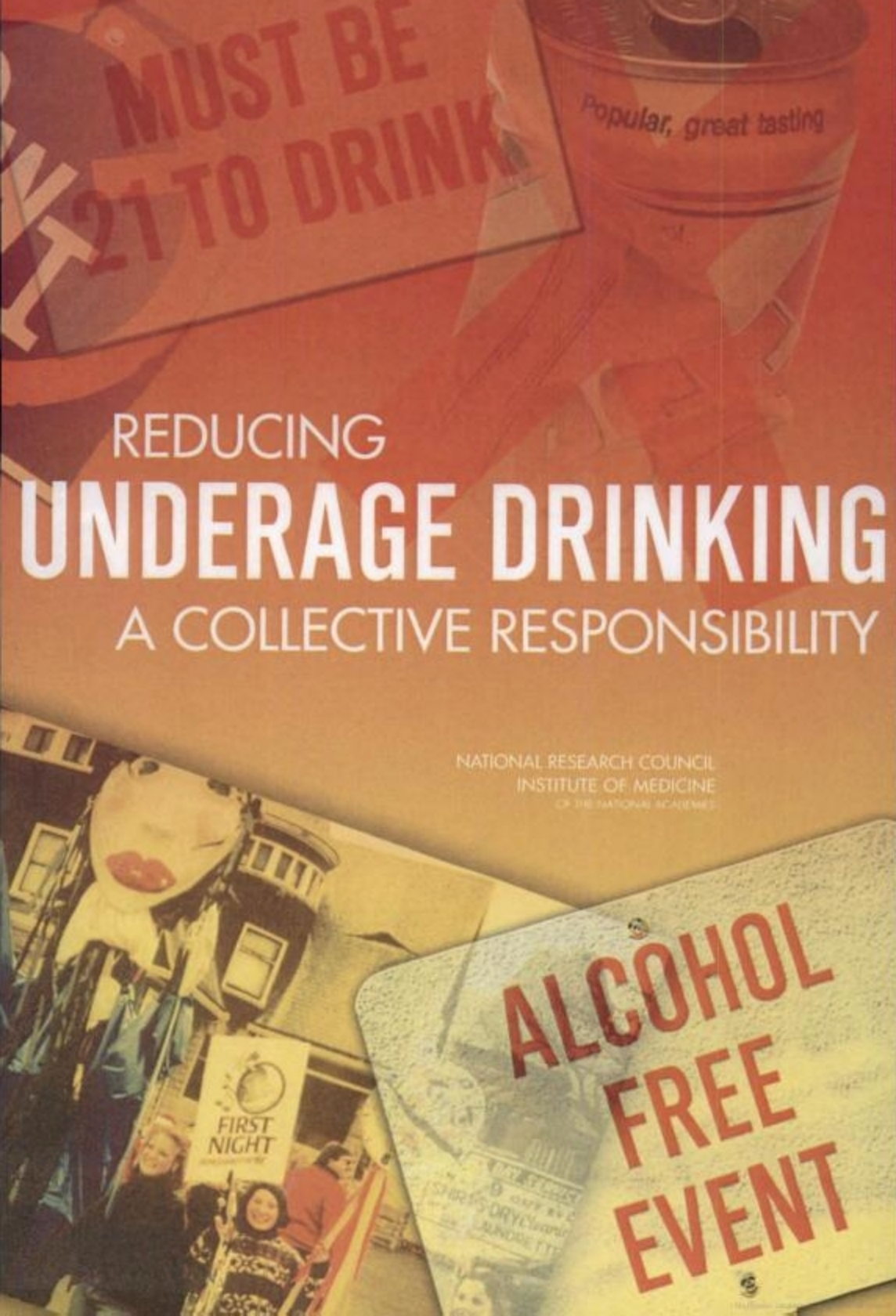

REDUCING UNDERAGE DRINKING

A COLLECTIVE RESPONSIBILITY

NATIONAL RESEARCH COUNCIL
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

REDUCING
UNDERAGE DRINKING
A COLLECTIVE RESPONSIBILITY

Committee on Developing a Strategy to Reduce and Prevent Underage Drinking

Richard J. Bonnie and Mary Ellen O'Connell, Editors

Board on Children, Youth, and Families
Division of Behavioral and Social Sciences and Education

NATIONAL RESEARCH COUNCIL
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Cover: First Night celebrations are meant to recapture the symbolic significance of the passage from the old year to the new; to unite the community through a shared cultural celebration; to deepen and broaden the public appreciation of the visual and performing arts; to help revitalize the urban core of a community; and to offer a family-friendly, alcohol-free alternative to traditional New Year's Eve revelry. For more information or to find a First Night Celebration near you go to www.firstnight.com.

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Acknowledgments

In addition to the expertise and hard work of the committee members, we benefited from the expertise and intellectual insights of a range of leaders in the field who enthusiastically contributed to the project. Numerous leading researchers wrote papers on a range of topics that helped to inform the work of the committee; see Appendix D for a list of their names.

Most of these papers were presented by the lead author and discussed at an October 2002 workshop, and many of the papers are on the CD-ROM attached to the inside back cover. The many participants at this workshop (see Appendix B) helped to enrich the discussion. The committee is grateful for their insights. The committee would also like to acknowledge contributions of Robert Pandina, Rutgers University, who shared his extensive expertise as a respondent at the workshop.

In November 2002 numerous individuals and organizations concerned with underage drinking provided written and verbal comments to the committee on their research findings, priorities, and concerns. We are thankful for the tireless, continued efforts of these groups; see Appendix C for the meeting agenda and participants. The committee also thanks Jeff Arnett, University of Maryland, for his insightful comments on youth perspectives at the November meeting.

Dozens of stakeholders and scientists provided program materials, literature, and other written materials or responded to requests for information from the committee; see Appendix D.

This report has been reviewed in draft form by individuals chosen for

their diverse perspectives and technical expertise, in accordance with procedures approved by the Report Review Committee of the National Research Council (NRC). The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process.

We thank the following individuals for their review of this report: David S. Anderson, Center for the Advancement of Public Health, George Mason University; Johnnetta Davis-Joyce, Pacific Institute for Research and Evaluation, Calverton, MD; Mary Jane England, Regis College; Susan Ennett, Department of Health Behavior and Health Education, University of North Carolina; Rob MacCoun, Goldman School of Public Policy and Boalt Hall School of Law, University of California at Berkeley; Michael Moore, Darden School of Business, University of Virginia; Rosalie Pacula, RAND, Santa Monica, CA; Seth J. Schwartz, Center for Family Studies, Department of Psychiatry and Behavioral Sciences, University of Miami School of Medicine; Jose Szapocznik, Center for Family Studies, Department of Psychiatry and Behavioral Sciences, University of Miami School of Medicine; Larry Wallack, School of Community Health, Portland State University; and Henry Wechsler, Harvard School of Public Health.

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations nor did they see the final draft of the report before its release. The review of this report was overseen by David S. Cordray, Institute for Public Policy Studies, Vanderbilt University, and John E. Dowling, The Biological Laboratories, Harvard University. Appointed by the National Research Council, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

Several people reviewed specific papers to add to the assessment of committee members and staff and the comments on them from workshop participants. The committee thanks the following people for their review of one or more papers: George Balch, Balch Associates; Maxine Hayes, Washington State Department of Health; Ralph Hingson, Department of Social and Behavioral Sciences, Boston University; Bernard Murphy, Center for Policy Analysis and Training, Pacific Institute for Research and Evaluation; Robert Pandina, Center for Alcohol Studies, Rutgers University; Cheryl Perry, Division of Epidemiology, School of Public Health,

University of Minnesota; Henry Saffer, National Bureau of Economic Research; and Susan Tapert, Department of Psychiatry, University of California, San Diego.

The committee recognizes the support provided by members of the Board on Children, Youth, and Families under the leadership of Michael Cohen. We are grateful for the leadership and support of Susanne Stoiber, executive officer of the Institute of Medicine; Michael Feuer, executive director of the NRC's Division of Behavioral and Social Sciences and Education; his predecessor, Barbara Torrey; Jane Ross, director of the Center for Economic and Social Sciences; and Susan Cummins, former director of the Board on Children, Youth, and Families.

Finally, the committee benefited from the support and assistance of several members of The National Academies staff. Joah Iannotta and Susan McCutchen provided valuable assistance in collecting, summarizing, and organizing materials and helping draft sections of the report. The research needs of the project were greatly aided by the able assistance of Georgeann Higgins of the NRC library. Anthony Mann managed numerous and sometimes complicated administrative responsibilities. We are indebted to Eugenia Grohman, who worked with us on several revisions and provided superb editorial guidance; and Yvonne Wise, who helped prepare the report for publication.

We also acknowledge Michael Biehl, University of California, San Francisco, who tirelessly prepared analyses of National Household Survey on Drug Abuse data and provided invaluable assistance to the committee.

Richard J. Bonnie, *Chair*
Mary Ellen O'Connell, *Study Director*
Committee on Developing a Strategy
to Reduce and Prevent Underage
Drinking

Contents

BACKGROUND PAPERS*

*The background papers are not printed in this book but are on the CD-ROM attached to the inside back cover.

Preface

By the time children are seniors in high school, about 30 percent are drinking heavily at least once a month. And 40 percent of full-time college students and more than 36 percent of other young adults (ages 18-22) report heavy drinking.

The consequences and costs of youthful alcohol use are enormous. Many of these harmful consequences are immediate and all too evident—injuries due to impaired driving or violence, sexual assault and unwanted pregnancies, and educational failure. The best available estimate places the annual social cost of underage drinking at $53 billion, far exceeding the costs of youthful use of illegal drugs. In recognition of the enormity of the problem, Congress asked the National Academies to develop a strategy for reducing and preventing underage drinking.

This is a daunting challenge. To what extent can public policy really affect underage drinking when alcohol is so widely used and approved by adults and when youthful indulgence is so often overlooked or condoned? After all, "kids will be kids." Presumably, the answer depends on whether instruments of public policy can affect the main determinants of underage drinking, particularly the factors associated with the most harmful features of underage alcohol use.

Some people believe that the dangers of underage drinking are at least partly attributable to the very fact that it is "underage" (i.e., illegal) conduct. Obviously, lowering the minimum drinking age would (by definition) reduce the amount of "underage" drinking. More importantly, according to some experts, at least some of the harmful drinking practices of underage

drinkers would not occur if their drinking were lawful. People who hold this view often point to European countries with lower drinking ages where, they claim, young people learn to drink under the supervision of adults and are not as inclined to drink heavily. The facts do not support this view, however. As the committee demonstrates in this report, countries with lower drinking ages are not better off than the United States in terms of the harmful consequences of youths' drinking. And one thing we do know for sure is that raising the drinking age to 21 in the United States has saved many thousands of lives. That is why Congress enacted the National Minimum Drinking Age Act of 1984, using the leverage of federal highway funds to induce every state to raise the drinking age to 21.

It turns out that the patterns and consequences of youthful drinking are closely related to the overall extent and patterns of drinking in the society, and they are affected by the same factors that affect the patterns of adult consumption. From this standpoint, it is possible that the most effective way to reduce the extent and adverse consequences of youthful drinking would be to reduce the extent and consequences of adult drinking. It is clear, however, that Congress intended for the committee to focus on youth drinking, rather than developing a strategy targeting adult drinking as well as youth drinking. This is what the committee has done.

The report outlines the committee's proposed strategy in detail. Substance abuse prevention is typically targeted on young people themselves—to persuade them to abstain and try to keep the dangerous substance out of their hands. At the center of the committee's strategy, however, is the judgment that parents and adults must be the main target of a strategy to reduce and prevent underage drinking. In requesting this report, Congress was specifically seeking advice about the message that should be conveyed to young people, especially in a national media campaign. However, in the committee's view, if we do no more than pepper kids with anti-drinking messages, things are not likely to get any better. We have to do more. We have to resolve, as a national community, to reduce underage drinking and the problems associated with it and to take comprehensive measures to achieve this goal. If we do this without equivocation, there is a reasonable prospect of success. And success—measured in many thousands of young lives and futures saved—is well worth the investment.

Richard J. Bonnie, *Chair*
Committee on Developing a
Strategy to Reduce and Prevent
Underage Drinking

REDUCING
UNDERAGE DRINKING

Executive Summary

Alcohol use by young people is dangerous, not only because of the risks associated with acute impairment, but also because of the threat to their long-term development and well-being. Traffic crashes are perhaps the most visible of these dangers, with alcohol being implicated in nearly one-third of youth traffic fatalities. Underage alcohol use is also associated with violence, suicide, educational failure, and other problem behaviors. All of these problems are magnified by early onset of teen drinking: the younger the drinker, the worse the problem. Moreover, frequent heavy drinking by young adolescents can lead to mild brain damage. The social cost of underage drinking has been estimated at $53 billion including $19 billion from traffic crashes and $29 billion from violent crime.

More youth drink than smoke tobacco or use other illegal drugs. Yet federal investments in preventing underage drinking pale in comparison with resources targeted (mostly to youths) at preventing illicit drug use. In fiscal 2000, $71.1 million was targeted at preventing underage alcohol use by the U.S. Departments of Health and Human Services (HHS), Justice, and Transportation. In contrast, the fiscal 2000 federal budget authority for drug abuse prevention (including prevention research) was 25 times higher, $1.8 billion; for tobacco prevention, funding for the Office of Smoking and Health, only one of several HHS agencies involved with smoking prevention, was approximately $100 million, with states spending a great deal more with resources from the states' Medicaid reimbursement suits against the tobacco companies.

Although it is illegal to sell or give alcohol to youths under age 21, they

do not have a hard time getting it, and they often get it from adults. More than 90 percent of twelfth graders report that alcohol is "very easy" or "fairly easy" to get. And when underage youths drink, they drink more heavily and recklessly than adults. They report that they "usually" drink an average of four and a half drinks, an amount very close to the threshold of five drinks typically used to define heavy drinking (also referred to as binge drinking). In contrast, adult drinkers report usually drinking fewer than three drinks.

In response to a congressional request in the HHS fiscal 2002 appropriations act, the Board on Children, Youth, and Families of the National Research Council and the Institute of Medicine formed the Committee on Developing a Strategy to Reduce and Prevent Underage Drinking. The committee was directed to review a broad range of federal, state, and nongovernmental programs, from environmental interventions to programs focusing directly on youth attitudes and behaviors, and to develop a cost-effective strategy to reduce and prevent underage drinking. In conducting this review, the committee relied on the available scientific literature, including a series of papers written for the committee, public input, and its expertise.

The committee conducted its work within the framework of the current national policy establishing 21 as the minimum legal drinking age in every state. We concentrated more on population-based primary prevention approaches rather than on individually oriented approaches.

STRATEGY OVERVIEW

The committee reached the fundamental conclusion that underage drinking cannot be successfully addressed by focusing on youth alone. Youth drink within the context of a society in which alcohol use is normative behavior and images about alcohol are pervasive. They usually obtain alcohol—either directly or indirectly—from adults. Efforts to reduce underage drinking, therefore, need to focus on adults and must engage the society at large.

The preeminent goal of the recommended strategy is to create and sustain a broad societal commitment to reduce underage drinking. Such a commitment will require participation by multiple individuals and organizations at the national, state, local, and community levels who are in a position to affect youth decisions—including parents and other adults, alcohol producers, wholesalers and retail outlets, restaurants and bars, entertainment media, schools, colleges and universities, the military, landlords, community organizations, and youths themselves. The nation must collectively pursue opportunities to reduce the availability of alcohol to underage

drinkers, the occasions for underage drinking, and the demand for alcohol among young people.

THE STRATEGY

The committee's proposed strategy for broad societal commitment to reduce underage drinking has ten main components.

National Adult-Oriented Media Campaign

Most adults express concern about youth drinking and support public policy actions to reduce youth access to alcohol. Nonetheless, youth obtain alcohol from adults. Parents tend to dramatically underestimate underage drinking generally and their own children's drinking in particular. The first component in the strategy calls for the development of a media campaign, including rigorous formative research on effective messages, aimed at increasing specific actions by adults meant to reduce underage drinking and decreasing adult conduct that facilitates underage drinking.

Recommendation 6-1: The federal government should fund and actively support the development of a national media effort, as a major component of an adult-oriented campaign to reduce underage drinking.

Partnership to Prevent Underage Drinking

Despite laws that aim to preclude drinking by those under the age of 21, a significant amount of underage drinking occurs, generating revenues for producers, wholesalers, and retailers of alcoholic beverages, especially beer. The alcohol industry has declared its commitment to reducing underage drinking and has invested in programs with that aim. However, the outcomes of these efforts are not always apparent, and the motives are sometimes questioned. A partnership between the alcohol industry, government, and other private partners would facilitate a coordinated, evidence-based approach to reduce and prevent underage drinking.

Recommendation 7-1: All segments of the alcohol industry that profit from underage drinking, inadvertently or otherwise, should join with other private and public partners to establish and fund an independent nonprofit foundation with the sole mission of reducing and preventing underage drinking.

Alcohol Advertising

A substantial proportion of alcohol advertising reaches an underage audience and is presented in a style that is attractive to youths. For example, television alcohol advertisements routinely appear on programs for which the percentage of underage viewers is greater than the percentage of underage youths in the population. Although a clear causal link between advertising and youth consumption has not been established, youth exposure to advertising and marketing of products with particular appeal to youths should be reduced. Strengthened self-regulation would be in keeping with the industry's stated commitment to avoid sale to minors and with recommendations by the Federal Trade Commission (FTC) in 1999 regarding industry advertising standards. Only one company has adopted the FTC's 1999 recommendation that the industry create independent external review boards to address complaints regarding violations of advertising codes. In light of constitutional constraints on direct advertising restrictions, and to enable the industry to be responsive to public concerns about advertising, the most fruitful governmental response would be to facilitate public awareness of advertising practices.

Recommendation 7-2: Alcohol companies, advertising companies, and commercial media should refrain from marketing practices (including product design, advertising, and promotional techniques) that have substantial underage appeal and should take reasonable precautions in the time, place, and manner of placement and promotion to reduce youthful exposure to other alcohol advertising and marketing activity.

Recommendation 7-3: The alcohol industry trade associations, as well as individual companies, should strengthen their advertising codes to preclude placement of commercial messages in venues where a significant proportion of the expected audience is underage, to prohibit the use of commercial messages that have substantial underage appeal, and to establish independent external review boards to investigate complaints and enforce the codes.

Recommendation 7-4: Congress should appropriate the necessary funding for the U.S. Department of Health and Human Services to monitor underage exposure to alcohol advertising on a continuing basis and to report periodically to Congress and the public. The report should include information on the underage percentage of the exposed audience and estimated number of underage viewers of print and broadcasting alcohol advertising in national markets and, for television and radio broadcasting, in a selection of large local or regional markets.

Entertainment Media

Since artistic expression inevitably reflects the culture in which it is embedded, it is hardly surprising that alcohol use and alcohol products are frequently displayed or mentioned in prime-time television, movies, and music. Although the viewing or listening audiences for most of these media products are predominantly adult, some of them are disproportionately underage, and even the predominantly adult audiences inevitably include large numbers of young people. As in the case of commercial alcohol advertising, the entertainment media have a social responsibility to eschew displays or lyrics that portray underage drinking in a favorable light or that glamorize or promote alcohol consumption in products that are targeted toward or likely to be heard or viewed by large underage audiences. Labeling and notice requirements have been voluntarily adopted in analogous contexts. Although the industry restrictions should be undertaken on a voluntary basis, some independent oversight and public awareness of these standards is warranted.

Recommendation 8-1: The entertainment industries should use rating systems and marketing codes to reduce the likelihood that underage audiences will be exposed to movies, recordings, or television programs with unsuitable alcohol content, even if adults are expected to predominate in the viewing or listening audiences

Recommendation 8-2: The film rating board of the Motion Picture Association of America should consider alcohol content in rating films, avoiding G or PG ratings for films with unsuitable alcohol content, and assigning mature ratings for films that portray underage drinking in a favorable light.

Recommendation 8-3: The music recording industry should not market recordings that promote or glamorize alcohol use to young people; should include alcohol content in a comprehensive rating system, similar to those used by the television, film, and video game industries; and should establish an independent body to assign ratings and oversee the industry code.

Recommendation 8-4: Television broadcasters and producers should take appropriate precautions to ensure that programs do not portray underage drinking in a favorable light, and that unsuitable alcohol content is included in the category of mature content for purposes of parental warnings.

Recommendation 8-5: Congress should appropriate the necessary funds to enable the U.S. Department of Health and Human Services to conduct a periodic review of a representative sample of movies, televi-

sion programs, and music recordings and videos that are offered at times or in venues likely to have a significant youth audience (e.g., 15 percent) to ascertain the nature and frequency of lyrics or images pertaining to alcohol. The results of these reviews should be reported to Congress and the public.

Limiting Access

Limiting youth access to alcohol has been shown to be effective in reducing and preventing underage drinking and drinking-related problems. Since 21 became the nationwide legal drinking age, there have been significant decreases in drinking, fatal traffic crashes, alcohol-related crashes, and arrests for "driving under the influence" (DUI) among young people. Given the widespread availability of alcohol and easy access by underage drinkers, minimum drinking age laws must be enforced more effectively, along with social sanctions. The effectiveness of underage drinking laws could be enhanced through such approaches as compliance checks, server training, zero tolerance laws, and graduated driver licensing laws.

Recommendation 9-1: The minimum drinking age laws of each state should prohibit

- **purchase or attempted purchase, possession, and consumption of alcoholic beverages by persons under 21;**
- **possession of and use of falsified or fraudulent identification to purchase or attempt to purchase alcoholic beverages;**
- **provision of any alcohol to minors by adults, except to their own children in their own residences; and**
- **underage drinking in private clubs and establishments.**

Recommendation 9-2: States should strengthen their compliance check programs in retail outlets, using media campaigns and license revocation to increase deterrence.

- **Communities and states should undertake regular and comprehensive compliance check programs, including notification of retailers concerning the program and follow-up communication to them about the outcome (sale/no sale) for their outlet.**
- **Enforcement agencies should issue citations for violations of underage sales laws, with substantial fines and temporary suspension of license for first offenses and increasingly stronger penalties thereafter, leading to permanent revocation of license after three offenses.**
- **Communities and states should implement media campaigns in conjunction with compliance check programs detailing the program, its purpose, and outcomes.**

Recommendation 9-3: The federal government should require states to achieve designated rates of retailer compliance with youth access prohibitions as a condition of receiving relevant block grant funding, similar to the Synar Amendment's requirements for youth tobacco sales.

Recommendation 9-4: States should require all sellers and servers of alcohol to complete state-approved training as a condition of employment.

Recommendation 9-5: States should enact or strengthen dram shop liability statutes to authorize negligence-based civil actions against commercial providers of alcohol for serving or selling alcohol to a minor who subsequently causes injury to others, while allowing a defense for sellers who have demonstrated compliance with responsible business practices. States should include in their dram shop statutes key portions of the Model Alcoholic Beverage Retail Licensee Liability Act of 1985, including the responsible business practices defense.

Recommendation 9-6: States that allow Internet sales and home delivery of alcohol should regulate these activities to reduce the likelihood of sales to underage purchasers. States should

- **require all packages for delivery containing alcohol to be clearly labeled as such;**
- **require persons who deliver alcohol to record the recipient's age identification information from a valid government-issued document (such as a driver's license or ID card); and**
- **require recipients of home delivery of alcohol to sign a statement verifying receipt of alcohol and attesting that he or she is of legal age to purchase alcohol.**

Recommendation 9-7: States and localities should implement enforcement programs to deter adults from purchasing alcohol for minors. States and communities should

- **routinely undertake shoulder tap or other prevention programs targeting adults who purchase alcohol for minors, using warnings, rather than citations, for the first offense;**
- **enact and enforce laws to hold retailers responsible, as a condition of licensing, for allowing minors to loiter and solicit adults to purchase alcohol for them on outlet property; and**
- **use nuisance and loitering ordinances as a means of discouraging youth from congregating outside of alcohol outlets in order to solicit adults to purchase alcohol.**

Recommendation 9-8: States and communities should establish and implement a system requiring registration of beer kegs that records information on the identity of purchasers.

Recommendation 9-9: States should facilitate enforcement of zero tolerance laws in order to increase their deterrent effect. States should

- **modify existing laws to allow passive breath testing, streamlined administrative procedures, and administrative penalties and**
- **implement media campaigns to increase young peoples' awareness of reduced blood alcohol content (BAC) limits and of enforcement efforts.**

Recommendation 9-10: States should enact and enforce graduated driver licensing laws.

Recommendation 9-11: States and localities should routinely implement sobriety checkpoints.

Recommendation 9-12: Local police, working with community leaders, should adopt and announce policies for detecting and terminating underage drinking parties, including:

- **routinely responding to complaints from the public about noisy teenage parties and entering the premises when there is probable cause to suspect underage drinking is taking place;**
- **routinely checking, as a part of regular weekend patrols, open areas where teenage drinking parties are known to occur; and**
- **routinely citing underage drinkers and, if possible, the person who supplied the alcohol when underage drinking is observed at parties.**

Recommendation 9-13: States should strengthen efforts to prevent and detect use of false identification by minors to make alcohol purchases. States should

- **prohibit the production, sale, distribution, possession, and use of false identification for attempted alcohol purchase;**
- **issue driver's licenses and state identification cards that can be electronically scanned;**
- **allow retailers to confiscate apparently false identification for law enforcement inspection; and**
- **implement administrative penalties (e.g., immediate confiscation of a driver's license and issuance of a citation resulting in a substantial fine) for attempted use of false identification by minors for alcohol purchases.**

Recommendation 9-14: States should establish administrative procedures and noncriminal penalties, such as fines or community service, for alcohol infractions by minors.

Youth-Oriented Interventions

Although the proposed strategy focuses mainly on adult attitudes and behavior toward underage drinking and on reducing the availability of alcohol to underage youth, approaches that directly target youth are also needed. A national youth-oriented media campaign to reduce and prevent underage drinking would be premature in the absence of more evidence supporting this approach. However, effective education-oriented approaches in schools and other settings aimed at preventing alcohol use by youths, as well as interventions with youths who have already developed alcohol problems, play a role. Interventions that rely on provision of information alone, or that focus on increasing self-esteem or resisting peer pressure, have not been demonstrated to be effective.

Residential colleges and universities have witnessed serious drinking problems among students under 21. Despite efforts by nearly all campuses to address this problem, heavy drinking has not declined over the past decade. Residential colleges and universities are in a unique position to develop and evaluate comprehensive approaches that address both individual and population-level issues.

Recommendation 10-1: Intensive research and development for a youth-focused national media campaign relating to underage drinking should be initiated. If this work yields promising results, the inclusion of a youth-focused campaign in the strategy should be reconsidered.

Recommendation 10-2: The U.S. Department of Health and Human Services and the U.S. Department of Education should fund only evidence-based education interventions, with priority given both to those that incorporate elements known to be effective and those that are part of comprehensive community programs.

Recommendation 10-3: Residential colleges and universities should adopt comprehensive prevention approaches, including evidence-based screening, brief intervention strategies, consistent policy enforcement, and environmental changes that limit underage access to alcohol. They should use universal education interventions, as well as selective and indicated approaches with relevant populations.

Recommendation 10-4: The National Institute on Alcohol Abuse and Alcoholism and the Substance Abuse and Mental Health Services Administration should continue to fund evaluations of college-based interventions, with a particular emphasis on targeting of interventions to specific college characteristics, and should maintain a list of evidence-based programs.

Recommendation 10-5: The U.S. Department of Health and Human Services and states should expand the availability of effective clinical services for treating alcohol abuse among underage populations and for following up on treatment. The U.S. Department of Education, the U.S. Department of Health and Human Services, and the U.S. Department of Justice should establish policies that facilitate diagnosing and referring underage alcohol abusers and those who are alcohol dependent for clinical treatment.

Community Interventions

Community mobilization can be a powerful vehicle to implement and support interventions, especially those that target community-level policies and practices. Communities can design multipronged comprehensive initiatives that rely on scientifically based strategies and are responsive to the specific problems of their communities. College campuses and local communities have a reciprocal influence on one another in relation to student alcohol use and the need to develop complementary strategies.

Recommendation 11-1: Community leaders should assess the underage drinking problem in their communities and consider effective approaches—such as community organizing, coalition building, and the strategic use of the mass media—to reduce drinking among underage youth.

Recommendation 11-2: Public and private funders should support community mobilization to reduce underage drinking. Federal funding for reducing and preventing underage drinking should be available under a national program dedicated to community-level approaches to reducing underage drinking, similar to the Drug Free Communities Act, which supports communities in addressing substance abuse with targeted, evidence-based prevention strategies.

Government Assistance and Coordination

The ultimate responsibility for preventing and reducing underage drinking lies with the entire national community, not with government alone.

However, the federal and state governments have important responsibilities in addition to enforcing the law. These responsibilities include funding media campaigns, supporting community efforts, monitoring alcohol and entertainment industry portrayals of drinking, monitoring trends in underage drinking and the effectiveness of efforts to reduce it, coordinating multiple agency activities, and supporting continued research and evaluation.

Recommendation 12-1: A federal interagency coordinating committee on prevention of underage drinking should be established, chaired by the secretary of the U.S. Department of Health and Human Services.

Recommendation 12-2: A National Training and Research Center on Underage Drinking should be established in the U.S. Department of Health and Human Services. This body would provide technical assistance, training, and evaluation support and would monitor progress in implementing national goals.

Recommendation 12-3: The secretary of the U.S. Department of Health and Human Services should issue an annual report on underage drinking to Congress summarizing all federal agency activities, progress in reducing underage drinking, and key surveillance data.

Recommendation 12-4: Each state should designate a lead agency to coordinate and spearhead its activities and programs to reduce and prevent underage drinking.

Recommendation 12-5: The annual report of the secretary of the U.S. Department of Health and Human Services on underage drinking should include key indicators of underage drinking.

Recommendation 12-6: The Monitoring the Future Survey and the National Survey on Drug Use and Health should be revised to elicit more precise information on the quantity of alcohol consumed and to ascertain brand preferences of underage drinkers.

Alcohol Excise Taxes

Alcoholic beverages are far cheaper (after adjusting for overall inflation) today than they were in the 1960s and 1970s. While raising excise taxes, and therefore prices, would have some effect on alcohol use by adults, price has been documented to have a differential effect on youth alcohol consumption patterns. Taxes can also be a source of revenue for funding strategies aimed at reducing underage drinking and its associated harms.

Recommendation 12-7: Congress and state legislatures should raise excise taxes to reduce underage consumption and to raise additional revenues for this purpose. Top priority should be given to raising beer taxes, and excise tax rates for all alcoholic beverages should be indexed to the consumer price index so that they keep pace with inflation without the necessity of further legislative action.

Research and Evaluation

Rigorous research and evaluation are needed to assess the effectiveness of specific interventions and to ensure that future refinements of the strategy are grounded in evidence-based approaches. Research related to prototype development for the proposed adult media campaign is a core component of the strategy outlined in this report. In addition, continued research and evaluation are necessary to develop new approaches aimed at reaching all segments of the underage population.

Recommendation 12-8: All interventions, including media messages and education programs, whether funded by public or private sources, should be rigorously evaluated, and a portion of all federal grant funds for alcohol-related programs should be designated for evaluation.

Recommendation 12-9: States and the federal government—particularly the U.S. Department of Health and Human Services and the U.S. Department of Education—should fund the development and evaluation of programs to cover all underage populations.

In sum, our proposed strategy calls for development of a national campaign to engage adults in a concerted effort to stop enabling or ignoring youth drinking. The proposed strategy calls on the alcohol industry to enter a partnership with government and other private funders to implement a coordinated, evidence-based approach to reducing underage drinking. It proposes steps to increase compliance with laws against selling or providing alcohol to minors. It calls for reducing youth exposure to alcohol advertising or music and other entertainment with products and ads that glorify drinking. It recognizes the potential importance of school-based education approaches and the need for residential colleges and universities to implement comprehensive approaches. It calls on local leaders to apply the multiple tools available to address underage drinking within the context of their communities. And it challenges federal and state governments to coordinate their efforts and to raise excise taxes to reduce underage consumption and raise revenues for the proposed strategy. Finally, it recommends ongoing monitoring and continued research and evaluation to facilitate continued refinement of the strategy and its implementation.

1

Introduction: The Challenge

Alcohol use by children, adolescents, and young adults under the legal drinking age of 21 produces human tragedies with alarming regularity. Motor vehicle crashes, homicides, suicides, and other unintentional injuries are the four leading causes of death of 15- to 20-year-olds, and alcohol is a factor in many of these deaths. Indeed, so many underage drinkers die in car crashes that this problem, by itself, is a major national concern. In relation to the number of licensed drivers, young people under age 21 who have been drinking are involved in fatal crashes at twice the rate of adult drivers (National Highway Traffic Safety Administration, 2002a).

Car crashes are the most visible and most numbing consequences of underage drinking, but they represent only a small proportion of the social toll that underage drinking takes on the present and future welfare of society. Other damaging problems include dangerous sexual practices that lead to both serious disease and unwanted pregnancies, unintentional injuries, fights, and school failures that lead to expulsions or withdrawals. Levy et al. (1999) estimated that in 1996 underage drinking led to 3,500 deaths, 2 million nonfatal injuries, 1,200 cases of fetal alcohol syndrome, and 57,000 cases of treatment for alcohol dependence. Worse yet, underage drinking reaches into the future by impeding normal development and constricting future opportunities. Conservatively estimated, the social cost of underage drinking in the United States in 1996 was $52.8 billion (Pacific Institute for Research and Evaluation, 1999).

For many children, alcohol use begins early, during a critical developmental period: in 2002, 19.6 percent of eighth graders were current users of alcohol (use within the past 30 days), which can be compared with 10.7 percent who smoked cigarettes and 8.3 percent who used marijuana. Among each older age cohort of high school students, the prevalence, frequency, and intensity of drinking increase, contributing to increasing rates of educational failure, injury, and death as children move from grade to grade. By the time young people are seniors in high school, almost three-quarters (71.5 percent) report having drunk in the past year, almost half (48.6 percent) are current drinkers, and more than one-quarter (28.6 percent) report having had five or more drinks in a row in the past 2 weeks (Johnston et al., 2003). Among 18- to 22-year-olds, 41.4 percent of full-time college students and 35.9 percent of other young adults report heavy drinking (Substance Abuse and Mental Health Services Administration, 2002). Heavy childhood and teenage drinking injures the developing brain and otherwise interferes with important developmental tasks. In addition, children and adolescents who begin drinking early are more likely than others to wind up with alcohol problems throughout their adult lives.

The public is certainly aware of these problems, especially drunk driving by teens. However, recent surveys demonstrate that parents underestimate the prevalence and intensity of alcohol use by their own children and by the underage population (see Chapter 6). Moreover, as measured by media attention and government expenditures, public concern about teenage alcohol use has not been remotely commensurate with the magnitude of the problem. A telling measure of the current societal response is the large gap in the federal government's investment in discouraging illicit drug use among teenagers and in discouraging underage drinking, given that the social damage from underage alcohol use far exceeds the harms caused by illicit drug use. In fiscal 2000, the nation spent approximately $1.8 billion on preventing illicit drug use (Office of National Drug Control Policy, 2003), which was 25 times the amount, $71.1 million, targeted at preventing underage alcohol use (U.S. General Accounting Office, 2001). The amount spent on preventing underage drinking also appears to be less than the amount spent on preventing tobacco use: in fiscal 2000, the Office of Smoking and Health, only one of many agencies in the Department of Health and Human Services concerned with smoking prevention, spent approximately $100 million. In addition, the states spent a great deal more, including funds generated by the agreement that settled the states' Medicaid reimbursement suits against the tobacco companies.

There are signs that public attention to underage drinking is increasing and that the public recognizes the need to address the problem more aggressively than has thus far occurred. A recent study on public attitudes toward

underage drinking (Wagenaar et al., 2002) shows almost universal recognition of this problem. In fact, 98 percent of adults polled said they were concerned about teen drinking and 66 percent said they were "very concerned." Moreover, a majority of respondents favored strong regulatory actions, such as additional controls on alcohol sales and advertising that would "make it harder for teenagers to get alcoholic beverages." In 1999, Mothers Against Drunk Driving (MADD) added the goal of reducing underage drinking to its mission statement, and its activities and public statements increasingly reflect this focus (e.g., Mothers Against Drunk Driving, 2002). Underage drinking has also won the attention of the spouses of the nation's governors, many of whom have come together to form the Leadership to Keep Children Alcohol Free, in collaboration with the Robert Wood Johnson Foundation (RWJF) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA, part of the National Institutes of Health). In collaboration with the American Medical Association (AMA), the RWJF has also provided long-term support to 12 community and 10 university-based coalitions with the specific mission of reducing and preventing underage drinking. The AMA has itself also become increasingly active on the issue of underage drinking, calling for tighter regulation of alcohol availability, higher excise taxes, and restrictions on alcohol advertising. Members of the alcohol industry also have continued their efforts to discourage underage drinking through responsible drinking campaigns and approaches such as server, parent, and youth-oriented education and involvement in prevention efforts on college campuses.

Underage drinking has also begun to attract increased government attention in Washington. The U.S. Federal Trade Commission (FTC), at the request of Congress, recently reviewed the alcohol industry's advertising and marketing practices. Its report (U.S. Federal Trade Commission, 1999) called on alcohol companies to move toward the "best practices" in the industry "to reduce underage alcohol ad exposure." In 2003 Congress called on the FTC to revisit its inquiry into alcohol advertising and youth and to investigate if and how the recommendations issued in its 1999 report have been implemented by the alcohol industry. Advocacy groups have also urged Congress to include underage alcohol use in the major media campaign being waged against illegal drug use under the auspices of the Office of National Drug Control Policy.

THE COMMITTEE STUDY

In 2001 Congress responded to the increasing level of public concern about underage alcohol consumption by appropriating funds for a study by The National Academies. Acting through the NIAAA and the Substance

Abuse and Mental Health Services Administration of the U.S. Department of Health and Human Services (HHS), Congress requested[1] The National Academies to undertake an examination of the pertinent literature, to "review existing federal, state, and nongovernmental programs, including media-based programs, designed to change the attitudes and health behaviors of youth," and to "develop a cost effective strategy for reducing and preventing underage drinking." Based on consultations with several of the Academies' standing advisory boards, members of the Academies, and the Academies' governing bodies, the final statement of task directs the committee to examine programs ranging from environmental interventions (e.g., taxation, access restrictions) to programs focusing directly on the attitudes and behavior of young people (see Appendix A for the full statement of task).

