactions experienced immediately after the viewing experience. In cases where viewers experience anger subsequent to viewing an arousing program, the anger will be more intensely experienced and will be more likely to result in aggressive behavior. Many studies in the media context that are designed to test the excitation transfer hypothesis have revealed strong support for this formulation. Of course, one implication of the theory is that viewing media violence may also result in the intensification of positive emotions subsequent to viewing—if those positive emotions occur in reaction to some stimulus.

Desensitization

While most of the theories about the effects of media violence have attempted to shed light on the question about the extent to which viewing results in increased aggressive behavior, some research has focused on the question of desensitization to violence. According to the desensitization hypothesis, repeated exposure to violence results in emotional adjustment or saturation. Under this formulation, initial levels of excitement, anxiety, tension, disgust, and so on weaken with repeated exposure to violence. One of the most important consequences of this effect could be the reduced likelihood of a desensitized viewer to respond with a sense of urgency to violence in real life. While desensitization has been studied less frequently than instigation of violence, the research that does exist supports the idea that desensitization occurs.

Ronald Drabman and Margaret Thomas (1976) studied the desensitization hypothesis with children in an experimental context. After exposing randomly selected children to either violent or nonviolent television, they asked each child to monitor the activity between two other children presented on a video monitor. The child was instructed that if the activity of the children turned violent, they should seek out the experimenter for assistance. Children who had viewed television violence just prior to the monitoring task were significantly less likely to notify the experimenter when the interaction on the monitor turned violent. In addition, those children who did notify the experimenter took a significantly longer time to do so.

Cultivation

Gerbner's early contributions to the violence literature in the form of content analyses helped to form the basis for his theory of media cultivation. According to this view, viewers who watch large amounts of television content become cultivated into accepting the view of social reality presented in the television messages. Because, as the content analyses had revealed, the television world was one filled with violence, viewers who watch large amounts of television should come to believe that the world was a violent place. Specifically, because the incidence of violence on television suggests a more violent world than the one that actually exists, viewers who watch large amounts of television should adopt exaggerated perceptions of the occurrence of violence and should also come to fear criminal victimization more than viewers who watch smaller amounts of television.

Gerbner and his colleagues (1994) have presented evidence from sample surveys pertaining to the cultivation hypothesis. According to the theory, because cultivation is a gradual process, it cannot be studied by the experimental method. This feature of the theory poses some methodological difficulties in terms of being able to establish clearly the cause-effect relationship that the theory posits between television viewing and fear of criminal victimization. Sample surveys are inherently incapable of controlling all possible third variables that might contribute to the relationship between television viewing and any supposed cultivated attitude. Despite the fact that the theory and research pertaining to it have come under various attacks over the years, Gerbner has been a strong advocate of the perspective, and there appears to be enough empirical support to keep the theory viable.

Fear

Joanne Cantor (1998) and her associates developed a program of research demonstrating that viewing specific programs or movies that involve violence or the threat of harm often causes children to have nightmares or intense and enduring anxieties. The research also shows that there are important differences in the types of media stimuli that frighten children of different ages. These variations are based on the viewer's level of cognitive development.

Research Evidence and the Question of Causation

If there is a pivotal issue running through all of the research on media violence, it is the issue of causality. In the end, the challenge for the research community and the consumer is to evaluate the various kinds of evidence that have been presented, with a view toward formulating a reasonable conclusion about the effects of media violence. This evidence can be naturally occurring, the result of a survey, or the result of an experiment.

Naturally Occurring Data

Brandon Centerwall's 1989 analysis of crime statistics across several countries constitutes some of the most provocative data available on the question of whether television is related to an increase in violence in society. In 1945, prior to the emergence of television in the United States, the crime statistics show three homicides per 100,000 people. By 1974, that figured had doubled. This same sort of increase emerged in Canada. According to Centerwall, the relationship between the introduction of television in any society and the increase in homicides in not accidental. Instead, Centerwall believes it is a direct causal relationship. Of course, there is no way to establish an unequivocal case for causality with this type of data. Literally hundreds of changes occurred along with the rise of television, and those other changes could theoretically be related to increases in homicides. Centerwall's approach to this problem is to compare other countries that are similar to the United States in many of the ways that are known to affect the homicide rate. For example, he argues that South Africa is quite comparable to the United States on almost any variable of interest between 1945 and 1974-except for the fact that the South African government had a ban on television during this time period. In contrast to the doubling homicide rate in the United States, the rate in South Africa dropped by 7 percent. When South Africa lifted the ban on television in 1974, the homicide rate promptly increased by 56 percent during the next nine years. By 1990, the increase had grown to 130 percent-more than doubling in less than twenty years in nearly the same way it had done in the United States. Centerwall attempted to introduce careful controls in these comparisons in order to boost the integrity of his analysis. For example, he excluded all homicides in South Africa that could be attributed to racial tensions. Even with these controls, the data still show a relationship between homicides and the introduction of television. In the end, Centerwall claims that roughly half of all homicides in the United States result, in part, from exposure to television. The problem in evaluating this claim is that the method of analysis falls short of meeting the strict criteria for making causal claims.

David Phillips (1979, 1983, 1985) has also reported the results of a series of studies that appear to show a link between mass-media violence and violence in the real world. One line of studies attempted to show a connection between widely publicized stories of suicide and subsequent increases in the suicide rate, presumably as a result of direct imitation. Another line of studies attempted to show a link between the occurrence of heavyweight prizefights and subsequent increases in the homicide rate. Phillips's analysis is provocative but controversial. In addition to failing to meet the conventional criteria for establishing a causal claim, there are various anomalies in Phillips's data, and these anomalies defy clear explanation. For example, the main increase in homicides after prizefights seems to occur on the third day after the fight, but increases also appear on the sixth and ninth days following the fight. Phillips's analyses have been the subject of some major methodological disputes in the sociological literature. In the final analysis, the naturally occurring data pertaining to the effects of media violence is suggestive, but it is not conclusive.

Survey Data

The best survey evidence pertaining to media violence comes from longitudinal panel studies that relate early viewing of television violence to later incidents of aggressive behavior. This method has the advantage of examining the basic relationship between viewing violence and aggressive behavior in a context where the time-order of the variables can be firmly established. L. Rowell Huesmann and Leonard Eron (1986) have collected the best evidence of this type by studying subjects from the time when they were eight years old until they were thirty years old. The most important finding in this study was that young children who watched the highest levels of television violence were more likely to be involved in serious crime when they were adults. Huesmann (1986) summarized these findings by stating, "Aggressive habits seem to be learned early in life, and once established, are resistant to change and predictive of serious adult antisocial behavior. If a child's observation of media violence promotes the learning of aggressive habits, it can have harmful lifelong consequences. Consistent with this theory, early television habits are in fact correlated with adult criminality" (pp. 129-130).

Of course, as noted in the discussion of Gerbner's cultivation theory, the survey method, similar to the studies that rely on naturally occurring data, is limited in terms of drawing unequivocal conclusions about cause and effect. Added to this limitation is the fact that some other longitudinal surveys, after controlling for several different variables, failed to find a significant correlation over time between aggressive behavior and the viewing of violence in the media. Most notable among this group of surveys was one funded by the television industry and directed by J. Ronald Milavsky (1982), who was the vice-president of News and Social Research for NBC at the time. Taken together, the available survey data do suggest a relationship between aggressive behavior and the viewing of violence in the media. However, it remains impossible for researchers to argue for a clear causal link between the two variables based on this type of data.

Experiments

The experimental method is the only way, in principle, to demonstrate a causal relationship between two variables. In addition to some of the laboratory experiments mentioned above, there have been some notable field experiments that attempted to show, in more naturalistic settings, a causal relationship between aggressive behavior and media violence. One such study, by Ross Parke and his colleagues (1977), summarized the results of three field experiments that supported the notion that viewing violent films increases aggressive behavior. Although experimental research on the effects of media violence has become less prevalent than in the 1970s, the conclusions of more recent studies of this type reinforce the widely shared conclusion from earlier studies that support the idea that viewing violence causes aggressive behavior. Zillmann and James Weaver (1999) reported a study showing that violent films viewed on four consecutive days produced increased hostile behavior on the part of both males and females a day later, regardless of whether the subjects had been provoked to respond aggressively.

Conclusion

In the mid-1990s, a major new content analysis of violence on television was conducted. The National Television Violence Study was carried out by researchers from four U.S. universities. This analysis, which was funded by the National Cable Television Association but not subjected to industry control, reconfirmed the high levels of violence on television (including cable television). Moreover, reporting on the context features associated with violence, such as the prevalence of attractive perpetrators and the scarcity of depicted negative consequences, the report concluded that the way in which violence is typically depicted promotes imitation.

In 1994, Haejung Paik and George Comstock reinforced the causal conclusion in a meta-analysis of all studies pertaining to the question of media violence and aggressive behavior. Even researchers who have been cautious in reaching the consensus opinion among scholars lend credence to this conclusion. For example, in his review of the literature, Richard Felson (1996) was much more reluctant than most scholars to interpret the available evidence as being strongly supportive of the causal relationship. In the end, however, he stated, "I conclude that exposure to television violence probably does have a small effect on violent behavior for some viewers, possibly because the media directs viewer's attention to novel forms of violent behavior that they would not otherwise consider" (p. 103). With the causal connection being well established, the research in the late 1990s focused mainly on other types of questions, including why media violence is attractive, how program warnings affect children's desire to view violent content, how violent video games affect players, and how parents might intervene in the negative effects. These issues ensure that research on media violence will continue to be a vibrant area of scholarship.

See also: Arousal Processes and Media Effects; Catharsis Theory and Media Effects; Cultivation Theory and Media Effects; Cumulative Media Effects; Desensitization and Media Effects; Fear and the Media; National Television Violence Study; Parental Mediation of Media Effects; Ratings for Movies; Ratings for Television Programs; Social Cognitive Theory and Media Effects; Violence in the Media, Attraction to.

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GLENN G. SPARKS

VISUALIZATION OF INFORMATION

Visualization is defined in the Oxford English Dictionary as "the action or fact of visualizing, the power or process of forming a mental picture or vision of something not actually present to the sight." As the old adage "a picture is worth a thousand words" goes, visualization can be defined as a method that makes the best use of a person's perceptual abilities to observe, access, and understand data and information. Generally speaking, the purpose of visualization is to provide the user with not only a visual presentation and interpretation of the data and information but also a better understanding of the phenomenon behind the data and information. A more recent and domainspecific definition of visualization is given by the following: "Visualization provides an interface between two powerful information processing systems-human mind and the modern computer. Visualization is the process of transforming data, information, and knowledge into visual form making use of human's natural visual capabilities. With effective visual interfaces we can interact with large volumes of data rapidly and effectively to discover hidden characteristics, patterns, and trends" (Gershon, Eick, and Card, 1998, p. 9).

There are many ways to approach the concept of visualization. Edward Tufte (1990) categorizes visualization into three types: pictures of numbers (e.g., statistic graphs), pictures of nouns (e.g., maps and aerial photographs), and pictures of verbs (e.g., representations of motion, process, cause and effect). Visualization through computers can be portrayed as pictures and graphs, twodimensional and three-dimensional images, three-dimensional models and simulations, animations, video segments, and so on. Visualization has been studied by a variety of scholars and researchers from such disciplines as art history, cognitive science, computer graphics, epistemology, graphic design, image processing, linguistics, semiotics, technical communication, and visual interfaces.

History of Visualization

The use of images to represent objects from the real world has a long history. As far back as 20,000 B.C.E., humans began to draw, paint, or carve images on cave walls to record and depict aspects of their experiences. For example, the Paleolithic cave paintings found in the Remigia Cave at La Gasulla in Spain vividly illustrate a group of hunters killing a wild boar. However, the use of graphs, pictures, and drawings was not restricted to the recording and depicting of objects; visualization also became an effective means for representing abstract concepts and communicating abstract ideas. The ancient Egyptian hieroglyphics are pictures that were used as a form of visual communication. The term "ideograph" refers to a symbol that is used to represent a concept in a pictographic language. In modern Chinese, for example, there are more than fifty thousand ideographs.

Visual representation of information has been helpful in assisting humans with the description, classification, analysis, and comprehension of the natural world. Astronomy, cartography, and meteorology were some of the earliest fields to use visualization techniques. For example, the astronomical images painted in the tomb of Pharaoh Seti I in 1290 B.C.E. describe the relationship between Egyptian astronomy and mythology. The earliest map to use a latitude/longitude grid was drawn in China in 1137 to depict the travels of Da Yu (Yu the Great). In the 1920s, American meteorologists began to use symbols and pictograms to represent such natural phenomena as hail, lighting, snow, and thunderstorms in their weather charts.

Ever since Leonardo da Vinci created perspective drawing in the 1400s, the technique has been used as the primary method for creating technical



The use of a pie chart or other forms of visualizing information can often help to enhance and clarify a business presentation. (Jack Hollingsworth/Corbis)

graphics communications. In the late 1700s, Gaspard Monge developed the science of descriptive geometry, which provided the foundation for three-dimensional representations using twodimensional media. Wilhelm Röntgen's discovery of x-rays in 1895 made it possible for humans to visualize what could not be seen with the naked eyes. The discovery also revolutionized the scientific fields of medicine and chemistry because it resulted in x-ray photography and chemical crystallography, respectively.

The Semi-Automatic Ground Environment (SAGE) system was the first time that computers were used for visualizing information. The system, which was developed in the United States in the mid 1950s, used interactive computer graphics combined with radar to track, analyze, and display aircraft positions on a cathode-ray-tube monitor. In 1965, Ivan Sutherland designed Sketchpad, a minicomputer drawing system. The field of computer graphics quickly developed to produce applications such as computer-aided

design (CAD), geographical mapping, and molecular modeling. With the development of more powerful computers, better software, and advanced interaction techniques, virtual reality became possible. Using this technology, it has become possible to explore information visually and interactively in real time.

A large variety of visualization techniques have been used for different applications. Some commonly used techniques of visualization include bar charts, pie charts, HiLo glyphs, XY diagrams, scatter plots, treemaps, contour plots, cone trees, fractal rooms, hyperbolic trees, and perspective walls.