In response, the Board on Children, Youth, and Families (BCYF) of the National Research Council and the Institute of Medicine of the National Academies established a committee of 12 members with special expertise in key domains relating to underage drinking. To supplement the expertise of its members, the committee commissioned a set of papers to provide systematic reviews of the scientific literature on determinants of underage drinking and effective ways of reducing it. Topics explored in these papers include the demographics of underage drinking; its economic and social costs; adolescent decision making and risk and protective factors; and the effectiveness of various prevention programs and approaches, including media campaigns, school-based education, pricing, and access. Draft papers were presented at public meetings in October and November 2002 (see Appendixes B and C) and subsequently reviewed and revised.[2]

Numerous programs with the common goal of reducing underage drinking have been implemented at the national, state, and local levels, by governments and nonprofit and grassroots organizations. At the federal level, the Departments of Health and Human Services (HHS), Justice, and Transportation operate several programs that specifically target underage drinking. Seven other federal agencies fund efforts that include underage alcohol use within a broader mandate (U.S. General Accounting Office, 2001). Similarly, numerous state-level agencies administer programs to reduce underage drinking. In most states, the health, human service, transportation, criminal justice, and education departments play some role. State alcohol beverage control bodies also play a role. Many communities, colleges and universities, and grassroots organizations across the country have initiated

[1]Department of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act, 2002, H.R. 3061.

[2]A select compilation of these papers is available as a CD-ROM attached to the inside back cover.

efforts to reduce underage drinking and its associated problems in their communities. The alcohol industry also has implemented a range of efforts with the goal of reducing underage drinking.

The committee reviewed the 2001 report of the General Accounting Office on federal programs. This report focused on federal funding that targets underage drinking or includes underage drinking within a broader mandate. It does not include evidence on the effectiveness of specific programs. For the programs operated by the Departments of Transportation and Justice, the report provides general information on the types of activities funded—traffic safety and enforcement of underage drinking laws, respectively. No information is provided on the HHS-funded programs or activities, the largest overall funder of targeted underage drinking activities (see Chapter 12), probably because the funds generally do not represent a national program but, rather, funding for select state or local programs or research aimed at specific aspects of the problem. Although HHS has funded evaluations of specific state and community-level programs, the committee is not aware of any national-level HHS evaluations, or national evaluations of the Department of Transportation program. Each of the federal agencies have initiatives to highlight promising practices, based on varying levels of evidence. Evaluations of state or local programs that receive federal funding that are available in the literature, are reflected in the papers prepared for the committee's study.

The largest single federal program that targets underage drinking is the Enforcing the Underage Drinking Laws (EUDL) Program, operated by the Department of Justice's Office of Juvenile Justice and Delinquency Prevention (OJJDP). A national evaluation of this program is in its fourth year, with only very preliminary outcomes information now available (see Chapter 9). The training and technical assistance center funded by the EUDL program produces a variety of materials that highlight best practices, many of which were reviewed by the committee.

The committee also reviewed written materials submitted by numerous organizations and individuals and considered both written and oral information presented at a public meeting held on November 21, 2002, by a wide range of organizations and people (see Appendix C). This input highlighted programs or approaches considered effective by diverse communities and provided insights into their attitudes and experiences. The judgments provided through this process regarding effectiveness of particular programs or interventions were primarily subjective or based on informal evaluations.

Industry representatives provided extensive materials that were reviewed by the committee on the multiple activities they fund to reduce underage drinking. Included were descriptive materials such as summaries, brochures, pamphlets, videos, and guidebooks; testimonials from commu-

nity representatives on the utility of specific activities, and an evaluation of Alcohol 101, an industry-funded college-based intervention (see Chapter 7 for further discussion of these activities).

The committee's basic charge is to provide science-based recommendations about how best to prevent and reduce underage drinking. Based on its expertise, consideration of public input, and review of the available scientific literature, including the papers written for the committee, the committee identified eight categories of programs or interventions and presents the evidence for each in the relevant chapter:

- media campaigns designed to discourage underage drinking directly, to affect the behavior of adults, and to build a broader public awareness of the nature and magnitude of the problem (Chapter 6 for adult-oriented campaigns and Chapter 10 for youth-oriented campaigns);
- measures to curtail or counteract activities by individuals or businesses, including alcohol marketing practices, that tend to encourage or facilitate underage drinking (Chapters 7 and 8);
- measures restricting youth access to alcohol in both commercial and noncommercial settings, together with programs enforcing these laws (Chapter 9);
- measures to reduce alcohol-related social harms by enforcing compliance with underage drinking restrictions, such as zero tolerance laws and other programs to reduce alcohol-related traffic injuries and criminal behavior (Chapter 9);
- educational activities undertaken by schools, colleges and universities, faith-based institutions, healthcare organizations, alcohol companies, parent associations, and other entities designed to discourage underage drinking (Chapter 10);
- community-based initiatives designed to tailor comprehensive approaches to the specific underage drinking problems of local communities (Chapter 11);
- screening, counseling, and treatment programs to assist underage drinkers who have developed alcohol problems (Chapter 11); and
- methods of increasing the price of alcohol to underage purchasers, including increases in excise taxes (Chapter 12).

It is important to recognize that implementation of any national "strategy" will depend on the cooperative actions of thousands of organizations and millions of individuals who have their own ideas about what is likely to be effective and valuable. These organizations include agencies at all levels of government (federal, state, and local) with an interest in underage drinking (e.g., alcoholic beverage control commissions, schools, and agencies responsible for law enforcement, substance abuse prevention, social ser-

vices, and public health). It also includes all the companies and establishments involved in producing, distributing, and selling alcohol—including distillers, vintners, breweries, package stores, and bars—as well as the advertising agencies that advise companies about how to position their products in different segments of the markets they seek to reach. It includes entertainment companies and other organizations that shape popular culture and affect young people's attitudes about alcohol. A key role in any national response to the problem is played by parents who set models of drinking behavior for their children and who can affect the conditions under which their children have access to alcohol products. Of course, youths themselves make important decisions—not only about their own drinking, but also about how they view the drinking of their friends and peers.

The scope of the current efforts of many national, state, local, and nongovernmental group initiatives to prevent underage drinking or the consequences of drinking, particularly drinking and driving, is impressive. These programs include educational interventions, media campaigns, and activities to support enforcement of minimum drinking age laws. Young people themselves have organized efforts to discourage drinking among their peers. While few of these activities have been evaluated in any formal way, a successful national strategy will require the continued involvement, wisdom, and experience of the range of people and organizations that have been committed to preventing and controlling underage drinking.

A CHALLENGING TASK

The committee was charged with "developing a cost-effective strategy for preventing and reducing underage drinking." As we set about this important task, it soon became evident that preventing and reducing underage alcohol use poses unusual challenges. Four of those challenges are the pervasiveness of drinking in the United States, the need for a broad consensus for a national strategy, ambivalence about goals and means, and commercial factors.

Pervasiveness of Drinking

Alcohol is readily available to adults (those over 21) through a large number of outlets for on-premise or off-premise consumption. About half of U.S. adults currently drink alcohol; among drinkers, the mean number of drinking days per month in 1999 was approximately eight.[3]

[3]Based on the committee's analysis of 2000 data from the National Household Survey on Drug Abuse.

Notwithstanding the legal ban, alcohol is also readily available to underage drinkers. In recent surveys of high school students, 94.7 percent of twelfth graders and 67.9 percent of eighth graders reported that alcohol is "fairly" or "very" easy to get (Johnston et al., 2003). Purchase surveys reveal that from 30 to 70 percent of outlets may sell to underage buyers, depending in part on their geographic location (Forster et al., 1994, 1995; Preusser and Williams, 1992; Grube, 1997). Focus groups have also indicated that underage youths typically procure alcohol from commercial sources and adults or at parties where parents and other adults have left the youths unchaperoned (Jones-Webb et al., 1997; Wagenaar et al., 1993). Wagenaar et al. (1996) reported that 46 percent of ninth graders, 60 percent of twelfth graders, and 68 percent of 18- to 20-year-olds obtained alcohol from an adult on their last drinking occasion. Commercial outlets were the second most prevalent alcohol source for youths 18 to 20. For younger adolescents, the primary sources of alcohol are older siblings, friends and acquaintances, adults (through third-party transactions), and at parties (Harrison et al., 2000; Jones-Webb et al., 1997; Schwartz et al., 1998; Wagenaar et al., 1993). National surveys of college student drinking find that a large percentage of college youth report they do not have to pay anything for alcohol, presumably because they are at a party where someone else is supplying the alcohol (Wechsler et al., 2000).

American culture is also replete with messages touting the attractions of alcohol use, which often imply that drinking is acceptable even for people under 21. Recent content analyses of television showed that alcohol use was depicted, typically in a positive light, in more than 70 percent of episodes sampled from prime-time programs shown in 1999 (Christensen et al., 2000), and in more than 90 percent of the 200 most popular movie rentals for 1996-1997 (Roberts et al., 1999b). Roberts et al. (1999b) also found that 17 percent of 1,000 of the most popular songs in 1996-1997 across five genres of music that are popular with youth contained alcohol references, including almost one-half of the rap music recordings. Positive images are also disseminated by the alcohol industry, which spent $1.6 billion on advertising in 2001 and at least twice that amount in other promotional activity. Thus, overall, young people are exposed to a steady stream of images and lyrics presenting alcohol use in an attractive light.

Need for Consensus

An effective strategy to reduce a behavior as pervasive and widely facilitated as underage drinking will depend on a public consensus about both goals and means, which will require an unequivocal commitment from a broad array of public and private institutions. If the nation is to succeed in promoting abstention or reduced consumption by minors in a country

that has more than 120 million drinkers, the need to do so has to be understood and embraced by many people in a position to reduce drinking opportunities for minors. An effective strategy will depend on adoption of public policies by authoritative decision makers about how to use tax money and public authority—for example, whether to use federal dollars to fund a national media campaign, how to enforce existing state laws banning sales to underage drinkers, or how local school boards should discipline students who drink. The process of enacting such policies will require some degree of public consensus, but this is only the start.

Ultimately, the effectiveness of government policies will depend on how enthusiastically a great many public and private agencies join in the effort to implement them. If parents, animated by a national media campaign, join local police and school boards in concerted efforts to discourage underage drinking and if alcohol distributors join with regulatory agencies to find means to deny underage drinkers easy access to alcohol, then the impact of government policies will be increased. In short, a public consensus to deal determinedly and effectively with underage drinking is needed not only to generate support for adopting strong policies, but also to make them effective. Conversely, both enactment and implementation will be seriously impeded if the public is divided or ambivalent about the importance of reducing underage drinking.

It is here that the greatest challenge lies. In the nation's diverse society, communities have differing beliefs and sensibilities about the consumption and social meaning of alcohol use in general, as well as about what should be expected and demanded of young people during the transition between childhood and adulthood. These differences contribute to varying beliefs, varying public policies, and varying individual practices regarding underage access to alcohol. Although the vast majority of families would agree that the nation as a whole has a powerful interest in reducing the negative consequences of underage drinking on society and on the youths themselves, individuals, families, groups, and communities all have different views on the wisdom and propriety of various approaches to the problem.

In this respect, surveys that show that certain steps by governments (e.g., increasing alcohol excise taxes or restricting advertising) are widely supported obscures disagreements about whether young people should be severely punished for using alcohol, whether parents should be punished for allowing parties with alcohol for youth in their homes, or whether the legal drinking age should be 21.

Ambivalence About Goals and Means

The problem of mustering a societal consensus to achieve an objective as subtle, complex, and contested as reducing underage drinking can be

seen most sharply when one compares underage drinking with illegal drug use and underage smoking. The goal of the nation's policy toward illegal drugs and tobacco—abstention by everyone—is both unambiguous and widely, if not universally, embraced. Thus, the nation aims to discourage and suppress nonmedical use of marijuana, cocaine, and other controlled substances by everyone (whatever their age) through a comprehensive legal regime prohibiting the manufacture, distribution, and possession of these drugs for nonmedical purposes. Even though tobacco products, by contrast, are lawfully available to adults, the nation's clearly expressed goal is to discourage tobacco use by everyone, by preventing initiation and promoting cessation. The messages to young people and adults in these two contexts are identical: indeed, because few people take up smoking as adults, the overall success of the nation's anti-tobacco policy depends substantially on the success of its efforts to prevent initiation among young people.

The task of developing a strategy for preventing and reducing alcohol use among young people, in contrast, faces an uncertain policy goal. A strong cultural, political, economic, and institutional base supports certain forms of drinking in the society. Unlike the goals for illegal drugs and tobacco, the nation does not aim to discourage or eliminate alcohol consumption by adults. It is probably a fair characterization to say that the implicit aims of the nation's current alcohol policy are to discourage excessive or irresponsible consumption that puts others at risk, while being tolerant of moderate consumption (at appropriate places and times) by adults (especially in light of the possible health benefits of moderate use for some populations over 40). For example, as long as others are not endangered or offended, attitudes toward intoxication (per se) vary according to religious beliefs and personal moral standards. In short, current alcohol policy rests on a collective judgment, rooted in the Prohibition experience, that the wisdom and propriety of alcohol use among adults should be left to the diverse moral judgments of the American people. This is not to say that everyone supports this stance of government neutrality. Many public health experts would like to take steps (short of prohibition) to suppress alcohol consumption as a way of reducing alcohol problems, and some conservative religious groups would take a more aggressive public stance against intoxication itself. However, the current stance of tempered neutrality seems to be widely accepted and therefore fairly stable.

In this policy context, the message to young people as well as adults about alcohol use is both subtle and confusing. The message to young people is "wait" or "abstain now," rather than "abstain always," as it is with tobacco and illegal drugs. Unlike the policies for those other products, the ban on underage alcohol use explicitly represents a youth-only rule, and its violation is often viewed as a rite of passage to adulthood. The problem

is exacerbated because the age of majority is higher for alcohol than it is for any other right or privilege defined by adulthood (e.g., voting, executing binding contracts). Explaining convincingly—to young people as well as adults—why alcohol use is permissible for 21-year-olds but not for anyone younger is a difficult but essential task for reducing or preventing underage drinking.

There is also confusion about whether messages to young people should emphasize abstention, perhaps drawing together alcohol, tobacco, and illegal drugs, or whether messages should focus on the dangers of intoxication and heavy drinking. Many people believe that abstention messages are more appropriate (and more likely to be effective) for younger teens than for older teens and college students.

This overall debate raises the same question posed by all wait rules: What is the age of demarcation between childhood and adulthood (see, generally, Zimring, 1982; Kett, 1977). The argument has been given a raw edge by the trend, in recent years, to curtail the jurisdiction of juvenile courts and to prescribe severe punishments, including the death penalty, for teenagers who commit crimes (Fagan and Zimring, 2000).

Commercial Factors

Alcohol is a $116 billion-per-year industry in the United States, catering to the tastes and needs of the more than 120 million Americans who drink. All states generate revenue from the sale of alcohol, either through excise taxes or product mark-ups, and 18 states participate in the alcohol market through retail and/or wholesale monopolies over distribution of certain alcoholic beverages. A strategy to suppress underage alcohol use must somehow be implemented in the very midst of a society replete with practices and messages promoting its use, and with a strong sector of deeply vested economic interests and the accompanying political and economic power. A significant level of underage use is inevitable under these circumstances—as an inevitable spillover effect, even if unintended by the industry—no matter what strategy is implemented. Foster et al. (2003) recently estimated that underage drinkers account for 19.7 percent of all drinks consumed and 19.4 percent of the revenues of the alcohol industry (about $22.5 billion). On the basis of the committee's independent calculations, we conclude that youth consumption falls somewhere between 10 and 20 percent of all drinks and accounts for a somewhat lower, although still significant, percentage of total expenditures (see Chapter 2).

Although a similar challenge confronts tobacco control policy makers in the effort to prevent youthful use of tobacco products, the potency and impact of tobacco industry activity are gradually being lessened by the growing consensus that tobacco is a deadly and disapproved product, that

the industry has misled its customers for decades, and that aggressive regulation is needed to prevent young people from using tobacco and otherwise to protect the public health. It is generally believed that the tobacco industry has targeted young people to maintain demand for tobacco products as older consumers quit or die, notwithstanding the industry's professed efforts, in the wake of the Master Settlement Agreement, to discourage underage use of their products. In short, public health officials and the major tobacco companies are not on the same side, and "big tobacco" is regarded as the enemy of the public's health.

In contrast, the alcohol industry is diverse and uniformly acknowledges the dangers of underage drinking. Alcohol experts generally assume that the level of adult demand for alcohol products will not be substantially affected, over the long term, by reducing underage consumption—although getting young people to wait will obviously reduce the overall level of consumption. Thus, while the commercial interests of the alcohol industry are not perfectly aligned with the public health, they are not as antagonistic to the public health as the interests of the tobacco industry. In any case, a strategy for preventing and reducing underage drinking will have a much better chance for success if it attracts the active cooperation, and at least the acquiescence, of various segments of the alcohol industry.

The effectiveness of any policy focused explicitly on reducing underage drinking will be limited by the existence of a large legitimate practice of drinking and by the power of a large industry responding to legitimate consumer demand. When alcohol is available in many home liquor cabinets, the success of strategies to discourage young people from buying at package stores will be much different than in a world where relatively few parents have stocks of alcohol. The widespread legal use of alcohol in the society affects not only cultural and individual attitudes toward drinking, but also the extent to which any youth-oriented control regime can be effective in reducing opportunities for youths' access to alcohol and drinking opportunities. One can establish a clear-cut boundary between acceptable drinking and unacceptable drinking at conceptual, policy, and legal levels, but it must be understood not only that different communities will construct that boundary differently as a matter of policy but also that the scope created for legal drinking has a profound, practical effect on the effectiveness of other policy instruments in discouraging unwanted, underage drinking.

In sum, the committee set about its task of developing a strategy for preventing and reducing underage drinking while being fully aware of the complexity of defining the public interest in this area and mindful of the severe constraints within which the strategy must be framed and implemented.

UNDERLYING ASSUMPTIONS

In conducting its work, the committee did not begin with a blank slate. Instead, we were asked to develop a national strategy given the basic framework of the nation's current policy toward underage drinking. That policy aims to delay drinking by young people as long as possible and forbids lawful access to alcohol for people under 21.

Some people argue that the delay strategy is misguided and that the legal drinking age should be lower than 21 (typically 18). According to this view, allowing drinking at younger ages would mitigate youthful desire for alcohol as a "forbidden fruit"; would provide opportunities to "learn" to drink, thereby reducing harms; and would bring the age at which youth are allowed to drink into alignment with the age at which they can join the military, vote, and participate in other aspects of adult life. Whatever the merits of this view, the committee believes that Congress intended us to work within the framework of current law, anchored in the National Minimum Drinking Age Act of 1984, and that reconsideration of the 21-year-old drinking age, and of the premises on which it is predicated, is beyond our mandate. Moreover, as a practical matter, the current policy framework, though disputed by some, rests on a strong scientific foundation, is widely accepted, and is certain to be preserved for the foreseeable future.

Because the current policy framework provides the foundation for the committee's work, and for the strategy recommended in this report, it is useful to summarize it here and to highlight its basic rationale.

Evolution of Current Policy

Until the last decades of the 19th century, society relied largely on nonlegal mechanisms of social control to constrain youthful drinking. However, in the wake of urbanization, immigration, and industrialization, alcohol came under tighter control, including bans against selling it to people under the legal age (Mosher et al., 2002). After the repeal of Prohibition in 1933, it became settled that decisions about alcohol control rested with the states, and the structure of modern alcohol regulation took shape.

Until 1970, the minimum drinking age in most states was 21. Between 1970 and 1976, 21 states reduced the minimum drinking age to 18, and another 8 states reduced it to 19 or 20 (usually as part of a more general statutory reform reducing the age of majority to 18) (Wagenaar, 1981). Proposals to restore a higher age were soon introduced, however, largely because alcohol-related automobile crashes had significantly increased among teenagers and young adults. Of the 29 states that lowered their drinking age, 24 raised the age again between 1976 and 1984. By that time, only three states allowed 18-year-olds to drink all types of alcoholic bever-

ages, while five others (including the District of Columbia) allowed 18-year-olds to drink beer and light wine while setting the age limit for distilled spirits and wine with high alcohol content at 21. Thirteen states set a uniform age of 19, and four others allowed 19-year-olds to drink beer and set the limit at 21 for other alcoholic beverages. Four states set the age at 20 for all alcohol, and the remaining 22 states set a uniform age of 21 (Bonnie, 1985).

In 1984 Congress enacted the National Minimum Drinking Age Act, as recommended by the Presidential Commission on Drunk Driving, using the threat of withholding 10 percent of federal highway funds to induce states to set the minimum drinking age at 21 for all alcoholic beverages. All states eventually complied and have a variety of mechanisms in place to enforce this restriction

The Goal of Delay

The explicit aim of existing policy is to delay underage alcohol use as long as possible and, even if use begins, to reduce its frequency and quantity as much as possible. Most people recognize that drinking itself is not the issue. Rather, the underlying challenge is protecting young people while they are growing up. Children and adolescents need to be protected in the first instance from the immediate harms that can occur when they are drinking. But they also need to be protected from the possibility that they will mortgage their own future prospects by initiating practices that could cause them permanent harm during a critical developmental period and that could lead to patterns of drinking that will worsen as they grow older.

The question is how best to go about that protective task. As indicated, some people argue that the most sensible approach is to permit drinking by young people (at least older teens) rather than trying to suppress it. In their view, a "wait" rule is not the best way to reduce the problems associated with underage drinking—at least in a society in which it is bound to occur with considerable frequency anyway. They would allow youthful drinking and focus on supervision rather than drinking per se (at least for older adolescents). In their view, a "learner's permit" for drinking is preferable to a prohibition that drives underage drinking into the shadows and sacrifices the opportunity for supervision. A learner's permit approach could be implemented in a variety of ways, such as by permitting youth access to only certain kinds of alcohol during the learning period (analogous to a graduated driving license) and by prescribing particular requirements for adult supervision.

If the drinking age were lowered, the critical question is whether the intensity of youthful drinking, and the accompanying problems, would decrease, as contended by proponents of the learner's permit approach.

Admittedly, the current approach may create incentives for heavy unsupervised drinking on the occasions where alcohol is available. However, as discussed in Chapter 9, young people who drink tend to do so heavily even in societies with a learner's permit approach.

In addition, a substantial body of scientific evidence shows that raising the minimum drinking age reduced alcohol-related crashes and fatalities among young people (Cook and Tauchen, 1984; U.S. General Accounting Office, 1987; Wagenaar and Toomey, 2002) as well as deaths from suicide, homicide, and nonvehicle unintentional injuries (Jones et al., 1992; Parker and Rebhun, 1995). Increasing the minimum drinking age to 21 is credited with having saved 18,220 lives on the nation's highways between 1975 and 1998 (National Highway Traffic Safety Administration, 1998). Voas, Tippetts, and Fell (1999), using data from all 50 states and the District of Columbia for 1982 through 1997, concluded that the enactment of the uniform 21-year-old minimum drinking age law was responsible for a 19 percent net decrease in fatal crashes involving young drivers who had been drinking, after controlling for driving exposure, beer consumption, enactment of zero tolerance laws, and other relevant changes in the laws during that time.

These findings reinforce the decision by Congress to act in 1984. In short, current national policy rests on the view, supported by substantial evidence, that delaying drinking reduces problem drinking and its consequences. The nation's legislators and public health leaders have reached the nearly uniform judgment that the benefits of setting it at 21 far exceed the costs of doing so.

The Instrumental Role of the Law

Our earlier comparison among alcohol, tobacco, and illegal drugs raises another important preliminary question—about the role of the law in the prevention of underage drinking. It is possible to imagine an official policy aiming to delay and discourage underage drinking that does not rely in any way on the coercive authority of the state to implement this policy: instead of banning underage access to alcohol by law, society might rely entirely on parenting, education, community expectations, and other mechanisms of social control to suppress youthful drinking and, for older teens, to transmit the desired drinking-related norms and to encourage adults to refrain from supplying youths with alcohol or otherwise facilitating their drinking. Various forms of social disapproval, including social and economic sanctions (e.g., not patronizing stores or bars that serve minors) can be imagined.

In contrast, the United States has decided that there must be laws against supplying alcohol to young people and that it should also be illegal for young people to possess or use alcohol, at least in public. Thus, because

the law plays such a central role in the nation's policy toward underage drinking, it is essential to clarify the functions that these laws should reasonably be expected to serve.

At the outset, it should be emphasized that a secular society seeks to delay underage drinking because it is dangerous to youths and others, not because it is inherently evil or wrong. The ban on underage drinking is an age-specific prohibition, implying that the aim is to delay alcohol use, not to condemn it or inoculate against it. For this reason, the prohibition is distinctly instrumental in nature and is not grounded in the moral disapproval that characterizes many legal prohibitions. To use a traditional legal classification, underage drinking is an example of a prohibition that is *malum prohibitum* (wrong because it is prohibited) rather than *malum in se* (wrong in itself). Punishment for an underage drinker, or even for an adult facilitator, is not an expression of public moral condemnation as is, for example, punishment for child sexual abuse or robbery.

Enforcement of prohibitions against immoral behavior serves the twin goals of reducing the harmful behavior and condemning and punishing the perpetrator for the transgression. The prohibition of underage drinking does not aim to serve this second (retributive) objective in any strong sense. Its aim is exclusively instrumental. Consequently, the measure of the prohibition's effectiveness, and of the social policy it implements, has to be whether it reduces or avoids the dangerous consequences associated with youthful drinking.

Law is a blunt instrument. It is not self-executing, and it requires the affirmative support of a substantial proportion of the population and of those who are expected to enforce it. These characteristics of a law are particularly important for instrumental prohibitions, such as the ban against underage drinking, because the level of compliance will depend heavily on the willingness of a large number of individuals to adhere to the law simply because they accept its moral authority to command their obedience. That is, a legal norm of this kind, which affects so many people in so many everyday social and economic contexts, cannot be successfully implemented based on deterrence (the threat of punishment) alone. It must rely heavily on the "declarative" or "expressive" function of the law: by forbidding the conduct, it aims to shape people's beliefs and attitudes about what is acceptable social behavior and thereby to draw on their disposition to obey.

Since the ultimate goal is to protect youths (and others within the zone of danger) from harmful consequences, one might wonder whether it is possible to implement an underage alcohol policy by focusing exclusively on the dangerous behavior rather than the drinking itself. In theory, it might be possible to define the prohibited conduct exclusively in relation to the magnitude of the risk: for example, "don't drive a car after having had alcohol" or "don't give alcohol to a youth who intends to drive a car or is

otherwise likely to behave dangerously." However, any such dangerous drinking prohibitions are extremely difficult to implement successfully and would not exert a sufficient deterrent by themselves to prevent the risky behaviors associated with underage alcohol use. As the nation's lawmakers have concluded, only a categorical prohibition of underage access to alcohol has any realistic chance of doing that, especially in a large industrial society in which the risks are pervasive (and magnified by developmental vulnerability) and where young people have large periods of time outside parental supervision and outside the reach of formal social controls. It is also relevant to note that at least one of the risks associated with underage drinking is intrinsic to the drinking itself—the permanent damage of alcohol consumption on the adolescent brain (see Chapter 3).

Given an age-based categorical prohibition aiming to serve exclusively instrumental aims, other policy judgments are needed regarding the scope of the restrictions, the severity of the prescribed sanctions, and the resources and tools that should be used to enforce the law. Banning commercial distribution of alcohol to underage persons is an essential element of the prohibition, but what about noncommercial distribution? Even if noncommercial distribution is banned, what about parental distribution to their own children in their own home? (Many states do not prohibit this distribution.) Is it also necessary to penalize young people who purchase or consume alcohol? Even in their own homes? What enforcement strategies should be used? And how severe should the sanctions be? These issues are addressed in Chapter 9. The answers require careful assessment of the possible benefits (in reducing harms associated with underage drinking) and the costs of any particular strategy. The degree of public support and the difficulty of enforcement bear on both the potential effectiveness and on the possible costs.

A POPULATION PERSPECTIVE

In requesting the National Academies to develop a strategy for reducing and preventing underage drinking, Congress clearly anticipated that we would do so from a public health perspective, reviewing the etiology and consequences of alcohol use by the underage population and assessing the effectiveness of interventions that might be deployed to reduce the prevalence of drinking in this population, particularly the patterns of consumption most clearly associated with alcohol problems. (The outcomes of interest in assessing the effectiveness of interventions are discussed in Chapter 5.) Recognizing that underage drinking substantially increases the short-term risks of death, injury, and other harms, as well as long-term risks of alcoholism and other dysfunction, a population-oriented strategy aims to lower the mean level of risk in the underage population in order "to shift

the whole distribution of exposure in a favorable direction," typically by "altering some of society's norms of behavior" (Rose, 1985, p. 371). Accordingly, we emphasize the population-oriented tools of primary prevention, rather than the individually oriented methods of secondary or tertiary prevention. Thus, identification and treatment of youths with drinking problems, or at high risk for developing such problems, and the challenge of instilling habits of responsible drinking as young people mature are addressed only incidentally in this report. These issues are important for improved policy and practice, but they are peripheral to our basic charge—delaying underage drinking and reducing its prevalence.

In developing a strategy to delay and reduce underage drinking, the committee has tried to understand the problem from two angles. First, we looked at the problem from the viewpoint of a young person deciding whether and under what circumstances to use alcohol. Our framework draws on the developing literature regarding adolescent decision making, especially in relation to health and risk behaviors. We pay particular attention to youthful decision-making abilities at various ages in the context of the changing social realities of teenage alcohol use. Some components of a comprehensive strategy must aim to help young people make the right decisions, depending on their age and developmental stage, taking account of the dangers of alcohol use at varying points in development.

It is not enough, however, to try to persuade young people to make the right choices. If the strategy relied exclusively on tools directed at changing the attitudes and behavior of underage youths, it would not have much chance of succeeding. To complement a youth-centered decision-making perspective, the committee also drew on the multidisciplinary perspective used by public policy analysts. This framework combines the disciplines of epidemiology, economics, health communications, law, and other social sciences to envision the array of policy instruments that can be brought to bear on the problem and to assess their probable effectiveness and costs, used alone or in combination.

OVERVIEW OF THE REPORT

Although the committee's recommended strategy responds to a congressional request, the report is intended for a broad audience, including parents, businesses, alcohol companies, educators, state and local policy makers and legislators, healthcare producers and retailers, practitioners, and community organizers. Our work is presented in two parts.

Part I, Chapters 2 through 4, provides important contextual information about underage drinking and its consequences and determinants. Chapter 2 discusses key definitions and presents pertinent demographic and epidemiological data regarding the scope of underage drinking and the

characteristics of underage drinkers. It includes data on the prevalence of alcohol use and drinking behavior by gender, race, and ethnicity as well as comparisons of youth and adult drinking patterns. Chapter 3 provides an account of the social consequences and costs of underage drinking.

Chapter 4 offers a context for the underlying reasons, motivations, social influences, and risk factors that influence young people's decisions about drinking. The chapter explores the specific motivations and influences relevant to young people's drinking behavior and attempts to answer why some young people choose to drink and do so intensively while others choose to drink moderately or not at all. The chapter also discusses the social environment in which young people are immersed and the ways that community and social factors affect underage drinking.

Part II, Chapters 5 through 12, presents the committee's recommended strategy to prevent and reduce underage drinking. In each of these chapters, the committee summarizes what is known about the effectiveness of existing programs or interventions in the pertinent domain and presents its conclusions and recommendations. The committee has tried to be realistic in assessing the potential effectiveness of efforts to prevent and reduce underage drinking. The committee assumes that most adults in the United States will continue to use alcohol and that most drinkers will begin their alcohol use sometime before they are 21, despite laws and policies to the contrary. Within that constraint, however, there is substantial room for preventing and reducing underage drinking in the United States, and this part of the report explores various tools that can be used in this effort.

At the heart of the committee's proposed strategy is the effort to foster a collective societal acceptance of responsibility for reducing underage drinking. Although continued efforts to speak directly to young people about the dangers of alcohol use are an important component of the committee's proposed strategy, the committee believes that the highest priority should be given to changing the attitudes and behaviors of adults. Adults often facilitate or enable underage drinking directly by supplying alcohol to young people, by failing to take effective precautions to prevent it, or by sending the message that alcohol use is to be expected. Few programs currently seek to influence parents to alter their behaviors and attitudes toward youth drinking as a way of reducing youth access to alcohol, changing permissive social norms about underage drinking, and galvanizing community action.

In Chapter 5 we explain our interpretation of the committee's charge and some of the key assumptions underlying the strategy, including the criteria for assessing effectiveness and cost. This chapter is the foundation for the rest of the report. In Chapter 6 we discuss development of a national media effort as a major component of a campaign aimed at educating parents and other adults about underage drinking and ways adults can help

reduce opportunities for youth drinking. In Chapter 7 we discuss how the alcoholic beverage industry can become a partner in the overall effort by helping to establish and fund an independent nonprofit organization charged with reducing underage drinking and by exercising greater self-restraint in advertising and promotional activity. Our messages to the alcohol industry (and other industries that benefit from a large alcohol market) are clear: Your efforts to satisfy and expand the legitimate adult market for alcohol inevitably spill over to a large underage market. Even if you do not intend to stimulate or satisfy underage demand, you derive financial benefits from it. As a society, we cannot have a substantial impact on underage drinking without your active engagement in this effort. Chapter 8 issues a similar challenge to the entertainment media, urging more attentive self-regulation to reduce exposure of children and adolescents to lyrics and images that portray drinking in an attractive way. The committee believes that market incentives can be used to reward companies, including entertainment media, who take meaningful steps to help reduce underage drinking, and to punish companies that do not. Chapter 9 explores ways to reduce youth access to alcohol through both commercial and noncommercial channels.

Chapter 10 explains why the committee does not recommend a youth-oriented national media campaign at this time, preferring instead a cautious program of research and development. It also addresses educational efforts in schools, colleges, and other settings designed to persuade young people to choose not to drink and to reduce alcohol problems. The chapter also briefly discusses programs for assisting youths with alcohol problems. Chapter 11 reviews the potential advantages of mobilizing communities to implement locally specific efforts to reduce underage drinking.

Chapter 12 identifies several ways in which the federal and state governments can help implement the proposed strategy, including through increases in excise taxes. Regulatory action by the government is not at the center of the committee's proposed strategy. The major priority, in the committee's view, is to galvanize the necessary societal commitment to prevent and reduce underage drinking. Thus, the committee focuses its attention on community action, business responsibility, public-private partnerships, and all the other institutional expressions of a genuine social movement. In this context, government has a supportive, but nonetheless indispensable, role—to provide funding (possibly through increased excise taxes on alcohol) and technical support to strengthen and enforce access restrictions, to keep regulatory pressure on the alcohol industry to act responsibly, and to monitor the effectiveness of the overall strategy.

PART I

UNDERAGE DRINKING IN THE UNITED STATES

2

Characteristics of Underage Drinking

Alcohol is the most commonly used drug among America's youth. More young people drink alcohol than smoke tobacco or use marijuana. And young people who drink tend to drink a lot. They have easy access to alcohol, largely from adults. Yet adults tend to underestimate the prevalence of underage drinking, fail to recognize the full range of negative consequences that can result, and assume that drinking is something that other children, not theirs, do (Institute of Medicine and National Research Council, 2001).

PATTERNS AND TRENDS

Despite minimum legal drinking age laws, actual drinking patterns in the United States suggest that almost all young people use alcohol before they are 21. Those who drink tend to drink much more heavily than adults. Biglan et al. (in press) estimate, based on the National Household Survey on Drug Abuse (NHSDA), that 91 percent of all drinks consumed by teenagers are consumed by those who drink heavily. In addition, the average age of first alcohol use has generally decreased since 1965, indicating that youth are starting to drink at a younger age (Substance Abuse and Mental Health Services Administration, 2003). This early onset and heavy use of alcohol poses serious concerns for healthy, unimpeded development.

According to 2002 Monitoring the Future (MTF) data, almost half (48.6 percent) of twelfth graders reported recent (within the past 30 days) alcohol use. Based on 2001 NHSDA data, more than one in four (28.5

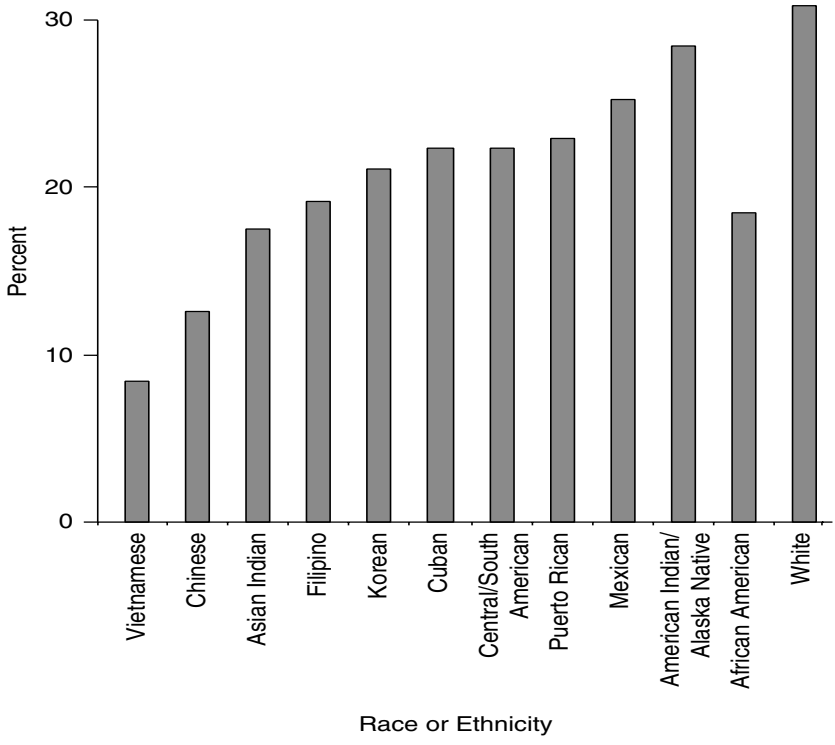

FIGURE 2-1 Past month alcohol use by 12- to 20-year-olds, by race or ethnicity: 1999-2000 annual averages.
SOURCE: NHSDA (2001).

percent) youth aged 12 to 20 have recently used alcohol. When disaggregated by racial and ethnic groups for that age group, whites reported the highest past month use of alcohol (30 percent), followed by American Indians and Alaska natives (28.4 percent), Mexican Americans (25.2 percent), and Puerto Ricans, Central and South Americans, and Cubans (22.9 percent, 22.3 percent, and 22.3 percent, respectively); see Figure 2-1.

Terminology

Multiple data sources—including the NHSDA, (now called the National Survey on Drug Use and Health), the Youth Risk Behavior Survey, and MTF—collect extensive information on the frequency and quantity of alcohol consumed (see Chapter 12 for additional discussion of these sur-

veys). To provide consistency and allow comparisons with adult consumption patterns, the majority of data presented in this report are drawn from the NHSDA.[1] However, no measures of alcohol use or patterns of use have been universally accepted (Flewelling et al., 2004), and no common terminology is used to characterize different patterns of drinking (National Institute on Alcohol Abuse and Alcoholism, 2002). For example, having five or more drinks on the same occasion has been referred to as heavy drinking, heavy episodic drinking, and binge drinking. A report by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2003) using NHSDA data, used binge drinking to refer to five or more drinks on one occasion and heavy drinking to refer to five or more drinks on at least 5 different days in the past 30 days. In the context of college drinking, binge drinking has been commonly used to refer to five or more drinks in a row for men and four or more drinks in a row for women. In other cases, binge drinking is referred to as 5 or more drinks in the last 30 days. Usage of other terms, such as heavy, frequent heavy, or heavy episodic drinking, are similarly inconsistent. For purposes of this report, the committee chose to use the terms "heavy drinking" and "frequent heavy drinking": heavy drinking refers to five or more drinks on the same occasion in the past 30 days; frequent heavy drinking refers to five or more drinks on at least five occasions in the last 30 days.