Scientific Visualization Versus Information Visualization

Visualization can be divided into two areas: scientific visualization and information visualization. Scientific visualization primarily deals with data or information that describe physical or spatial objects (e.g., the human body, the earth, and molecules), and information visualization primarily visualizes data or information that is nonphysical or abstract (e.g., text, hierarchy, and statistics). Both areas of visualization share the same goal of using visual representations via computers to access, explore, explain, organize, and understand the data and information.

According to I. Herman, G. Melanáon, and M. S. Marshall (2000), there are three essential differences between the two areas. First, the data or information that is visualized by scientific visualization is different from the data or information that is visualized by information visualization; the former often has an inherent geometry, but the latter does not. Second, the users of scientific visualization are different from the users of information visualization; the former are usually experts, while the latter may have different levels of expertise. Third, scientific visualization and information visualization have different computer requirements; scientific visualization demands the capability of complex computation and graphic representation, which is not always necessary with information visualization. Therefore, scientific visualization, a well-established yet relatively specialized field with a relatively small number of scientists, involves many visualization techniques, uses various software tools, and requires enormous computer resources to make data or information more accessible and comprehensible. Information visualization, one of the increasingly important subfields of Human-Computer Interaction (HCI), takes advantage of the graphical capabilities of the computer and the perceptual abilities of the user to process, interpret, and understand data and information visually.

Typical Applications of Visualization

Visualization of information has many practical applications, ranging from the visualization of simple numerical data to the visualization of complex molecular structures. Some typical applications of visualization techniques are those related to geography, software, medicine, education, information retrieval, data mining and electronic commerce.

Geographical information systems (GIS) were designed to collect, store, retrieve, manipulate, and display geographically referenced data. GIS visually helps users to gain new insights related to the data and to solve complex research, planning, and management problems. GIS software is developed all over the world, but three of the better-known products are Maptitude, GeoMedia, and MapInfo.

Software visualization uses computer graphics and animation to illustrate and present computer programs, processes, and algorithms. Software visualization systems are a way to help programmers understand their code in a more effective way, and they can also be used to help teach students how algorithms work in programming. There are many software visualization systems, ranging from Algorithm Animation to Visualization of Object-Oriented Programming.

The application of computerized imagery to the field of medicine has resulted in medical imaging techniques such as computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine imaging (NMI), and ultrasonography. These techniques visually magnify the subtle aspects of the diagnostic, therapeutic, and healing process of patients, thus allowing the members of the clinical staff (e.g., doctors, nurses, students, technicians, and managers) to handle medical data and information in a more intuitive and effective manner. Many medical visualization tools have been developed, but two of the more popular tools are Imaging Application Platform (IAP) and Medical Imaging Software Developer's Kit (SDK).

Visualization in education helps students using images to represent and comprehend concepts and ideas, reinforce understanding, develop critical thinking, and integrate new knowledge. Visualization is helpful for teaching and learning in language arts, mathematics, medicine, social studies, science, engineering, and so on. Visualization has been used as a helpful means in some new teaching paradigms, such as web-based courses, interactive classrooms, and distributed learning. Popular software of visual learning and teaching include a.d.A.M, ClassWise, and Inspiration.

Interactive two-dimensional or three-dimensional visualization techniques can enhance the information retrieval process by providing effective visual interfaces for users to use in navigating and manipulating large amounts of textual information. Visualization techniques also help the user to identify the relationships between documents and to refine the search results until relevant information is located. Two examples of software that are used for visualization in information retrieval are Visual Thesaurus and DR- LINK (Document Retrieval using LINguistic Knowledge). Visual Thesaurus presents an animated visual display of semantic relationships between words. DR-LINK is an online search service that uses natural language queries to search a text database, facilitates information retrieval with various features, and outputs the results in different ways, including bar charts and graphs.

Data mining is the analysis of data for underlying relationships, patterns, and trends that have not previously been discovered. Visualization is used in data mining to provide visual interfaces during the data analysis process, visual manipulation of the data representation, and visual presentation of the mined data for a better understanding. Some examples of data mining visualization software are Spotfire, DEVise, and WinViz.

Visualization of marketing and advertising data in market analysis provides executives, managers, and researchers with a new way to query and explore the vast amounts of customer, product, and market data that are generated by customer relationship management. For the customers of electronic commerce, visualization can be used to make it easier for them to comparison shop through interactive visual interfaces. Cult3D, ecBuilder, and Webstores 2000 are three of the companies that develop software for use with electronic commerce.

Future Trends in Visualization

With the advancement of science and technology, visualization technologies will bring people new ways to view, analyze, and interact with data and information. Several trends in visualization provide a glimpse of its future potential.

First, new technologies are being developed for new applications. For example, virtual reality as a visualization tool can help build a simpler user interface that allows users to interact directly with data in a virtual environment (e.g., CAVE—a multiperson, room-sized, high-resolution, threedimensional video and audio environment that allows the user to control visualization parameters). Object-oriented visualization environments can be built by visual programming with functional objects (e.g., interfaces and classes are shown in different colors). In addition, animation allows the viewing of discrete images in rapid succession for studying data that vary over time. Second, the cost of visualization technologies is decreasing dramatically. As a result, more inexpensive, standardized software and hardware for information visualization will become available and affordable.

Third, there will be more collaboration among the producers and users of visualization products. For example, collaborative visualization will enable users to share data and information visualization processes via computer-supported cooperative work using collaborative technologies, such as Habanero, Microsoft NetMeeting, and Tango. In addition, the emerging visualization libraries created by corporate and academic research groups will provide a consistent cross-platform environment for the development of graphic products.

Fourth, more attention is being given to education for visualization. Both professional and academic communities are developing guidelines and teaching materials for visualization curricula and courses. These developments include books, videos, and websites.

Finally, universally recognized visual metaphors and conventions for structuring data and information in multiple dimensions will be developed.

Conclusion

Visualization, as a human perceptive ability and cognitive process, has existed throughout history, and it has evolved as humans have evolved. Visualization of information via computer technology has had an enormous effect on human society even though is has only a very short history. As society and technology advance into the future, the human quest into the nature of visualization and the visualization of information will lead to a better understanding of the relationships between information, visualization, technology, human cognition, and the natural world.

See also: Computing; Electronic Commerce; Geographic Information Systems; Human–Computer Interaction; Retrieval of Information; Use of Information.

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Shaoyi He

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WEBER, MAX (1864-1920)

Max Weber was one of the founding figures of sociology. His work is important to students of communication for several reasons, including his methodological and theoretical innovations as well as a diversity of useful concepts and examples for the analysis of social behavior, economic organization and administration, authority, leadership, culture, society, and politics.

Weber grew up in Berlin, where his father was a lawyer and politicians and scholars were family friends. He studied law, economics, history, and philosophy at the universities in Heidelberg, Göttingen, and Berlin. He taught law briefly at the University of Berlin and became professor of economics at Freiberg in 1894 and then at Heidelberg in 1896. Depression and anxiety interrupted his career in 1898. He returned to his research in 1903 but did not hold another teaching post until just a few years prior to his death. All of his important work comes from the later period, including his most famous work, The Protestant Ethic and the Spirit of Capitalism (1904), and his studies of The Religion of China (1916), The Religion of India (1916), and Ancient Judaism (1917–1918). The masterwork, Economy and Society, was left fragmentary; it was edited and published posthumously in 1922.

Weber's work provides an example of historical and comparative social science that successfully negotiated between attention to theoretical concepts and empirical details. Rather than concluding an investigation with a generalization or theoretical claim—that all economic behavior is rational, for example—Weber would use the concept of rational behavior as a comparison point in conducting his research. In this way, his work explored particular differences and contingencies rather than generalizing across them.

Weber's work provides the origin of action theory as such. Weber defines action as meaningfully oriented behavior, and takes it to be the fundamental unit of sociological investigation. This is crucially important for communication studies, for it defines a model of social science distinct from behaviorism. Unlike behaviorism, in action theory the meanings that people have for their behaviors are taken to be crucially important. For example, "her arm went up" is a statement of behaviorism; "she raised her arm" is a statement of action theory. In behaviorism, all implications of meaning and motivation are avoided in favor of simple descriptions of physical events. In action theory, meanings and motives are the point of investigation. For students of communication, simple behavior is an important substratum of their investigations, but it is never enough. The study of communication without attention to motive and meaning can never be complete. Thus, Weber's example of a scientific approach to such problems is crucially important.

How could Weber claim a scientific approach to motives and meanings, which cannot be directly observed? His resolution of this problem has been widely admired and imitated. On the one hand, he combined logic, empathy, and interpretation to construct ideal types for the analysis of historical cases. He constructed, for example, ideal



Max Weber. (Archive Photos)

type models of how the perfectly rational or perfectly traditional actor would make choices in ideal circumstances. These expectations would then be compared with what real people did in actual circumstances. When historical actors deviated from the ideal types, Weber did not take that as evidence of their cognitive shortcomings (their irrationality, for example) but as clues to additional concepts he needed to develop for further analysis. Working from the other direction, he interpreted historical records empathetically, striving to identify how the actors in a particular situation could have seen their action as a rational response to their circumstances. In this way, he was able to construct models of a range of types of rational action, opening up his theory to a greater range of human situations than either the behaviorists or the economists. Prayer, for example, as Weber pointed out, is rational behavior from the point of view of the faithful.

Weber's work also provides many useful concepts and examples for communication studies, in addition to the wide-ranging importance of his action theory and his methodological innovations. His analysis of economic organization and administration is the standard model of rational organization in the study of organizational communication. His studies of authority and leadership are important to students of both organizational and political communication. His studies in the sociology of religion explore the range of possibilities in the relation between ideas and social structures, a problem that continues to be at the heart of cultural studies. His contrasts of rational and traditional and his analysis of modern bureaucracy are starting points for analysis of modern industrial-commercial culture and communication and the effect of the media on culture and politics.

See also: Cultural Studies; Models of Communication; Organizational Communication.

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ERIC W. ROTHENBUHLER

WEBMASTERS

Along with the emergence and growth of the Internet and the World Wide Web has come the creation of a new occupation: the webmaster. This person is responsible for publishing a website, which may be a single page or hundreds of thousands of pages. It is difficult to be precise about



A group of web-page designers work together to evaluate a design in their San Francisco office, which is located in an area that is home to so many high tech businesses that it is sometimes called the "Cybergulch." (Catherine Karnow/Corbis)

what a webmaster does, because the web itself is changing, and this in turn changes the way in which people use it. Some people consider the term "webmaster" to be an unnecessarily sexist term. Alternate terms include "webster," "web designer," and "information architect."

A key role for the webmaster is to be responsible for organizing the information at a website. Other people may decide on the content and provide excellent resources for the potential users of the website, but if those users are not able to find the resources that would interest them, then the work is in vain. Organization involves understanding the site as a whole and deciding on the best ways in which to help users get to the appropriate pages. Thus, organization is not just about how to arrange information within a single page; it is also about deciding how all the pages of a website will fit together. This is clearly a complex task.

In many ways, a webmaster is like the editor of a newspaper. Other people provide most of the content, but the editor has to arrange the content so that readers can find their way around the newspaper. A consistent house style is important in helping people to use a website. That means not just the style of writing but also the names that are used to describe parts of the website and the mechanisms that are provided to help the user to navigate within the website. Graphic design can be important in conveying an appropriate impression about the nature of the website and the organization that it represents. However, an obsession with flashy graphics, particularly animation, can make the website much harder to use, more confusing, and slower to download. Therefore, a webmaster must balance competing design interests.

It is important to remember that a website is intended to be used by different kinds of people with different needs. For example, in the case of a commercial website, the users may be people who work in the organization, regular customers, firsttime customers, experienced web surfers, novices, people who have a specific thing that they want to find out about or buy, or people who want to browse around. A good design will help *all* users find their way around the website. A poor design will confuse users, which probably means that they will give up and go to a competitor's website instead.

Website design involves a lot of interaction with other people. This includes people who are going to write pages or provide text for the website and people who have opinions about what the website is for, how it should look, and what information it should provide. Inevitably, that means that the design process can be political because everyone thinks the things that they do are so important and crucial to the success of the organization that their pages should be directly featured on the home page and that they should be given priority at the top of any list of links.

In order to help users to find information within a website, the webmaster needs to consider issues of usability, which involves examining the existing website for potential sources of confusion. User testing of a website can reveal many problems, particularly where the designers have accidentally assumed more knowledge about the website than a casual user would have. If people do not realize that something is a link, they will not click on it. Support for navigation is especially crucial; otherwise, as users click around in a website, they may get a feeling of being lost.

The webmaster needs to be aware of the different ways in which people will use the website. For example, a website may be easy to use on a powerful computer with a big monitor and good network connections, but if the intended users are using less-powerful machines and poorer Internet connections, then the website should be tested in that environment as well. It may help to create text-only versions for some pages to make them easier to download over slow modems. Users who have disabilities should also be considered. For example, users who are visually impaired will have difficulties with graphical icons. However, additions to the Hypertext Markup Language (HTML) that creates the page can be made to describe in words what the graphic shows, so a text-to-speech browser can still be used. In addition to helping visually impaired viewers, this feature helps all users who simply prefer not to download graphics for reasons of speed. Wider benefits often result when designs are created that bear in mind users who have specific disabilities.

Another important task for a webmaster is the maintenance of a website. New pages will be created and need to be integrated into the website so that they can be easily found. Existing pages may become obsolete, and links to other pages may no longer work. A webmaster should be concerned with the continual improvement of the usability and usefulness of the website. Traditionally, many webmasters focused on the technical aspects of a website (i.e., creating scripts for ordering products, managing backups of the data, and handling the server on which the website was hosted). However, the role of a webmaster has become much broader than that. A webmaster may now have a much more senior position that is responsible for creating an overall strategy for the website and then overseeing the work of others who are responsible for the more specific tasks that are involved in fulfilling that strategy.