Long-Term Trends

MTF data, available for 1975-2002, document that the prevalence of drinking among high school seniors peaked in the late 1970s and then decreased throughout the 1980s. Drinking rates have been relatively stable since then, with 30-day prevalence rates hovering at approximately 50 percent throughout the 1990s. The proportion of high school seniors who reported drinking in the last 30 days was the same in 2002 as it was in 1993 (48.6 percent). The proportion of seniors who reported having five or more drinks in that past 2 weeks was higher in 2002 (28.6 percent) than it was in 1993 (27.5 percent). Rates of annual drinking show a similar pattern, but the 2003 rates are slightly lower than they were in 1993; see Figure 2-2. Although there have been modest reductions in the 30-day and annual prevalence rates for the past 5 years, current rates are not significantly different than they were in 1993, and they remain high. Nearly half (48.6

[1]Unless cited otherwise, reported NHSDA data are based either on a paper commissioned by the committee (Flewelling et al., 2004) or additional analyses conducted for the committee.

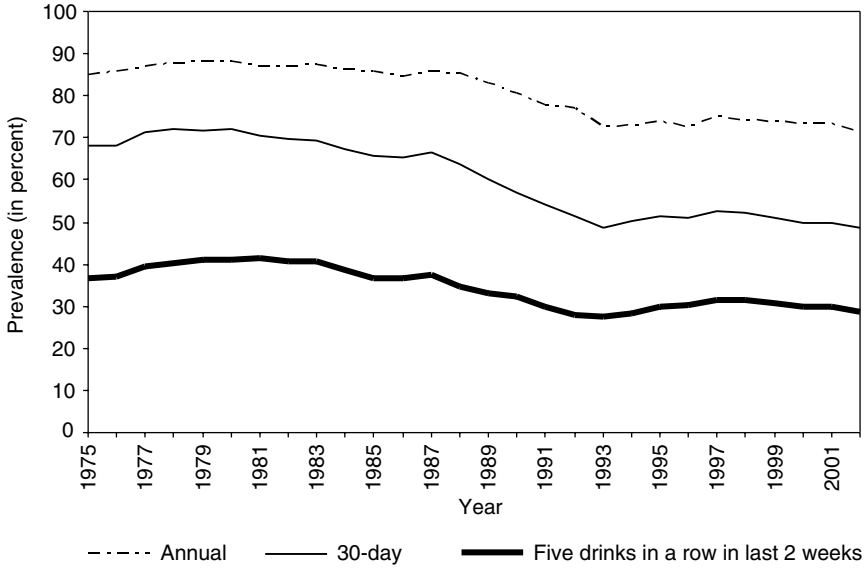

FIGURE 2-2 Long-term trends in prevalence of drinking among twelfth graders.
SOURCE: Data from the MTF online data tables.

percent) of high school seniors report drinking in the last 30 days—significantly more than the proportion of youth that report either using marijuana (21.5 percent) or smoking (26.7 percent) in the last 30 days.

NHSDA data indicate that the average age of self-reported first use of alcohol among individuals of all ages reporting any alcohol use decreased from 17.6 years to 15.9 years between 1965 and 1999. Recent studies also suggest that gender and some racial and ethnic differences are diminishing and that these groups with historically low drinking rates are moving toward the higher rates of non-Hispanic white males. Finally, while college surveys have indicated a decrease in overall drinking on college campuses over the past decade, there has been little change in heavy drinking (Wechsler et al., 2002a).

Overall Patterns

In 2000, about 9.7 million young people aged 12 to 20 had used alcohol in the past 30 days. Of these recent users, almost 6.6 million were heavy drinkers, and about 2.1 million were frequent heavy drinkers

(SAMHSA, 2003). Non-Hispanic white youth consistently report the highest prevalence of all types of drinking.

As shown in Table 2-1, underage drinkers of all ages are much more likely to drink heavily than are adults. Although drinking is very uncommon among 12- to 14-year-olds, even those in this group who drink are more likely to engage in heavy drinking than adults. With increasing age, more youth drink and more drinkers are heavy drinkers. By the ages of 18 to 20, the rate of any alcohol use in the last 30 days is identical with the rate for adults over 26, but among those who drink, the proportion of 18- to 20-year-olds who drink heavily is significantly higher than that of adults over 26. Rates of both any drinking and heavy drinking peak between ages 21 and 25, shortly after drinking has become legal.

Different patterns of adolescent alcohol use have been identified. Schulenberg and his colleagues used ten cohorts from the MTF study to identify six different trajectories for frequent drinking during late adolescence (Schulenberg et al., 1996). These included "chronic drinkers," who drank heavily in high school and continued this pattern into young adulthood (12 percent of males and 3 percent of females); the "decreased" group, who drank heavily in high school, but reduced their amount of heavy drinking as they moved into adulthood (14 percent of males and 7 percent of females); the "fling" group, who had a low rate of heavy drinking in high school, a substantial increase between the ages of 21 and 22, and a low frequency by age 23 to 34 (9 percent of males and 10 percent of females); the "rare" group, who maintained a low level of heavy drinking in

TABLE 2-1 Drinking Patterns Among Adults and Youths (in percent)

	Age				
Drinking Pattern	12-14	15-17	18-20	21-25	26+
Nondrinkers	93	74	51	38	51
Drinkers					
Alcohol use but no heavy drinking in past 30 days	51	32	29	36	61
Heavy drinking in past 30 days	42	49	45	44	29
Frequent heavy drinking in past 30 days	8	19	26	21	10

SOURCE: Data from the 2000 NHSDA.

high school and in young adulthood (15 percent of males and 18 percent of females); and the group who reported never drinking alcohol (24 percent of males and 45 percent of females). These data suggest that not all adolescents drink and that many who do drink in high school or college choose to drink less as they enter young adulthood, suggesting that both developmental and contextual factors contribute to alcohol consumption during adolescence.

Drinking Initiation

According to the most recent year that public NHSDA data on this topic are available, the average age of first use of alcohol among individuals of all ages reporting any alcohol use, based on the respondents' recall of this information, has decreased from 17.6 years in 1965 to 15.9 years in 1999 (SAMHSA 2003).[2] For 12- to 20-year-olds only, the average age of first use in 2000 is even younger—14 (Foster et al., 2003). According to Youth Risk Behavior Surveillance, United States, 2001 (Grunbaum et al., 2002), 33.7 percent of Latino youth were more likely to report drinking before age 13 than their white (28.4 percent) and African American (28.2 percent) counterparts; see Figure 2-3.

As discussed in Chapter 3, early onset is associated with a number of problematic consequences. For instance, individuals who begin drinking before the age of 15 are more likely to have substance abuse problems in their lifetimes, to engage in risky sexual behavior, and to suffer other negative consequences in comparison with those who begin drinking at a later age. However, we recognize that age of "first drink" may not be a good measure of age of onset of drinking.

How Youth Drink

Looking at data for youths, rather than just those who are drinkers, reveals similar patterns to those discussed above (see Figure 2-4): any recent use and heavy use progressively increases as youths approach the legal drinking age. Figure 2-4 also shows steady increases in frequent heavy drinking from ages 12 to 20.

Over 40 percent of 18-year-olds and a majority (56 percent) of 20-year-olds report having recently drunk alcohol. Although overall alcohol use is low for the youngest age group, almost one-half of the 12-year-olds who reported alcohol use reported having drunk heavily in the past 30 days. The

[2] "Age of first use" refers to the age respondents report having consumed at least one drink (e.g., a bottle of beer, glass of wine, shot glass of liquor, or a mixed drink), not having had "a sip or two from a drink."

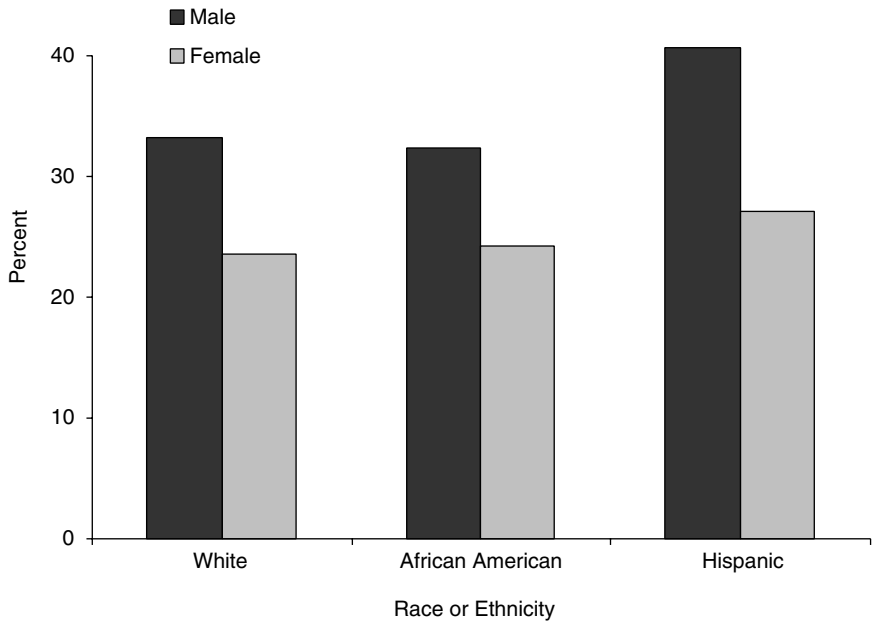

FIGURE 2-3 Students in grades 9-12 who initiated alcohol use before age 13 by sex and race or ethnicity.
SOURCE: Youth Risk Behavior Surveillance (2001, Table 26).

rate of heavy drinking doubles from age 14 (about 6 percent) to age 15 (about 12 percent) and continues to increase steadily. By age 18, more than 30 percent report heavy drinking, and at age 20 nearly 40 percent report heavy drinking. By ages 19 and 20 a full 70 percent of recent alcohol users engaged in heavy drinking.

Frequent heavy drinking also steadily increases for each age between 12 and 20. More than 10 percent of 18-year-olds and nearly 15 percent of 20-year-olds report frequent heavy drinking (Flewelling et al., 2004). When reported by race or ethnicity, white youths aged 12-20 have the highest reported rates of heavy drinking (21.4 percent), followed by American Indians and Alaska Natives (20.3 percent), Latinos (17.2 percent), African Americans (10.3 percent), and Asian Americans (7.9 percent) (SAMHSA, 2002). Data from MTF show somewhat different prevalence rates, but a similar pattern (see Table 2-2). Drinking prevalence increases as youth age, for lifetime use, use in the last 30 days, and five or more drinks in the past 2 weeks. As mentioned above, though MTF reports multiyear decreases in underage drinking (see Table 2-3) the rates remain disturbingly high. For

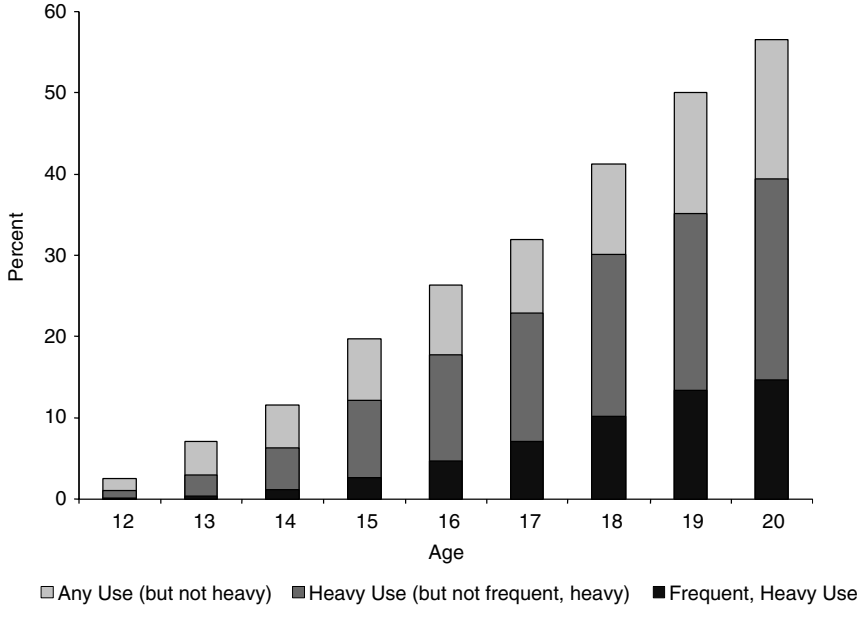

FIGURE 2-4 Prevalence of any use, heavy use, and frequent, heavy use of alcohol in the past 30 days, for youths aged 12 to 20, 2000.
SOURCE: Flewelling et al. (2004, Fig. 1).

example, despite continual decreases between 1996 and 2002 in lifetime use among junior high students (eighth graders), nearly one-half (47 percent) still report drinking in their lifetimes. Similarly, while the proportion of high school seniors who report having had five or more drinks in the past 2 weeks has decreased every year since 1998, nearly 30 percent (28.6) still report such use.

As drinking becomes legal, with the exception of 21- to 25-year-olds, the rate of heavy drinking and frequent, heavy drinking decreases substantially with increasing age (see Figure 2-5). In contrast, alcohol use that is not heavy (i.e., having fewer than five drinks on one occasion) increases and remains higher than that of underage drinkers until the age of 55. After their early 20s, adults begin to drink in a far more moderate manner than underage drinkers (SAMHSA, 2003).

TABLE 2-2 Drinking Prevalence Among Eighth, Tenth, and Twelfth Graders (in percent)

Prevalence	8th Graders	10th Graders	12th Graders
Lifetime	47.0	66.9	78.4
Last 30 days	19.6	35.4	48.6
Heavy Drinking*	12.4	22.4	28.6

*Defined as five or more drinks in a row in the previous 2 weeks.
SOURCE: Data from Johnston et al. (2003).

Overall Drinking Frequency

Although underage drinkers tend to consume alcohol more heavily than the majority of adults, they drink less frequently: 12- to 20-year-olds averaged about 6 drinking days per month, compared with slightly more than 8 days for adults (see Table 2-4). However, while adults drank less than three drinks in a day, young people reported that when they drink, they "usually" consume about four-and-a-half drinks. Again, the evidence shows that adults tend to drink fewer drinks per occasion than young people.

To examine differences more closely, the committee analyzed the same data by the number of days that current drinkers reported drinking heavily in the past month for different age groups (see Table 2-5). This more detailed analysis confirms the similar findings discussed above that drinking patterns for underage drinkers are notably different than those for the adult population. The number of drinks usually consumed on a single occasion is higher for 15- to 20-year-olds than for 21- to 25-year-olds, and is nearly double that of drinkers aged 26 and older. Underage drinkers do have far fewer drinking days than those aged 26 and older: 15- to 17-year-olds have 61 percent as many drinking days, and 18- to 20-year-olds have 80 percent as many drinking days as adults older than 26.

College Drinking Patterns

Much attention has been devoted to drinking on college campuses. A recent report from the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2002) cited data that about four in five college students drink and that, among these drinkers, about half engage in heavy drinking. A recent

TABLE 2-3 Prevalence Rates for Eighth, Tenth, and Twelfth Graders: 1993-2002 (in percent)

	1993	1994	1995	1996
Lifetime				
8th Grade	55.7	55.8	54.5	55.3
10th Grade	71.6	71.1	70.5	71.8
12th Grade	80.0	80.4	80.7	79.2
Annual				
8th Grade	45.4	46.8	45.3	46.5
10th Grade	63.4	63.9	63.5	65.0
12th Grade	72.7	73.0	73.7	72.5
Last 30 Days				
8th Grade	24.3	25.5	24.6	26.2
10th Grade	38.2	39.2	38.8	40.4
12th Grade	48.6	50.1	51.3	50.8
Five or More Drinks in a Row in the Previous 2 Weeks				
8th Grade	13.5	14.5	14.5	15.6
10th Grade	23.0	23.6	24.0	24.8
12th Grade	27.5	28.2	29.8	30.2

NOTE: Underline indicates an increase from the previous year.
SOURCE: Data from Johnston et al. (2003).

Harvard School of Public Health survey (Wechsler et al., 2002b) indicated that while the percentage of abstainers increased between 1993 and 2001, both frequent heavy drinking (defined as three or more times in the past two weeks) and drinking to intoxication also increased. Trends in college drinking over the last decade have found that the rate of self-reported heavy drinking has remained at approximately 44 percent (Wechsler et al., 2002a). Nearly half (48 percent) of all the alcohol consumed by students attending 4-year colleges is consumed by underage students (Wechsler et al., 2002b).

Multiple studies have indicated that the most likely individuals to report participation in heavy drinking are white, male, fraternity members, under the age of 24, involved in athletics, who do not hold strong religious beliefs and have a tendency to socialize a great deal (for example, cf. Wechsler et al., 2002a; Kellogg, 1999; Presley et al., 2002). However, clearly not all students fitting this profile drink, and not all drinkers share these characteristics.

Alcohol consumption rates increase significantly during the first year of college: this increased use has been attributed by some to adjustment

1997	1998	1999	2000	2001	2002
53.8	52.5	52.1	51.7	50.5	47.0
72.0	69.8	70.6	71.4	70.1	66.9
81.7	81.4	80.0	80.3	79.7	78.4
45.5	43.7	43.5	43.1	41.9	38.7
65.2	62.7	63.7	65.3	63.5	60.0
74.8	74.3	73.8	73.2	73.3	71.5
24.5	23.0	24.0	22.4	21.5	19.6
40.1	38.8	40.0	41.0	39.0	35.4
52.7	52.0	51.0	50.0	49.8	48.6
14.5	13.7	15.2	14.1	13.2	12.4
25.1	24.3	25.6	26.2	24.9	22.4
31.3	31.5	30.8	30.0	29.7	28.6

experiences that adolescents report during that first year (Kenny and Donaldson, 1991; Rice, 1992; Brooks and DuBois, 1995). The first 6 weeks of the school year have been cited as the most dangerous with respect to drinking behavior due to the increased stress levels associated with a new environment and the pressure to be accepted by a peer group (Prendergast, 1994; Werch et al., 2000; Carlson et al., 2001).

According to data from the 2000 NHSDA, 41 percent of full-time college students aged 18 to 22 engaged in heavy drinking, compared with 36 percent of young adults who were attending college part time or not at all (see Table 2-6). This difference in drinking behavior by college enrollment status was greatest among 19- and 20-year-olds. The highest rates of heavy drinking occurred for both groups at age 21, and the gap between full-time students and other young adults began to close. By age 22, the percentage of heavy drinkers subsided for both groups, although full-time college students still engaged in this behavior more often than other young adults.

There is, however, some evidence to suggest that the key variable may

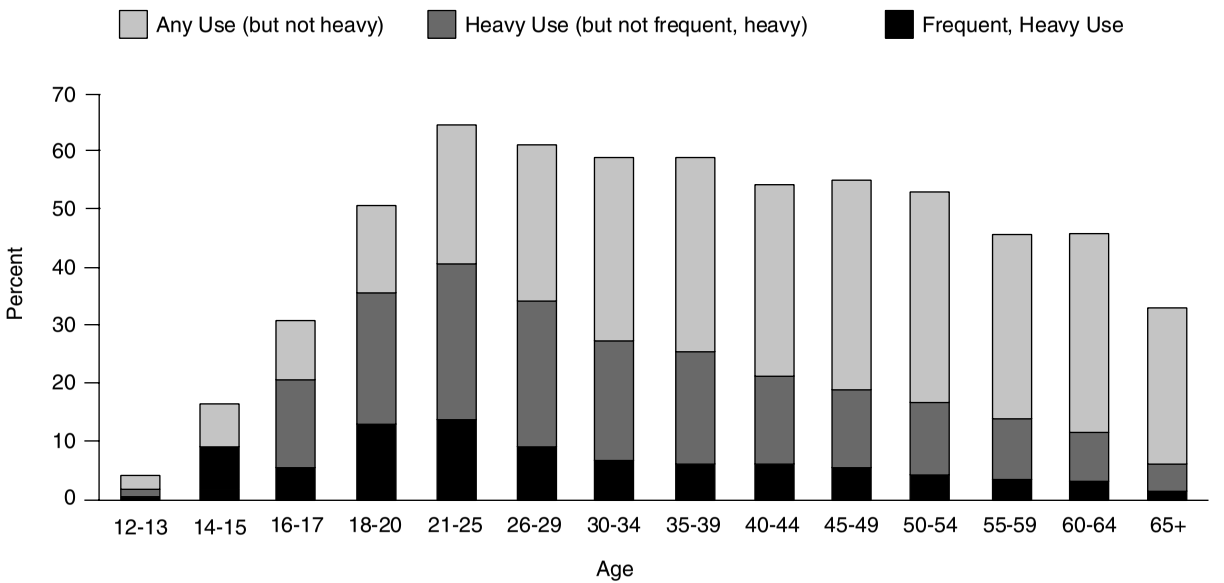

FIGURE 2-5 Past month alcohol use, by age: 2001.
SOURCE: Adapted from SAMHSA (2001, Fig. 3.1).

TABLE 2-4 Drinking Frequency and Intensity for Youths and Adults (current drinkers only)

	Age	
Frequency and Intensity	12-20	21 and older
Mean number of drinking days per month	5.79 (6.03)	8.02 (8.32)
Mean number of "usual" drinks on a drinking day*	4.48 (2.75)	2.78 (2.07)

*If respondents indicated that their usual number of drinks per occasion was some number greater than 12, that response was recoded as "missing." Missing values were imputed, using means for the same sex and age group.

NOTE: Standard deviations in parentheses.

SOURCE: Data from the 2000 NHSDA.

TABLE 2-5 Drinking Patterns for Youth and Adults (current drinkers only)

	Age				
Drinking Pattern	12-14	15-17	18-20	21-25	26+
Mean number of drinking days per month	3.40 (4.12)	4.98 (5.45)	6.54 (6.39)	6.87 (6.59)	8.16 (8.50)
Mean number of "usual" drinks on a drinking day	4.65 (8.09)	6.30 (7.70)	6.47 (8.30)	5.34 (7.71)	3.25 (5.02)
Mean number of days drank heavily per month	1.35 (2.74)	2.69 (4.09)	3.59 (5.11)	3.00 (4.76)	1.68 (4.25)

NOTE: Standard deviations in parentheses.
SOURCE: Data from the 2000 NHSDA.

be type of housing rather than college enrollment. Using data from the National Longitudinal Survey of Youth, Cook and Moore (2001) found that being in school actually reduced drinking and heavy drinking. The group with the highest prevalence of heavy drinking, other things equal,

TABLE 2-6 Past Month Heavy Drinking Among 18- to 22-Year-Olds by College Enrollment Status (in percent)

Age	Full-Time College Students	Other Young Adults	Difference Between Students and Others
18	33.8	29.8	4.0
19	39.1	31.7	9.3
20	42.9	35.6	7.3
21	48.0	43.7	4.3
22	44.8	40.7	4.1
Average, 18-22	41.4	35.9	5.5

SOURCE: Data from SAMHSA (2002).

were those living in a dormitory or fraternity house. Bachman et al. (1997) have found a similar "dormitory effect."

Race and Ethnicity

In general, drinking among racial and ethnic minorities is lower than among whites, and there is a great deal of variability across racial and ethnic groups. Among youths aged 12 to 20, drinking of all types (recent, heavy, frequent heavy) is highest for non-Hispanic whites, followed closely by Native Americans. Asian Americans and African Americans have the lowest prevalence of any racial or ethnic group. Hispanics and youth of multiple races fall about midway between the highest and lowest rates (Flewelling et al., 2004). For the 12- to 20-year-old population as a whole, the prevalence of alcohol use and heavy alcohol use increases among various racial and ethnic groups as they approach the legal drinking age (see Figures 2-6 and 2-7). "Due to sample size limitations, finer breakdowns by age groups and gender within the underage [whites, Hispanics, African Americans] population was only possible for the three major racial/ethnic groups" (Flewelling et al., 2004). This pattern holds for all three age groups and racial and ethnic groups.

Ethnic minorities consistently have lower rates of alcohol use than non-Hispanic whites, although it is unclear whether reporting bias contributes to these differences. Trend analysis of data from the Alcohol Research Group's National Alcohol Surveys showed that while rates of heavy drinking among 18- to 29-year-olds dropped between 1984 and 1995, rates among African American males remained the same (Caetano and Clark, 1998). This suggests the need to further explore explanations for racial and ethnic differences in drinking rates.

Gender

Alcohol use varies by gender as well as ethnicity. In the past, boys have consumed alcohol at notably higher rates than girls (National Center on Addiction and Substance Abuse [CASA], 2003). Unfortunately, this particular gender gap, most notably for younger children, appears to be closing. As of 2000, the prevalence of alcohol use among boys and girls aged 12 to 14 and 15 to 17 were within a few percentage points of each other (see Figure 2-6). Girls aged 12 to 14 in all three racial and ethnic groups, but most notably Hispanic girls, are actually more likely than boys to have used alcohol in the past 30 days—9.8 percent of Hispanic females, 8.3 percent of non-Hispanic white females, and 4.8 percent of African American females (see Figure 2-7). These rates compare with 6.3 percent of Hispanic males, 7.5 percent of non-Hispanic white males, and 4.2 percent of African American males. Clearly, a greater number of girls are initiating alcohol use at a younger age than boys. African American girls aged 15 to 17 also tend to drink more than African American boys of the same age. Among 18- to 20-year-olds, boys drink more than girls across the three racial and ethnic groups. However, the gap between boys and girls in each group is relatively small (see Figures 2-6 and 2-7)—for non-Hispanic whites the difference in any alcohol use in the past 30 days for 18- to 20-year-olds is 5.9 percent, 9.5 percent for Hispanics, and 8.4 percent for African Americans (with the exception of 12- to 14-year-olds). Males do consistently report engaging in heavy drinking at a higher rate than females.

In general, the differences between girls and boys is greater for heavy drinking than for recent use: for example, non-Hispanic white males aged 18 to 20 have a 13 percent higher prevalence for heavy drinking than non-Hispanic white females, compared to a 5.9 difference for any recent use. Similar patterns are observed in Hispanics and African Americans—Hispanic males have a 14.9 percent higher prevalence and African American males have an 8.6 percent higher prevalence for heavy drinking compared to their female counterparts. Males also have a higher prevalence of frequent heavy drinking than females: for example, more than 20 percent of non-Hispanic white males aged 18 to 20 are frequent heavy drinkers, compared with about 10 percent of non-Hispanic white females in this age group (Flewelling et al., 2004).

When considering these differences, however, we should be mindful of the biological differences between women and men that result in women processing alcohol more slowly. From a physiological perspective, five drinks is substantially more alcohol for a young female than a young male (NIAAA, 1990). As a result, women may be drinking somewhat less, but given their size and body weight, still drinking heavily. Acknowledging differences in body composition and alcohol metabolism, recent measures

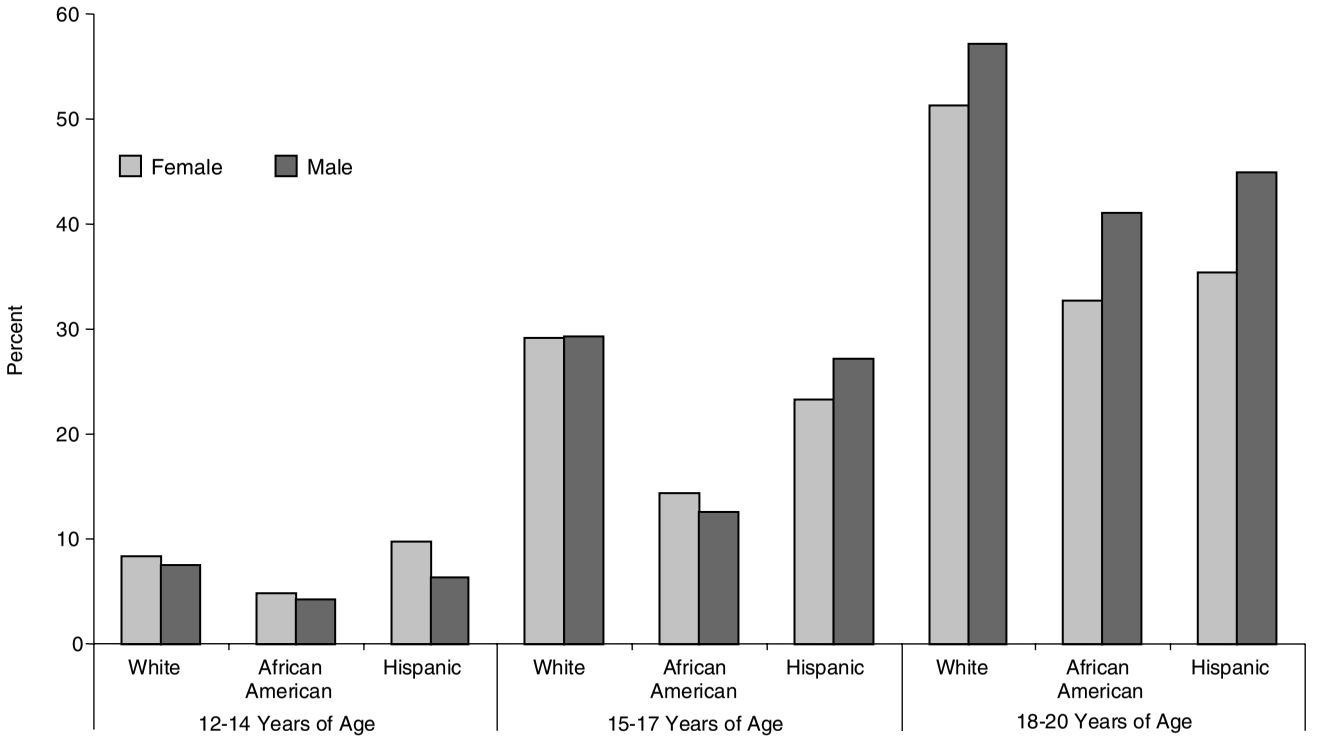

FIGURE 2-6 Any use of alcohol in the past 30 days for 12- to 20-year-olds, by gender, race or ethnicity, and age group: 2000.
SOURCE: Flewelling et al. (2004, Fig. 2).

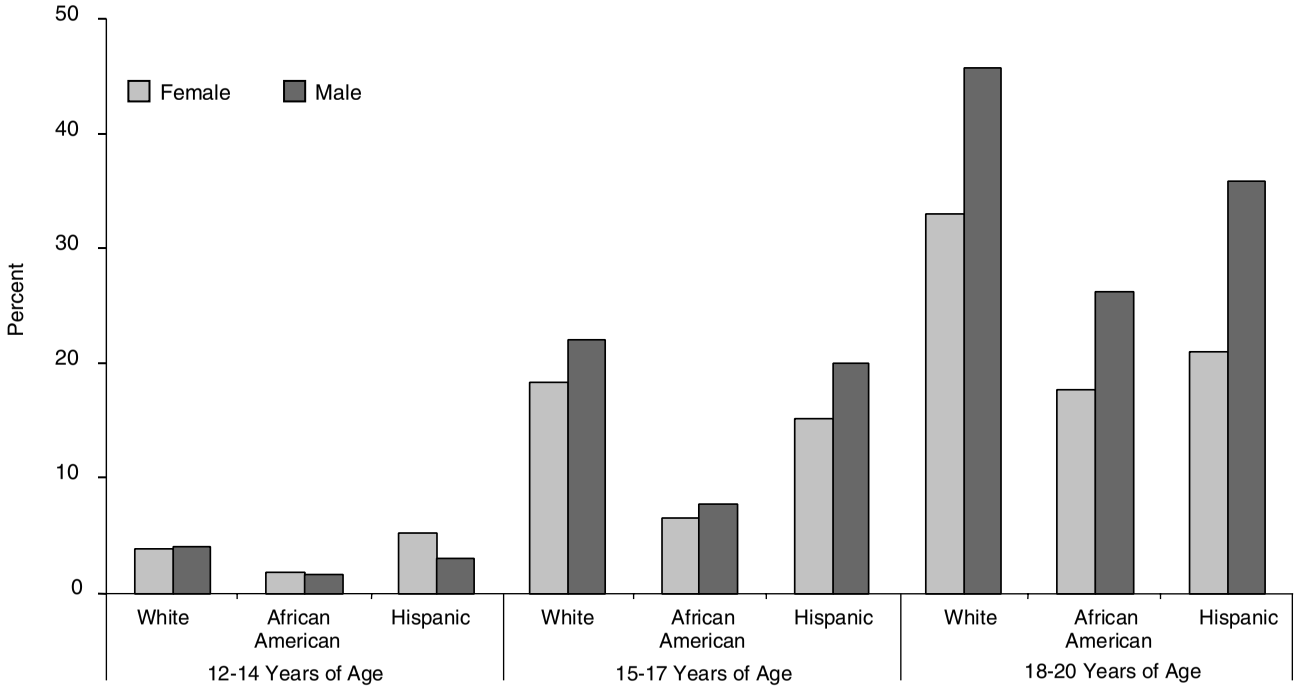

FIGURE 2-7 Heavy use of alcohol in the past 30 days for 12- to 20-year-olds, by gender, race or ethnicity, and age group: 2000.
SOURCE: Flewelling et al. (2004, Fig. 3).

of heavy drinking on college campuses modify the definition for women to four rather than five drinks in a row. Recent studies using this modified measure have reported increased rates of heavy drinking among women on college campuses; this may suggest that gender differences in heavy drinking are also beginning to erode (Wechsler et al., 2002).

Summary

Several generalizations about underage drinking emerge from these data. Substantial numbers of 12- to 14-year-olds are using alcohol, and more girls than boys are having their first drink at this age. When adolescents and young adults do drink, they generally do not drink often as adults, but they drink more heavily. Variation in prevalence and drinking patterns are found by ethnicity and gender: racial and ethnic minorities tend to have a lower prevalence than non-Hispanic whites, and although the gender gap appears to be eroding, older females (18 to 20 years) tend to have a lower prevalence than males.

While it is encouraging that racial and ethnic minority youth as a whole have lower rates of alcohol use than non-Hispanic white youth, it is notable to mention that alcohol abuse and alcohol-related problems affect these communities to varying degrees. While Asian American youth as a whole tend to have lower rates of alcohol use than other youth, specific subgroups (Koreans, 21.1 percent; Filipinos, 19.1 percent; and Asian Indians, 17.5 percent) report similar rates of past month use as some Latino subgroups (Central or South American, 22.3 percent; Cuban, 22.3 percent) and African American youth (18.5 percent) (NHSDA, 2001). Moreover, for youth aged 12 to 17, nearly one-third of all Filipinos (29.5 percent) and a quarter of all Koreans (24.9 percent) reported alcohol use within the past year (NHSDA, 2001). By ignoring the differences that occur both across and within youth subgroups, misperceptions about alcohol use among certain groups may lead to incorrect views of actual need.

It is also important to consider acculturation experiences as they affect drinking behavior. Research has shown that while newly arrived immigrants have lower rates of alcohol use, consumption and more liberal attitudes toward drinking increase as individuals become more acculturated (NIAAA, 1994; National Women's Health Information Center, 2002). This trend has serious implications for many minority communities as subsequent generations reside in the United States for longer periods of time.

OVERALL CONSUMPTION LEVELS

Efforts to estimate the proportion of alcohol consumed by underage drinkers have been bedeviled by the imprecision of quantity questions in

drinking surveys and by concerns about the differing prevalence rates that result from the three major national surveys, with the NHSDA consistently reporting the lowest prevalence. The most recent and prominent effort, by Foster et al. (2003), used the NHSDA data to estimate the number of drinks consumed during the previous 30 days by current drinkers, based on multiplying together answers to questions on the number of drinking days during that period, and on how many drinks the respondent "usually" had on a drinking day.[3] But NHSDA data were *not* used to estimate the participation rates—the proportions of the youth and adult populations that were current drinkers. Instead, the authors chose to use the Youth Risk Behavior Survey (YRBS) of the Centers for Disease Control and Prevention to estimate the proportion of underage individuals (12 to 20) who were current drinkers, and the Behavioral Risk Factor Surveillance Survey to estimate the proportion of adults who were current drinkers. These estimated participation rates were then combined with the NHSDA data on average drinks per current drinker to estimate the total amounts of alcohol consumed by youths and adults. The authors (Foster et al., 2003) calculated that underage individuals consumed 19.7 percent of the total number of drinks consumed in the United States in 1999, amounting to more than 830.6 million drinks per month. It is easy to find fault with the procedure adopted by Foster et al. (2003), but it is nonetheless not clear a priori whether the estimate is high, low, or about right. Three problems may be especially important. First, the *average* number of drinks consumed on drinking occasions is not well captured by the NHSDA item, which asks about the *usual* number of drinks. For example, a respondent who drinks a beer with supper every night and an additional six-pack on Saturday nights will "usually" drink one drink per occasion, but will drink *an average* of two drinks per occasion (14 for the week, divided by 7 days). What is not known is how each respondent interpreted this question and whether he or she then answered one or two drinks or something else. Whether this problem is greater for underage or adult drinkers is not clear, so the possible bias in the Foster et al. estimate could be either positive or negative.

Second, the YBRS does not seem well suited for estimating the participation rate for all youth aged 12 to 20 because the YRBS sampling frame is limited to youth aged 12 to 18 who are in school. Unlike the NHSDA, dropouts and older youths are not included in the YRBS. If the omitted groups have a higher drinking participation rate, as seems reasonable, then

[3]Foster et al. (2003) excluded cases that reported 50 or more drinks as the usual number of drinks consumed on days they drank in the last 30 days because the response suggest a misunderstanding of the question. It is not clear to what extent inclusion of these responses in the analysis would have changed the outcomes.

the YRBS estimate will tend to underestimate the youth participation rate, and hence underestimate the bottom line.

Third, since the prevalence rates for NHSDA youth respondents are substantially lower than for YRBS respondents and since NHSDA conducts household-based interviews only when a parent is in the home, Foster et al. (2003, p. 990) assert, reasonably enough, that "the accuracy of the responses may be suspect." In contrast, YRBS is conducted in schools. But if, as also seems reasonable, current drinkers who deny drinking in the NHSDA interview also tend to drink less than average, then these youths will be excluded from the calculation (since they have denied drinking) of the average number of drinks per self-admitted drinker and the average may be too high. (There is no analogous problem with the adult estimates.) The effect would be an overestimate.

Unfortunately, the estimate of the underage share of alcohol consumption is very sensitive to the procedure used. The somewhat elaborate procedure preferred by Foster et al. (2003) produces an estimate of about 20 percent. The more straightforward procedure of using the NHSDA data for estimating not only average quantity of drinks per drinker, but also the participation rates, produces an estimate of 10.8 percent for 2000.[4] Based on their preferred quantity estimates, the researchers then estimate the expenditures made by underage drinkers for beer, spirits, and wine. They conclude that underage drinkers spent $22.5 billion, representing 19.4 percent of total consumer expenditures for alcohol (slightly lower than the proportion of consumption because youths are more likely to consume beer, a lower priced beverage).

The procedure used by Foster et al. (2003) does not account for the differences in the average prices paid by underage youths and adults. It seems likely that youths pay less because they are less likely than adults to buy their drinks at bars or restaurants and because they may drink lower quality beverages. Unfortunately, there are no systematic data on prices paid by age. Given these problems, there is a good deal of uncertainty about the shares of total quantity consumed and total expenditures accounted for by underage drinkers. Is the true share of quantity nearer the 20 percent estimate preferred by Foster et al. based on combining selected statistics from three different surveys, or the 11 percent estimate using only the NHSDA survey data? Is it reasonable to assume (as do Foster et al.) that

[4]This estimate is computed under the assumption that respondents who reported that their "usual" number of drinks per occasion was greater than 12 had misunderstood the question. Those and other missing values were recoded with imputed values based on the age and sex of the respondent. Other reasonable assumptions and imputation procedures produce only slight differences in the estimate.

underage drinkers pay the same amount for beer or other beverages as adult drinkers or that youths tend to drink more cheaply? Current data sources do not provide reliable answers to these questions, and there is a wide range of plausible possibilities. The committee concludes that one can only say that underage youths consume in the range of 10 to 20 percent of all drinks and account for a somewhat lower, albeit still substantial, percentage of total expenditures.

CONTEXTS OF UNDERAGE DRINKING

It is apparently not difficult for youth who want to drink to readily obtain alcohol. A majority of high school students, even eighth graders, report that alcohol is "fairly easy" or "very easy" to get, with the proportion increasing from eighth to tenth to twelfth grade. Although the proportion of eighth graders who report that alcohol is fairly easy or very easy to get has decreased over the past decade, it remains more than 60 percent. For twelfth graders, the percentage is more than 90 percent (Johnston et al., 2003).

The alcohol most favored by underage drinkers is beer. Based on 2000 MTF data, high school seniors, more than one-half of males and more than one-third of females drank beer in the past 30 days. Liquor (the term used in MTF) was a close second—41.7 and 30.7 percent of males and females, respectively—with far fewer drinking wine and wine coolers.[5] Among those who reported heavy drinking, a similar pattern is found (see Figure 2-8). However, there are differences by beverage types in the relative proportion of heavy drinkers. Most beer and liquor drinkers also tend to be heavy drinkers, particularly boys. This relationship is much weaker for wine and wine coolers (Flewelling et al., 2004). Although it is reasonable to assume that youth drink beer more often than adults, data comparable to the above are not available for adults.

Young people drink in a variety of locations and situations. Drinking at one's own home, friends' homes, outdoors, and in cars or other vehicles are the most commonly reported drinking contexts for young people. For example, survey data from high school seniors in Minnesota indicate that 38 percent of drinkers reported drinking in their own home, 83 percent drinking at another person's home, 22 percent in a bar or restaurant, 46 percent outdoors, 7 percent at work, and 41 percent in a moving car or vehicle (Lee et al., 1997). Similarly, for 15- to 20-year-old drinkers in a recent survey in

[5]It is unclear whether and how youth report drinking newer alcohol products such as "alcopops," which do not neatly translate into the current MTF categories of beer, liquor, wine, and wine coolers.

FIGURE 2-8 Kind of alcohol consumed by high school seniors who are heavy drinkers, by gender.
NOTE: Heavy drinkers consumed five or more drinks in a row during the past 2 weeks.
SOURCE: Flewelling et al. (2004, Fig. 5).

California (Table 2-7), parties and outdoor venues were the most frequently reported drinking locations during the past year followed by cars (Walker et al., 2001). In this same survey, drinking in bars and restaurants was rare among younger adolescents, but increased substantially with age. Some studies suggest that drinking in supervised settings (i.e., at home with parent present) decreases with age, while drinking in unsupervised settings (i.e., parties, cars, and outdoors) increases with age (Harford, 1984). For young people, drinking in friends' homes, bars, parties, cars, and parking lots and other outdoor locations is related to higher frequency of intoxication, drinking and driving, and riding with drinking drivers than drinking in the home (Jones-Webb et al., 1997; Lee et al., 1997; Snow and Landrum, 1986; Walker et al., 2001).

TABLE 2-7 Alcohol Consumption by Specific Locations, by Age, in California

Age Group	Location				
	Party	Bar	Restaurant	Outdoors	Car
≤ 15	75.8	9.7	19.4	56.5	38.7
16-17	80.8	17.2	20.2	54.5	32.8
18-20	85.7	45.3	30.1	53.0	31.0

SOURCE: Walker et al. (2001).

3

Consequences of Underage Drinking

Underage drinking, especially heavy drinking and frequent, heavy drinking, is associated with numerous negative consequences. The consequences of alcohol use can be acute and immediate outcomes of a single episode of alcohol-impaired functioning, such as accidental death and injury, or they can be the accumulated and diverse effects of a chronic pattern of drinking, such as poor school performance and fractured relationships secondary to alcohol abuse and addiction. By ages 19 and 20, 70 percent of all drinkers engage in heavy drinking, suggesting that the majority of young people are at great risk of making poor decisions that have significant long-term consequences (Flewelling et al., 2004). But underage drinkers need not drink heavily to be at high risk of experiencing negative consequences. The crash risk associated with driving after drinking is higher for youths than for adults at all blood alcohol content (BAC) levels (Hingson and Kenkel, 2004). In other words, adolescents and young adults do not need to drink heavily to significantly increase their risk of negative consequences.

This chapter reviews some of the acute and chronic consequences of underage drinking. It covers such problems as drunk driving, as well as a range of other common consequences of acute impairment, such as violence. It also discusses long-term consequences of early drinking, including recent research on the possible effects of early onset of alcohol use on adolescent brain development.

Many adults may assume that the risks and potential consequences of underage drinking are more or less the same as they are for adults, but

research suggests that the dangers of youth drinking are magnified. In 2000, 36.6 percent of youths (under age 21) traffic fatalities involved alcohol, a rate slightly lower than the rate for adults (41.7 percent). However, when the denominator is the number of licensed drivers, drinking drivers under age 21 are involved in fatal crashes at twice the rate of adult drivers (National Highway Traffic Safety Administration, 2002a). Moreover, alcohol use among youths is strongly correlated with violence, risky sexual behavior, poor school performance, suicide, and other harmful behaviors (Hingson and Kenkel, 2004). College students are also significantly and negatively affected by their peer's drinking (Wechsler, 1996; Wechsler et al., 2001a, 2001b, 2001c), including being assaulted, having one's property damaged or experiencing an unwanted sexual advance. Recent research also suggests that adolescent drinking can inflict permanent damage on the developing brain (Brown and Tapert, 2004). And as noted in Chapter 2, early onset of alcohol use greatly increases the probability of adult alcohol dependence. In addition to the negative consequences to individual youth who drink, the costs of underage drinking to society—in lost lives, lost productivity, and increased health care costs—are substantial.

CONSEQUENCES OF ACUTE IMPAIRMENT

Alcohol impairs one's decision-making capacity. As a result, young people who drink are more likely to engage in risk-taking behavior that can result in illness, injury, and death. Acute consequences of underage drinking include unintentional death and injury associated with driving or engaging in other risky tasks after drinking, homicide and violence, suicide attempts, sexual assault, risky sexual behavior, and vandalism and property damage. In addition, these consequences appear to be more severe for those who start drinking at a young age. Hingson and Kenkel (2004), report on a series of studies that controlled for history of alcohol dependency, frequency of heavy drinking, years of drinking, age, gender, race or ethnicity, history of cigarette smoking, and illicit drug use. These studies reveal that youth who started drinking before age 15, compared to those who waited until they were 21, were 12 times more likely to be unintentionally injured while under the influence of alcohol, 7 times more likely to be in a motor vehicle crash after drinking, and 10 times more likely to have been in a physical fight after drinking.

Drinking and Driving

The consequences of driving after drinking have received intense media attention and targeted policy responses. Laws have been passed to lower allowable blood alcohol content levels for underage drivers to near zero

(typically 0.02, compared with the adult limit of 0.08 or 0.10). Although alcohol-related youth motor vehicle fatalities have decreased substantially over the past decade or so, youth are still overrepresented in alcohol-related fatal crashes compared with the older population. In 2000, 69 percent of youths who died in alcohol-related traffic fatalities involved young drinking drivers. It remains a very serious issue with extreme consequences, not only for the young driver but also for innocent victims. While only 7 percent of licensed drivers in 2000 were aged 15 to 20, they represented approximately 13 percent of drivers involved in fatal crashes who had been drinking (National Highway Traffic Safety Administration, 2002b). According to Grunbaum et al. (2002), 38.3 percent of Latinos, 30.3 percent of whites, and 27.6 percent of African Americans in this age group rode with a driver who had been drinking alcohol. And 14.7 percent of whites, 13.1 percent of Latinos, and 7.7 percent of African Americans aged 15 to 20 admitted to driving a car after drinking alcohol.

Alcohol-related traffic fatalities constituted almost 37 percent of all fatal youth traffic fatalities (National Highway Traffic Safety Administration, 2002b). Youths who drive after drinking are more likely to be in a crash than youths who have not had a drink, and the crashes underage drinkers are involved in tend to be more severe than those of adults, resulting in a greater number of deaths and more serious injury. Underage drinkers present greater risks than adults when driving, even at lower BAC levels. More 19-year-olds died in alcohol-related crashes with relatively low BAC levels than any other age (National Highway Traffic Safety Administration, 2002b).

When young people drink and get into a car, they also tend to make poor decisions that bear on their safety. For example, young people who have been drinking are less likely to wear a safety belt. They are more likely to get in a car with an intoxicated driver: 41 percent of frequent heavy drinkers reported riding with an intoxicated driver, compared with only 14 percent of those who never drank (Hingson and Kenkel, 2004). In alcohol-related traffic crashes, there were three times more deaths among young people who were not wearing their seat belts than among those who were wearing them. In sum, alcohol-related crashes involving underage drinkers are more likely to result in death and serious injury than those involving other drivers.

Homicide, Suicide, and Unintentional Injuries

Alcohol is implicated in a large proportion of unintentional deaths and injuries caused by other forms of dangerous behavior than driving. In 1999, nearly 40 percent of people under age 21 who were victims of drownings, burns, and falls tested positive for alcohol. Youth constituted 7 percent of

nonfatal and 30 percent of fatal alcohol-related drownings and burns (Levy et al., 1999).

Drinking not only increases one's risk of being involved in a traffic accident or suffering another unintentional injury, it is also implicated in deaths and injuries associated with violence and suicidal behavior. Frequent heavy alcohol use is associated with increased feelings of hopelessness, suicide ideation, and suicide attempts. Alcohol has been reported to be involved in 36 percent of homicides, 12 percent of male suicides, and 8 percent of female suicides involving people under 21—a total of about 1,500 homicides and 300 suicides in 2000. Homicide is the second leading cause of death for 15- to 24-year-olds (Centers for Disease Control and Prevention, 2001). By racial and ethnic group, deaths due to homicide for ages 15 to 24 are the leading cause of death for African Americans, second for Latinos, and fourth for whites. In that age group, suicide is the second leading cause of death for whites, third for Latinos, and third for African Americans (Anderson, 2002). Caetano and Clark (1998) report that the incidence of social consequences from drinking among Latinas is almost three times higher than for white females, despite generally lower rates of drinking.

According to Levy et al. (1999), individuals under the age of 21 commit 45 percent of rapes, 44 percent of robberies, and 37 percent of other assaults, and it is estimated that 50 percent of violent crime is alcohol-related (Harwood et al., 1998).[1] A report by the National Center on Addiction and Substance Abuse (1994) found that on college campuses 95 percent of all violent crime and 90 percent of college rapes involve the use of alcohol by the assailant, victim, or both. Although it is difficult to disentangle alcohol use from other possible contributing factors, such as depression, emerging evidence demonstrates a causal link between alcohol and suicide (Light et al., 2003).

Sexual Activity

Sexual violence and unplanned and unprotected sexual activity constitute yet another set of alcohol-related problems. As reported in *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (National

[1]Underage drinkers are also more likely than their nondrinking peers to carry a weapon—44 percent of frequent heavy drinkers had carried a weapon, and 22 percent had carried a gun in the past 30 days, compared with only 10 and 3 percent, respectively, of nondrinkers. Carrying a weapon increases the dangers associated with drinking; not surprisingly, injuries due to a physical fight were more common among frequent heavy drinkers (13 percent) than for nondrinking peers (only about 2 percent).

Institute on Alcohol Abuse and Alcoholism [NIAAA], 2002) more than 70,000 students aged 18 to 24 are victims of alcohol-related sexual assault or date rape. Studies of date rape and sexual assault on college campuses suggest that alcohol use factors into the behavior of both assailants and victims. For example, Harrington and Leitenberg (1994) found that date rape victims who reported being at least "somewhat drunk" at the time of the assault believed that their assailants were also under the influence of alcohol. A study of assailants showed that 44 percent of the men had been drinking when they committed a sexual assault (Abbey et al., 1996). Given that many sexual assaults—especially acquaintance rape—are believed to be unreported, it is possible that alcohol figures into many more assaults than these studies indicate.

In addition to being more vulnerable to experiencing (or committing) sexual assault, young people who are drinking are also more likely to engage in risky sexual behavior. According to research by the Kaiser Family Foundation, young people are more likely to engage in consensual sexual activity after drinking and report that they "do more" sexually while using alcohol than they had planned. According to Strunin and Hingson (1992), 44 percent of sexually active teenagers report that they are more likely to have intercourse if they have been drinking. Based on analysis of 2001 Youth Risk Behavior Surveillance data, Grunbaum and colleagues (2002) report that 23.4 percent of white youth, 24.1 percent of Latino youth, and 17.8 percent of African American youth reported using alcohol or other drugs at the time of their last sexual intercourse.

Young people are less likely to use a condom if they have been drinking, which puts them at risk for unplanned pregnancies and contracting sexually transmitted diseases and HIV (the virus that causes AIDS). More disturbing still is that young people seem to be aware that using alcohol influences their decisions about sexual behavior: 29 percent of 15- to 17-year-olds and 37 percent of 18- to 24-year-olds said that alcohol or drugs influenced their decision to do something sexual. In other words, young people choose to drink even though they realize that alcohol affects their decision making and may cause them to engage in sexual behaviors they would not do while sober.

Early onset of alcohol use has also been associated with unplanned and unprotected sex. A college survey conducted by the Boston University School of Public Health showed that among drinkers, those who had their first drink before the age of 13 were twice as likely to have unplanned sex and more than twice as likely to have unprotected sex (Hingson and Kenkel, 2004).

Vandalism and Property Damage

Vandalism and property damage represent yet another set of consequences influenced by alcohol. Intoxicated youth are more likely to commit these acts regardless of their age, but vandalism and property damage are a particular problem on college campuses. Wechsler et al. (2002) report that about 11 percent of college students admitted to having damaged property while drinking. The cost of these behaviors is picked up by the college or by the local communities if the vandalism happens off campus.

LONG-TERM CONSEQUENCES

A single episode of alcohol-impaired judgment can have immediate consequences (leading to death, injury, or arrest, for example) with long-term effects. In addition, heavy alcohol use at a young age has been implicated in long-term changes in the youths' life prospects. Individuals who begin drinking before age 15 appear to be at greater risk for serious lifelong problems (Hingson and Kenkel, 2004). For example, young people who begin drinking before age 15 are significantly more likely to develop alcohol dependence than those who begin drinking at older ages. Youth who begin drinking before the age of 15 have a 41 percent chance of future alcohol dependence, compared with a 10 percent chance for those who begin after the legal drinking age (Grant and Dawson, 1997). Some become dependent during adolescence.[2] Analyses of the 1999 Harvard School of Public Health National College Alcohol Survey of students age 19 or older, after controlling for a variety of factors, found that the earlier they had first drunk to intoxication, the more likely they were to experience alcohol dependence and frequent heavy drinking in college (Gruber et al., 1996).

Frequent heavy use is associated with low self-esteem, depression (which is probably related to greater suicide attempts among underage drinkers), conduct disorders, antisocial behavior, dependency on other drugs and tobacco, and anxiety (Brown and Tapert, in press). Adolescents and college-age students who use alcohol have higher rates of academic problems and poor performance than nondrinkers. *A Call to Action* (NIAAA, 2002) noted that about 25 percent of college students report that using alcohol resulted in problematic consequences, such as missing classes, falling behind in school work, performing badly on papers and exams, and receiving lower grades overall.

[2]Data from the NHSDA show that in 2000, between 4 and 12 percent of young people aged 12 to 20 met alcohol abuse or dependence diagnostic criteria.

Chronic health problems resulting from heavy alcohol use are generally not observed in adolescents because such effects take longer to accumulate. However, heavy drinking during adolescence, especially if this behavior is continued in adulthood, places a person at risk of such health problems as pancreatitis, hepatitis, liver cirrhosis, hypertension, and anemia. Chronic liver disease and cirrhosis among Latinos and American Indian and Alaskan natives are the sixth leading cause of death among these groups (Anderson, 2002). Recent research suggests that drinking during puberty may have deleterious effects on bone density development: for young women, failing to develop maximal bone density during adolescence puts them at risk later in life for osteoporosis.

Effects on the Adolescent Brain

New research on adolescent brain development suggests that early heavy alcohol use may also have negative effects on the actual physical development of brain structure (Brown and Tapert, 2004). Contrary to earlier beliefs, the brain continues to change physiologically well beyond childhood. Brain growth among infants and children is focused essentially on volume—creating as many brain cells with as many connections to other brain cells as possible. During adolescence, development shifts from producing a great number of neurons to creating efficient neural pathways, which occurs in two ways. First, the structure of neurons changes as they become encased by an insulating tissue (myelin) that helps to speed the movement of the electric impulses carried by brain cells. This change means that adults can relay information from one part of the brain to another more rapidly than can children. In adolescence, this myelination occurs predominantly in the frontal and prefrontal lobes, the part of the brain responsible for important functions such as planning, organization, and halting an impulse. The second change in brain development has to do with synaptic refinement, the process by which connections between brain cells are pruned and eliminated so that only the most efficient connections are used and maintained. Like myelination, synaptic refinement also contributes to increasing the speed and efficiency of transmitting information from one part of the brain to another, which in turn improves reaction time. Adolescent brain developments occur in areas of the brain critical for considering the consequences of actions and important for stress responses and managing drives (Spear, 2002).

Recent studies based on animal models suggest that alcohol use during adolescence may have deleterious effects on myelination and synaptic refinement. Rats that were given doses of alcohol in quantities and frequency that mimic the use of frequent heavy adolescent drinkers had problems with memory tasks (White et al., 2000). Another study showed that heavy alco-

hol use caused damage to the frontal regions of the brain (Crews et al., 2000).

New research using magnetic resonance imaging (MRI) technology to obtain a portrait of adolescent human brains support these animal studies, showing that the brain structure of youths with alcohol-use disorders is adversely affected. The hippocampus, which is responsible for forming new memories, was noticeably smaller in youth who abuse alcohol than in their nondrinking peers (De Bellis et al., 2000). Youth with alcohol-use disorders also performed worse on memory tests than nondrinkers, further suggesting that the structural difference in hippocampus size was affecting brain functioning. Neuropsychological studies also suggest that alcohol use during adolescence may have a direct effect on brain functioning: negative effects included decreased ability in planning and executive functioning, memory, spatial operations, and attention—all of which are important to academic performance and future functioning (Giancola and Mezzich, 2000; Brown et al., 2000; Tapert and Brown, 1999; Tapert et al., 2001).

THE CAUSATION QUESTION

Many consequences—both immediate and long-term—are correlated with youthful drinking. In the case of immediate consequences, drinking impairs one's perceptual and motor skills, and this impairment clearly increases the risk of a car crash if one drives after drinking—a risk that is demonstrably higher for young drivers. Similarly, the disinhibiting effect of alcohol use impairs judgment and increases the risk of violence and unprotected sexual intercourse. In this sense, the causal link between alcohol use and the outcomes and problem behaviors just reviewed is not in doubt. The empirical evidence also shows a clear correlation between early drinking and problematic adult drinking and other related longer term problems: that is, the earlier that young people start drinking, the more likely they are to have problems in their adult lives.

However, these outcomes and behaviors may not be entirely attributable to alcohol. For example, some youths who have alcohol-related crashes or engage in alcohol-related violence or other risk-taking behavior may have been otherwise strongly predisposed to engage in problem behaviors of all sorts due to genetics, family circumstances, or other factors. Similarly, the higher rates of alcohol dependence, disease, and dysfunction among adults who began heavy drinking as youths may not be attributable to the early drinking per se. Some of these long-term outcomes are also consistent with the possibility that some individuals have a particular vulnerability to developing bad drinking habits and that one of the characteristics of these individuals is that they start drinking early. (For example, children of alco-

holics are more likely than children of nonalcoholics to start drinking during adolescence [NIAAA, 1997].)

Some of the strongest evidence of the causal role of alcohol in negative outcomes is derived from studies designed to assess the effects of policy interventions targeted on underage alcohol consumption. It is clear from these studies that reducing alcohol consumption among young people reduces such immediate outcomes as deaths, crime, and other consequences of impaired behavior. For example, research has shown that policies that affect alcohol availability, including excise tax rates and the minimum drinking age, have measurable effects on such outcomes as crime, highway fatalities, tobacco and drug use, and sexually transmitted diseases with greater availability associated with increases in these outcomes (Chaloupka, 2004; Chesson et al., 1997; Coate and Grossman, 1988; Cook, 1981; Cook and Moore, 1993a, 1993b; Cook and Tauchen, 1982, 1984; Kenkel, 2000; Ohsfeldt and Morrisey, 1997; Pacula, 1998; Ruhm, 1996; Saffer and Grossman, 1987; Wagenaar and Toomey, 2002). Given that the only plausible mechanisms by which such policies could affect these outcomes are through their effects on the volume and patterns of alcohol consumption, it is logical to conclude that alcohol consumption is indeed a causal agent for these outcomes.

In the case of long-term negative outcomes, the key question is whether reducing underage drinking would also reduce those outcomes. To the extent that individual vulnerability plays a large role, merely delaying the onset of drinking would not necessarily have much of an effect; the vulnerable people would eventually end up as problematic drinkers regardless of when they started. Moreover, many underage individuals who start heavy drinking in their late teens give it up as they reach their late 20s and 30s. The committee has carefully considered the evidence on this important issue—the extent to which early drinking causes later drinking problems, reduces them, or has no effect at all. Clearly predisposition and early alcohol use interact, and the effect of alcohol varies according to the degree of vulnerability of different individuals. However, notwithstanding the complexity of the inquiry, the committee concludes that the evidence establishes a prima facie case regarding the negative effects of early drinking on long-term welfare.

We think that prudent parents and a prudent society should assume, based on the current evidence, that underage drinking increases the risk of future drinking problems and contributes independently to the many deficits experienced by early drinkers over the course of their lives. However, additional research to further refine understanding of the interaction of the multiple interrelated factors on long-term outcomes is warranted.

SOCIAL COSTS

It has become standard practice in formal assessments of the social burden of an illness or harmful activity to translate the resulting disability and death into dollar figures. Underage drinking is no exception. For example, a recent report concluded that the cost of alcohol use by youth was $53 billion in 1996, including $19 billion from traffic crashes and $29 billion from violent crime (Pacific Institute for Research and Evaluation [PIRE]). If the costs of other consequences—such as low academic performance or medical costs other than those associated with traffic crashes—were quantified, it is possible that the cost would be even higher. Since numbers of this sort are potentially important in setting public priorities, it is worth understanding some of the controversies and practical difficulties in making such estimates (see Chapter 4; Cook and Ludwig, 2000; Cook, 1991).

Policy Relevance

It is natural to measure the burden of underage drinking in terms of the incidence of various consequences. As we have seen, those consequences include violent death, disability, disease, reduced academic and occupational achievement, and property damage, among many others. Estimating the causal role that underage drinking plays in each of these outcomes is the very big and difficult challenge for epidemiologists. But even with reliable estimates for the contribution of underage drinking for each consequence, one would be left with the question of how to sum them up. A summary statistic is useful in assigning relative priority to this particular problem in comparison with all the other problems requiring public attention. A summary statistic quoted in dollar terms is particularly useful because it lends itself to comparison with the budget costs of policies to remediate the problem.

What question is to be answered by the estimate of social cost? Ultimately the question is something like the following: *"How much would Americans' overall standard of living improve if underage drinking were somehow eliminated?"* In the PIRE study (1999) it is noted that the "cost" of underage drinking, based on the given assumptions, equaled $530 per year for every household in the United States; the suggestion is that eliminating underage drinking would be the equivalent of adding that amount to average household income.

Of course in practice there is no way to entirely eliminate underage drinking. But the total cost is nonetheless of some interest as a guide to how underage drinking can be compared with, say, cancer or illiteracy or terrorism in setting national priorities. The total is also useful to the extent that a

partial reduction in underage drinking may confer benefit in proportion to the total. Thus, the study suggests that a 10 percent reduction would be worth about $53 per household, or 10 percent of the total cost per household. Of course, a complete analysis would require an assessment of the costs of achieving the reduction as well as the benefit; if the 10 percent reduction is achieved through a set of programs that cost $10 billion, then the net gain per household would be just $43.

An Accounting Framework

There are two problems in doing this sort of accounting exercise well. First is the epidemiologist's problem of discerning the actual consequences of eliminating (or reducing) underage drinking. What reduction would there be in highway crashes, crime, and school dropouts and in all the long-term effects of these events? All such consequences are the result of complex multicausal processes; knowing that there is alcohol involvement in some percentage of such cases leaves one far short of knowing the causal importance of drinking. A further complication is introduced by the realization that the actual effects of a reduction in underage drinking will depend not just on how much of a reduction is accomplished, but also on what sort of collateral consequences will occur. What effect will that intervention have on routine activities, such as weekend driving with friends, the use of other illicit drugs, or dating? The answers may be important in influencing the net consequences, which may well depend on the nature of an intervention to prevent or reduce underage drinking.

The second problem is to develop and implement a sound accounting system for translating outcomes into a measure of social burden. The choice of accounting rules in this context necessarily reflects decisions about deep issues in understanding the public good. Two specific issues are particularly thorny: whose preference should count in defining relevant consequences? Should the social cost computation include subjective losses or only production losses?

The presumption in our society is that the public good is the sum of individual preferences. A reasonable exception may be the preferences of teenagers, who tend to place too little emphasis on their long-term well-being and too much emphasis on pleasing their peers. That commonsense view of adolescent human nature, coupled with the fact that underage drinking is illegal, provides some justification for ignoring the pleasures of drinking as perceived by teens and accounting only for the harmful consequences.

Although few people think that the value of the life of someone killed or permanently disabled by a drunken teenager is limited to his or her lost earnings, that in fact has been the accounting rule used in the traditional

"cost of illness" method of accounting. That method stipulates that the social cost of a harmful activity or illness is the sum of direct costs (property damage, medical costs, and so forth) and indirect costs (lost productivity). Lost productivity has little relationship to the value that individuals and those who care about them place on the value of health and continued life.

A comprehensive accounting framework, then, should take account of both tangible and intangible costs associated with the consequences of underage drinking. The PIRE analysis cited above does just that. Of the $53 billion in costs estimated for 1996, all but $4 billion is the result of lost quality and quantity of life.[3]

While this report is not the place to explain the methods used to arrive at this result, we note that it is based on the underlying principle that (adult) preferences should guide the valuation. Those preferences are observed in a generic sense in a variety of settings and choices, where people make risky decisions. For example, wages for risky jobs tend to be higher than safe jobs requiring comparable skill and effort: the "risk premium" reflects the amount that workers must be compensated to take on additional risk, and thereby form a useful basis for assessing the average "value of life." Note that what is being valued is not literally life itself, but rather a slight reduction in the probability of continued life. This valuation of small changes in safety is relevant for a forward-looking assessment. In assessing a proposed policy to reduce underage drinking, one does not know the identity of which lives will be saved; rather, the prospective accomplishment is a general reduction in risk for all, and that is what is to be valued.

The PIRE study is somewhat incomplete. For example, the study's estimate does not include medical costs other than those associated with traffic crashes (Hingson and Kenkel, 2004). Perhaps most important is that it neglects the possibility that drinking by teens may cause mild brain damage and lead to impaired academic performance and early termination of schooling. It also takes no account of the possibility that underage drinking engenders a greater likelihood of subsequent problems with alcohol dependence and abuse. In these respects the $53 billion appears to be an underestimate of the social costs of underage drinking.

In sum, the cost of underage drinking to society is substantial. Society is affected by loss of young lives, lost productivity and significant health care costs and stands to gain from reductions in underage drinking. The committee concludes that the PIRE estimate of $53 billion, while perhaps somewhat low, is a reasonable starting point for assessing social costs.

[3]The study reports separately the value of lost productivity ($11 billion) and of additional losses in quality and quantity of life ($38.5 billion). The reason for making this distinction is apparently a belief that some of the audience for the report expect to see the productivity measure as a separate statistic.

4

Understanding Youth Drinking

Adolescents in the United States grow up in a world filled with messages about alcohol (see Box 4-1 for select vignettes). Most of the messages present drinking in a positive light, and most of them show alcohol as a normal part of adult and teen social life. Warnings against underage drinking from parents or in health class may well be drowned out by the barrage of daily messages about alcohol in daily life.

Given this backdrop, it is not surprising that experimental or occasional use of alcohol is reported by the majority of adolescents in the United States, making it a normative behavior during the second decade of life. As noted in Chapter 2, about 50 percent of 20-year-olds report having recently drunk alcohol and the majority of twelfth graders (78 percent) report having drunk alcohol in their lifetimes. In this chapter we examine factors—primarily developmental and environmental factors—that are related to normative alcohol consumption. We do not discuss those involved in excessive or atypical use (e.g., youths with mental or addictive disorders). This is an important distinction because the factors that contribute to drinking patterns within the normative group of adolescents are different than those for youth who develop alcohol abuse patterns or dependency at a young age.

WHY DO ADOLESCENTS SAY THEY DRINK?

Adolescents say they drink for many of the same reasons as adults (Dunn and Goldman, 1996). Alcohol-related expectancies are well formed

BOX 4-1
Select Vignettes of Alcohol Messages to Youth

Twelve-year-old Jenna rides her bike to and from school most days. Her route takes her past a large billboard advertising a popular malt liquor.

Fourteen-year-old Joshua loves to watch basketball on television. During a typical game, he sees many beer commercials.

At 15, Sarah enjoys going to movies with friends. Many of the movies she has seen lately include scenes of adults drinking alcohol with dinner and at parties. A recent favorite showed teenagers getting into a nightclub using fake identification.

A favorite T-shirt for 16-year-old Sam says, "I'm trying to graduate with a 4.0 . . . blood alcohol level." His best friend's favorite sports shirt has an advertisement for a local bar on the back and "start drinking at 9 a.m. . . . it's gotta be happy hour somewhere" on the front.

Following the homecoming dance, 17-year-old Lynne attends an all-night party at a friend's home. The parents greet the guests as they arrive and take their car keys because they are serving beer. They prefer that their children and their friends drink at their home in a "safe environment" since they assume that their children will be drinking anyway.

After moving his belongings into his college dormitory and bidding his parents farewell, 19-year-old Jeremy attends an off-campus "welcome party" with a new acquaintance. He learns a lot on his first night on campus—how to play a drinking game, where to get a fake ID (identification), and which bars have happy hours on Thursdays.

by age 12, among drinkers as well as among those who have never consumed alcohol (Christiansen et al., 1982; Jones et al., 2001). Although it is always difficult to know if individuals can accurately report the reasons for their behavior, including drinking (see Nisbett and Wilson, 1977), both adolescents and adults indicate that alcohol is an important ingredient in social interactions, allowing them to lower their inhibitions and feel more relaxed in social situations (Jones et al., 2001; Wood et al., 1992). Other reasons given for drinking include reducing tension, fostering courage, reducing worry, increasing a sense of power, and causing cognitive and behavioral impairment (Prendergast, 1994). In addition, most individuals assign some costs to drinking, as well, which are discussed later in this chapter.

According to models such as the theory of planned behavior (Ajzen, 1991), social cognitive theory (e.g., Bandura, 1986), and alcohol expectancy theory (e.g., Goldman et al., 1991; Leigh, 1989), alcohol use can be largely explained by the alcohol-related expectancies for both positive and negative outcomes. Initiation and continuation of drinking, as well as the onset of problem drinking, are strongly and positively associated with expected benefits of drinking and negatively related to perceived negative

expectancies (Christiansen et al., 1989; Christiansen et al., 1982; Chen et al., 1994; Grube et al., 1995; Jones et al., 2001; Smith et al., 1995; Wood et al., 1992; Goldberg et al., 2002).

Although children's and adult's alcohol expectancies are similar (Dunn and Goldman, 1996), younger children are more likely to report negative expectancies; perceptions of positive outcomes increase with age (Miller et al., 1990; Goldberg et al., 2002). Specific expectancies also differ by age: 12- to 14-year-olds rank reduced tension and impaired behavioral functioning highest; 15- to 16-year-olds cite enhanced social and physical pleasure and modified social and emotional behavior; and 17- to 19-year-olds cite enhanced sexual performance and increased power as top alcohol expectancies (Christiansen et al., 1982). There are also gender differences in alcohol expectations, with adolescent males perceiving more positive and fewer negative consequences of alcohol than do adolescent females. Although the relationship between quantity of alcohol use and social and physical outcomes was similar for adolescent males and females, the frequency of alcohol use may be associated with global positive effects, sexual enhancement, and pleasure for men, but reduced tension for women (Jones et al., 2001).

DEVELOPMENTAL FACTORS

During adolescence, individuals are going through rapid physical, social, and cognitive changes. These enormous changes to body, friendship, and thinking about the world are juxtaposed against changing expectations for behavior and increases in need and opportunities for autonomy. The desire to be *autonomous* and to be granted more decision making opportunities increases with age (Steinberg and Cauffman, 1996) and occurs in tandem with several other changes that serve to increase adolescents' desires for autonomy. First, the physical changes of puberty result in adolescents' seeing themselves as more deserving of adult-like privileges and opportunities to make decisions. In addition, as adolescents mature physically and develop secondary sex characteristics, they look older and are presumed to be able to take on more adult-like roles and responsibilities. Second, increased time spent with peers leads to more experiences and comparison of others' authority, power, and privileges. Third, cultural and societal beliefs suggest that adolescence is a time to practice adult roles. All of these factors serve to underscore the importance of autonomy from parents and push adolescents toward assuming more adult roles. In the United States, alcohol use is an important symbol of adult status.

The shift away from childhood and toward independence and adult roles is accompanied by a focus on peer acceptance and perceived norms in addition to parental standards. Adolescents need to develop their own sense of self or identity during this time, although expectations about the appro-

priate timing for increased autonomy during adolescence varies across cultures (e.g., Feldman and Rosenthal, 1990). Individuals adapt and modify their identities to enable them to function best in their particular social and cultural context (Baumeister and Muraven, 1996). Adolescents may "try on" various identities that will be defined, in part, by how time is spent and with whom it is spent. While constructing an identity, an adolescent's motivation may be to gain new experiences that will allow them to evaluate what fits and what does not with their newly developing identities. This process allows them to create adult selves that are realistic and comfortable (Curry et al., 1994). During this period, adolescents report having a "true self" (who they really are inside) and a "false self" (who they want other people to think they are, to impress or please them) (Harter et al., 1996). At this point, adolescents may knowingly make choices that they know they may later regret "just to see what it is like," to act more like an adult, or to impress others (e.g., Moffit, 1993). Some of these choices are likely to involve alcohol consumption.

In order to understand the shifts that adolescents are undergoing, it is important to consider both changes in cognition and in the social world in which adolescents find themselves during this period.

Cognitive Changes

Cognitive changes during adolescence include gradual improvements in social perspective, to about age 16 (Steinberg and Cauffman, 1996). These newfound perspective-taking skills allow an adolescent to recognize how the thoughts and actions of one person influence those of another and to imagine how others might perceive them. Although generally an indicator of greater maturity, a downside of this new ability is that adolescents are highly concerned with peer conformity, which may make them particularly susceptible to peer influence. The majority of studies indicate a positive relationship between susceptibility to peer pressure and risk-taking behavior (such as drinking). For reasons not yet known, there is variation in the extent to which adolescents succumb to social influence, including pressure to engage in behaviors that are undesirable (see Steinberg and Cauffman, 1996, for a review).

In general, thinking becomes more abstract and more future-oriented during adolescence, allowing adolescents to consider multiple aspects of any decision at one time, assess potential consequences of a decision, consider possible outcomes associated with various choices, and plan for the future. These cognitive changes enhance the adolescent's capacity for competent decision making (see, for example, Halpern-Felsher and Cauffman, 2001; Steinberg and Cauffman, 1996). However, these newly formed competencies are not always practiced when adolescents are confronted with

real-world social situations. Many studies suggest that adolescents, as well as adults, may make less than optimal decisions when personal goals, beliefs, prior experience, values, social expectations, and emotions are added to the decision making equation (Jacobs and Klaczynski, 2002). This outcome is especially true for social decisions (like choosing whether to drink or how much to drink). This is so for a variety of reasons.

First, outcomes of decisions in social situations are probabilistic, meaning that negative consequences of bad decisions may not occur and may not even be highly likely, although they are devastating if they do occur. For example, while the probability of having a car crash after drinking is much higher than after not drinking, drinking and driving does not *always* end in a crash or a ticket. Because outcomes are probabilistic, adolescents may interpret the fact that they previously drank too much and drove home without a crash as evidence that they can drink and drive safely (Jacobs and Ganzel, 1994). In one study, older adolescents who had a lot of experience drinking and driving, but had not experienced a negative outcome, such as a traffic citation or crash, believed that they were in little danger of having an accident after drinking (Finken et al., 1998), this result suggests that engaging in risky behaviors without consequence may have caused them to lower their perceptions of the risks of drinking and driving. Other correlational studies have shown that greater involvement in risk-taking behaviors was related to lower perceptions of personal risk (e.g., Halpern-Felsher and Cauffman, 2001; Goldberg et al., 2002). Second, the norms for social decisions are not typically known. Instead, individuals are often forced to make judgments on the basis of their own estimates of the norms of social behaviors or attitudes. This general dilemma, faced by people of all ages, is even more difficult for adolescents because they must make decisions based on a limited amount of experience and little feedback from earlier decisions (Jacobs et al., 1995). Several studies indicate that most adolescents overestimate the number of others who drink alcohol (e.g., Basch et al., 1989; Jaccard and Turrisi, 1987). Not surprisingly, the overestimation is greatest for those individuals who drink. This same pattern has been found for other risk-taking and deviant behaviors (e.g., Benthin et al., 1993; Nucci et al., 1991), and it may be related to the fact that those who drink have friends who drink and so they begin to believe that everyone is drinking. In one longitudinal study, adolescents who spent time with peers who encouraged drinking later reported more positive views of drinkers (Blanton et al., 1997).