Webmasters come from a variety of backgrounds, including programming, graphic design, librarianship, and technical writing. Because the web itself is still evolving rapidly, it is difficult to say which particular skills, backgrounds, or training will become the most crucial for finding employment in this occupation in the future. Clearly, a webmaster must understand how the web is used and how web-pages are constructed. That requires some familiarity with HTML. New design toolkits are always being developed, as are new protocols and technologies for providing access to different kinds of multimedia. Hence, the ability to learn these new technologies very rapidly is more important than knowledge of a particular technique that may quickly become obsolete. The skills of organizing information, interacting with different individuals and groups, and writing in a clear style will, however, always remain important.

See also: Computer Literacy; Human-Computer Interaction; Internet and the World Wide Web.

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MICHAEL TWIDALE

WELLES, ORSON (1915-1985)

When Orson Welles's name is mentioned, the first thing that comes to mind is *Citizen Kane* (1941), which is still considered to be one of the best films in the history of motion pictures. However, Welles's "show business" success began long before (and continued long after) the creation of *Citizen Kane*.

Welles was born George Orson Welles on May 6, 1915, in Kenosha, Wisconsin. He was the son of Richard Head Welles, who became wealthy by owning wagon factories, and Beatrice Ives Welles, who was well known for her devotion to the arts and community involvement. Orson Welles was involved in theater from the age of three, when he played the role of "Trouble" in a production of Madame Butterfly at the Chicago Opera. By age ten, he had produced, directed, and starred in his own production of Dr. Jekyll and Mr. Hyde. In his young adult life, Welles produced Macbeth at the Negro Theatre in Harlem in 1936. Then, Welles, with the help of the Federal Theatre, formed the Mercury Theatre, for which The Cradle Will Rock was the debut production.

As radio became a successful entertainment medium, Welles made a smooth transition from theater to radio. He was involved in more than one hundred radio productions from 1936 to 1941. His productions ranged from classics such as *Hamlet*



Orson Welles displays many emotions during a 1938 radio broadcast. (Bettmann/Corbis)

(1936) and Julius Caesar (1938) to new shows such as The Silent Avenger (1938) and War of the Worlds (1938). War of the Worlds, an adaptation of the H. G. Wells novel, used fake news bulletins to announce that there were disturbances noted on Mars and then that there was a Martian invasion of Earth taking place. Although it was stated quite clearly four times during the broadcast that it was simply a radio drama, many listeners believing that Martians had really landed and were dispensing poison gas. As a result, panic struck from coast to coast. Phones rung off the hook at Columbia Broadcasting System (CBS) offices, some people flocked to churches to pray, and traffic jams were attributed to people fleeing areas where the Martians had "landed." However, myths surrounding the extent of the panic continue to exist. Stories abound about people committing suicide to avoid succumbing to the invaders and about other people dying of heart attacks from the shock of the Martian landing. None of these stories have ever been substantiated.

Sociologist Hadley Cantril (1940) studied the people who were most and least affected by the radio drama. Simply put, there was a direct correlation between the degree of panic and the amount of education and/or religious belief. The less educated and the more devoutly religious a listener was, the more often he or she believed the reports. Nothing major occurred in the regulation of the radio broadcast industry because of the event; Welles simply illustrated the power of the medium. The Federal Communications Commission issued a terse response saying the incident was "regrettable."

Citizen Kane, coming just a few years after Welles's War of the Worlds radio production, started a new chapter in the career of Orson Welles. Citizen Kane is remembered for a multitude of reasons, including that (1) it was Welles's first feature film, (2) he was only twenty-five years old when he made it, (3) the film featured many technical innovations, such as the creation of deep-focus lenses, the use of camera movement, and audio mixing, that had previously only been used in radio, and (4) the subject matter was highly controversial, since it was a thinly disguised biography of William Randolph Hearst, the newspaper mogul. The movie angered Hearst so much that none of the Hearst newspapers carried advertisements for the film and Hearstemployed film critics were harsh in their reviews. Other reviews were essentially good, but Citizen Kane was still a failure at the box office, and though it was nominated for nine Academy Awards, the movie won only the Best Original Screenplay award, which Welles shared with Herman J. Mankiewicz. Citizen Kane was voted the best film of all time in 1972 (and then again in 1998) by a panel of international film critics. In addition, film historians Thomas W. Bohn and Richard L. Stromgren, in Light and Shadows: A History of Motion Pictures (1975), wrote that Citizen Kane had the greatest influence on filmmaking since D. W. Griffith's The Birth of a Nation (1915), which had ushered in the art of storytelling in motion pictures.

Welles's second feature film, *The Magnificent Ambersons*, was released in 1942. The studio system made the film possible because Welles's style demanded extensive facilities, polished actors, and skilled technicians. For example, Welles filmed winter scenes in a cold storage locker, achieving the desired realism while still having complete control over lighting and camera positioning. Although *The Magnificent Ambersons* featured such additional technical innovations, it has generally received less attention because it followed so closely on the heels of *Citizen Kane*, which was released only one year earlier. During his career, Welles directed fewer than twenty feature films (some of which were never completed) but acted in more than sixty. In his later years, he primarily served as a "voice" (i.e., he did voiceover narration, hosted various television shows, and provided voices for animated characters).

Welles's personal life included three wives and at least two other long-term relationships. Welles eloped with actress Virginia Nicholson in November 1934. They had a child, Christopher, in 1937 but were divorced in February 1940. Welles had an affair with Dolores Del Rio, another actress, while she was still married to Cedric Gibbons. Welles married Rita Hayworth, the actress, dancer, and "pin-up girl," in 1943. The couple had a child, Rebecca, in 1944, but were divorced in 1947. Actress Paola Mori was the next woman to marry Welles, in May 1955; Mori and Welles had a child, Beatrice, that same year. During Welles's later years, his female companion was actress and director Oja Kodar. Welles suffered a fatal heart attack on October 10, 1985, at age seventy.

Jonathan Rosenbaum wrote in a December 1996 article in *Cineaste* that there are probably two main perspectives about Welles's career. Rosenbaum contends that one view, which is most common in the United States, is that Welles's life is a bit of a mystery with some wondering why Welles did not live up to his potential, referring to *Citizen Kane* as his one and only major achievement. The other view, according to Rosenbaum, looks at Welles's life more compassionately, objectively considering a body of work—from theater to radio to film—and giving credit to Welles beyond focusing simply on *Citizen Kane*.

See also: Film Industry, History of; Griffith, D. W.; Hearst, William Randolph; Paranormal Events and the Media; Radio Broadcasting, History of.

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LAWRENCE N. STROUT

WILLIAMS, RAYMOND (1921-1988)

Blurring the distinctions between traditional academic boundaries, while focusing attention on aspects of culture usually silenced by the dominant society, Raymond Williams was a pervasively influential twentieth-century thinker. In more than thirty published books, and in hundreds of articles, Williams addressed questions of culture, communication, politics, literature, and drama. Working outside mainstream communication research agendas, two of Williams's books, *Culture and Society* (1958) and *The Long Revolution* (1961), became foundational texts in the development of a new political and intellectual tradition known today as British cultural studies.