In addition, studies indicate that adolescents make more biased estimates when they are reasoning about populations with greater variability and when they are reasoning about unfamiliar others (Jacobs, 2004) Underage drinking and other forms of risk taking are likely to occur in social situations and when adolescents find themselves with large groups of unfa-

miliar peers. In these situations, they are left to estimate how others typically behave and what they think. The outcome may be overestimates of others' drinking and acceptance of such behavior, leading them to believe that the norm is to drink and that they should do it, too. However, providing adolescents with more realistic information about the extent to which people drink alcohol may not by itself reduce alcohol consumption. Instead, a focus on injunctive norms—views concerning what others think about one's drinking—might be more effective (Cialdini et al., 1990; Kallgren et al., 2000; Prentice and Miller, 1993).

Social Situations

The social situations in which adolescents find themselves also change during this period. Indeed, movement toward autonomy is accompanied by real and perceived changes in the social world as adolescents mature. Most move from environments in which they are protected, scheduled, and dominated by adults into environments that are primarily populated with other adolescents and in which they actually have much more autonomy. On average, middle-class adolescents spend about 20 percent of their time with parents and other relatives, 25 percent of their time alone, and the rest with friends and classmates (Csikszentmihalyi and Larson, 1984). Younger adolescents report that television and home- and family-centered activities fill much of their leisure time, but this shifts dramatically as they get older and report that peer-focused and solitary activities fill most of their time (Larson and Kleiber, 1990). Thus, as adolescents get older, they spend greater periods of their leisure time away from adult supervision, increasing the opportunities for becoming involved in such risk-taking behaviors as drinking alcohol.

In addition to the actual changes in supervision, teens are much more focused on real or imagined peer norms. They are most likely to attend to the standards set by their friends than by another same-age group. The often reported, "peer pressure" is, in reality, "friend pressure." As adolescents get older, they are more likely to choose friends who share their tastes and interests than when they were younger. Thus, they are likely to join crowds of teens who have similar values and life-styles. Crowd membership has been associated with alcohol consumption: some crowds or groups include drinking as part of how they spend their time, and an adolescent's choice to be involved in that crowd will include the knowledge that drinking is a typical activity for that group (Prinstein et al., 1996). For example, participation in competitive sports in high school has been related to higher rates of alcohol use (Eccles and Barber, 1999).

Unfortunately, information about a particular group's norms may not be available until after an adolescent has had one or more experiences with

the group and has been faced with situations in which saying "no" to alcohol will be viewed unfavorably by peers. Younger adolescents report having more trouble moving between crowds than older adolescents, so it may be more difficult for them to go against the norms of a crowd if they feel uncomfortable (Brown et al., 1994).

INDIVIDUAL DIFFERENCES

Although we have concentrated on describing the normative changes that affect adolescents, there are clear individual differences in development as well, and some of these differences may be associated with higher alcohol consumption. These differences include personality, perceptions of risk, and self-efficacy, as well as gender and racial differences in adolescent alcohol consumption (noted in Chapter 2). Although numerous clinical studies indicate that individuals differ in their likelihood of experiencing alcohol dependency and related disorders (Kessler et al., 1997; Swendsen et al., 2002), our focus in this chapter remains on nonclinical populations.

Personality Differences

Is there a personality profile that is related to adolescent risk for alcohol abuse? Cloninger (1991) found that three traits, present as early as age 10, were associated with alcoholism at age 28: (1) being easily bored and needing constant stimulation; (2) being driven to avoid negative consequence for actions; and (3) craving immediate external rewards for efforts. In addition, antisocial personality disorder has been linked to alcohol misuse among adolescents (Clark et al., 1998). Similarly, a recent study of children aged 8 to 15 found that conduct disorder often predates and predicts later alcohol use (Clark et al., 1998).

In nonclinical populations, a major personality characteristic that has been related to adolescent risk taking is sensation seeking, defined by seeking novel, complex, or risky situations (Zuckerman, 1979). The appeal of drinking alcohol and other "forbidden" behaviors for adolescents may be the novel and intense sensations provided by the experiences (Arnett and Balle-Jensen, 1993); students who have higher needs for sensation seeking are more likely to report higher levels of drinking, as well as other delinquent behaviors. Others have also reported associations between sensation seeking or novelty seeking and alcohol use (e.g., Martin et al., 2002). Donohew and colleagues (1999) argued that sensation seeking influences alcohol use indirectly, through peer affiliations: teens who are sensation seekers tend to choose friends with similar sensation seeking desires, and such peer group affiliations increase alcohol use.

Beliefs About Risk

Although many adults believe that adolescents underestimate the risks of engaging in particular behaviors, most research indicates that adults and adolescents actually give similar estimates of various types of risk taking, including drinking alcohol (e.g., Beyth-Marom et al., 1993; Quadrel et al., 1993). Although sweeping age differences in risk estimates have not typically been found (Millstein and Halpern-Felsher, 2002), individuals' perceptions of risk vary, and their perceptions have been linked to their behaviors. In general, drinkers of all ages view consuming alcohol as less risky than nondrinkers (Goldberg et al., 2002), although the absolute accuracy of various risk perceptions has been the topic of debate (e.g., Slovic, 2000). Although adolescents generally overestimate their mortality risks for a variety of activities including alcohol (e.g., Fischhoff et al., 2000), recent studies suggest that adolescents who perceive a higher likelihood of negative consequences following alcohol consumption do not drink at all or drink more moderately than others (e.g., Goldberg et al., 2002; Halpern-Felsher and Cauffman, 2001; Small et al., 1993.)

Both adults and adolescents tend to overestimate how many other people are involved in activities in which they, themselves, are engaged (e.g., Kruglanski, 1989). Indeed, adolescents as well as adults who participate in high-risk activities generally believe that the rate of participation by others is higher than do nonparticipants (Benthin et al., 1993); thus, beliefs about normative practices may be related to older adolescents' decisions to engage in risky behaviors (Basch et al., 1989; Beck and Treiman, 1996; Olds and Thombs, 2001). In one recent study, adolescents who reported higher levels of alcohol consumption and other risk-taking behavior than their peers overestimated how much other adolescents in their school were participating in the same high-risk behaviors (Jacobs, 2000). Extreme overestimaters engaged in significantly more mild and severe deviant behaviors than either the moderate overestimaters or those whose estimates were correct, and they reported poorer self-esteem, lower grade point averages, and less rational decision-making skills. One of the most intriguing implications of the research focusing on individual differences is that some adolescents are more likely than others to perceive drinking as low risk, to overestimate the likelihood of others' drinking, and to look for sensation-seeking opportunities. This is the group that one would expect to drink the most and take the most risks when drinking.

Prior Experience

Although correlated with age, drinking experiences have a significant and independent effect on alcohol expectancies, which in turn play a role in

alcohol use (Christiansen et al., 1989; Christiansen et al., 1982; Chen et al., 1994; Grube et al., 1995; Jones et al., 2001; Smith et al., 1995; Wood et al., 1992; Goldberg et al., 2002). More specific expectancies, such as enhanced sexual feelings, power, and reduced tension have been reported by those with greater drinking experiences, while youth with little or no alcohol experiences have more global expectancies of increased pleasure (Christiansen et al., 1982). As one gains more experience with alcohol, positive outcomes are reinforced and predict future drinking behaviors (Goldberg et al., 2002; Jones et al., 2001). Furthermore, positive drinking-related expectancies increase and negative expectations for risks decrease among adolescents with more drinking experiences (Halpern-Felsher et al., 2000; Goldberg et al., 2002).

Self-Efficacy

Drinking refusal self-efficacy, borrowed from Bandura's (1986, 1997) concept of general self-efficacy, refers to one's belief in her or his ability to resist urges or social pressures to drink, to drink in particular situations, or to consume large amounts of alcohol at one time. Adolescents with more positive self-efficacy are less likely to drink or drink excessively (Oei et al., 1998; Webb and Baer, 1995), and those with fewer refusal skills are more likely to drink (Hays and Ellickson, 1996). Refusal skills may be a better predictor of problem drinking than alcohol expectancies, especially for heavy or frequent alcohol use (Connor et al., 2000; Oei et al., 1998). Given that adolescents are more susceptible to peer pressure, it stands to reason that they will have lower drinking refusal skills. However, there is evidence that adolescents can be taught drinking refusal self-efficacy skills and that such skills can then result in less substance use (Bell et al., 1993; Ellickson et al., 1993).

CONTEXTUAL FACTORS

As noted in the previous chapter, the highest rate of both heavy drinking and frequent heavy drinking is found in young adults between the ages of 18 and 25. In addition, if adolescents between the ages of 14 and 20 drink alcohol, they are more likely to report heavy drinking than other drinking patterns (National Household Survey on Drug Abuse, 2001). These findings suggest that there may be something about the context of youth drinking that results in this particular pattern of alcohol consumption. Indeed, macrolevel and microlevel contextual factors are likely to contribute to both the number of underage drinkers and their patterns of alcohol use.

Community

U.S. culture is replete with messages touting the attractions of alcohol use, and—notwithstanding the legal norm—suggesting that drinking is acceptable for people under 21. Recent content analyses indicate that alcohol use was depicted, typically in a positive light, in more than 70 percent of a sample of episodes in prime-time television programming in 1999 (Christensen et al., 2000), and in more than 90 percent of the two hundred most popular movie rentals for 1996-1997 (Roberts et al., 1999b). Roberts et al. (1999b) also found that 17 percent of the 1,000 of the most popular songs in 1996-1997 across five genres of music popular with youth contained alcohol references, including almost one-half of the rap music recordings. The alcohol industry spent $1.6 billion on advertising in 2001, and probably twice that much in other promotional activity. Young people are exposed to a steady stream of images and lyrics presenting alcohol use in an attractive light.

Within any country, the specific community environment may contribute to drinking to a greater or lesser extent. The drinking environment can be characterized as varying on a "wet-dry" continuum. A "wet" community environment is one in which drinking is prevalent and common, public opinion is generally tolerant or positive, and alcohol is readily available both commercially and at private social occasions and is advertised as available. A "dry" community would be one in which drinking at social occasions is not the norm and is generally frowned on, and alcohol outlets are relatively scarce. One commonly used statistical indicator for the "wetness" of the environment is the per capita consumption of alcohol (the average number of drinks per person) for the population age 14 and over per year. In the United States, for example, per capita consumption ranged from 1.3 gallons of ethanol per capita in Utah to 2.8 gallons in Wisconsin, in 1997; see Table 4-1.

TABLE 4-1 Alcohol Consumption, 1999

State or Area	Ethanol*	Per Capita
Alabama	6,656	1.88
Alaska	1,346	2.88
Arizona	9,971	2.68
Arkansas	3,725	1.82
California	57,195	2.20
Colorado	8,305	2.57
Connecticut	5,953	2.26
Delaware	1,812	2.96
District of Columbia	1,647	3.74
Florida	32,773	2.66
Georgia	14,019	2.27

continued

TABLE 4-1 Continued

State or Area	Ethanol*	Per Capita
Hawaii	2,212	2.31
Idaho	2,355	2.39
Illinois	22,337	2.32
Indiana	9,371	1.97
Iowa	4,601	1.98
Kansas	3,925	1.85
Kentucky	5,662	1.76
Louisiana	8,678	2.50
Maine	2,348	2.26
Maryland	8,740	2.11
Massachusetts	12,290	2.45
Michigan	16,625	2.11
Minnesota	9,189	2.41
Mississippi	4,801	2.19
Missouri	9,962	2.26
Montana	1,828	2.55
Nebraska	2,979	2.24
Nevada	5,765	4.06
New Hampshire	3,943	4.07
New Jersey	14,416	2.20
New Mexico	3,308	2.43
New York	28,187	1.92
North Carolina	12,241	2.00
North Dakota	1,264	2.45
Ohio	18,203	2.01
Oklahoma	4,624	1.72
Oregon	6,239	2.32
Pennsylvania	18,723	1.91
Rhode Island	1,936	2.41
South Carolina	7,590	2.41
South Dakota	1,354	2.32
Tennessee	8,468	1.91
Texas	35,677	2.29
Utah	2,105	1.33
Vermont	1,144	2.34
Virginia	11,107	1.99
Washington	9,962	2.16
West Virginia	2,492	1.66
Wisconsin	11,664	2.75
Wyoming	961	2.48
Northeast	88,941	2.12
Midwest	111,474	2.20
South	170,712	2.21
West	111,551	2.32
U.S. Total	482,678	2.21

*Ethanol is the alcohol consumption measure used.
SOURCE: Data from National Institute on Alcohol Abuse and Alcoholism (2002).

To what extent do environmental factors influence individual drinking choices by youth? It is interesting in this regard to analyze trends in youth drinking over time. Based on their analysis of Monitoring the Future data for high school seniors, Cook and Moore (2001) report that the 30-day prevalence of drinking and also of heavy drinking[1] peaked in 1979, and then declined by approximately one-third (30.6 and 37.5 percent, respectively), reaching a low point in 1993 and increasing only slightly since then. This downward trend is unrelated to demographic changes in the composition of the population of high-school seniors and cannot be fully explained by trends in prices, minimum drinking age, or availability (Cook and Moore, 2001). However, this trend in drinking prevalence closely tracks the societal trend in drinking, as measured by national per capita consumption. Thus, whatever the reason for the decline in youth drinking during the 1980s, it seems to be related to, and perhaps in some sense is the result of, the overall decline in drinking in the society.

More persuasive evidence of the link between "wetness" and youth consumption comes from a study of individual drinking behavior. Cook and Moore (2001) analyzed data from the National Longitudinal Survey of Youth (NLSY) that included annual items on individual drinking for 1982-1985 and 1988-1989. The initial cohort of 12,000 respondents ranged in age from 17 to 24 at the beginning of this period in 1982, so that the NLSY data provide information on drinking trajectories for older teens and those in their twenties. They found that, even after controlling for family, religion, schooling, aspirations, employment, and cognitive ability, various aspects of the environment contributed significantly to patterns of drinking. Specifically, youth with similar backgrounds and individual characteristics were more likely to drink if they lived in a state with relatively high per capita consumption.

The minimum drinking age and the excise tax on beer are also related to youth drinking. Thus, an 18-year-old living in a state in which his drinking was legal in 1982 would have been more likely to drink (and to drink heavily) than an identical twin living in a state with a higher minimum drinking age. Increases in the beer tax (which has a direct effect on average price) generally tend to lower drinking, although it is harder to pin down with the NLSY data; however, other studies are quite consistent at documenting that taxes and prices influence youth drinking (Chaloupka and Wechsler, 1996). This research suggests that a "wetter" environment may provide adolescents with more social occasions to drink, more positive attitudes about drinking, more advertising and outlets, and more lenient regulations concerning the sale and consumption of alcohol. In short, such environments have an enabling effect on underage drinking.

[1]Defined as five or more drinks in a row in the last 2 weeks.

In addition to specific community norms for drinking, several other societal factors may affect the prevalence of heavy drinking in adolescence. First, U.S. society is largely segregated by age. As adolescents get older, they spend more and more time alone or with other peers in unsupervised settings, and both age-segregation and lack of adult supervision have been related to higher levels of substance abuse and deviance, including greater alcohol consumption. "Hanging out" with friends in unstructured, unsupervised contexts is generally related to negative outcomes, while spending time with others in adult-sanctioned, structured contexts is generally related to positive outcomes (e.g., Osgood, 1998; Osgood et al., 1996).

A particularly vulnerable time for youth is the after-school period, 3:00 to 6:00 p.m. This time is especially likely to be unsupervised as adolescents get older and parents believe that it is "safe" to leave them at home unattended. Youth who participate in after-school programs, such as sports, clubs, library-based activities, and youth-serving organizations are less likely to use alcohol than nonparticipants (Eccles and Barber, 1999). The same point about age segregation and lack of supervision applies to adolescents' attendance at unchaperoned parties and other activities. It is not uncommon for caring parents to decide to host an all-night party with alcohol for their teenage children, taking the car keys from the guests as they arrive, on the theory that it is safer to allow drinking at home rather than to forbid it and have teens drink and drive. Individuals or organizations that host and support such events are providing opportunities that enable adolescents to drink to excess. Not surprisingly, having parents who sanction alcohol use (even in "controlled" settings) is related to heavier drinking among adolescents (Barnes et al., 1995; Peterson et al., 1994).

By and large, adolescents are even segregated by age in the workplace. Adolescents who work for pay are often employed in fast-food and similar jobs in which most of their coworkers are other adolescents (Mortimer et al., 1992). It is not uncommon for a 17-year-old to be managing a fast-food establishment and supervising 15- and 16-year-olds. Given this situation, it may not be surprising that part-time work during adolescence is positively related to involvement in drugs, alcohol, and other deviant behaviors (e.g., Bachman and Schulenberg, 1993; Greenberger and Steinberg, 1986; Steinberg et al., 1993).

The place in which adolescents are most segregated is likely to be at residential colleges. Although less than one-quarter of college students are in such settings, student-segregated apartments or college residence halls provide the conditions under which binge drinking is likely to occur: cultural norms that support drinking, little supervision by any adults, and peers who are likely to be heavily involved in drinking. In a recent study, Cook and Moore (2001) found support that college students are more likely to engage in drinking, especially heavy drinking, if they live in a

dormitory than if they live off campus, even after controlling for other factors (such as age) that might explain this difference.

Social Setting

While adolescents are experiencing community-level influences related to the place of alcohol in our society, each adolescent is also making decisions about drinking within a particular social setting. Of particular importance with regard to social influences are adolescents' peers and friendship networks and their changing relationships with their parents. The effect of parents' and peers' alcohol consumption on adolescents' drinking patterns is both direct, through observation and modeling (Bandura, 1986) and indirect, through its influence on alcohol-related expectancies and attitudes (see Kuther, 2002, for a review).

Peers

Adolescents in the United States spend approximately twice as much time with peers as they spend with parents or other adults. Accordingly, peers are a major source of socialization and development for adolescents. Research supports the notion that both selection and socialization factors contribute to observed similarities in behavior among friends. That is, adolescents are influenced by the normative behaviors of their peers and they choose peers who reinforce their own norms and values (Kandel, 1978). The influences of peers are both direct and indirect (Bauman et al., 1989; Biddle et al., 1980; Ennett and Bauman 1991; Pruitt et al., 1991; Kandel and Logen, 1984). That is, adolescents are influenced directly (e.g., by observing peers' behavior or by peer pressure) and indirectly (e.g., by their perceptions of the extent to which their friends are drinking alcohol). The combination of the normative aspect of alcohol use and peer influences on underage alcohol use is also important. Youth are well aware of the normative nature of alcohol use, and they usually want to go along with their peer group (Aas and Klepp, 1992; Barnes et al., 1995; Beck and Treiman, 1996; Olds and Thombs, 2001). Perceived use of alcohol by one's peers and friends independently predicts self-reported alcohol use (e.g., Olds and Thombs, 2001; Reifman et al., 1998), with peers having a greater influence on adolescent drinking than do parents (Kuther, 2002).

It should be noted, however, that interventions that attempt to prevent or reduce alcohol consumption by focusing on changing perceptions of social norms must proceed cautiously. Research conducted by Cialdini and colleagues (Cialdini et al., 1990; Kallgren et al., 2000) points to the need to distinguish between descriptive norms (perceptions of what most others are doing) and injunctive norms (perception of what other people think one

should be doing or not doing). Cialdini argues that focusing on injunctive norms is more effective at changing behavior than targeting only descriptive norms.

Parents

Although peers are one important influence on adolescents' choices, parents remain important during the teen years. Many adolescents report that they turn to their parents for advice regarding educational and career decisions, although they turn to their friends for advice about clothes and music (Montemayor, 1982). Indeed, most theoretical perspectives today suggest that close connections to both parents and peers are related to easier transitions to independence (e.g., Allen and Hauser, 1996). Yet peer influences also depend in part on the quality of parent-child relationships (Parke and Ladd, 1992). Adolescents who have positive relationships with their parents may be more likely to have friends who engage in socially valued activities than do adolescents with less positive parental interactions. Similarly, more involved parents may oversee and monitor their child's peer relationships more than do less involved parents, thereby reducing adolescents' engagement in undesired behaviors (see, for example, Fletcher et al., 1995). Parents also have a significant amount of influence on their children's choice of friends. Parents help shape prosocial and antisocial behavior, which leads children to gravitate toward particular crowds.

Parental monitoring and involvement are key components in reducing adolescent alcohol use. Monitoring of an adolescent's behavior involves the parent or guardian supervising the adolescent; knowing the adolescent's whereabouts; knowing the adolescent's friends and peers; setting expectations that are clear and optimally challenging; delivering consequences that are fair, affirming, and useful; and communicating with the adolescent (Connell et al., 1995; Connell and Halpern-Felsher, 1997; Halpern-Felsher et al., 1997; Lee and Halpern-Felsher, 2001). Similarly, parental involvement is the extent to which parents show interest in, are knowledgeable about, and put effort into their child's activities and development. Both parental monitoring and involvement serve to prevent or reduce adolescents' health-compromising behaviors through the setting of curfews, awareness of and participation in after-school and weekend activities, prevention of adolescents' association with risky peers, and the improvement of social skills (Beck and Lockhart, 1992; Cohen et al., 1994; Steinberg et al., 1994). Research on parental monitoring consistently shows protective effects on alcohol use (Barnes et al., 2000; Bogenschneider et al., 1998; Reifman et al., 1998; DiClemente et al., 2001).

Families also provide an arena in which fledgling decision makers try their new skills and in which more experienced decision makers model

appropriate behavior or even provide instruction on how to make decisions (Jacobs and Ganzel, 1994). Learning to make decisions and live with their consequences and learn from them is an important developmental task that may be promoted or hindered by particular parenting practices. Although most parents give their adolescents increasing autonomy to make a wide range of decisions—in friendship, academics, extracurricular involvement, and consumer choices—many do so with little guidance or without letting adolescents experience the consequences of their actions. In addition, many parents provide an inconsistent pattern of restrictions and privileges (e.g., childlike restrictions about bedtime that don't match the adult privilege of driving the family car) that may lead adolescents to make choices that are aimed at rebelling against parental restrictions or that give them adult status (such as drinking alcohol).

Other aspects of parenting, such as parental norms and attitudes regarding adolescents' alcohol use and parents' own alcohol use, influence adolescent risk behavior. For example, Sieving and colleagues (2000) found that, in comparison with other variables, parent norms against underage drinking showed the strongest association with adolescents' abstention from alcohol use. In addition, parents, like other adults, may overestimate or underestimate drinking norms for adolescents, depending on their own experiences or their perceptions of societal norms. If parents believe that most adolescents drink, they may be more willing to "look the other way" when their children drink or to sponsor parties at which alcohol is served. Parents may benefit from knowing about other parents' practices and prohibitions concerning alcohol use by their children.

Parents' own alcohol use has also been linked to underage drinking (e.g., Pandina and Johnson, 1989), as well as to increased chance of experiencing alcohol-related negative consequences (Pandina and Johnson, 1990). However, family history of alcohol abuse and alcoholism alone may not be adequate to predict drinking patterns among children of parents with such drinking behaviors. It is possible that other factors, such as parental monitoring, personality, and stress coping strategies, mediate between family history of alcohol use and underage drinking (e.g., Johnson and Pandina, 1993; Reifman et al., 1998).

Two studies have demonstrated that sibling alcohol use is a risk factor. Of particular interest is the study by McGue and colleagues (1996) that examined the effect of both parental and sibling alcohol use on both adoptive and biological children raised in the same families: while parental alcohol use only had an effect for the biological children, sibling use had an effect on both adoptive and biological children. The effect was stronger if the sibling was similar in age, gender, and ethnicity.

CONFLUENCE OF FACTORS

In this chapter we have listed many social, cognitive, and contextual factors that are related to the reasons that adolescents drink. In a culture that promotes alcohol use, it is impossible to isolate one factor as the primary cause. Rather, understanding why adolescents drink is more likely to be found in the confluence of factors. Positive aspects of the normal developmental process (e.g., enhanced cognitive abilities and physical maturation) are directly related to the greater autonomy and freedom from supervision enjoyed by adolescents. However, increases in autonomy lead to more opportunities to obtain and use alcohol. Likewise, normal adolescent development includes focusing on peers and searching for one's own identity and friendship niche; however, these normal developmental processes lead to trying risky behaviors and conforming to peer norms that often include alcohol use. Thus, the trends that are typically associated with healthy adolescent development also set the stage for increased opportunities for alcohol use. In addition, adolescents are coming of age in the United States are doing so in a culture that promotes and enables underage drinking.

There is little that one can change about the timetable of cognitive and emotional development or personality characteristics, but one can consider interventions for some of the factors that have been related to adolescent alcohol consumption and can be changed. The most likely targets are adolescent, parent, and community attitudes about the acceptance of underage drinking. Media and educational campaigns with this goal, however, must keep in mind many of the factors that have been reviewed in this chapter. For example, messages to adolescents must consider factors such as developmental level; the need to act adult-like, try on new identities, and make decisions with little experience; and adolescents' peer norms and biased reasoning about these norms.

Communications aimed at parents and others must provide realistic information about the prevalence of underage drinking and the dangers associated with it. In addition, adults must be given clear messages about what they may be doing to enable underage drinking and concrete examples of what they can do to convey their expectations to their children, monitor their children, and provide a community environment that discourages rather than promotes underage drinking.

PART II

THE STRATEGY

5

Designing the Strategy

The committee was directed by Congress to "develop a cost-effective strategy to reduce underage drinking." This charge was admirably direct and simple. Still, to complete the task satisfactorily, the committee had to come to grips with some important issues raised by this mandate.

WHAT CONSTITUTES A "STRATEGY"?

The committee had first to consider what was meant by the idea of a strategy. To some, a strategy means a focused, sustained commitment to a single approach for accomplishing the desired result: for example, the adoption of a national media campaign designed to dissuade young people from drinking, or to restrict underage access to alcohol, or, a program to raise the price of alcohol through excise taxes. In this view, the important strategic decision would be to decide which of a variety of different policy tools or instruments is likely to produce the largest, most reliable effects at the least cost.

In the committee's view, a strategy is better understood not as a single approach, but rather as a portfolio of approaches or instruments—a multipronged effort to reduce underage drinking that can be refined and adjusted as knowledge and experience accumulate. There are several factors about underage drinking that lead to this view. The first is the heterogeneity of the problem. As shown in Part I, underage drinking encompasses several distinct phenomena that require different preventive approaches. For example,

the actions needed to prevent and reduce frequent drinking by 12-year-olds are different from those that will be useful or necessary in dealing with the intermittent heavy drinking of a much larger group of 17- to 18-year-old young people in high schools: and this problem, in turn, is different from the challenge posed by underage drinking on college campuses or in neighborhood bars by groups of workers that include many underage drinkers in their midst.

The second factor is the interaction among policy instruments. The effectiveness of one instrument often depends on the extent to which other instruments are being used. For example, a new policy prescribing sanctions for underage drinkers and those who sell or give them alcohol might be expected to produce some effects. However, this same policy intervention might be expected to have a stronger effect if accompanied by a media campaign designed not only to inform individuals of the new sanctions, but also to mobilize other community organizations to intervene. Or, a high school could decide to "crack down" on drinking in and around school-sponsored events, but find that its efforts are undermined by parents who are not committed to enforcing the same policies on weekends in their homes. Even a "zero tolerance" policy toward underage drinking, which might be expected to maximize general deterrence, might do so only by injuring the future prospects of those young people who are severely punished. In fact, a policy of penalizing youthful drinkers might be most effective, overall, if it is combined with sustained, focused assistance for youth who have already developed serious drinking problems. To the extent that the effects of one policy can be enhanced by using another tool and to the extent that the negative effects of one policy can be mitigated by using a second instrument, it makes sense to have a strategy based on a portfolio approach.

The third factor is the problem of uncertainty. Even when research suggests that a particular approach is likely to be effective, one cannot be sure how effective it will be in particular situations. It is usually good investment advice to diversify the investment in the face of uncertainty—to avoiding putting "all the eggs in one basket"—and the same applies to public policy. Thus, uncertainty, and the desire to learn from experience, leads to a portfolio approach to the problem.

The fourth factor is the problem of diminishing returns. Even when one knows that a chosen intervention will succeed, the marginal benefits of investing an additional dollar in the intervention are likely to decline at some point. Thus, with, say $1 billion to invest in reducing underage drinking, one could decide to spend it all on a single intervention believed to be effective (e.g., reducing access to alcohol or a youth-oriented media campaign), but the greatest effect is likely to come from combined investments in both approaches.

The fifth factor is the lack of consensus. A portfolio approach gives many actors a chance to contribute. Different communities, institutions, and individuals have different resources and different ideas about which approaches will be useful and effective. In a world in which people disagree about which interventions are best and in which it will be valuable to engage many actors in the effort to deal with the problem, it would be a serious mistake to insist that only one approach be used.

To say that the committee decided to recommend a portfolio of approaches, however, is not to say that comparative judgments concerning the relative effectiveness of different instruments must be avoided or that individual components of the strategy cannot be implemented independently from the others However, we propose a comprehensive strategy that we believe will be cost-effective based on the notion that several instruments will be reinforced by the addition of other instruments as they help to reach a problem that is missed (or created) by a particular policy or as they provide hedges against uncertainty or opportunities to learn. Evidence from youth smoking prevention policy reinforces the notion that a comprehensive, multifaceted approach is likely to be more effective than any single approach (Lantz, 2004).

But the balance among these instruments has to reflect a clear conception of both the nature of the problem and the reasons for selecting the chosen strategy. We present our overall analysis of cost-effectiveness at the end of Chapter 12 after more fully discussing the individual components of the strategy.

WHAT DOES "COST-EFFECTIVE" IMPLY AND REQUIRE?

The committee also considered what Congress meant by a "cost-effective" strategy and what data and analysis are needed to assess cost-effectiveness. We note that such an assessment involves more than the usual question in program evaluation, which focuses simply on whether a particular policy "works" to produce the desired effect (or effects).

Assessing Effectiveness

What did Congress mean by effectiveness? Presumably, one key measure of effectiveness is simply reducing the numbers of youth who drink alcohol at all before they turn 21. To the extent that the law treats all drinking by people under 21 as illegal and to the extent that the goal of any law is to get to as close to complete compliance as possible, the ultimate test of effectiveness would be the degree to which underage drinking stopped altogether. However, given that alcohol use is regarded as entirely appropriate for adults and that this normative stance (and the policies it spawns)

leads to ambivalent attitudes toward underage drinking and to easy opportunities for young people to drink, it is impossible as a practical matter to drive underage drinking to zero. Increasing the rate of abstention cannot be the *sole* measure of effectiveness.

Thus, it is necessary to develop different standards of effectiveness. In this light, it is important to recognize that some types of underage drinking are especially likely to be associated with harmful consequences, given the age of the drinkers, the characteristics of the drinking, and the contexts in which it occurs. Accordingly, effectiveness can be sensibly measured by reductions in these bad consequences, or in the intensity and dangerousness of underage drinking.

Relevant Outcomes

The committee has identified five goals that are pertinent to evaluating the effectiveness of a comprehensive strategy for preventing and reducing underage drinking.

- delaying onset (e.g., increasing the average age of first use or of first episode of heavy use);
- reducing the prevalence of (current) alcohol use;
- increasing the proportion of youths who are current abstainers and intend to continue to abstain until they meet the legal drinking age;
- reducing the intensity (frequency and quantity) of drinking (e.g., heavy drinking); and
- reducing the harmful consequences of alcohol use.

Delaying onset (meaning delaying the first episode of drinking, however measured) is an important outcome goal because of the documented relationship between early onset and adverse consequences, and because the average age of onset has been falling in recent years (see Chapter 2). Rates of prevalence (of use) and abstention are typically regarded as reciprocals of one another; however, in the present context, the committee believes that reducing prevalence and increasing abstention should be regarded as distinct objectives. In most surveys, prevalence of "current use" is operationalized as use within the last 30 days. As so measured, prevalence is not the reciprocal of abstention because individuals who are not abstaining and have no intention of doing so in the future may not have used alcohol within the last 30 days. This situation is particularly pertinent to underage drinking because many nonabstaining youths may not be current users (as measured by 30-day prevalence). As discussed in Chapter 2, young people who drink tend to drink heavily. One of the guiding assumptions of this report is that the most plausible goal for teenagers is to prevent or

reduce drinking altogether, rather than focusing on reducing drinking intensity. Accordingly, rates of prevalence and abstention are particularly important outcomes for children and teens.[1]

Comparing Outcomes

Assessed independently, the effectiveness of specific policies depends on the aspect of the problem they are designed to address. Some policies aim to discourage initiation by young teens or preteens; others aim to reduce the prevalence of any drinking in a high school population; and others aim to reduce the number of occasions when high school students engage in heavy drinking or when they drive after drinking. For the most part, the current policy evaluation literature does not compare the effectiveness of different policies or interventions. Instead, a given intervention is evaluated in terms of one or more particular outcomes.

Ultimately, however, a sophisticated assessment of cost-effectiveness requires a common metric for comparing the outcomes of policies that address different components of the problem of underage drinking. For example, preventive interventions for disease or injury are often evaluated in terms of such outcomes as deaths prevented, years of potential life lost before age 65, or the quality-adjusted years "saved" by the intervention. Such consequence-based assessments of effectiveness are rarely possible for underage drinking. The dots cannot now be connected in any rigorous way between an incremental reduction in the prevalence, intensity, or age-of-onset of underage drinking and any "ultimate" outcome.

The committee considered what metric would be best for comparing the value of upward shifts in the age of onset, downward shifts in current use (prevalence) of drinking among 15-year-olds, reductions in levels of heavy drinking among high school students, or reductions in the prevalence of driving after drinking among underage drinkers. It seems clear that the most important factor in identifying and ranking outcomes is the harms or negative consequences associated with particular patterns of consumption. Just as different components of the problem might need separate targeting,

[1]Educational programs and media campaigns aimed at young adults (18 to 21) often must grapple with the reality of pervasive drinking, and they must decide whether and how to formulate a "harm reduction" message—i.e., one that says, in effect: "It's illegal to use alcohol, and you shouldn't do it at all, but if you do, do it responsibly…" Though such approaches might be useful for young adults, such a "harm reduction" or "responsible drinking" message is wholly inappropriate for children and young teens. Nonetheless, exploring such options was inconsistent with the committee's charge and the committee did not consider interventions with this objective.

so different components of the problem might have different long-term social consequences and therefore be more or less important as targets of public policy intervention.

In looking at harms, one needs to look at the adverse effects of particular underage drinking behavior on the well-being of the drinker and those around him or her—the drinker's immediate family, friends, neighbors, and strangers whom the drinker encounters. Ultimately, the effectiveness of a policy means having an important effect in reducing any or all of these negative consequences. When direct measures of these adverse consequences are available (such as truancy or fatal automobile crashes), they will be the preferred measures of policy effectiveness. However, because direct measures of these effects are rarely available, measures of prevalence, intensity, and circumstances are used as proxies for the negative consequences (both short-term and long-term). Because adverse effects are most closely correlated with early onset and with heavy drinking, these two indicators are likely to be particularly useful in comparing the effectiveness of different policies.

Assessing Costs

Even if a program is effective on some relevant outcome measure, it still might not be worth implementing if its cost is excessive in relation to the benefits achieved, or if the same benefits can be achieved by a less costly intervention. How, then, does one measure the cost of policies to reduce underage drinking? At first blush, this task may not seem too hard: all one has to do is to determine the costs of developing, implementing, and sustaining the program whose cost-effectiveness is being calculated. However, even leaving aside for a moment the practical difficulties of actually measuring the direct and indirect costs of a program, three important conceptual issues arise in measuring costs.

First, while it might be feasible to estimate the (resource) costs to the government of developing and implementing a particular government-sponsored program, it is far more problematic to assess the program's total resource costs to the society. After all, government often acts not only directly, but also indirectly by encouraging others to contribute. The encouragement can be through exhortation and the provision of financial incentives (which do not cover the full costs of the effort). Or the encouragement can be through regulation and enforcement efforts that require private organizations and individuals—companies, distributors, tavern owners, parents, or even the companions of underage drinkers—to restrain from activities that encourage underage drinking or to materially contribute their time, energy, and money to prevent or reduce it. Although government is generally applauded for these catalytic roles in leveraging the re-

sources of others, it makes accounting for the full cost of the effort problematic.

Second, the costs of a policy have to include the negative (presumably unwanted) effects of a given policy, as well as the financial or material costs associated with implementing it. In judging the overall cost-effectiveness of a policy, it certainly makes sense to consider these unwanted, adverse effects of a policy as well as the desired, positive effects. And it certainly makes sense to enter these negative effects on the (negative) cost side of the ledger rather than the (positive) effectiveness side. But it is clear, we think, that the negative effects of a policy are costs in a much different sense than the resource costs necessary to carry out the program: they are often highly speculative and can rarely be quantified in monetary terms. Although they are no less important than costs that are easily quantified, they are much harder to account for in a cost-effectiveness analysis.

Third, it is important to recognize that one of the important costs of government policies is the burden that the use of government authority imposes on the freedom of private individuals. Government uses two different assets when it acts. It uses money raised through taxation—to mount media campaigns, provide incentives to states and localities to adopt certain programs that have proven effective in dealing with underage drinking, and so on. These costs can be captured relatively easily through financial cost accounting systems. The government also uses its authority to compel private individuals to take actions that are judged to be in the public's interest: for example, it penalizes package stores and bars for selling alcohol to underage drinkers, it creates very stiff penalties for those who drink and drive, and so on.

There is a measurable economic cost associated with these uses of state authority: one can estimate how much the state expends on its own efforts to enforce these laws and can try to estimate the economic consequences of these regulatory regimes for those affected by them. But what is missing from the calculation is that the state has reduced some individual liberty. All other things being equal, people in the United States usually prefer a policy that uses less coercive authority—that takes away less personal liberty—than a policy that achieves the same result with more coercive authority. As a result, when looking at alternative strategies for reducing underage drinking, it is important to try to account for the amount of coercive authority that is being used and treat its use as a cost in roughly the same way that the expenditure of public money is treated as a cost.

STANDARDS OF EVIDENCE

The committee has reviewed the pertinent evidence on the effectiveness of the various programs and interventions to prevent or reduce underage

drinking, as well as those to prevent the use of tobacco and illegal drugs, and, when relevant, interventions that have been used to affect other health-related behavior. Occasionally, the available evidence is direct and clear—that an intervention does or does not affect alcohol use or other outcomes. Usually, however, the evidence is more equivocal—studies may be in conflict, the intervention may work for some groups but not others, the intervention lacks any direct evidence but is supported by a strong body of indirect evidence, and so on. It is necessary, under these circumstances, to assess the strength or weight of the evidence. In so doing, we draw on the concept of "standards of evidence," a phrase that generally refers to the methodological strength of and basis for a conclusion or recommendation.

Much of the research presented in this report describes empirical associations between the presence or absence of a prevention approach and alcohol use or other outcomes. These correlations do not provide conclusive evidence that the approach caused a reduction in alcohol use or other outcomes; they merely index the direction and magnitude of the association. Establishing that a particular intervention caused a given outcome (above and beyond the role of other factors) requires evidence from experimental and quasi-experimental research. As noted in Chapter 1 and further discussed in subsequent chapters, the effects of some policy interventions bearing on underage drinking (e.g., increasing the minimum drinking age to 21) have been assessed with research that presents clear evidence of causation.