Williams, born in Pandy, Wales, was the only son of Henry Joseph Williams and Esther Gwendolene Williams (neé Bird). He was raised in a socialist, working-class household; his father was a railway signalman, the son of a farm laborer, and his mother was the daughter of a farm bailiff. Williams attended the local elementary school, and when he was eleven years old, he received a county scholarship to attend King Henry Eighth Grammar School in Abergavenny. In 1938, Williams earned his high school certificate in English, French, and Latin and won the state scholarship to Trinity College, Cambridge. As a student at Trinity, he wrote short stories and political articles, reviewed films, and became editor of the student newspaper, the Cambridge University Journal. Williams rejected prevailing class boundaries and



Raymond Williams. (Archive Photos)

social positions in his writings on the stereotype of working-class boy as social misfit.

After two years at Trinity, Williams was drafted into the army, commissioned into the Royal Artillery, and sent to Normandy. The dehumanization of people that he observed during World War II had a significant effect on him, and when he was later recalled to service in 1951, he refused as a conscientious objector. Williams returned to Cambridge in 1945 and completed his degree. Financial responsibilities forced him to reject a graduate university fellowship, and in 1946, he instead began working in adult education as a staff tutor for the Oxford Delegacy.

Williams developed an affiliation with the New Left, a working-class labor movement that reacted to modern developments of industrial capitalism and emphasized popular education and popular culture. Considering popular culture to be a crucial site of struggle, Williams, in his articles and books, thought historically about cultural practices and explored issues of alienation and reintegration, along with the challenges of going between academic and working-class cultures. In 1961, Williams was appointed to a lectureship on the English faculty at Cambridge and later became a professor of modern drama. As a professor at Cambridge, Williams earned a reputation for supporting dissent, even that which was inarticulate, incoherent, or messy.

Two early influences on Williams were Marxism and the ideas of Cambridge literary critic F. R. Leavis. From Marxism, Williams gained an appreciation of the relationship between the system of production and culture, while from the ideas of Leavis, Williams received an understanding of the connections between art and experience. Politics was central to Williams's life and work: he wrote as a socialist for socialism and believed in the necessary economic struggle of an organized working class. He viewed his own political commitment as part of a long revolution, through which the system of meanings and values that contemporary capitalist society has generated must be defeated by sustained intellectual and educational work. For Williams, the long revolution was an integral part of the struggle for democracy and economic victory for the working class. Williams and other members of the New Left addressed fundamental Marxist theoretical questions regarding issues of power, class, domination, and exploitation. Ultimately, Williams rejected the economic and reductionist emphasis of traditional Marxism in favor of a Marxist cultural perspective that connected the realm of art and ideas to the entire material social process.

It is the centrality of culture, in each study of society, that is the common theoretical thread found in all of Williams's writings. Culture is viewed as a basic component of an evolving social process; nothing is static, fixed, or predetermined because all of life is an active and evolving process. Culture is a way of life, the lived texture of any social order. Williams rejected traditional boundaries between high culture and popular culture, insisted that culture is more than the visible sign of a special type of cultivated people, and called culture "ordinary" because it is fundamental to each individual in every society. Williams saw communication as an integral part of culture because ideas, meanings, experiences, and activities are transmitted through language, in the form of certain communication rules, models, and conventions. Language, he said, is a socially shared, reciprocal activity that is a basic element of all material social practices. Every society is somewhat different and creates its own traditions and meanings through an ongoing and active process of negotiation and debate.

In Marxism and Literature (1977), Williams outlined his own theoretical position-cultural materialism. Cultural materialism combines an emphasis on creative and historical agency that privileges experience as a fundamental part of any cultural analysis. It insists that all cultural practices, such as newspaper articles, poems, paintings, novels, political speeches, and buildings, be considered as practical communications that are created by a particular group of people or class in a historically specific place and time. Williams saw individuals as active participants who help to create their own culture, and he suggested that cultural practices should be studied along with historically specific social relations that relate to these practices.

While much of Williams's work thematically reflects his Welsh origin, his concepts are not culture specific; they address universal humanistic considerations. Throughout his career, Williams resisted traditional academic disciplines, categories, and boundaries. He did not distinguish between the imaginative and factual types of writing and insisted that both are cultural practices within an ongoing social process, produced by a specific society, in a particular historical time, under specific political and economic conditions. He considered *Culture and Society, The Long Revolution,* and his first novel, *Border Country* (1960), to be the integral parts of his trilogy on culture.

Often considered to be one of the great European socialist intellectuals, Williams remained politically engaged throughout his life. His writings liberate previously marginalized thought and provide historically based analyses of ideas that transcend race, class, gender, and cultural boundaries.

See also: Culture and Communication; Language and Communication; Society and the Media.

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BONNIE S. BRENNEN

WILSON, HALSEY WILLIAM (1868-1954)

H. W. Wilson, founder of one of the first commercially successful bibliographic and indexing enterprises, contributed to the spread of bibliographic citation as a research practice, promoted the genre of reference publishing, and helped standardize library collections, especially in North American public and school libraries. Based first in Minneapolis, then in White Plains, New York, and later in New York City, by the time Wilson died the H. W. Wilson Company published more than twenty major indexing and reference services, including the Cumulative Book Index and the Readers' Guide to Periodical Literature. Wilson's business success resulted from a combination of factors: close attention to quality, efficient production methods, a unique pricing system, collaboration with his chief customers and his chief competitor, and the longterm dedication of talented key employees-many of them women. By 1998, one hundred years after its founding, the H. W. Wilson Company fully espoused digital technology, producing fifteen fulltext databases, nineteen indexes, a website (http://www.hwwilson.com/) and many additional library-related publications.

Born in Wilmington, Vermont, on May 12, 1868, Wilson was the son of stonecutter John Thompson Wilson and Althea Dunnell Wilson, both of whom died of tuberculosis when Wilson was only three years old. The boy went to live with relatives on a farm near Waterloo, Iowa, and later studied at the University of Minnesota. In 1889, to help finance their studies, Wilson and his roommate started a business to provide textbooks to faculty and fellow students. The bookstore, which was located first in their bedroom and later in a university basement, prospered, and commerce overtook education. Wilson never graduated from the university, and after three years he bought his partner out of the bookstore.

In 1895, Wilson married university student Justina Leavitt, and together the couple expanded the business venture. Wilson began a current awareness service for customers, which helped them keep abreast of rapidly increasing numbers of new books. However, the lack of a single trade catalog made this task difficult. What he needed, Wilson decided, was a monthly cumulative list of new publications. Others (including Frederick Leypoldt of Publishers' Weekly) had attempted to provide a comprehensive trade catalog, but costs had always proved overwhelming. Wilson's new catalog-the Cumulative Book Index (CBI)-combined new entries with the old in each monthly issue throughout the year, culminating in a single cumulated volume. However, instead of discarding the Linotype slugs created for the initial entries, he cut costs by interfiling them for reuse in the cumulated numbers. Organized by author, title, and subject, the CBI eventually became the standard record of books published in English. In 1901, with the launching of his general periodical index-the Readers' Guide to Periodical Literature (RG)-Wilson created a similar publication for the fast-expanding magazine industry. By making accessible the articles that had hitherto been buried in journal back numbers, RG stimulated research practices that in turn demanded more specialized indexes. In response, Wilson went on to found the Industrial Arts Index (1913) and the Agricultural Index (1916) and to manage the Index to Legal Periodicals and the Public Affairs Information Service. Subsequent indexes included Education Index (1929), Art Index (1929), Bibliographic Index (1938), Biography Index (1946), Play Index (1949), and Short Story Index (1953).