Even in the absence of direct causal evidence, correlational evidence, together with other kinds of evidence, may be sufficiently compelling to suggest that an intervention represents a promising approach; we refer to this as suggestive evidence of effectiveness. In other cases, however, the causal connection is less plausible than other explanations for any association that exists, and so the evidence is too weak to support a conclusion or recommendation.

Empirical evidence, even of the associational kind, is not always available. However, this does not mean that a scientific judgment is not possible. In some cases, a conclusion or recommendation may be based on a formal, theoretically based, logical analysis of a phenomenon or empirical evidence in analogous domains. Finally, some conclusions or recommendations derive from the scientific judgment of the committee based on the members' experience and deliberation.

CONNECTING EVIDENCE AND STRATEGY

Reaching a judgment about whether or not a particular intervention is likely to be effective in relation to a particular outcome is only one step on the way to formulating a judgment about whether such an intervention is

likely to be cost-effective and whether it should be a component of a strategy to prevent or reduce underage drinking. Inevitably, connecting the dots between evidence and policy requires a contextual judgment. How strong does the evidence bearing on effectiveness have to be to justify an intervention of this particular type in light of its likely range of costs? In making these judgments and designing the proposed strategy, the committee has been guided by several general considerations:

- In dealing with complex social phenomena, such as underage drinking, comprehensive, multipronged strategies usually work best. As we note above, one of the reasons to embrace a portfolio approach is to capture the synergistic effects of coordinated and reinforcing interventions. Moreover, although any one intervention may produce no effect at all or an effect too small to detect, it might make an important contribution to a multipronged strategy.
- It is necessary to distinguish between what is possible and what is likely. This distinction has two parts. One is between efficacy (what can be achieved in an experimental design?) and effectiveness (what can be achieved in the real world?) The second involves implementation. An intervention may be effective in a real-world context when it is carried out in faithful conformity with the recommended protocol, but not otherwise, or the effects may vary widely in relation to the quality of implementation. Whether a particular intervention should be included in a national strategy must depend on a judgment about implementation—how often would it be deployed effectively and with what cumulative effect—and whether that effect is worth the cost.
- One must carefully consider the risk that an intervention will produce a harmful effect. Some interventions may have a perverse effect—in the context of underage drinking, perhaps a media campaign or a school-based education program could have a boomerang effect that stimulates alcohol use rather than depressing it. This risk may be especially great if a program with proven effectiveness with a specific group is implemented for another group or is poorly implemented. Moreover, an intervention that is effective overall may have widely varying results for subpopulations, including harmful outcomes for some of them. This possibility raises an important ethical concern in balancing benefits and risks. The committee has been sensitive to any evidence that an intervention presents a risk of harm to any youth subgroup and suggests ways of reducing such risks when they might exist.
- Specific evidence of effectiveness for refinements of an intervention known to be effective and for which investments have already been made (e.g., limiting access) is not required. Because it is rarely possible, at this time, to quantify either the anticipated benefits or costs of proposed inter-

ventions, most of the committee's recommendations are based on qualitative judgments about likely cost-effectiveness.

UNDERAGE DRINKING AND LEGAL DRINKING

In designing the strategy, the committee also had to consider the extent to which the problem of underage drinking can be separated from the larger context of drinking in the general population. As noted in Chapter 4, the level and patterns of adult drinking importantly affect the level of underage drinking in the society. For example, the level of adult drinking determines how many liquor stores and bars exist in a particular area, how much alcohol is in home drinking cabinets, and, therefore, how conveniently available alcohol is to underage drinkers. The level of adult drinking also has a big effect on the level of advertising for alcohol products and, therefore, on the prevalence of mass media messages that expose young people to images and ideas about the virtues of drinking and also on the credibility of parents and others seeking to discourage it. The fact that the level and patterns of adult drinking shape the level and character of underage drinking in the society creates two important issues and concerns in relation to our charge.

First, given the potential influence of the adult drinking patterns on underage drinking, it is possible that the adult patterns sharply limit how much underage drinking can be reduced without also doing something to affect the adult drinking. The issue is the degree to which the problem of underage drinking can be disentangled or disaggregated from the overall pattern of drinking in the society. One possibility is that the level of underage drinking is nearly always more or less proportional to all drinking in the society: if adult drinking changes, underage drinking changes; if adult drinking does not change, underage drinking does not change very much, even with specific policies that try to discourage underage drinking while leaving adult drinking untouched. The implication of this analysis is that the only effective way to reduce underage drinking is to reduce the level of adult drinking; it would accordingly raise complex questions about the strength of the public commitment to reduce underage drinking. Another possibility is that the two phenomena are at least partly separable, that can have policies that focus explicitly on underage drinking that can be strong enough to produce a separate effect on underage drinking even when the aggregate patterns of adult drinking do not change.

Ultimately, the separability of underage drinking from general drinking patterns is an empirical question. The only way to answer the question definitively is by trying policies that are specific to underage drinking and measure their effects for prevention and reduction. However, as indicated in Chapter 4, the available evidence shows that the level of underage drink-

ing does seem to be strongly linked to the level of adult drinking, and the level of adult drinking—at the very least—probably places clear upper bounds on the effectiveness of any given set of policies to control underage drinking. This evidence highlights the challenge, to which we referred in Chapter 1, of trying to suppress underage drinking in a culture in which drinking is normative behavior.

The relationship between underage drinking and adult drinking is relevant to our charge for a second reason. Since the level of adult drinking might be an important determinant of underage drinking, it is at least logically possible that the most "cost-effective strategy to reduce underage drinking" includes policies that produce their main effects not on underage drinking, but rather on the overall level of drinking in the population. The question to be faced, then, is whether to construe our mandate (to propose a cost-effective strategy to reduce and prevent underage drinking) as including: a review of *all* policy instruments that could produce an effect on underage drinking, including those that are not directed specifically at underage drinking, such as taxes and other general policies affecting price and availability, or a review only of policy instruments that are specific to underage drinking, such as the enforcement of laws prohibiting underage drinking, or the development of special media campaigns targeted only on underage drinking, or the strict regulation of venues in which underage drinking is most likely to occur.

The committee decided that it would focus on policies specifically aimed at underage drinking, but that it would not close its eyes, categorically, to policies that affect all drinking. Instead, we have carefully reviewed the evidence regarding the effects of *general* alcohol policies on underage drinking and have included in our proposed strategy one of these general components (raising excise taxes) because a substantial increase can be expected to have a robust impact on underage drinking and can also strengthen the nation's capacity to implement a strategy aiming to reduce underage drinking.

DO WE REALLY NEED A NEW STRATEGY?

Some people have argued that recent declines in underage drinking negate the need for significant new interventions. As noted in Chapter 2, the prevalence of alcohol use in the past 30 days among high school seniors has declined from a high of about 72 percent in 1979 to about 49 percent in 2002; similarly, the prevalence of heavy drinking within the past 2 weeks has declined from a high of 41 percent in 1981 to about 29 percent in 2002. The proportion of youth fatalities involving alcohol-involved underage drivers has also declined, from 55.8 percent in 1982 to 30.1 percent in 2000, although there has been little change in recent years (National Highway

Traffic Safety Administration, 2002). Nonetheless, most people acknowledge that these prevalence rates for underage alcohol use are still too high and that the adverse consequences of underage drinking are enormous, as discussed in Chapter 3. The 30-day prevalence rates have hovered at approximately 50 percent throughout the 1990s, and the patterns have been similar for rates of heavy use and daily drinking.

Thus, there has *not* been a steady decline in underage drinking over the past two decades. Instead, the decline in the prevalence of underage drinking was limited to the period from around 1981 to 1992, and the rates have been relatively stable since then. To explain this period, we can identify three things: a parallel decline in use of illegal drugs, a raise from 18 to 21 in the minimum drinking age across the country, and intensive campaigns to discourage drinking and driving and to encourage use of designated drivers. Peak use in the late 1970s and early 1980s may also be partly explained by the overall culture of youth experimentation in the United States in the 1960s and 1970s, and conversely, changes in the youth culture in the 1980s may have contributed to decreased use of alcohol, as well as illegal drugs. Economic conditions during the 1980s, with reduced resources available to youth, may also have contributed to the marked decrease in drinking.

Substantial evidence suggests that changes in the minimum drinking age laws also contributed to the decline in alcohol use during the 1980s. As noted in Chapter 1, between 1970 and 1976, 21 states reduced the minimum drinking age to 18, and another 8 states reduced it to 19 or 20; however, states began to raise the minimum age to 21 in the late 1970s. By 1984, when the Minimum Drinking Age Act was passed, 23 states had such laws in place. All states had minimum drinking age laws in place by 1988. This trend in implementation of minimum drinking age laws mirrors the national trend in declining alcohol prevalence among youth. Furthermore, research demonstrates a clear relationship between increases in the minimum drinking age and reduced rates of drinking (Wagenaar, 1981; Wagenaar and Maybee, 1986; O'Malley and Wagenaar, 1991; Klepp et al., 1996; Yu et al., 1997). Finally, O'Malley and Johnston (1999), while acknowledging the role of minimum drinking age laws, postulate that other initiatives, such as "zero tolerance" laws and national campaigns aimed at discouraging drunk driving, may also have contributed to the reduction. They observe that these campaigns peaked during a time of the decline in drinking.

In the committee's judgment, the salient lesson in these trend data is that the decline in underage drinking prevalence in the 1980s is largely attributable to specific interventions, including the increase in the minimum drinking age—perhaps supplemented by a secular decline in substance abuse and the grassroots campaign against drunk driving. We believe that de-

creases in prevalence did not continue into the 1990s because the immediate declarative effect of raising the drinking age had been exhausted by 1992 and media attention to drinking had abated.

There have been modest reductions in the 30-day and annual prevalence rates among high school seniors for the past 5 years. However, current rates are not significantly different than they were in 1993 and remain disturbingly high. Nearly half (48.6 percent) of high school seniors report drinking in the past 30 days—the same proportion as 1993, and significantly more than the proportion of youth that report either using marijuana (21.5 percent) or smoking (26.7 percent) in the past 30 days. The proportion of twelfth graders who report heavy drinking in the past 2 weeks declined slightly over the past several years, but was still higher (28.6 percent) in 2002 than it had been in 1993 (27.5 percent).

Thus, rates have remained essentially stable during the past decade despite a variety of efforts to address underage drinking. Many school districts have offered classroom interventions, the alcohol industry has included a "drink responsibly" message in many of its ads and implemented a variety of other programs, various state and national agencies and nonprofit organizations have implemented interventions aimed at reducing use and have developed and disseminated a variety of informational materials, and grassroots community organizations have carried out diverse efforts. Absent some new intervention, there is no reason to expect any further substantial decline. The problem of underage drinking in the United States is endemic and, in the committee's judgment, is not likely to improve in the absence of a significant new intervention.

THE STRATEGY

In the following chapters, the committee details the major components of a cost-effective strategy to prevent and reduce underage drinking. The premises of the proposed strategy, its blueprint, and its key components are summarized here.

Premises

The committee's proposed strategy is based on three premises:

- Because alcohol use among *adults* is widespread, legally acceptable and deeply embedded in U.S. culture, youths receive mixed messages about the acceptability of underage drinking despite the fact that it is illegal. The proper message is that alcohol use by persons under 21 is both illegal and socially disapproved. A variety of institutions can play a role in establishing and sustaining a normative distinction that will reinforce the legal distinc-

tion between underage and adult drinking. Of special importance in this effort are parents, the alcohol industry, schools and other institutions that are responsible for adolescents, the media, and the entertainment industry.

- Although governments at all levels have an indispensable role to play in creating this boundary and in supporting actions to reduce underage drinking, voluntary initiatives taken by individuals and nongovernmental institutions are also of great importance.
- Although underage drinking is a national problem, and it must be addressed by the nation, much of the initiative must arise, and much of the work be accomplished, at the community level.

Blueprint

The preeminent goal of the recommended strategy is to animate and sustain a broad commitment to reduce underage drinking. Many actors can play important roles. Retail outlets and bars can reduce opportunities for young people to obtain and use alcohol. Parents and other adults can refrain from conduct that tends to encourage or facilitate underage drinking and use their authority and credibility to guide their children's choices about alcohol. Others who stand in the position of responsibility vis-à-vis young people—schools, landlords, employers with young employees, military commanders, and other community organization and business leaders—can contribute in a variety of ways to the community effort to prevent underage drinking and its associated harms.

Underage alcohol use, as we have said, is a pervasive problem. It follows, then, that numerous individuals and organizations are in a position to try to do something about it. Figure 5-1 depicts a schematic diagram depicting opportunities for intervention. Opportunities for effectuating a collective commitment can be sorted into three broad domains:

- Opportunities to reduce the *availability* of alcohol to underage drinkers (or to avoid practices that tend to increase availability).
- Opportunities to reduce the *occasions* and opportunities for underage drinking (or to avoid practices that tend to facilitate drinking opportunities).
- Opportunities to reduce the *demand* for alcohol among young people (or to avoid practices that tend to increase demand).

Availability

The major actors in any effort to reduce underage access to alcohol are the people and businesses engaged in the commercial production and distribution of alcohol: producers and importers of alcoholic beverages, whole-

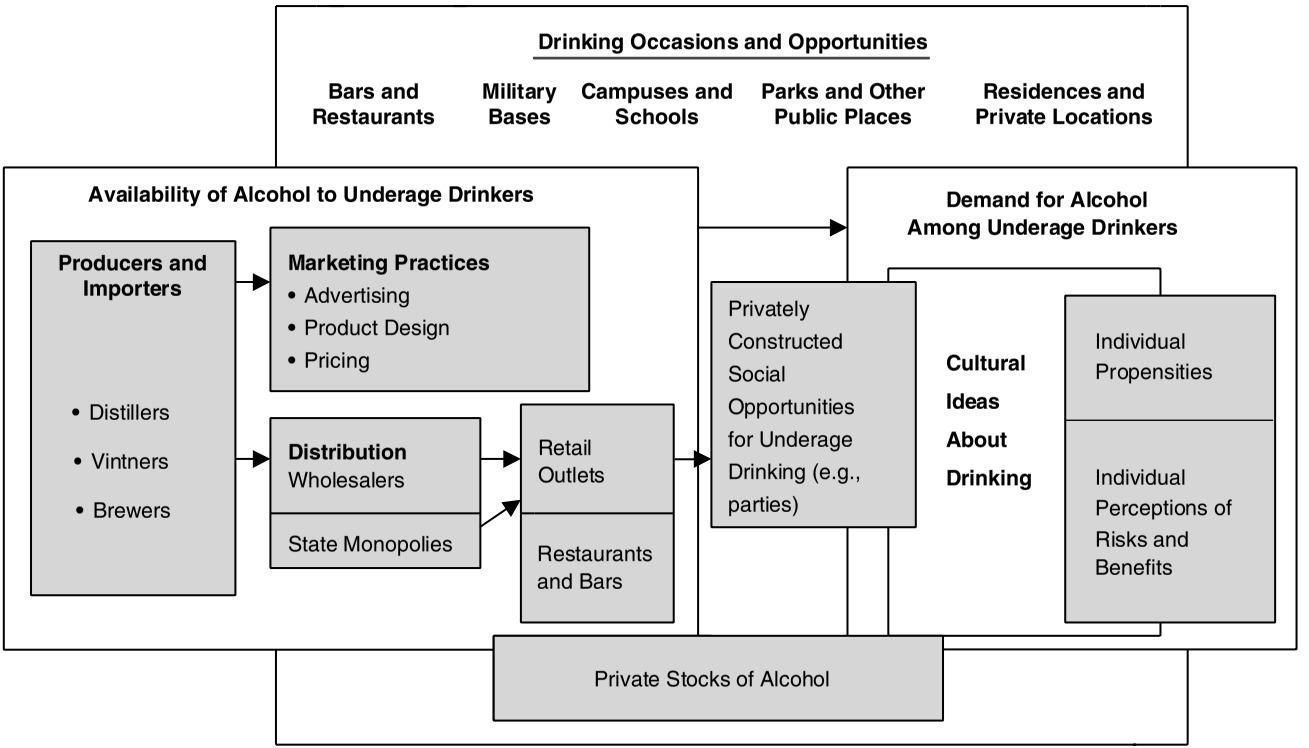

FIGURE 5-1 Opportunities for interventions in underage drinking: Occasions and opportunities; availability and demand.

salers, and retail distributors. In some states, some of these actors are government agencies. In principle, state control over distribution provides an opportunity for the state to achieve important social goals other than maximizing sale of alcoholic beverages, including keeping alcohol out of the hands of underage drinkers. It is also worth noting that an important source of supply to underage drinkers is not the commercial sector; instead, it is the diversion of alcohol from stocks kept in private homes to support adult drinking. Efforts to reduce underage access to alcohol are grounded in a legal prohibition, and the committee makes a variety of recommendations to strengthen this legal foundation and to increase the effectiveness of enforcement. However, given the diverse sources of supply to underage drinkers, it must be emphasized that the law cannot carry the weight of this obligation alone; it must be accompanied and reinforced by a genuine commitment to reduce underage drinking among these businesses and among parents.

Occasions

Responsibility for reducing drinking opportunities for young people, a distinctly practical task in everyday life, rests again with both commercial and noncommercial actors. Bars, taverns, public houses, restaurants, and other businesses that create opportunities for people to drink have an important responsibility to ensure that underage drinking does not occur. In addition, parents, schools, landlords, and everyone else with legal control over premises in which young people drink also have an obligation to take appropriate actions. Parents should not sponsor or facilitate underage drinking parties in the home on the assumption that "it will occur anyway" and that parental supervision can reduce the risks. Schools should work with community organizations to prevent drinking parties and to create alternatives. Local governments should develop strategies for preventing public parks and other public facilities from being used for underage drinking. Landlords who rent property to underage tenants should include lease provisions making drinking parties grounds for termination. Colleges and military installations have unique obligations in this context because such a large number of underage people in these settings are among slightly older peers.

Demand

Responsibility for reducing underage "demand" for alcohol and for teaching about acceptable drinking practices is generally thought to rest largely, if not exclusively, with parents and schools—perhaps supplemented by public service media messages funded by the government and private

foundations. In the committee's view, however, responsibility for reducing underage demand for alcohol is much more widely dispersed. Alcohol producers and advertisers have a special responsibility to resist marketing initiatives whose effects may be to stimulate or reinforce youthful desires to drink. Many alcohol companies have accepted the responsibility to support prevention initiatives designed to counteract the strong commercial forces tending to encourage underage drinking, and the committee makes several recommendations to build on this foundation. Responsibility for reducing underage demand for alcohol also rests with the entertainment media who command so much of the time and attention of the nation's youth—these media exposures offer opportunities either to stimulate or reinforce youthful demand for alcohol or to reduce it. At a local level, schools, colleges and universities, healthcare providers, and other organizations are in a position to influence the drinking habits of young people; the good will and energies of individuals and community organizations need to be more effectively harnessed. Table 5-1 summarizes the collective responsibilities of the full array of individuals and organizations in a position to reduce underage drinking.

Key Components

Within this broad framework the committee has identified ten core components of the proposed strategy to reduce underage drinking:

- a national media campaign designed to animate and sustain a broad, deep, societal commitment to reduce underage drinking, to muster support for actions aiming to reduce underage drinking, and to encourage parents and other adults to refrain from conduct tending to encourage or facilitate underage drinking (see Chapter 6);
- a meaningful commitment by the alcohol industry to contribute to this effort by helping to establish and fund an independent, nonprofit organization to support programs to reduce underage drinking (see Chapter 7);
- self-restraint in marketing and strengthened self-regulation by the alcohol industry to reduce youth exposure to alcohol advertising (see Chapter 7);
- a meaningful commitment by the entertainment industry, especially the music recording industry, to avoid images and lyrics that tend to encourage drinking in products that are likely to be heard or viewed by predominately underage audiences (see Chapter 8);
- stronger restrictions on youth access to alcohol in both commercial and noncommercial settings, and intensified enforcement of these laws by state and local governments (see Chapter 9);

TABLE 5-1 Reducing Underage Drinking: A Collective Responsibility

Responsible Party	Reduce Availability	Reduce Demand	Reduce Drinking Occasions
Alcohol producers and importers	x	x	
Wholesalers	x	x	
Retail outlets	x		x
Restaurants and bars	x		x
Entertainment media		x	
Schools		x	x
Colleges/universities	x	x	x
Youth employers		x	
Military bases	x	x	x
Landlords			x
Community organizations	x	x	x
Parents and other adults	x	x	x
Peers and friends	x	x	x

- expansion of educational, counseling, and treatment programs of proven effectiveness in elementary and secondary schools, colleges and universities, and in other settings where natural opportunities arise to discourage underage drinking and assist young people with drinking problems (see Chapter 10);
- mobilization of communities to design and implement multipronged, comprehensive programs to prevent and reduce underage drinking (see Chapter 11);
- a commitment by the federal government to implement a national strategy to prevent and reduce underage drinking, to provide stable funding and technical assistance, and to mount the necessary surveys to monitor its effectiveness, and an analogous commitment by state governments to establish and fund the necessary infrastructure to implement state-based components of the strategy, such as enforcing access restrictions (see Chapter 12);
- increases in federal and state excise taxes on alcohol to help reduce underage consumption, reflect the social costs of drinking, and raise revenue for implementing the proposed strategy (see Chapter 12); and
- rigorous research and evaluation to assess the effectiveness of current interventions, to help design new ones, and to facilitate refinements of the strategy and its implementation (see Chapter 12).

The committee strongly endorses what it finds are compelling arguments for a multipronged strategy and believes the effectiveness of its pro-

posed strategy for reducing underage drinking will be enhanced if the components are pursued simultaneously. However, we do not view the proposed strategy as an "all or none" proposition. In fact, implementation of the strategy requires the involvement of a range of decision makers from a variety of settings and levels of government, all of whom will be acting on different timetables with different constraints. Action on any one component should not be regarded as contingent on simultaneous action on any or all of the other components of our proposed strategy.

6

National Media Campaign

The committee was asked, particularly, to consider the role of a national media campaign in preventing and reducing underage drinking. As indicated in Chapter 1, we considered two mass media campaign approaches to affect youth alcohol consumption: a campaign directed primarily at youth, to affect their drinking decisions, and a campaign directed to parents and other adults who influence youth. On the basis of our review of the current evidence, we believe that an adult-oriented campaign holds more promise than a campaign directed at youth. Although there is limited direct evidence of effectiveness for either type of campaign, there is a clear and strong logical foundation for an adult campaign given the facilitative role of adult behavior in underage drinking and the potential preventive effect of parental monitoring. This logical argument is also strongly bolstered by the evidence of effectiveness of media campaigns in related public health areas. In the committee's judgment, this body of evidence provides reason for optimism regarding the potential effectiveness of an adult-oriented campaign on underage drinking and is sufficient to support a presumptive commitment to launch such a campaign after a carefully designed developmental phase. Our assessment of the possible effectiveness of a youth-focused campaign is presented in Chapter 10. In this chapter we address the adult-oriented campaign.

Recommendation 6-1: The federal government should fund and actively support the development of a national media effort, as a major component of an adult-oriented campaign to reduce underage drinking.

The goals of the national media campaign would be to instill a broad societal commitment to reduce underage drinking, to increase specific actions by adults that are meant to discourage or inhibit underage drinking, and to decrease adult conduct that tends to facilitate underage drinking.

Such a campaign would be undertaken in the context of a comprehensive, society-wide effort to address underage drinking through the other mechanisms described in this volume. Those efforts could and should be undertaken while the media campaign is being developed. In this chapter we describe the underlying logic for the approach, what the campaign would look like, evidence concerning its promise, and its possible strengths and weaknesses. We conclude by outlining the developmental approach we propose. We believe that the development of an adult-oriented campaign warrants a substantial investment if its promise of effectiveness is borne out during the developmental period.

ADULT ATTITUDES AND KNOWLEDGE ABOUT UNDERAGE DRINKING

Attitudes

Many groups concerned with underage drinking claim that societal acceptance of, or at least ambivalence toward such drinking, reflected both in expressed attitudes and in the actions of many adults in facilitating underage drinking, is a substantial cause for such drinking (see National Center on Addiction and Substance Abuse [CASA], 2002). Yet, when asked, the great majority of adults express concern about underage drinking. For example 84 percent of respondents to the 2001 survey undertaken by CASA said that underage drinking was either "a big problem" or "somewhat of a problem" in their community, and 92 percent said they were personally "somewhat" or "very much concerned" with underage alcohol use. That survey also shows widespread support for many public policy actions, with 83 percent favoring regulation of location of alcohol outlets near school, and 78 percent, 71 percent, and 69 percent supporting undercover compliance checks, "cops in shops" checks, and "shoulder tap" checks, respectively, to reduce alcohol outlet sales to underage youth.

Despite the high level of expressed adult concern, most underage drinking requires involvement by some adults—in selling the alcohol to youth, in purchasing it on behalf of youth, or in permitting minors to have parties in their homes where alcohol is served. Obviously, many adults are not taking proper precautions to restrict underage drinking, and often facilitate it in violation of the law. And even if adults do not supply alcohol to minors directly, underage drinking is tacitly supported by many adults—such as parents who view youth drinking as an inevitable part of adolescence and

do not respond to it, or who do not make sure that parties their children attend are alcohol free and properly supervised by adults. Even though adults tend to favor some strong measures to prevent underage drinking, the CASA study suggests that they are least enthusiastic about regulations that would affect them directly: only 60 percent favor restriction on the number of alcohol outlets, and 51 percent favor limitations on outlet days or hours. The reluctance of policy makers to enact alcohol restrictions that might reduce youth use but also affects adult use (such as controlling outlets) presumably reflects, in some part, perception of the lack of public support for such restrictions.

Adults themselves do not think that parents are doing all that they can do to prevent underage drinking. There is substantial recognition by adults that parents are the most important channel of influence on their children's underage drinking. When asked to choose what was most responsible for "preventing us from effectively reducing underage drinking" more than half of the adult respondents said "lack of or limited parental involvement in teens' lives" (see Table 6-1). This response indicates that there is another way that adult behavior may support underage drinking in addition to explicit or tacit support for alcohol use, which involves ineffective parenting more generally.

The parenting literature argues that effective parenting includes monitoring and supervising youth behavior. For younger adolescents, this parenting includes such things as: knowing who a child's friends are, making sure that children are always supervised by adults, knowing what a child's plans are for the coming day, knowing what children are doing

TABLE 6-1 Adults' Reports of Barriers to Reducing Underage Drinking (in percent)

Which of *(the following)* are most responsible for preventing us from effectively reducing underage drinking? (N = 900)

Barrier	Percent
Lack of limited parental involvement in teens' lives	52
Ineffective enforcement of current laws or regulations	19
Lack of effective prevention programs	7
The media	7
Insufficient laws or regulations	6
Alcohol advertisements	4
Lack of effective treatment programs	3
Other	3

SOURCE: Data from Roper Center at the University of Connecticut (2003a).

when away from home, and enforcing evening curfews. It also includes engagement with children's lives, including doing projects and activities with them, and the use of appropriate punishments for misbehavior and rewards for positive behavior. There is good evidence that such parenting is associated with a reduced risk of using all substances, including alcohol (see Chapter 4). A recent national longitudinal survey of parents and their 9- to 18-year-old children supports this claim. Children of parents who were relatively high on a supervision and monitoring scale were compared with children of parents who were low on the monitoring scale. Less monitored youth were more likely, subsequently, to progress to alcohol consumption in the next 12 to 18 months, and if they were already drinkers, were more likely to continue drinking.[1]

Knowledge

There is significant evidence that parents are unaware of the extent and riskiness of youth drinking. The national longitudinal survey mentioned above compared reports of alcohol use among youth aged 12 to 18 with their parents' perception of their alcohol use. Both parents and their children were asked about whether or not the child had used alcohol, more than a few sips, in the previous 12 months. Overall, parents moderately underestimated what their children reported as use: for 12- to 13-year-olds, the parents thought that 7 percent had used alcohol, but 11 percent of their children said they did; for 14- to 15-year-olds, the comparable numbers were 21 percent and 33 percent; and for 16- to 18-year-olds, the numbers were 44 percent and 56 percent.

An even more telling way to look at these data is to turn them around and ask how often parents knew when their own child was drinking. Including all of the children from 12 to 18 years old, 44 percent of all the youth who had had drinks in the past year were described by their parents as nondrinkers. Moreover, 31 percent of the youth who said they had been drunk in the past year were said by their parent to be nondrinkers, and 27 percent of those who said they had had five or more drinks in the past month were said by their parents to be nondrinkers. While a majority of parents may know whether or not their children drink, there is a substantial fraction who do not, even when their children admit to recent heavy drinking (see also Sieving, 1997; Beck et al., 1995).

A 1998 study by Bogenschneider and colleagues found that less than one-third of parents (29 percent of mothers and 31 percent of fathers) were

[1]Based on analysis by Robert Hornik of unpublished data collected by Westat for the National Institute on Drug Abuse for the evaluation of the Office of National Drug Control Policy's national youth antidrug media campaign.

TABLE 6-2 Parents' and Teenagers' Reports of Alcohol Use (in percent)

Alcohol Use	Parents	Teenagers
Has had more than a few sips in their life	17.0	65.2
Has been drinking in the past month	2.4	37.6
Has had five or more drinks in the past 2 weeks	1.0	20.4

NOTE: Two separate surveys were conducted; parents surveyed were not necessarily the parents of the teenagers surveyed.
SOURCE: Data from Strategic Marketing Services (2002).

aware of their adolescents' drinking even though all of the adolescents reported using alcohol at least once in the past month.[2] Parents were more likely to report use by their adolescents' close friends than by their own children. More than one-half of parents (56 percent of both mothers and fathers) reported that they were not sure or thought it was likely that their children's close friends use alcohol.

Bogenschneider and colleagues also found that adolescent children of aware parents were *more* likely to drink and drive than adolescent children of unaware parents. In response to these unanticipated results, the researchers postulated "episodes of drinking and driving serve to alert parents to the possibility that their offspring use alcohol" (1998:369). If this hypothesis is true, parents become aware of their children's drinking after they have engaged in a risky behavior.

Additional evidence that parents are not aware of teenage drinking comes from two surveys conducted by the state of Maine: one of parents of teenagers and the other of teenagers.[3] Although more than half of the parents surveyed (55.6 percent) reported that they are more concerned about teenage use of alcohol than tobacco, marijuana, other illegal drugs, or prescription drugs, these parents greatly underestimate the extent to which eighth to twelfth graders drink alcohol (Strategic Marketing Services, 2002). Table 6-2 presents the differences between the reports of the parents and the teenagers. The discrepancy between parent and youth reports is particularly notable for heavy drinking: although nearly all parents (99 percent) reported that they did not think their children had had five or more

[2]Awareness was defined as being unsure or believing that their adolescents' alcohol use was likely.

[3]The parents included in the parent survey were not necessarily the parents of the teens included in the teen survey.

drinks in the past 2 weeks, one in five youth (20 percent) reported having done so at least once.

While the majority of parents (56 percent) in the Maine Survey reported having serious talks about alcohol with their child several times a year, only slightly more than a third (34.2 percent) said that they had these discussions once a month or more. Not surprisingly, drinking and driving was the most common topic discussed, with 71 percent of parents reporting that they discussed this issue. Other primary topics, though less common, included the effects of alcohol on judgment or decision making (50.7 percent), peer pressure (48.9 percent), negative medical effects of alcohol (34.9 percent), and parental feelings about underage drinking (34.1 percent).

Clearly, many parents do not know when their children are drinking. However, even if the parents know their children are drinking, there is a question of whether they see underage alcohol consumption as risky. The evidence concerning whether or not parents perceive risks in underage drinking comes from the study by CASA (2002). In Table 6-3, we present the proportion of adult respondents who indicated that each of the named consequences of underage drinking was a concern.

There are two ways to read Table 6-3. One perspective notes that a majority of adults recognize every potential risk as a matter of concern. This is reinforced by the finding that, at most, only 14 percent of the respondents indicated that any of the potential consequences was not a concern at all. This view emphasizes that people recognize the risks. An alternative perspective notes the minimal discrimination among the various consequences. This lack of discrimination among consequences suggests

TABLE 6-3 Adult Reports of Concern for Potential Consequences of Underage Drinking (in percent) (N = 900)

	Level of Concern		
Potential Consequence	Very Much	Somewhat	Not at All
Delinquency or criminal behavior	64	30	6
Risk of sexual behavior	64	28	8
Risk of developing alcoholism or dependence	62	31	8
Gateway to illicit drug use	57	28	14
Physical health	55	36	9
Emotional or social consequences	54	37	9
Financial cost to society	53	39	8
Academic or work problems	53	38	10

SOURCE: Data from Roper Center at the University of Connecticut (2003b).

that the respondents have not thought about the consequences seriously and suggests that adults only recognize the risks in a rote fashion, when primed.

CAMPAIGN GOAL AND LOGIC

The primary role of a societal, adult-oriented media campaign would be to convince parents and other adults not merely that there is a general problem with underage drinking in their communities, an idea that they appear to accept already, but also that it is very likely a problem for their own children and their children's friends, that there are important negative consequences of such alcohol use besides those risks associated with drinking and driving, and that they have an obligation to their children and the community to do something about it. The campaign would argue that by taking specific personal actions to prevent underage alcohol use, by increasing recommended parenting behaviors, and by support of community-level policies, parents and other adults can affect underage drinking and reduce its bad consequences.

The campaign rests on five assumptions:

- Many parents do not recognize either the prevalence of or the many risks associated with underage drinking for their own children.
- Many parents effectively facilitate their underage children's drinking by giving youth access to alcohol, by not responding to known incidents of children's drinking, and by not adequately monitoring and supervising their children's lives, generally.
- If parents changed their beliefs about the nature of underage alcohol use and its consequences, they would increase monitoring and other actions to limit their children's use.
- Because many underage drinkers obtain their alcohol from adult acquaintances or even strangers, if adults' willingness to buy alcohol for young people or to facilitate their drinking decreases, it would be more difficult for underage youths to obtain or use alcohol.
- If parents and other adults increased monitoring and other actions aiming to limit use, there would be a reduction in underage drinking, particularly heavy drinking.

What are the arguments in favor of such an adult-oriented campaign? One argument is that campaigns that offer new information are more promising than campaigns that revisit information that already has been widely distributed. Youth have often heard anti-alcohol messages addressed to them, but they have shown little change in recent years in most drinking behavior, although they have been somewhat responsive to the drinking

and driving message (see below). A new youth-focused campaign would be seen as old hat and redundant with what they are already hearing. In contrast, an adult-oriented campaign would present new messages. It would target parents and other adults, who are now facilitating youth alcohol use because they are not sufficiently aware of the problem for their children; not aware of the many harmful consequences of youth alcohol use; not aware that actions they take can affect the risks; and not aware that buying alcohol for underage persons or giving it to them, is socially irresponsible and usually illegal. For adults, in contrast with youth, there is the possibility of a communication program diffusing new information, which suggests greater effectiveness. In addition, it is possible that an adult-focused campaign may work to make what parents already believe more salient to them as they consider their actions to restrict their children's alcohol access. Effectively, a campaign can give them permission to act on the concerns they already have.

POTENTIAL EFFECTIVENESS

Disseminating Facts

An important question is what evidence is available that a large-scale communication campaign could affect awareness of extent and riskiness, and (assuming that such knowledge leads to motivation to act) teach effective actions (for review, see Atkin, 2004).

There have been a small number of campaigns that tried to affect adult awareness of the extent and perceived riskiness of underage drinking and parental actions to reduce underage drinking, but they do not provide a solid foundation for estimating the promise for this approach. For example, the Australian National Alcohol Campaign in 2000 and 2001 primarily addressed youth, with some magazine advertising and brochure distribution to parents. However, the parent component was probably too small to expect much effect, and the evaluation information for parents does not provide an adequate basis for determining its behavioral effect (Ball et al., 2002). We then turn to less direct evidence that such a campaign will influence parent knowledge and behavior, relying on a reasonable generalization of evidence from other programs. In some sense, it is possible to separate two aspects of such a campaign and ask about the availability of evidence for each.

Insofar as an adult-focused campaign is only presenting facts, not previously known by parents, there is good evidence that this can be accomplished readily. Diffusing facts is what communication programs do well.

There are many examples of diffusion of a new idea or set of facts through mass media. And there are some examples that suggest circum-

stances when simple diffusion of new facts was sufficient to produce behavior change. In one clear case, campaigns to encourage parents to put their infants to sleep on their backs to avoid sudden infant death syndrome have had fairly quick and widespread success (Willinger et al., 2000; Engelberts et al., 1991). This behavior required a small change by parents and the changed sleeping position promised to avoid a dreaded consequence. Of most relevance for this discussion, the value of the back sleeping position represented new information for most parents.

Closer to the alcohol area, the idea of the "designated driver" diffused rapidly in the United States. The first mention of the term in the Lexis-Nexis electronic news major papers database is the fall of 1982, which is presumably when it was introduced to public discussion. By 1987, 91 percent of the respondents to a Gallup Poll indicated they approved of the idea (Roper Center at the University of Connecticut, 1987). By 1988, the term could be used in questions without a parenthetical definition, suggesting that it was well known. The proportion of adults who reported using designated drivers also grew rapidly (Roper Center at the University of Connecticut, 1988; see also Winsten, 1994).

In terms of diffusing facts, the major issue is not whether it can be done, but whether a comprehensible and credible message can be transmitted with sufficient reach and frequency so that most people become aware of it and whether the particular facts encourage behavior change.[4]

Changing Behavior?

The more difficult claim to support is not whether a mass media campaign can diffuse facts but whether it can effectively teach and, most important, influence specific new behaviors by adults. We do not know of any studies of a specific intervention of this sort relating to alcohol. The closest published example comes from Project Northland (Perry et al., 2002), which used only community-level media, along with other community activities, to try and affect parenting norms and behaviors. That limited intervention showed little effect on parental attitudes or behavior (although, as we discuss in Chapter 10, the initiative overall provides evidence for positive effects on youth). However, like the Australian campaign described above, Project Northland is a much more limited program than we propose, which

[4]We recognize that any message encouraging parents to recognize that many children drink has the risk of containing an additional implied message: that all kids drink so maybe it is not a big concern. It will be important to test messages for parents to make sure they do not hear such a mixed message.

would involve a national focus, heavy use of mass media, and involvement of the alcohol industry and other important institutions.

There is evidence that mass media campaigns, usually combining publicity and law enforcement, have succeeded in influencing drinking and driving (Murray, 1991; Bierness et al., 2000; Voas et al., 1997; Nienstedt, 1990; Hurst and Wright, 1981; Cameron and Newstead, 1996; Tay, 2000). There is also evidence that campaigns have influenced the use of designated drivers (Winsten, 1994; Dejong and Hingson, 1998; Boots and Midford, 1999; Hingson et al., 1996).