Aware that his principal market consisted of libraries, Wilson consciously cultivated the goodwill and collaboration of librarians. He included periodicals in RG, for instance, only after carrying out regular opinion surveys among practicing librarians. The publications from Wilson also aided library collection development with the 1905 introduction of the *Book Review Digest*, followed by *Children's Catalog* (1909), *Standard Catalog for Public Libraries* (1918; later titled *Public*

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Library Catalog), Standard Catalog for High School Libraries (1926), and Fiction Catalog (1942). Other publications for librarians included the journal Wilson Library Bulletin (1914), the Sears List of Subject Headings (first edited by employee Minnie Earl Sears in 1923), and the periodical index Library Literature (1936). These products contributed to a rationalization and standardization that helped shape library collecting, reference, and cataloging practices for decades.

Initially, Wilson's indexing ventures required subsidy from the old bookstore. Recognizing the need for self-sustainability, Wilson devised a pricing system intended to make his indexes affordable to large and small libraries and booksellers alike, while still achieving commercial viability. He called this system the "service basis," basing it on use rather than ownership. Instead of paying a flat fee for the number of volumes received, libraries paid a variable fee depending on the number of periodicals in their collection, a principle that foreshadowed pricing systems later adopted for digital databases. Wilson made another move to achieve sustainability when, in 1911, he reached agreement with his main competitor, Richard Rogers Bowker (by then publisher of Publishers' Weekly, Library Journal, and several indexes), to divide up the market and reduce overlap. Wilson undertook more frequent cumulations of CBI, added new journals to RG, and transferred to Bowker his directories of librarians and booksellers, while Bowker dropped some rival publications, including a periodical index.

Throughout his long career (which ended with his death on March 1, 1954), Wilson realized his visions with the help of several dedicated and ingenious women, including Justina Leavitt Wilson and employees Marion E. Potter, Edith Phelps, and Anna L. Guthrie. Firmly antiunion, Wilson ran his company as a "family," with himself the ever-present paterfamilias. Employees appreciated his unremitting hard work, austere lifestyle, and dedication to quality, and they rewarded him with their loyalty. Two symbols-a thirty-foot lighthouse atop a bronze book mounted on the roof of the company's building and a dime-store mousetrap on Wilson's deskrepresented his striving for bibliographic enlightenment and his continual search for product improvement.

See also: Bibliography; Cataloging and Knowl-Edge Organization.

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CHRISTINE PAWLEY

WIRELESS TELECOMMUNICATIONS

See: Telecommunications, Wireless

WITTGENSTEIN, LUDWIG (1889-1951)

Among the foremost philosophers of the twentieth century, Ludwig Wittgenstein made important contributions to the philosophy of logic, theory of meaning, and philosophical psychology and methodology.

Wittgenstein was born into a wealthy Viennese family and began his education in engineering, before turning his attention to problems of mathematical logic and the philosophy of language. He studied with Bertrand Russell at Cambridge University, where he developed a unique perspective on emerging topics of analytic philosophy. He combined an extraordinary rigor of logical methods with a penetrating, uncompromising demand for clarity and philosophical justification of many aspects of logic and mathematics about which working theorists in the field, including Russell, were willing to take for granted. After World War
I, in which he served as an artillery officer in the Austrian army, Wittgenstein's reflections on logic and philosophy took a more ethical and aesthetic turn, due in part to his wartime experience, but also due to the influence of his early reading of the *Bible* and works by Arthur Schopenhauer and Leo Tolstoy.

Wittgenstein's philosophy is divided into early and later periods. In the early period, usually dated from 1912 to 1922, Wittgenstein was preoccupied with the task of developing a formal semantics for possible languages and the proper understanding of formal symbolic logic. He believed that language could only be meaningful if sentences are analyzable into ultimate atomic constituents that stand in one-to-one correspondence with possible facts that the sentences represent as a logical picture of the world. Specifically, Wittgenstein's Tractatus Logico-Philosophicus (1922) interprets all propositions as describing facts that collectively constitute the world. Sentences in colloquial language are conventional sign-system expressions for what on analysis in their transcendental symbolic aspects are concatenations of names for simple objects. Therefore, the meaning of a proposition is explained in Wittgenstein's early picture theory of meaning as a one-to-one correspondence between the articulated combinations of simple names that constitute fully analyzed propositions and the assemblages of simple objects that constitute the atomic facts that propositions describe. A proposition is true in Wittgenstein's analysis just in case the possible state of affairs it pictures actually occurs. Language, and with it all communication of information, is meaningful only insofar as it describes contingent empirical states of affairs. Wittgenstein limits meaningful expression to whatever can be said, which he distinguishes from the transcendental aspects of language that can only be shown by the picturing relation in the correspondence of simple names and simple objects.

The saying-showing distinction supports Wittgenstein's efforts to eliminate all traditional philosophical problems as literally nonsensical, which he argues cannot arise except through a misunderstanding of the logic and semantic requirements of language. The simple objects are the substance of the word, according to Wittgenstein's metaphysics of "logical atomism" in the *Tractatus*, because the same objects must exist in different configurations constituting different atomic facts in

different, logically possible worlds. If it were not so, Wittgenstein argues, then there could be no extrasemantic foundation for semantics, and the meaning of a sentence would have to depend on the meaning of another sentence, in a semantic circle or infinite regress that contradicts the assumption that at least some language is determinately meaningful. All possible language in its symbolic aspect can be specified in terms of the sum total of logical combinations of names for all possible existent or nonexistent atomic facts interpreted as all possible combinations of simple objects. Wittgenstein describes the totality of meaningful expressions in a language by what he terms the general form of proposition, which he conceives as a truth functional operation on all elementary propositions that picture all atomic facts. The general form of proposition demarcates the class of all possible language, of all possible meaningful expressions, and, hence, of all meaningful thought. It thereby excludes as meaningless all efforts to use language to express ethical or aesthetic values (which Wittgenstein regards as one and indistinguishable), logical and mathematical form, forms of representation, the self as a subject of intentional states, religious awe and the sense of the mystical, whatever can be shown rather than said, and, finally, all traditional pseudoconcepts, pseudoproblems, and pseudopropositions of traditional philosophy. Wittgenstein concludes that there are no meaningful philosophical problems or philosophical theses and that the only proper task for philosophy is the clarification of meaning and the debunking of efforts to use language improperly to express anything that is not a logically contingent proposition about a logically contingent state of affairs.