Although there have been many campaigns to affect adult drinking behavior (other than driving), they have generally been understudied. For example, the National Institute on Alcohol Abuse and Alcoholism sponsored campaigns in 1971-1972, and in 1980-1982, and there is some published information about regular campaigns about drinking in Denmark from 1990 to 1996 (Strunge, 1998) and about single campaigns in other places. However the evaluations of those campaigns are weaker than those addressing drunk driving, and they often do not measure behavior or have credible comparison groups.[5] In any case, these results, even the favorable ones about drunk driving, are not the same as evidence that parenting behaviors concerning their children's alcohol use can be affected. We recognize that in contrast to these other campaigns, the recommended campaign does not focus on a single behavior, nor does it focus on specific changes in adults' own behavior with regard to alcohol use. It urges parents and other adults to accept and act on a broad social norm, and it therefore has a longer time horizon than many of these more focused campaigns.

Although the available evidence bearing on the effectiveness of an adult-oriented campaign is modest, the committee is reasonably optimistic about the potential value of such a campaign, for two reasons. First, there is associational evidence that periods of broad national campaigns incorporating a variety of channels and institutional change efforts have been matched by periods of reductions in risky behavior. Those examples include the National High Blood Pressure Campaign from 1972 to 1984 (Roccella, 2002), the anti-tobacco efforts of the late 1960s-early 1970s (Warner, 1981) and the late 1990s-early 2000s (Siegel, 2002), and the anti-drug campaigns of the middle 1980s (Institute of Medicine, 2002).

[5]The best evaluated of these, the winners campaign in California (Wallack and Barrows, 1982), showed some differences in levels of exposure between control and mass media communities and some hints about attitude difference, but none suggesting behavior change. However, the authors of the evaluation caution against generalizing too much from the results since they indicate how far the realized program departed from the proposed intervention.

Second, there is particularly strong evidence for the positive effects of media campaigns, which are able to link communication efforts with enforcement. The drinking and driving efforts described above were successful when they were able to link their messages to a specific expectation of enforcement. Similarly, seat belt use has climbed quickly when media publicity is linked to enforcement (Williams et al., 1996). Indeed one meta-analysis of the literature concludes that the largest effects evident in the mass media campaign literature come from campaigns which link media publicity with enforcement (Snyder and Hamilton, 2002).

Also pertinent to this aspect of the proposed campaign, both for parents and other adults, is the literature on compliance with the law. A central theme in the proposed campaign is that facilitating underage drinking is not only socially irresponsible but also illegal in most situations. Deterrence—through the threat of criminal prosecution or of civil liability for any injuries to third parties—can be part of the message, but the more powerful mechanism may be through the "expressive" or "declarative" function of the law, the mechanism through which the law registers social disapproval, teaches that the behavior is perhaps more dangerous than may have been appreciated, and thereby instills or reinforces the desired social norm. The mechanism here is not fear, but rather a powerful form of instruction drawing on the general desire to comply with legal rules (see Bonnie, 1985; Tyler, 1992; Tyler and Huo, 2002).

This discussion has focused on intervening with parents and other adults in ways that encourage their active prevention of underage drinking specifically. However, there is a second route of intervention with parents that might well be incorporated into the proposed campaign. Evidence shows that the extent of supervision and monitoring by parents of youth, in general, affects youth initiation of risky behaviors and that intensive individual or group parent counseling can affect parenting behavior and, in turn, youth risk behaviors, including alcohol consumption (Taylor and Biglan, 1998; Dishion and Andrews, 1995; Dishion et al., 2002). So a reasonable argument has been made that it would be worthwhile to attempt to communicate about new parenting behaviors, particularly through the use of advertising.

The Office of National Drug Control Policy (ONDCP) took this task on as a complement to its youth-focused campaign, described in Chapter 10. It dedicated nearly an equal amount of its ad campaign to parenting skills, particularly encouraging the close monitoring of children by parents. The expectation was that success in encouraging closer monitoring would in turn affect youth use of drug. Thus far the evaluation of this component of the anti-drug campaign suggests mixed results (Hornik et al., 2002). There is some evidence of an effect on the extent that parents talk with their children about drugs and for an effect on parental beliefs about the value of

monitoring. The evidence for effects on actual monitoring and supervision is less strong, however. The ONDCP campaign is still ongoing, so definitive results are not yet available.

It may be possible that some actions to prevent youth drinking are easier to affect than general parent monitoring. For example, it may be easier to convince parents and other adults to stop facilitating drinking parties by their underage children than it is to encourage them to systematically monitor their children. Although this may be a sensible argument, there is not yet evidence to support it.

THE EVIDENCE FOR ACTION

In sum, there are several arguments in favor of a campaign aimed at parents and other adults: they often do not know about their children's drinking behavior; they probably do not have a well-developed understanding of the specific risks of drinking; communication campaigns are often quite good at diffusing new knowledge; such campaigns have been successful in promoting specific protective behaviors by parents and in changing attitudes and behaviors relating to drunk driving; and parental monitoring of their children is prospectively related to their likelihood of using alcohol. At the same time, the evidence is not clear as to whether such knowledge about their children's risk of alcohol use and abuse, and of the negative consequences of such use, affects parents' behavior with regard to alcohol. In addition, there is as yet no evidence of any campaign effects on relevant parental behavior, particularly on monitoring and supervision behaviors. Yet the campaign proposed here is sufficiently different than previous efforts that we ought not be constrained by the lack of clear prior success. It is different because it intends a more comprehensive approach, combining media attention with community efforts; it is different because it addresses both general parenting skills and specific adult behaviors that may facilitate underage drinking; and it is different because it is taking the long view, recognizing that there is a need for transformation in that community social norms underlie underage drinking.

A complex additional concern has to do with the indirectness of this approach. A campaign directed toward youth will be successful if it affects youth behavior, its immediate target. A campaign directed toward adults is only successful if it first affects adults' behaviors and if those behaviors then affect youths' behavior. Such a two-stage approach may appear to be less promising than a direct one if the goal is to reduce youth drinking. However, from a longer-term perspective, the goal is to change or strengthen the social norm against facilitation of underage drinking, and any effects on youth are secondary to this change in the normative climate. The goal is to convince parents and other adults to embrace the idea that they need to

take their own obligation seriously and that they need to hold other parents and adults to a high standard as well. The success of this effort cannot be judged, in the short term, by whether it has an effect on underage drinking. A reasonable goal, in the very short term, would be to show an effect on adult knowledge and attitudes, and, in the intermediate term, to show an effect on adult behavior. If the campaign has these effects, the committee is reasonably confident that it would ultimately have an impact on youth drinking over the long term.

DESIGNING THE CAMPAIGN

It is premature for the committee to propose a particular structure or content for the media campaign before a program of formative research has been carried out.[6] However, to give Congress and other interested audiences a more concrete idea of what we envision, we briefly describe a possible structure for such a campaign.

An adult-focused campaign might have three major themes. At the start, much of the emphasis might on broad social norms. As detailed above, most parents consider youth alcohol use to be problematic, but do not accurately perceive the risk to their own children and fail to recognize their own role in influencing their children's alcohol use. The earliest phase of the campaign might work on these perceptions, readying parents and other adults for the need to change their own behavior insofar as it facilitates or condones underage alcohol use. If the legal messages are determined in the developmental phase to be significant with the target audience, this phase might also include information about the law governing underage drinking and the legal duties of parents and other adults.

The preparatory phase might serve as the foundation for the next phase a more action-oriented phase that might include two complementary approaches. One approach might focus on specific beliefs related to youth alcohol use that has been shown by preliminary research to motivate adult action—such as perception that youth drinking is harmful in specific ways other than drinking and driving or that parents expect other parents to take action to prevent youth drinking. The accompanying message might recommend specific actions to prevent youth alcohol use, such as not hosting

[6]During this period of formative research, consideration must be given to the growing diversity of the U.S. population. For example, the percentage of Hispanic children increased from 9 to 16 percent between 1980 and 2000 and is projected to increase to 22 percent by 2020. Cultural and linguistic factors will need to be taken in to account for specific racial or ethnic groups.

teenage parties that provide alcohol and not purchasing liquor on behalf of underage youth. The second, complementary approach might focus on parental monitoring—including supervision, engaging with children, and imposing consistent and appropriate discipline—on the grounds that those skills can have a major influence on underage drinking, as well as other risky behavior.

These themes might be delivered through a variety of channels. Paid media would probably have to play a substantial role in diffusing specific messages and would probably represent the most costly portion of the campaign. However, the messages conveyed through paid media would probably be insufficient to produce a change in parental norms and behavior unless messages supporting such changes were reinforced through other channels that reach parents and adults. Assuring that multiple sources of information and a wide variety of institutions are presenting reinforcing messages would be a crucial objective for the campaign.

Possible Models

One model for this approach can be found in one of the first and most successful national campaigns, the National High Blood Pressure Education Campaign. Although this campaign did some advertising of its messages, it relied heavily on actions by other institutions: campaign planners worked with physicians' organizations to encourage physicians to provide advice about high blood pressure consistent with national guidelines; they proposed stories to newspapers and television and radio that conveyed their priority messages; and they developed affiliations with, and provided materials to, grassroots organizations interested in hypertension (Roccella, 2002).

The California anti-tobacco campaign provides another possible model for this approach. That effort was able to mobilize statewide support for a dedicated tobacco tax: those revenues were then used to purchase media time for anti-tobacco advertising, to support school and community-level anti-tobacco programs, and to promote local policies limiting exposure to environmental tobacco smoke. The media campaign was expected to directly influence smokers or potential smokers, but it also served to energize the population around the state and to promote policy changes designed to further reduce opportunities for smoking. While the increased tax on tobacco surely had independent effects on consumption, there is evidence that the observed reductions in smoking in California reflected the interaction of higher cost, direct advertising, and complementary local activities (Pierce, 2002; Hu et al., 1995).

As we envision it, an adult-focused campaign to reduce underage drinking would work similarly to the California campaign and other successful

campaigns. It would make use of a range of channels to reach its audience, continuously adjusting its message strategy, its mix of channels, and its links with grassroots organizations and national leadership groups and policy makers. It would both encourage policy changes and grassroots support for local and national policy changes and use policy changes as a basis for disseminating messages to individual parents and other adults and for encouraging specific behavioral actions.

A Developmental Approach

The committee believes that there is a sound, though limited, evidentiary and logical foundation for an adult-focused campaign. Given the limited knowledge, however, some people may be reluctant to support a national campaign and suggest, instead, pilot programs to test the strategy. The committee disagrees with this view because underage drinking is so well embedded in U.S. culture that small-scale prototype tests may miss the point or at least find it difficult to make much headway.

Because the acceptability of underage drinking is widespread, it will take more than an isolated campaign to affect it, no matter how well designed such a campaign might be. It will take a multipronged effort over a long period, making use of as many routes of influence as possible. We think the evidence is sufficient to support a presumptive commitment to the idea of launching such a campaign after a carefully designed, step-by-step developmental phase. Thus, while we do not favor a small-scale pilot test of the campaign as a whole, we do recommend pilot testing of specific features of the campaign during the developmental period, as discussed below.

The Challenge

The history of campaigns aimed at tobacco use and drunk driving are instructive in indicating why we think that the presumptive commitment is warranted. The anti-tobacco efforts have been successful because they changed the culture about smoking. That cultural change has permitted many other things about smoking to change (social and legal norms about where people can smoke, etc.). Drunk driving has been subject to a similar cultural shift. Grassroots lobbying from Mothers Against Drunk Driving and others, along with specific government-sponsored interventions and new regulations and enforcement policies, transformed a behavior that was once perceived as risky, but not strongly condemned, into conduct that is universally regarded as socially unacceptable.

If one assumes that the culture around underage drinking needs to change in the same way that the cultures around drunk driving and tobacco use have changed, then that history becomes the model. National cam-

paigns are part of a broad effort to affect the culture. It is instructive that both of these exemplars reflect interactions between private and public entities. They are better described as social movements, in which the government's role is to respond to, support, and stimulate private action.

In this approach, a government-sponsored communication campaign has as its goal the support of changes in social norms that relate to adult behavior insofar as it enables and facilitates underage drinking. Such efforts are not to be evaluated by their short-term effects on youth drinking, but by their effects on broad social norms about that drinking, by the willingness of adults to take actions to reduce it, and by changes in public policies known to affect underage drinking rates.

An adult-focused mass communication campaign is also meant to support local efforts to reduce drinking. It is important not only because of what it does on its own, but also because its effects provide leverage for local efforts—and vice versa. It would link its activities to the broadest group of adult stakeholders—industry, colleges and universities, the military, and community organizations. Wherever possible, a national campaign would coordinate activities with local needs and provide for the tailoring of its messages for different communities. It cannot be tested as a prototype on a very local scale because its effectiveness depends on the involvement of a wide range of constituencies and, ideally, the engagement of the entire nation's attention.

Our Approach

In the end, the committee is faced with a conundrum in formulating its recommendation for developing and implementing an adult-focused media campaign. On one side, we find the idea to be highly promising, but lacking the kind of direct evidence needed for unequivocal endorsement of the high costs of such a campaign. On the other side, testing the campaign in a very limited way in order to gather more evidence is not a viable option because a small-scale effort (relying, for example, only on paid media messages delivered in one locality alone without any reinforcement by national or even regional media and other institutional partners) would almost certainly produce unimpressive results (see Institute of Medicine, 2002). In short, implementing an adult-oriented campaign in the absence of an opportunity to build the social movement around the idea would not be a fair test of the approach. Is there a middle course? We suggest a substantial effort to develop the program, with the aim of erecting circumscribed conditions of demonstrated efficacy that would have to be satisfied before the decision is made to implement a national campaign.

The proposed campaign would be developed over time on the basis of an intensive agenda of formative research designed to define the promising

messages, the appropriate channels to reach target audiences, and the timing and weight given to various messages and channels over time. Campaign strategy would reflect initial research with target audiences and continual monitoring of how they respond to the campaign as it evolves. A central issue would be how best to link the campaign with local, state, and national policy changes about youth alcohol use, if they are adopted.

During the first phase, we suggest funding the basic formative work for the campaign, including intensive and multifaceted developmental research. This phase might involve controlled tests of whether high exposure to messages leads parents and other adults to be willing to change their behavior, particularly if this can be done in the context of actions by local organizations concerned about youth alcohol use or of local policy changes. While we would be reluctant to expect too much influence from such a highly localized campaign, given the lack of nonlocal sources of reinforcing information, a good deal might be learned about what is promising and what falls completely flat.

A second preliminary phase might build on that local effort and develop larger-scale efforts in one or two states where there was substantial interest among government or grassroots organizations. While the national media and national policy would not be engaged, there would still be opportunities for building a statewide social movement, with analogies to the state-level anti-tobacco campaigns in California, Florida, and Massachusetts. If these statewide efforts show enough promise to suggest that a nationwide effort would be worthwhile, then the decision to build the broad national effort would rest on a strong scientific foundation and would be fully justified.

If results were positive at each stage, a projected schedule might require 3 years for developmental and preliminary testing. This would be followed by 5 years of full operation. In subsequent years, booster efforts might be implemented, as monitoring evidence established a need.

7

Alcohol Industry

The alcoholic beverage industry—the brewers, vintners, and producers of distilled spirits—and the distributors and servers of these products—have been an important part of U.S. society from its colonial beginnings. Indeed, it was in the "public houses" where "potables" were served that much of the planning for the American Revolution was accomplished. Part of that tradition, however, has been a general understanding that while alcohol is woven into the fabric of the nation's collective life, it also has great potential for causing harm, and that producers, distributors, and servers of alcohol bear some of the responsibility for preventing that harm and for promoting safe and responsible drinking. That is at least part of what it meant to be a "publican"—a position of significant status and responsibility in colonial society. That idea survives today in the licensing requirements for drinking establishments, in the existence of a structure of server liability, and in the commitment of the alcohol producers to encourage responsible drinking.

It is clear, we think, that those who produce and distribute alcohol have the opportunity to act in ways that will either ameliorate or exacerbate the problem of underage drinking. We take at face value the industry's collective commitment to helping society manage and reduce underage drinking. Such a declaration of values and intentions is consistent with a commonsense understanding of the industry's social and legal responsibility with respect to underage drinking. Yet two important social realities are inescapable: first, that a significant amount of underage drinking occurs in violation of the law and against the stated intentions of the industry, and second,

that the alcohol beverage industry gains financial returns (both revenues and profits) from underage drinking.

Some have taken these facts to suggest that the alcohol industry's commitment to reducing underage drinking may be equivocal. After all, today's underage drinkers are tomorrow's legitimate customers, and the industry has self-evident economic incentives to satisfy the underage demand. Suspicion that some new alcohol products and some alcohol advertising seem to be specifically targeted at the tastes and sensibilities of underage drinkers leads some industry critics to claim that at least some companies are not only being negligent with respect to underage drinking, but may (more culpably) be encouraging it (American Academy of Pediatrics, 1995; Center on Alcohol Marketing and Youth, 2002a; Community Anti-Drug Coalitions of America, n.d.).

In this report we take the industry's professed motives as its true motives and focus our attention on how the industry's collective efforts to reduce underage drinking could become both more effective and more credible. In the committee's judgment, a great deal can and should be done by the alcohol industry to help society prevent and ameliorate some of the harms associated with its otherwise legitimate efforts to produce and market a product valued by the adult population. Specifically, the industry's commendable investment in programs to reduce underage drinking or promote responsible adult drinking warrant more rigorous evaluation and improved coordination with other efforts. The committee makes several recommendations designed to increase and channel the industry's prevention efforts. In addition, the committee urges the industry to exercise greater collective self-restraint in its marketing practices in order to reduce underage exposure to alcohol advertising. Although the evidence regarding the causal effects of alcohol advertising on underage consumption is inconclusive, it has been amply documented that there is a large underage market for alcohol, that advertising reaches a substantial underage audience, and that many commercial alcohol messages are particularly appealing to youth. In the committee's judgment, this evidence warrants more aggressive self-regulatory efforts to reduce youth exposure to advertising. Specific recommendations, drawing on the industry's best practices, are presented later in the chapter.

THE UNDERAGE MARKET

Efforts to estimate the proportion of alcohol consumed by underage drinkers have been bedeviled by the imprecision of quantity questions in national surveys and by concerns about underreporting, particularly in the National Household Survey of Drug Abuse. The most recent effort, by Foster et al. (2003), estimated that underage drinkers consumed 830.6

million drinks per month, or 19.7 percent of the total alcohol consumed. As discussed in Chapter 2, the estimation procedure used in that study is subject to a number of criticisms, and the committee calculates that the proportion is likely somewhere between 10 and 20 percent.

Based on their quantity estimates, Foster et al. (2003) estimated the expenditures by underage drinkers for beer, spirits, and wine, and concluded that underage drinkers spent $22.5 billion, or 19.4 percent of total consumer expenditures for alcohol. (It is lower than the proportion of consumption because youths are more likely to consume beer, a lower-priced beverage.) As explained in Chapter 2, we think this revenue estimate is a bit high because underage drinkers probably spend less per drink than do adults for a variety of reasons: most important is the fact that most of the drinks consumed by underage youths are off premise, originally purchased in the form of bottles, kegs, or six-packs, rather than from restaurants and bars, and the average price for on-premise sales is probably three or four times as high as off-premise sales. Whatever the precise amount, however, it is highly likely that underage drinking accounts for a significant proportion of the alcohol market, especially for beer.

INDUSTRY PROGRAMS TO REDUCE AND PREVENT UNDERAGE DRINKING

In recognition of the high prevalence of underage and illegal drinking, the alcohol industry has declared its collective support of the 21-year-old minimum drinking age and has undertaken efforts to discourage alcohol use by underage youths. Various industry-sponsored initiatives and programs have been implemented with the stated objectives of reducing underage drinking and promoting responsible or moderate drinking among adults.[1] The Beer Institute, the national trade association for the nation's brewers, reported that the beer industry has "committed hundreds of millions of dollars to create effective anti-underage drinking programs."[2] For example, Anheuser-Busch and its wholesalers have "invested more than $375 million [time period not specified] to implement alcohol awareness programs to fight drunk driving, help retailers spot fake IDs, and encourage parents to talk with their kids about drinking."

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[1]For brief descriptions of some of the industry-sponsored activities, see http://www.centurycouncil.org/under_age/prevention.cfm; http://www.centurycouncil.org/underage_age/retail/cops.htm; http://www.discus.org/industry/underagedrinking.htm; http://www.discus.org/ir/college_education.htm; http://www.beerinstitute.org/alcoholprograms.htm; and http://www.nbwa.org/advocates/respons.htm.

[2]Quotations included in this section are based on materials submitted to the committee by various industry organizations; they are available in the public access file for this committee at the National Academies.

Beer producers and wholesalers have produced numerous brochures, booklets, compact disks, videos, and public service announcements aimed at educating youth, parents, potential servers of alcohol to youth, and the general public. Programs for servers of alcohol (e.g., "We I.D.," "TIPS") are designed to promote enforcement of laws prohibiting sales to minors and to prevent serving underage and intoxicated persons. Other materials highlight the perils of drinking and driving, promote responsible drinking, or provide advice to parents on helping kids make responsible decisions. The industry also has sponsored activities specific to college campuses. They include the types of activities just noted, as well as support for the social norms approach (i.e., counteracting beliefs that the prevalence of drinking among peers is higher than it really is). Some companies in the beer industry also have sponsored public speakers and participated in community efforts to address underage drinking.

Representatives of the distilled spirits industry reported to the committee a similar commitment to reducing underage drinking. For example, the Distilled Spirits Council of the United States (DISCUS), a national trade association representing producers and marketers of distilled sprits and importers of wines sold in the United States, recently provided funding to a number of colleges to implement alcohol action plans. DISCUS also supports the programs funded by the Century Council,[3] a nonprofit entity established in 1991 that reports having invested "more than $120 million" over the last 10 years "in programs that fight against the misuse of their products." The Century Council defines its core activities as being aimed at four objectives, two of which focus on drunk driving and two of which focus specifically on underage drinking:

- educate middle-school through college students, their parents, teachers, and adult caregivers about the importance of making responsible decisions regarding beverage alcohol;
- inform the public about how gender, weight, and number and type of drink affect an individual's blood alcohol concentration (BAC) and increase awareness of state BAC driving laws;
- deter minors from buying beverage alcohol through joint programs with law enforcement, retailers, and wholesalers, using point-of-sale materials and public awareness campaigns; and
- reduce drunk driving through research and promising strategies, tougher state and federal legislation, treatment, and education.

[3]The Century Council is funded by Allied Domecq Spirits and Wine North America; Bacardi USA, Inc.; Brown-Forman; DIAGEO; Future Brands LLC; and Pernod Ricard USA.

In addition to activities similar to those described above, the Century Council (2001) has produced resource materials (e.g., *Promising Practices: Campus Alcohol Strategies*) aimed at helping colleges develop effective programs to reduce alcohol abuse. They also have developed and distributed Alcohol 101, a college-level interactive program on alcohol-related problems that is distributed to hundreds of campuses nationwide and Cops in Shops, a program aimed at deterring underage purchases.

Overall, the alcohol industry has apparently invested significant resources in a diverse range of efforts aimed at reducing underage drinking and its associated harms, including media messages, educational programs, and enforcement activities. Some industry members have also entered into partnerships with specific colleges and universities to reduce drinking problems on those campuses, often grounded in social norms marketing approaches (see Chapter 10).

The committee is aware of only one industry-sponsored education program that has been independently evaluated—Alcohol 101. The evaluation (Anderson and Cohen, 2001) used a naturalistic design with purposeful sampling, including attention to regional sampling, and included colleges and universities believed to have done a good job implementing the program. Anderson and Cohen reported that the program is viewed "with a high degree of positive regard" (2001, p. 22), with some campus personnel suggesting modest changes on their campuses, and others reporting positive student engagement. Anderson and Cohen reported, with the most robust implementations, measurable gains in relevant knowledge, willingness to act in emergencies, and intentions to modify drinking to reduce alcohol problems. Nonetheless, they suggested additional in-depth analysis of the campus-based findings involving additional institutions and types of settings and further statistical analyses of existing data.

A recent study by the Center on Alcohol Marketing and Youth (2003) studied "responsibility advertising" by the alcohol industry on television in 2001 and reported that industry spent $23.2 million to air 2,379 responsibility messages (discouraging underage drinking and drunk driving); they contrasted these with $811.2 million on 208,909 product advertisements. With regard to underage drinking in particular, they report that there were 179 product ads for every ad that referred to the legal drinking age. All of the legal-drinking age messages were broadcast by only two alcohol companies—Anheuser Busch ($12.2 million) and Coors ($3.6 million).

Many public health experts in the alcohol prevention field are highly skeptical about the value of the industry's underage drinking programs and other prevention activities and about the industry's collective motivation for sponsoring them. The criticism most frequently heard is that the main effect of these programs may be to promote brand identification, if not alcohol use itself. The committee is in no position to assess or ascertain the

actual intentions underlying these programs. However, in the absence of documented evidence of effectiveness from independent evaluation, skepticism about the value of industry-sponsored programs is likely to continue. Based on our own review of the materials submitted by industry representatives, the alcohol prevention literature, and the other materials and testimony submitted to the committee, we believe that industry efforts to prevent and reduce underage drinking, however sincere, should be redirected and strengthened.

Recommendation 7-1: All segments of the alcohol industry that profit from underage drinking, inadvertently or otherwise, should join with other private and public partners to establish and fund an independent nonprofit foundation with the sole mission of reducing and preventing underage drinking.

Other public health leaders have recently urged the alcohol industry to endow an independent foundation to curb excessive drinking by adults as well as underage drinking (National Center on Addiction and Substance Abuse, 2003). However, the committee believes that—at the outset, at least—the mission should be strictly limited to the prevention of underage drinking. If the mission is not limited to underage drinking, which is illegal, the committee is doubtful that agreement could be reached about the foundation's goals and the scope of its activities. While a very strong social consensus supports strong measures to reduce underage drinking, such a consensus does not yet exist about what it means to reduce "excessive" or otherwise "irresponsible" drinking or about the measures that should be taken to achieve this goal.

The committee believes that a foundation that is focused exclusively on preventing and reducing underage drinking—through activities, programs, and methods that can be carefully defined and specified in the founding charter—would provide an opportunity for the alcohol industry, interested business associations, advocacy organizations, and government to enter into a social contract grounded in, and manifesting, recognition of collective responsibility.[4] Primary funding for such a foundation would ideally be

[4]The agreement envisioned by the committee would differ substantially from the terms of the Master Settlement Agreement (MSA), executed by major tobacco manufacturers and the state attorneys general to settle the Medicaid lawsuits against the tobacco industry. The MSA established the American Legacy Foundation, charging it with specific functions relating to reducing youth smoking, and obligated the industry to fund the Foundation at least for a period of years. The Legacy Foundation grew out of a lawsuit and is currently in litigation over one tobacco company's claim that Legacy violated its obligation under the MSA to avoid "vilifying" the industry. The committee envisions a collaborative nonadversarial relationship among the parties to the agreement establishing a foundation to prevent underage drinking.

provided by alcohol producers and wholesalers as an offset to income they receive as a result of underage drinking. By contributing to the foundation, they would have an opportunity to acknowledge, without defensiveness, that marketing of alcohol to young adults contributes, however unintentionally, to the web of social influences promoting underage drinking. The foundation also would provide an opportunity for all member organizations to declare and implement a genuine and unequivocal commitment to try to curtail alcohol use by underage youths and to conduct impartial evaluation of the effectiveness of interventions undertaken.

As the committee envisions it, many, if not all, of the existing industry activities in the domain of underage drinking would be redirected to the new foundation. The committee is no position to write the charter for this entity, which will have to be negotiated among all the organizational participants. However, it is clear that the charter would have to ensure that the foundation's ability to operate is not hampered by the dominance of any single interest group or by the perception that it serves the commercial interests of its funders. A possible funding formula among all the participating industry partners could be developed along the following lines: Each alcohol producer, acting individually or through trade associations or other entities, would help to fund the activities of the foundation in a manner that is commensurate with the amount and proportion of industry revenues attributable to underage consumption. As indicated in Chapter 2, underage drinkers consumed between 10 and 20 percent of all alcohol consumed in 2000, representing about $11 to 22 billion, although the proportion differs substantially among beer, wine, and spirits. A reasonable target for the annual industry contribution to the foundation would be 0.5 percent of gross revenues (about $250-500 million) prorated according to the particular company's share of the underage market (estimated based on surveys about underage brand use, or, in the absence of such data, based on the particular company's share of the overall beer, wine, or spirits market).[5]

Until the proposed foundation has been established, the committee believes that the alcohol industry should take two immediate steps to redirect the resources and activities currently devoted to preventing underage drinking and to move toward the strategy recommended by the committee.

[5]A bill developed by the California Alcohol Policy Reform Initiative and pending before the California Assembly, would impose a "fee" on alcohol producers based on the producers' respective shares of the underage market. Under the bill, the California Department of Alcohol and Drug Programs would conduct an annual survey of youth drinking to determine brand preferences. Up to $100 million would be collected annually and distributed to the counties for youth prevention and treatment programs. The committee's proposal urges alcohol producers, advocacy groups, and other interested parties to reach agreement on such an approach in lieu of a governmental solution.

First, industry-sponsored media messages regarding underage drinking should be redirected away from youth audiences and focused instead on changing the attitudes and behavior of parents and other adults—to persuade them not to facilitate or enable underage drinking and to accept responsibility for preventing it. For example, industry-sponsored messages could be designed to alert adults to their legal responsibilities, including potential liability for injuries caused by underage drinkers to whom they give alcohol, or could show a shoulder-tap enforcement sting by undercover youths (see Chapter 9). Although the alcohol industry may not be the most credible source of messages aiming to reduce the demand for alcohol (by either adults or youths), messages aimed specifically at curbing behaviors that violate the restrictions on underage access can hardly be used as pretexts to stimulate demand. Indeed, they might be especially effective because the industry has both credibility and natural channels of communication with its adult customers. Second, industry-funded messages and programs should be delivered directly to young people only if they rest on a scientific foundation, as judged by qualified, independent organizations, or incorporate rigorous evaluation. Programs that have an exclusive focus on providing information have been demonstrated to be ineffective at reducing alcohol use and should be avoided (see Chapter 10).

ADVERTISING AND PROMOTION

In 2001, alcoholic beverage companies spent $1.6 billion on advertising in print media, broadcast media, billboards, and other venues—known as measured media purchases. At least twice that amount was spent on unmeasured promotion, which include sponsorships, product placement payment in entertainment media, point-of-sale advertising, discount promotion, apparel and other items with brand-name logos, and other activities (Federal Trade Commission, 1999, Appendix B; see Figure 7-1 for recent trends). Industry critics assert that some of these marketing activities are intentionally directed toward underage audiences (see, e.g., Center for Science in the Public Interest, 2002; Center on Alcohol Marketing and Youth, 2002a), but even if the companies are not targeting young people, abundant evidence shows that a large proportion of these commercial messages and promotional activities do, in fact, reach underage audiences. The current practice of some companies—advertising on television programs with an audience that is at least 50 percent adult—routinely allows placement of alcohol advertising on programs for which the percentage of underage viewers is higher than the percentage of underage children in the United States (Center for Alcohol Marketing and Youth, 2002b).

The effect on youth drinking of voluminous and pervasive alcohol advertising and promotional activity is one of the most highly contested

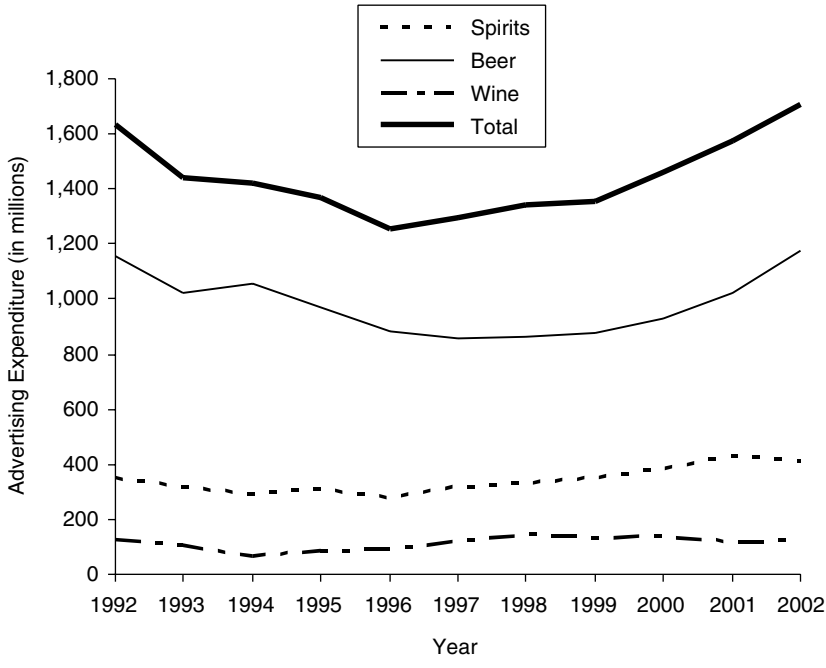

FIGURE 7-1 Measured media advertising expenditures for alcohol products, 1992-2002, in 2002 dollars (adjusted for inflation).
SOURCE: Data from LNA/Mediawatch multimedia service, competitive media reporting (expenditure) and McCann-Erikson world group (media cost-per-thousand composite index).

issues in the alcohol prevention field. The question is complex, both empirically and legally. Before turning to the controversial aspects, however, we present the undisputed points.

Alcohol advertising is designed to highlight the attractions of using alcohol, especially to enhance the enjoyment of social occasions, and to induce or persuade potential consumers to feel favorably toward the promoted product. Even though these messages may not be intentionally targeted at youths under 21, messages aimed at "young adults" (e.g., ages 21- to 25-year-olds) will inevitably reach older teens (e.g., ages 16- to 20-year-olds); moreover, many of those messages will also be attractive to children and teenagers (those under 16). A particularly troubling illustration of the youth-specific attractions of an alcohol marketing campaign concerns so-called "alcopops," sweet, flavored alcoholic malt beverages. Recent survey data suggest that these products are more popular with teenagers than with adults, in terms of both awareness and use. These concerns recently led

Congress to direct the Federal Trade Commission to study the impact of alcopop advertising on underage consumers (see Consolidated Appropriations Resolution, 2003). In sum, the widespread exposure of youth to alcohol marketing and the attractiveness of alcohol-related messages to them are well documented. The disputed issue, empirically, is whether alcohol advertising contributes, *in a causal sense*, to the prevalence and intensity of underage drinking. Although many people believe that it does (Community Anti-Drug Coalitions of America, n.d.) and there is some evidence of a correlation between exposure to alcohol advertising and drinking by young people (Atkin and Block, 1981; Atkin et al., 1984), a causal link between alcohol advertising and underage alcohol use has not been clearly established (e.g., Atkin, 1987, 1995; Smart, 1988; Lastovicka, 1995; Grube, 2004). A substantial body of research on the effects of advertising and promotion on alcohol consumption and its consequences, and specifically on underage alcohol consumption, has produced findings that are mixed and inconclusive (Grube, 2004). With some notable exceptions (e.g., Saffer, 1997), experimental and ecological studies have produced little evidence that alcohol advertising affects drinking beliefs, behaviors, or problems among young people.

Recent survey evidence (further described below) shows that young peoples' awareness of, and affect toward, certain types of commercial messages about alcohol are correlated with their drinking beliefs and behaviors (Austin and Nach-Ferguson, 1995; Grube, 1995; Slater et al., 1997), but because most of these studies are cross-sectional, the evidence is only suggestive. That is, it is possible that advertising affects young people's drinking beliefs and behaviors or, conversely, that preexisting predispositions to drink increase attention to alcohol advertising. Nonetheless, some research (Grube and Wallack, 1994) suggests that attention to alcohol advertising has a significant effect on drinking beliefs and intentions among school children, even when the reciprocal effects of these beliefs on attention are controlled. These effects, however, are modest and, overall, the evidence is best considered inconclusive.

It is sometimes assumed that, in the absence of compelling evidence of causation, there is no legitimate basis for limiting the exposure of young people to alcohol advertising. This assumption is wrong for three reasons. First, the absence of definitive proof may be caused by the methodological complexity of the inquiry rather than the absence of a contributing effect (e.g., see, Thorson, 1995; Calfee and Scheraga, 1994). Obviously, many social and cultural influences are propelling young people toward alcohol use, and it should come as little surprise that the available scientific tools cannot disentangle advertising from this web of influences. Second, there is a sound commonsense basis for believing, even in the absence of definitive proof, that making alcohol use attractive to young people increases the

likelihood that they will become alcohol consumers as young people rather than waiting until they are adults. It is abundantly clear that young people attend to and are attracted to some alcohol advertisements. Moreover, young people who are drinkers or who are predisposed to drinking are more attracted to these advertisements than other young people (Martin et al., 2002; Casswell and Zhang, 1998; Wyllie et al., 1998a, 1998b; Grube and Wallack, 1994). Third, persistent exposure of young people to messages *encouraging* drinking by young people (even if they appear to be 21) contradicts and interferes with the implementation of the nation's goal of *discouraging* underage drinking. In this respect, the emphasis is less on causation than on contradiction and ambiguity.

The ongoing dispute about whether alcohol advertising causes underage drinking is tied to the legal controversy over whether government-imposed bans or restrictions on alcohol advertising would violate the First Amendment because the constitutionality of any significant limitations on advertising imposed by the government would probably turn on the strength of the evidence on causation. However, this emphasis on the constitutionality of government intervention, and the accompanying preoccupation with proof of causation, overlooks the paramount importance of self-regulation by the alcohol industry. The industry has the prerogative—indeed, the social obligation—to regulate its own practices and to refrain from marketing products or engaging in promotional activities that have a particular appeal to youngsters, irrespective of whether such practices can be *proven* to "cause" underage drinking.

In an important report on alcohol advertising, the Federal Trade Commission (FTC) (1999, p. 3) emphasized the virtues of self-regulation:

> Self-regulation often can be more prompt, flexible, and effective than the government regulation. It can permit application of the accumulated judgment and experience of an industry to issues that are sometimes difficult for the government to define with bright line rules. With respect to advertising practices, self-regulation is an appropriate mechanism because many forms of government intervention raise First Amendment concerns.

The FTC went on to fault the alcohol industry for the weakness of its current self-regulatory efforts, and that was the starting point for this committee's deliberations. The committee believes that greater self-restraint by the alcohol industry in its marketing practices is an essential component of a sound national strategy for reducing underage drinking.

In sum, the committee regards the empirical dispute about whether advertising causes underage drinking, and whether the existing evidence of causation is strong enough to justify government restriction under the First Amendment, to be an unnecessary distraction from the most important task at hand—strengthening industry self-regulation and promoting corporate

responsibility. In the event that the industry fails to respond satisfactorily to this challenge, the case for some government action might become more compelling.[6]

Recommendation 7-2: Alcohol companies, advertising companies, and commercial media should refrain from marketing practices (including product design, advertising, and promotional techniques) that have substantial underage appeal and should take reasonable precautions in the time, place, and manner of placement and promotion to reduce youthful exposure to other alcohol advertising and marketing activity.