After a seven-year hiatus, during which he taught schoolchildren in the Austrian Alps and worked on artistic and architectural projects, Wittgenstein decided that he might once again have something of interest to contribute to philosophy. In his later development, after 1929, Wittgenstein rejected the picture theory of meaning but continued to regard ethics as deeply rooted in common social practices or "forms of life." In his *Philosophical Investigations* (1953) and other posthumously published writings, on which he continued to work until shortly before his death, Wittgenstein regards philosophy as a kind of therapy for eliminating philosophical problems that arise through the misunderstanding of language. It

is no part of philosophy to offer a positive doctrine of right and wrong, good and evil, but only to explain what Wittgenstein calls the "philosophical grammar" of these terms as they can permissibly be used in the language of ethics. The business of philosophy is to arrive at a correct understanding of meaning, rather than to formulate and defend substantive commitments to particular doctrines. As in the Tractatus, Wittgenstein in the later period resists the idea of philosophy as a discipline like pure science, which has a special subject matter and special methods of inquiry. Instead, he continues to see philosophy as a method of clarifying meaning in order to arrive at a perspective from which all traditional philosophical problems evaporate. The later Wittgenstein interprets meaning in terms of rule-governed "language games," in which linguistic and extralinguistic activities are fully integrated with ordinary nonphilosophical human purposes, and in which language is an instrument or tool whose meaning cannot be disassociated from its use in a language game.

See also: LANGUAGE AND COMMUNICATION; LAN-GUAGE STRUCTURE.

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WORLD WIDE WEB

See: Internet and the World Wide Web

WRITERS

Writing is essential to many professional careers but can also be a career itself. Most freelance writers of fiction, drama, or poetry must support their work with secondary jobs unless they have produced a bestseller or achieved an outstandingand long-standing-reputation. Other types of writing are financially viable in commercial or academic settings. These include journalism; research in science, social science, and the humanities; literary criticism; philosophical essays and commentary; reviewing; scriptwriting in both film and television; and advertising and marketing. The importance of writing has increased as the Internet-with its various forms of e-mail, listservs, Usenet newsgroups, online publishing, and Web forums-increasingly dominates communications and extends the verbal mobility of an individual.

Some writers approach their craft as an art form and practice it in strict isolation; others approach it as a product, using teamwork strategies to brainstorm and articulate ideas into a final format. All writing depends on fluency of language, which begins in childhood and develops during primary, secondary, and graduate phases of education. Talent is only the beginning. Good writers evolve through effort, usually over a long period of maturation, but in their career they have an advantage over those who must employ physical skills that deteriorate with age. Theoretically, the wisdom that comes from experience will only enhance the skill, style, and scope of a writer.

One interesting way to discuss the enormous range of activity among writers is to divide writing into creative, factual, and interpretive forms, with generous allowance for combinations. The term "creative writing" is somewhat misleading, since creative and critical processes are involved in every kind of writing, but this is the term commonly used to cover the creation of poetry, drama, short stories, novels, and various other fictional genres. Creative writing depends on the freedom to blend the real and the imagined outside a framework of factual accuracy. Factual writing, on the other hand, requires objective fidelity to known facts—inasmuch as objectivity is individually and culturally possible. Factual writing can take the form of reporting or synthesizing information for news services, magazines, research journals, textbooks, and other nonfiction publications. Interpretive writing involves the critical analysis of fictional and factual texts, or of physical, sociopolitical, intellectual, psychological, cultural, and historical phenomena. The preparation and apprenticeship for these various kinds of writing vary, as do the careers connected with them.

The work of writing stories, poems, and plays traditionally has not required formal training. The best preparation for a writer is reading widely, writing constantly, and surviving the challenge of an unstructured career and income. The lifestyle of the writer of fiction has often been romanticized. In fact, self-discipline is fundamental, since the deadlines of a poet or novelist are generally self-imposed unless the individual is under contract—a happy situation that few attain without an established track record of publication. (Saul Bellow, one of the most successful and revered American novelists of the twentieth century, writes every morning without fail, consigning the rest of the day to teaching, reading, and other activities that stimulate and feed into his work. Similarly, renowned poet William Merwin maintains a daily writing schedule and fiercely protects his time and privacy to do so.) Since the financial rewards for young writers are precarious, and loneliness is more likely than public response, self-discipline depends on a deep commitment, even compulsion, to write for writing's sake. Moreover, writers shelve or throw away much more than they publish-there is a common saying that the wastebasket is a writer's best friend. Days, weeks, and even years may go by between truly productive periods. With persistent time and attention, however, writers are often surprised by unexpected ideas and solutions that seem to surface from subconscious processes.

The critical exercise of revising is as important as creating an initial draft, and some writers benefit from an editor or peer group to give them feedback on the clarity and effects of their work. Those who pursue a Master of Fine Arts (MFA) degree in creative writing have a built-in structure for this phase, in the form of professors who mentor them and fellow students who can form the nucleus of a lifelong network. The MFA not only provides these benefits within a context that allows time for concentrated writing, but also enables graduates to teach creative writing as a means of supporting their own work.

Whereas the MFA is optional for a successful career in creative writing, a master's degree in journalism has become essential for entering the profession of reporting, including news coverage in print and electronic media. Reporters are typically assigned a particular "beat" (e.g., the police station, city hall, and so on) or subject (e.g., education, culture, sports, politics) in which they investigate newsworthy events, interview witnesses, cultivate sources, and write up accounts based on fact-checking that is double-checked by editors before presentation on television or in print. The ethics of journalism have been subject to close scrutiny when reporters or feature writers make up what they do not know, attribute quotes inaccurately, or assemble composite stories based on representative but not actual situations. Ideally, the more knowledge a reporter builds in a particular area, the more reliable the information. Many other kinds of factual writing either depend on or benefit from the authority of a writer who holds a doctorate degree or has other advanced training. Some textbook publishers even refuse to publish a work written by a nondegreed author, no matter how experienced, and most academic journals assume specialized credentials for articles reporting on or summarizing research in science, social science, and the humanities.

An interesting contrast is the writing of advertisements, where truth and accuracy acquire a commercial standard of measurement, and success derives from effective persuasion rather than objectivity. Writers of advertisements use facts selectively to present products in their best light, competing for the attention of readers or viewers with quick, clever, repetitive, mnemonic phrases. An undergraduate degree in marketing or a Master of Business Administration (MBA) degree can boost a career in commercial writing, but a brilliant portfolio of sample advertisements may be just as convincing.

On a higher intellectual plane is the attempt to persuade readers of a theory through interpretive writing. Sociopolitical commentary, literary analysis, art criticism, and biblical interpretation are all examples of writing based on facts, documents, or data related to support a stated viewpoint. History

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depends on who is telling it, and interpretive writing, especially in areas such as biography, can edge close to creative writing when authors must use their imaginations to fill in the gaps of a life long gone. Writing a story, then, can take the form of creating, reporting, or interpreting—each process with patterns of its own—or an innovative blend of all three.

See also: Editors; Internet and the World Wide Web; Storytellers; Storytelling.

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Betsy Hearne

WRITING

See: Alphabets and Writing; Literacy; Writers



XENOPHOBIA

See: Intercultural Communication, Interethnic Relations and

YOUTHS AND MEDIA VIOLENCE

See: Violence in the Media, Attraction to

ZOOLOGY

See: Animal Communication

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