Use of images or other content uniquely or unusually attractive to children provides highly persuasive evidence of an intention to target an illegal, underage audience. However, by far the more common situation involves advertisements that are not uniquely attractive to children and that have equivalent appeal to children or teenagers and adults. Should alcohol advertisers display or broadcast such messages knowing that they will appeal to young people? Obviously this is not a scientific question, and it highlights the challenge of defining socially responsible advertising behavior. This key issue is whether companies should voluntarily forgo potentially highly successful commercial messages (or display them only in adult-only venues) in order to avoid exposing them to young people who will find them attractive.

In the committee's opinion, alcohol companies should refrain from displaying commercial messages encouraging alcohol use to audiences known to include a significant number of children or teens when these messages are known to be highly attractive to young people. It is not enough for the company to say: "Because these messages also appeal to adults, who will predominate in the expected audience, we are within our legal rights."

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[6]The committee emphasizes, in this connection, that government is not altogether powerless to regulate advertising, especially if effective industry self-regulation is not forthcoming. Even though banning or severely restricting the informational content of alcohol advertising as a means of preventing underage drinking may be impermissible in the absence of persuasive scientific evidence of causation, restrictions on the "time, place, and manner" of alcohol advertising to reduce its exposure to children and teenagers are probably permissible, on the basis of logic, experience, and common sense, as long as they do not substantially impede the industry's opportunity to communicate with its lawful consumers through equivalent channels. Few would doubt the authority of the government to preclude alcohol advertising in children's magazines, on television during daylight hours on weekdays, or on billboards immediately adjacent to an elementary or secondary school window. Furthermore, certain messages (e.g., "Hey kids, drinking is fun") would be precluded on the basis of the advertiser's illegal intention, and it can certainly be argued that use of cartoon characters or other images especially likely to attract children can also be restricted as long as informational content is unrestricted.

From the standpoint of industry self-regulation, there are two ways of responding to this situation. The most effective, and the easiest to administer, is to circumscribe the media locations (time and place) in which any alcohol messages can be placed. So, for example, there could be an industry guideline that no alcohol advertisement can be placed in a magazine or television show in which more than a designated percentage of the audience (say, 25 percent) is expected to be under 21. This approach is called a limit on the "placement" of advertising. The second approach focuses on the "content" of the advertising. Thus, the industry code might aim to preclude the use of certain types of images, sounds, or words that have particular appeal to youths. Obviously, formulating and applying a content-based standard is a difficult undertaking. The need to do so will depend in part on whether and to what extent the placement of advertisements is restricted. For example, there would ordinarily be less need for a content restriction if placements were precluded in any media for which more than 10 percent of the audience was expected to be underage than there would be if placements were precluded only if more than 50 percent of the audience was expected to be underage.

In 1998, Congress requested the FTC to assess the adequacy of self-regulatory efforts by the alcohol industry to prevent practices that encourage underage drinking. The FTC's report, issued in 1999, reviewed existing industry standards and practices, identified deficiencies and best practices, and recommended improvements in relation to advertising placement and content. Four years later, the 2003 appropriations bill directed the FTC to reexamine industry practice regarding liquor-branded "alcopop" advertising and expressed concern that the industry had not fully implemented the commission's 1999 recommendations. Although the committee believes the 1999 FTC recommendations are too weak in some respects, alcohol producers, wholesalers, and their trade associations should implement those recommendations forthwith, as an expression of good faith and as a signal of their willingness to become active partners in the nation's campaign to reduce underage drinking.

Recommendation 7-3: The alcohol industry trade associations, as well as individual companies, should strengthen their advertising codes to preclude placement of commercial messages in venues where a significant proportion of the expected audience is underage, to prohibit the use of commercial messages that have substantial underage appeal, and to establish independent external review boards to investigate complaints and enforce the codes.

Advertising Placement

Industry codes for beer and distilled spirits currently allow placement of alcohol advertising in media for which most of the audience is expected to be 21 or older. Because 70 percent of the population is 21 or over, this standard effectively allows placements almost anywhere except young children's television shows or magazines, and therefore allows alcohol messages to reach large numbers of children and teenagers on a regular basis. A good example is the pervasive beer advertising that accompanies sports broadcasts on weekday evenings and throughout the weekend. In 2001, for example, the alcohol industry spent $492 million dollars on advertising for sports television: Twenty percent of these ads (11,630 ads, with spending totaling more than $48 million) were on sports programs for which, based on expected proportions of the viewing audience, youth were more likely than adults to have seen the ads (Center on Alcohol Marketing and Youth, 2002b). In its 1999 report, the FTC recommended that the industry threshold be moved toward 25 percent, representing the industry's current best practices, and that companies be required by the codes to measure their compliance against the most reliable, up-to-date audience composition data available.

Since the 1999 FTC report, the wine industry and several individual beer and spirits companies have embraced a 30 percent threshold. These steps should be applauded, but the industry standard should continue to be reduced. In the committee's view, immediate implementation of an industry standard of 25 percent for television advertising, as suggested by the FTC, would signify meaningful self-restraint in alcohol marketing to reduce youth exposure. Based on data provided by the Center on Alcohol Marketing and Youth (CAMY) at Georgetown University, a 25 percent threshold would have a modest, but significant, effect on the volume of alcohol advertising on television and on the number of young people exposed to it. The current 50 percent voluntary standard for beer and spirits precludes advertising on only 6 percent of the television programs tracked by Nielsen if the denominator for the viewing population encompasses viewers as young as 2 and only 1 percent of the programs if the viewing population base excludes children under 12. A 25 percent threshold would preclude alcohol advertising on 16.4 percent of programs if the base includes children under 12 and 8.2 percent if it excludes children under 12.

Over time, the industry standard should move toward a 15 percent threshold for television advertising,[7] a standard currently being considered

[7]According to figures provided to the committee by the Center on Alcohol Marketing and Youth, a 15 percent threshold would preclude alcohol advertising on 34.0 percent of programs if the base includes children under 12 and 19.2 percent if it excludes children under 12.

by at least one industry member. Some advocacy groups have recommended that the audience proportion threshold be reduced to 10 percent and that it be coupled with a numerical maximum (e.g., 1 million youths) to take account of the size of the audience and the absolute number of young people likely to be exposed to the ads. However, the committee does not regard this as a practical suggestion, at least for the foreseeable future. Such a limit would preclude alcohol advertising on major "adult" viewing events, such as the Super Bowl, and the industry cannot reasonably be expected to embrace such a restrictive approach as a preferred practice.

Although most of the attention regarding alcohol advertising has focused on television, print advertising raises analogous concerns.[8] A recent study of alcohol advertising in magazines by Garfield et al. (2003) counted advertisements that appeared from 1997-2001 in 35 of 48 major U.S. magazines that tracked their adolescent readership. Variation was assessed in placement frequency for each alcohol product type according to size of adolescent readership and other variables. Garfield et al. (2003) found that the alcohol industry placed 9,148 advertisements, at a cost of $696 million, during this period, with adolescent readership of the magazines ranging from 1.0 to 7.1 million. Most (82 percent) of these advertisements were for liquor, with fewer placements for beer (13 percent) and wine (5 percent). The finding highlighted by the investigators was that, after adjustment for other magazine characteristics, the advertisement rate ratio for beer and liquor was 1.6 times higher for each additional million adolescent readers. However, the committee believes that the significance of this finding must be assessed in light of the accompanying finding that, for liquor advertising, the rate ratio is even higher (2.6) for every additional million young adult readers (defined as 20-24 because advertising industry data do not distinguish between 20- and 21-year-olds) than it is for increased adolescent readership.

This study calls attention to the basic policy problem in relation to alcohol advertising—increased exposure to the lawful young adult audience often involves increased exposure to older teens. In relation to liquor advertising, increasing young adult exposure was accompanied by increased youth

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Assuming that alcohol advertising dollars would be redeployed to programs with audience compositions below the threshold, a 15 percent threshold (using a base of 12 and older) would reduce youth gross rating points (the industry standard measure of exposure) by 22 percent.

[8]In the context of billboards and other print media in local retail markets, allowing text-only advertising of price and key product characteristics, which may be less attractive to youth (Kelly et al., 2002), is a suitable alternative to a more sweeping restriction, whether self-imposed or enacted by local governments. The FDA's unsuccessful regulatory effort to restrict tobacco advertising to a text-only format, as recommended in *Growing Up Tobacco Free* (Institute of Medicine, 1994a), provides a useful model.

exposure, but at a lower rate. (By contrast, the advertisement rate ratio for beer advertising was only 1.0 for every additional million young adult readers, as compared with 1.6 for every additional million adolescent readers.) It is possible that a marketing strategy aiming for young adults could identify magazines with high young adult exposure but small youth readership. Indeed, although the numbers are small, Garfield et al. (2003) found that the wine advertisers were able to increase young adult exposure (advertisement rate ratio = 3.0) without increasing youth exposure (advertisement rate ratio = 0.72), and they also report that their findings regarding increased exposure of youth and young adults were statistically independent. In the overall policy context, however, the underlying problem remains—in order to avoid youth exposure, liquor advertisers might have to avoid placements in the magazines with the most promising young adult readership.

Setting a 25 percent threshold would be a useful improvement in the current industry practice, as a demonstration of good faith in the effort to find a formula that reasonably accommodates the industry's interest in communicating with its young adult consumers and the public's interest in minimizing underage exposure. According to CAMY, nearly 30 percent of alcohol advertising dollars spent in a sample of 98 magazines were spent in magazines with at least 25 percent adolescent readers. More than half of the money was spent in magazines whose adolescent and young adult (12-20) audience exceeded their proportion in the U.S. population (CAMY, 2002a). Based on these data, adoption of a 25 percent threshold, would reflect a meaningful commitment to alter otherwise lawful magazine advertising practices to reduce youth exposure to alcohol advertising.[9] As with television advertising, however, the industry should consider eventually moving toward a 15 percent threshold to further reduce the number of youth who are exposed to advertising intended for adults.

Advertising Content

As noted above, under some circumstances, the likelihood that a particular message will appeal to a youthful audience may be so great that the company will be said to have "intended" to target an underage audience

[9]The absolute size of the youth readership is obviously relevant for magazines, just as it is for television advertising. However, coupling a threshold for audience proportion with a ceiling on youth readership would selectively apply different rules to the largest circulation magazines with young adult audiences, and would have the effect of precluding alcohol advertising in these magazines altogether. Standing alone (rather than as part of a more complicated formula), a ceiling on youth readership does not appear to be a feasible solution.

with that advertisement, in violation of the existing codes and in violation of the federal and state laws prohibiting "unfair acts or practices" in advertising. The industry codes each ban the use of images or depictions, such as cartoons, uniquely attractive to youth.[10] However, the usual case is that the message is equally appealing to adults and young people. What should be done in these cases?

As suggested above, the answer depends in part on the nature and extent of any restrictions on placements. If placements of alcohol advertising are not permitted unless the expected audience is 85 percent or 90 percent adults, then the companies are presumably not targeting young people, and the message is being designed to be attractive to adults. Under these circumstances and in the absence of other evidence of youth targeting, it seems disingenuous to insist that a particular type of message be banned because it is also attractive to youths in an otherwise overwhelmingly adult audience. However, if the industry's current 50 percent threshold is maintained—or even if the threshold is reduced as suggested by the committee—the exposure of underage viewers will remain substantial. Under these circumstances, companies may properly be expected to avoid advertising content with strong appeal to young viewers.

Admittedly such a standard is not self-defining and self-executing. The committee joins the FTC in encouraging the companies and their trade associations to embrace and build on best practices to reduce the likelihood that alcohol advertising will have particular appeal to youths. Specifically, the kinds of practices to avoid would include any advertising content (a song, character, or idea) that would be effective in promoting a product that is explicitly meant to be used by children or young teens. Companies would also limit the "spillover" appeal to underage drinkers by targeting their alcohol messages to an audience that is no younger than 25.

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[10]For example, the Wine Institute Code of Advertising Standards states that wine advertisements should not "use music, language, gestures, cartoon characters, or depictions, images, figures, or objects that are popular predominantly with children or otherwise specifically associated with or directed toward those below the legal drinking age, including the use of Santa Claus or the Easter Bunny." The Beer Institute Advertising and Marketing Code provides that "advertising and marketing materials should not employ any symbol, language, music, gesture, or cartoon character that is intended to appeal primarily to persons below the legal purchase age." To "appeal primarily" to youth means having "special attractiveness to such persons above and beyond the general attractiveness it has for persons above the legal purchase age, including young adults above the legal purchase age." The Code of Good Practice for Distilled Spirits Advertising and Marketing provides that distilled spirits advertising and marketing materials "should not depict a child or portray objects, images, or cartoon figures that are popular predominantly with children."

Internet Advertising

Many Internet sites sponsored by alcohol companies are easy for children to access. According to the FTC's 1999 report, there are more than 100 commercial alcohol websites, but only 43 percent of beer sites and 72 percent of spirit sites have some kind of age restriction (either a filter or a warning). Although these data are undoubtedly out of date, no recent review is available. While it appears that most sites now use "virtual bouncers" to check for age of viewers, the effectiveness of this approach is unknown. In keeping with their commitment to prevent underage drinking, alcohol companies should use their best efforts, based on evolving technology, to restrict underage access to their web sites and avoid using games and cartoons that are unusually attractive to children and teenagers.

Product Placement

As discussed in greater detail in the next chapter, the entertainment industry should acknowledge its own responsibility to avoid program content that glorifies, or presents in a favorable way, underage use of alcohol or that exposes young audiences to unsuitable messages relating to alcohol. The committee recognizes that the content of movies, television programs, web-based entertainment, and live theater lies at the heart of the First Amendment and that any governmental regulation is constitutionally precluded. However, these media have a social responsibility to try to avoid or reduce youth exposure to unsuitable alcohol messages.

Obviously, alcohol companies do not have complete control over artistic decisions to display or use their products in films or other entertainment media. However, an identifiable brand is not likely to be prominently displayed without the request or permission of the alcohol company. Moreover, it is a common practice within the industry to seek placements of alcohol products or logos in films, television programs, and music videos. In 1997-1998, eight companies responding to the FTC reported that they made product placements in 233 movies and one or more episodes of 181 different television series. The companies sometimes pay for these placements.

According to the FTC's 1999 report, alcohol companies avoid product placement in films, programs, or videos that actually show underage drinking, but otherwise do not seem to have a common practice regarding screening films and programs for alcohol-related content and for the likelihood of exposure to underage audiences. The FTC recommended that product placements be restricted to movies that are rated "R" (or NC-17), that they be avoided when an underage person is the primary character, and that the standards for placement of advertising (discussed above) also be applied to

product placement. These recommendations seem sensible and the committee encourages the industry to implement them. At a minimum, product placements should be explicitly disclosed.

Code Enforcement

Among the most important recommendations in the FTC's 1999 report was its call for the industry to create independent external review boards with responsibility and authority to address complaints from the public or other industry members regarding alleged violations of the codes. In support of this recommendation, the FTC reported favorably on the experience of the National Advertising Division of the Council of Better Business Bureaus (CBBB), which receives and investigates complaints about the truthfulness of advertising, and the National Advertising Review Board, which receives advertiser appeals, and whose members are drawn from both inside and outside the advertising industry. Since the FTC's 1999 report, Coors is the only company to establish such a review mechanism. The company's "Advertising Complaint Evaluation" process opens company advertising and marketing materials to review by CBBB's Advertising Pledge program.

ACCOUNTABILITY

What should be done if the industry codes are not strengthened and the nation's young people continue to be exposed to such a large volume of messages portraying alcohol use in a favorable light? In the absence of external review mechanisms and in light of constitutional constraints on direct restrictions of advertising, the committee believes that the most fruitful governmental response would be to facilitate public awareness of industry advertising practices and thereby to promote industry accountability through the marketplace.

Recommendation 7-4: Congress should appropriate the necessary funding for the U.S. Department of Health and Human Services to monitor underage exposure to alcohol advertising on a continuing basis and to report periodically to Congress and the public. The report should include information on the underage percentage of the exposed audience and estimated number of underage viewers for print and broadcasting alcohol advertising in national markets and, for television and radio broadcasting, in a selection of large local or regional markets.

In Chapter 12, the committee recommends that a market surveillance mechanism be established to monitor underage use of alcohol according to

brand. Together with the advertising data collected and reported in accord with the recommendation set forth above, this information would enable the public to judge whether a company's marketing practices are attracting disproportionate numbers of underage consumers, whether wittingly or unwittingly. In such situations, the public will be in a position to bring market pressure to bear on the relevant company. And, of course, if the data suggest intentional targeting, or reckless disregard for the effects of the marketing on underage drinking, regulatory intervention might be undertaken.

THE SPECIAL CASE OF COLLEGES AND UNIVERSITIES

Colleges and universities should ban alcohol advertising and promotion on campus. Currently, 72 percent of colleges and universities prohibit on-campus alcohol advertising and 62 percent prohibit industry sponsorship of athletic events. The Congress (by "sense of the Congress resolution"), the Department of Health and Human Services, DISCUS, and the Wine Institute have urged all colleges and universities to adopt these policies. It should be emphasized, again, that this recommendation is not predicated on the argument that banning the advertising will, in itself, reduce the prevalence and intensity of drinking among underage college students. Instead, the objective is to declare and affirm colleges' genuine commitment to a policy of discouraging alcohol use among underage students.

8

Entertainment Industries

Since artistic expression inevitably reflects the culture in which it is embedded, it is hardly surprising that alcohol use and alcohol products are frequently displayed or mentioned in prime-time television, movies, and music recordings. Although the viewing or listening audiences for many of these media products are predominantly adult, some of them are disproportionately underage, and even the predominantly adult audiences typically include large numbers of young people.

The committee recognizes, of course, that the entertainment media and their adult audiences have a common interest in a robust free market in television programming as well as in movies, video games, and music recordings and that alcohol consumption is an inescapable element of modern U.S. culture. At the same time, it must also be recognized that images and lyrics depicting underage drinking in a favorable light or otherwise glamorizing alcohol consumption affect the perceptions and attitudes of children and teenagers toward alcohol consumption and that exposure to those images and lyrics is associated with youthful drinking.

Despite abundant correlational data from cross-sectional studies, however, there is no definitive evidence that youthful exposure to alcohol content in the entertainment media has a causal effect on underage drinking (Grube, 2004). Concern that such a relationship may exist is reinforced, however, by the findings of an important cohort study of adolescent initiation of smoking. Of more than 3,000 adolescents aged 10 to 14 who had never smoked, Dalton et al. (2003) report that 10 percent had initiated smoking 13 to 26 months later, and that 17 percent of those in the highest

quartile of exposure to movie smoking had initiated smoking, in comparison with 3 percent of those in the lowest quartile of exposure. After controlling for baseline characteristics, the researchers concluded that adolescents in the highest quartile of exposure to movie smoking were 2.71 time more likely to initiate smoking than those in the lowest quartile, and that, in this cohort, 52 percent of smoking initiation was attributable to exposure to smoking in movies.

On the basis of this limited, but suggestive, evidence, the committee believes that there is a strong possibility that youthful exposure to alcohol content in entertainment media contributes to early initiation of alcohol use. In light of that possibility, the entertainment industries have a social responsibility to eschew displays or lyrics that portray underage drinking in a favorable light or that glamorize or promote alcohol consumption or irresponsible behavior in products that are targeted toward or likely to be heard or viewed by large underage audiences.

Recommendation 8-1: The entertainment industries should use rating systems and marketing codes to reduce the likelihood that underage audiences will be exposed to movies, recordings, or television programs with unsuitable alcohol content, even if adults are expected to predominate in the viewing or listening audiences.

By "unsuitable alcohol content," the committee means to include lyrics, images, depictions, or messages that portray underage drinking in a favorable light; that portray intoxication or otherwise excessive alcohol use by anyone in an attractive way; or that promote or glorify alcohol use in high-risk situations, such as while driving. Further specification of unsuitable alcohol content can be found in the advertising and marketing codes of the beer, wine, and distilled spirits industries. The committee urges the entertainment industries to review these codes to help develop specific standards for rating and marketing practices.

The challenge of promoting responsible industry practices regarding underage alcohol use is analogous to the challenge of reducing youth exposure to explicit sexual themes, violence, or illegal drug use. The committee accordingly reviewed industry practices in these areas—as well as the efforts of the Federal Trade Commission (FTC) to prod the industry into stronger self-regulation. In the context of violent programming, a recent series of FTC reports is highly instructive. In a 2000 report, the FTC found that members of all three major entertainment industries—motion pictures, music, and video games—had engaged in widespread marketing of violent movies, music, and electronic games to children under 17 by promoting their products on television, in magazines, and on Internet sites that have large underage audiences (FTC, 2000).

The FTC found that 80 percent of the 44 R-rated movies selected for

study had been marketed to children under 17; as had 70 percent of the adult-rated video games and 100 percent of the explicit music recordings. In addition, the FTC found that advertisements for these products rarely contained rating information. The FTC also conducted undercover shopping operations to retailers and movie theaters with unaccompanied teens (aged 13-17); the young shoppers were able to buy M-rated electronic games and "parental advisory" labeled music recordings 85 percent of the time and to purchase tickets for R-rated movies 46 percent of the time.

Follow-up reports (FTC, 2001, 2002) noted progress by the movie and video game industries in disclosing rating information in advertising and in limiting advertising for R-rated movies and M-rated games in teen-oriented media. However, the report found little improvement in advertising by the music recording industry and only weak progress in strengthening self-regulation. The motion picture studios and video game manufacturers have developed an age-based rating system, designed to inform parents of the level of objectionable material suitable for children of different ages. In contrast, the music industry's "explicit content" warnings are not age specific and make no mention of the specific reasons for the warning (e.g., drug use, language, violence). However, one music industry member has begun including reasons for the warning on product packaging and advertising.

MOVIES

Extrapolating from recent national survey data, 11- to 13-year-olds spend an average of 6.2 hours per week, and 14- to 18-year-olds spend an average of 4.7 hours per week watching movies (Roberts et al., 1999a). In terms of alcohol content in films, recent content analyses indicate that alcohol was shown or consumed in 93 percent of the 200 most popular movie rentals for 1996 to 1997 (Roberts et al., 1999b). Although underage use of alcohol occurred in only about 9 percent of these films, alcohol and drinking were presented in an overwhelmingly positive light. Drinking was associated with wealth or luxury in 34 percent of films containing alcohol references and pro-use statements or overt advocacy of use occurred in 20 percent of the films. Anti-use statements appeared in 9 percent of films with alcohol references, 6 percent contained statements on limits as to when, where, and how much alcohol should be consumed, and 14 percent depicted refusals to drink.

Drinking in movies is often associated with such risky activities as crime or violence (38 percent), driving (14 percent), and sexual activity (19 percent). Portrayals of negative consequences of drinking are relatively rare. In all, 57 percent of films with alcohol references portrayed no consequences at all. Similar findings have emerged from other content analyses. Thus, at least one lead character drank in 79 percent of the top money-

making U.S. films from 1985 to 1995 (Everett et al., 1998). Moreover, 96 percent of those films contained references supportive of alcohol use, while only 37 percent contained references discouraging alcohol use. Alcohol use even occurs in G-rated films. Among G-rated animated feature films released in U.S. theaters from 1937 to 2000 and available on videocassette, 47 percent showed alcohol use with, at best, ambivalent connotations (Thompson and Yokota, 2001). A review by Roberts, Henriksen, and Christensen (1999b) showed that alcohol use occurred in 76 percent of movies rated G or PG, 97 percent of movies rated PG-13, and 94 percent of movies rated R.

Ratings are assigned by a Rating Board appointed by the president of the Motion Picture Association of America (MPAA). According to the current MPAA Rating Board guidelines, the criteria taken into account by the board include theme violence, language, nudity, sensuality, and drug abuse. Films are rated as a whole. Under the rating system, films are rated G (all ages admitted), PG (parental guidance suggested because some material may be unsuitable for children), PG-13 (parents strongly cautioned because some material may be inappropriate for children under 13), R (restricted for children under 17 unless accompanied by parent), and NC-17 (no one under 17 admitted). Alcohol use is not explicitly mentioned as a rating criterion in the MPAA guidelines, and actual rating practice is not easily inferred. Although a film with illegal drug use cannot be assigned a G or PG rating, alcohol use (by adults) is widely depicted in films with these ratings.

Recommendation 8-2: The film rating board of the Motion Picture Association of America should consider alcohol content in rating films, avoiding G or PG ratings for films with unsuitable alcohol content, and assigning mature ratings for films that portray underage drinking in a favorable light.

MUSIC RECORDINGS

Music is a popular form of entertainment for young people: 11- to 13-year-olds spend 11.2 hours per week and 14- to 18-year-olds spend 9.3 hours per week listening to music on radio, compact disks (CDs), or tape (Roberts et al., 1999a). Many parents and other adults are likely unaware of the extent of alcohol images in today's music and music videos, particularly rap music, which is especially appealing to young people. References to alcohol and drinking, including brand-name references and lyrics and images glamorizing alcohol use, are commonplace in today's music, particularly in hip hop songs and music videos. A recent content analysis (Roberts et al., 1999b) examined 1,000 of the most popular songs from

1996 to 1997 across five genres of music popular with youth. They found that 17 percent of all the lyrics contained references to alcohol: alcohol was mentioned much more frequently in rap music (47 percent) than in other genres, which included country-western (13 percent), top 40 (12 percent), alternative rock (10 percent), and heavy metal (4 percent). Overall, 22 percent of songs with alcohol mentions referred to beer or malt liquor, 34 percent to wine or champagne, 36 percent to hard liquor or mixed drinks, and 31 percent to generic terms such as "booze." A common theme was getting intoxicated or high (24 percent), although drinking was also associated with wealth and luxury (24 percent), sexual activity (34 percent), and crime or violence (13 percent). Consequences of drinking were mentioned in only 9 percent, and anti-use messages occurred in only 3 percent of the songs with alcohol references. Product placements or brand-name mentions occurred in 30 percent of them and were especially common in rap music (48 percent). An analysis of alcohol depictions in rap music (Herd, 1993) found the portrayal of alcohol use to convey elements of disinhibition, rebellion, identity, pleasure, sensuality, and personal power.

DuRant et al. (1997) analyzed 518 music videos from four television stations—MTV, BET, CMT and VH1—for portrayals of alcohol and tobacco use. In terms of music genre, rap music contained the highest percentage of depictions of alcohol use, and rhythm and blues videos showed the least alcohol use. Alcohol use was found in a higher proportion of music videos that had any sexual content than in videos that had no sexual content.

The music industry has been the slowest to implement rating and advertising restrictions in line with the FTC's recommendations in its reports on the marketing of recordings with violent content to young audiences. The deficiencies identified by the FTC in these reports are directly applicable to the marketing of recordings with alcohol content to young audiences. The recording industry has no independent review board for its decision to label recordings. There are also no stated standards for what sort of recording receives a label, and the current labeling system does not require recording companies to inform buyers of the reasons for the explicit-content label. The FTC's follow-up reports in 2001 and 2002 found that advertising for explicit-content labeled recordings continued to appear on television programs popular with teen audiences. Although there have been some recent improvements, these advertisements frequently failed to indicate that the advertised product had a parental warning label; even when this information was indicated, it was often too small to be read. Except for one recording company, the companies themselves provide little to no information as to the reasons for the parental warning label or where to find such information (FTC, 2002).

In the committee's judgment, more responsible self-regulation by the

music recording industry is an essential component of a meaningful societal commitment to reduce underage drinking. At the present time, lyrics glamorizing alcohol use are proliferating in recordings that are marketed predominantly to teenagers, and the music recording industry has failed to take suitable steps to establish and enforce an appropriate rating system.

Recommendation 8-3: The music recording industry should not market recordings that promote or glamorize alcohol use to young people; should include alcohol content in a comprehensive rating system, similar to those used by the television, film, and video game industries; and should establish an independent body to assign ratings and oversee the industry code.

Unlike the movie and video game industries, the music recording industry has not committed itself to meaningful self-regulation. It is time for the music recording industry to adopt such a code and to include in the code a specific ban against lyrics and images that depict underage drinking in a favorable light or otherwise glamorize or promote alcohol use in products that are marketed to underage audiences. These guidelines could be adapted from the FTC recommendations regarding alcohol advertising to youth (see FTC, 1999).

A music recording industry rating system of songs should provide consumers with brief descriptors of lyric and image content, including alcohol content, similar to rating systems adopted by the television, film, and video game industries. A rating system provides parents with information that can help them make informed decisions. While movies, television programs, and video games are rated on a gradient with specific guidelines for each of the ratings, the current system used by the music recording industry effectively classifies all products into two categories—with or without explicit content (on sex and violence). The packaging and marketing of music provides no other information as to the content of the product.

The system from the video gaming industry, established by the Entertainment Software Rating Board (ESRB), serves as the best model for a comprehensive rating system that can be adapted by the music recording industry. The system includes a rating that is displayed in a rating symbol on the front of the product's packaging and content descriptors that are located on the back of the product. The ESRB uses five ratings (early childhood, everyone, teen, mature, and adults only); fewer would probably be suitable for music recordings. The ESRB system has 26 content descriptors, including 2 for alcohol content—alcohol reference and use of alcohol—that can be used in any combination to describe the content found in the game; see Box 8-1.

The music recording industry should specify when the recording includes alcohol content, and when a rating system has been adopted, the

BOX 8-1
ESRB Rating System

Rating Symbols

EARLY CHILDHOOD: Content may be suitable for ages 3 and older; contains no material that parents would find inappropriate.
EVERYONE: Content may be suitable for persons aged 6 and older; may contain minimal violence and some comic mischief or crude language.
TEEN: Content may be suitable for persons aged 13 and older; may contain violent content, mild or strong language, or suggestive themes.
MATURE: Content may be suitable for persons aged 17 and older; may contain mature sexual themes or more intense violence or language.
ADULTS ONLY: Content is suitable only for adults; may include graphic depictions of sex or violence. Not intended for persons under the age of 18.
RATING PENDING: The product has been submitted to the ESRB and is awaiting final rating.

Examples of ESRB Content Descriptors

Alcohol reference: reference to images of alcoholic beverages.
Animated blood: cartoon or pixilated depictions of blood.
Blood and gore: depictions of blood or the mutilation of body parts.
Comic mischief: scenes depicting slapstick or gross vulgar humor.
Drug reference: reference to images of illegal drugs.
Gambling: betting like behavior.
Mature humor: vulgar or crude jokes and antics, including "bathroom" humor.
Mature sexual themes: provocative material, possibly including partial nudity.
Nudity: graphic or prolonged depictions of nudity.
Strong language: profanity and explicit references to sexuality, violence, alcohol, or drug use.
Strong sexual content: graphic depiction of sexual behavior, possibly including nudity.
Suggestive themes: mild provocative references or materials.
Tobacco reference: reference to images of tobacco products.
Use of drugs: the consumption or use of illegal drugs.
Use of alcohol: the consumption of alcoholic beverages.
Use of tobacco: the consumption of tobacco products.
Violence: scenes involving aggressive conflict.

SOURCE: Adapted from ESRB (2003).

rating board should classify any recording with unsuitable alcohol content, including name-brand reference of alcohol products, as appropriate only for "mature' audiences. Using this approach for name-brand references would be analogous to the FTC's recommendation that all films with paid alcohol placement receive an R or NC-17 rating (FTC, 1999). In conjunc-

tion with the alcohol industry, the music recording industry should work to bar alcohol placement in music videos aimed at underage audiences. Finally, the music recording industry should increase consumer and parental understanding of the improved rating system. In its December 2001 report on the marketing of violent entertainment to children, the FTC found that all of the 55 recordings in their study with explicit lyrical content (pertaining to violence) were targeted to children under the age of 17. With that type of marketing and pressure geared toward young people, parents must take an active role in regulating the images their children receive, and it is up to the industry to provide parents with the necessary information they need to make educated decisions regarding consumption. The recording industry should adopt a more comprehensive rating system, and it should provide literature on the reasons behind the ratings. This information should be made available either within the product packaging or in some other easily accessible area, such as through a telephone hotline or an Internet web site. The point is that parents be better able to access and understand information about the content of products they purchase for their children.

The MPAA has the Ratings Board and the Interactive Digital Software Association (IDSA) has the ESRB, but the Recording Industry Association of America (RIAA) has no separate governing body that rates the content of their industries products. MPAA's rating board and the IDSA's ESRB are both governing bodies established by their respective industry associations to provide nonbiased review and ratings of products for the purpose of educating parents. After viewing the content of a game (using video clips) or a movie (in its entirety), the boards make a rating decision on each game or film that is submitted to them; see Box 8-2.

The RIAA's Parental Advisory Program consists of a set of guidelines that regulate the placement of the parental advisory label on the packaging and marketing of music, but it establishes no authoritative board to review the content of products. Individual record companies and their artists determine whether each individual recording warrants a parental advisory label. Asking record companies to rate their own records is akin to asking studios to rate their own movies. Without an independent review board, any determination of explicit content is probably both unreliable and inconsistent. Furthermore, without a comprehensive ratings system (similar to the one used by the video game industry), the determination of explicit content in records is of little use to parents.

RETAIL ACCESS TO MOVIES AND RECORDINGS

FTC's recent reports on violence in the entertainment media, described above, recommended that all three industries (movie, music recording, and

video game) improve the usefulness of their ratings and labels by establishing codes that prohibit marketing R/NC-rated/M-rated/explicit-labeled products in media or venues with a substantial under-17 audience. The reports also emphasized that restricting children's retail access to entertainment containing violent content is an essential complement to restricting the placement of advertising. Such restriction could be implemented by checking identification or requiring parental permission before selling tickets to R or NC movies and by not selling or renting products labeled "explicit" or rated R or M to children. In addition, the FTC suggested that each industry's trade associations monitor and encourage their members' compliance with these policies and impose meaningful sanctions for noncompliance.

We fully endorse the FTC's recommendation and suggestion. We believe that these would also be appropriate actions to reduce the exposure of underage audiences to unsuitable images relating to use of alcoholic beverages in the entertainment media.

TELEVISION

Adolescents are heavy users of television. Each week, 11- to 13-year-olds watch 27.7 hours, and 14- to 18-year-olds watch 20.2 hours of broadcast and taped television programming (Roberts et al., 1999). As a result, they are immersed in drinking portrayals and alcohol product placements. A recent content analysis of prime-time television from the 1998-1999 season, for example, showed that 71 percent of episodes sampled from prime-time programs depicted alcohol use, typically in a positive light, and that 77 percent contained some reference to alcohol (Christensen et al., 2000).

Among those programs most popular with teenagers, 53 percent portrayed alcohol use: 84 percent of TV-14 rated programming, 77 percent of TV-PG programming, and 38 percent of TV-G programming depicted alcohol use. More episodes portrayed drinking as an overall positive experience (40 percent) than a negative one (10 percent), although negative consequences were mentioned or portrayed in 23 percent of episodes. Underage drinking was relatively rare. Only 2 percent of regular characters under the age of 18 were depicted drinking alcohol. In another recent content analysis, however, characters between the ages of 13 and 18 accounted for 7 percent of all alcohol incidents portrayed (Mathios et al., 1998). When it occurs, youthful drinking or expressed desire to drink is often presented as means of appearing to be adult and grown-up (Grube, 1995).

The television networks have adopted a mandatory rating policy. Shows are rated for age-appropriate content under seven grades:

BOX 8-2
Ratings of the MPAA

G: "General Audiences—All Ages Admitted"

This is a film which contains nothing in theme, language, nudity and sex, violence, etc. which would, in the view of the Rating Board, be offensive to parents whose younger children view the film. The G rating is not a "certificate of approval," nor does it signify a children's film.

Some snippets of language may go beyond polite conversation but they are common everyday expressions. No stronger words are present in G-rated films. The violence is at a minimum. Nudity and sex scenes are not present; nor is there any drug use content.

PG: "Parental Guidance Suggested. Some Material May Not Be Suitable For Children"

This is a film which clearly needs to be examined or inquired into by parents before they let their children attend. The label PG plainly states that parents may consider some material unsuitable for their children, but the parent must make the decision.

Parents are warned against sending their children, unseen and without inquiry, to PG-rated movies.

The theme of a PG-rated film may itself call for parental guidance. There may be some profanity in these films. There may be some violence or brief nudity. But these elements are not deemed so intense as to require that parents be strongly cautioned beyond the suggestion of parental guidance. There is no drug use content in a PG-rated film.

The PG rating, suggesting parental guidance, is thus an alert for examination of a film by parents before deciding on its viewing by their children.

Obviously such a line is difficult to draw. In our pluralistic society it is not easy to make judgments without incurring some disagreement. So long as parents know they must exercise parental responsibility, the rating serves as a meaningful guide and as a warning.

PG-13: "Parents Strongly Cautioned. Some Material May Be Inappropriate For Children Under 13"

PG-13 is thus a sterner warning to parents to determine for themselves the attendance in particular of their younger children as they might consider some material not suited for them. Parents, by the rating, are alerted to be very careful about the attendance of their under-teenage children.

A PG-13 film is one which, in the view of the Rating Board, leaps beyond the boundaries of the PG rating in theme, violence, nudity, sensuality, language, or

- TV-Y—appropriate for all ages
- TV-Y7—appropriate for ages 7 and above
- TV-Y7-FV—suitable for ages 7 and up but containing some elements of fantasy violence
- TV-G—appropriate for most children

other contents, but does not quite fit within the restricted R category. Any drug use content will initially require at least a PG-13 rating. In effect, the PG-13 cautions parents with more stringency than usual to give special attention to this film before they allow their 12-year olds and younger to attend.

If nudity is sexually oriented, the film will generally not be found in the PG-13 category. If violence is too rough or persistent, the film goes into the R (restricted) rating. A film's single use of one of the harsher sexually-derived words, though only as an expletive, shall initially require the Rating Board to issue that film at least a PG-13 rating. More than one such expletive must lead the Rating Board to issue a film an R rating, as must even one of these words used in a sexual context. These films can be rated less severely, however, if by a special vote, the Rating Board feels that a lesser rating would more responsibly reflect the opinion of American parents.

PG-13 places larger responsibilities on parents for their children's movie going. The voluntary rating system is not a surrogate parent, nor should it be. It cannot, and should not, insert itself in family decisions that only parents can, and should, make. Its purpose is to give prescreening advance informational warnings, so that parents can form their own judgments. PG-13 is designed to make these parental decisions easier for films between PG and R.

R: "Restricted, Under 17 Requires Accompanying Parent Or Adult Guardian"

In the opinion of the Rating Board, this film definitely contains some adult material. Parents are strongly urged to find out more about this film before they allow their children to accompany them.

An R-rated film may include hard language, or tough violence, or nudity within sensual scenes, or drug abuse or other elements, or a combination of some of the above, so that parents are counseled, in advance, to take this advisory rating very seriously. Parents must find out more about an R-rated movie before they allow their teenagers to view it.

NC-17: "No One 17 And Under Admitted"

This rating declares that the Rating Board believes that this is a film that most parents will consider patently too adult for their youngsters under 17. No children will be admitted. NC-17 does not necessarily mean "obscene or pornographic" in the oft-accepted or legal meaning of those words. The Board does not and cannot mark films with those words. These are legal terms and for courts to decide. The reasons for the application of an NC-17 rating can be violence or sex or aberrational behavior or drug abuse or any other elements which, when present, most parents would consider too strong and therefore off-limits for viewing by their children.

SOURCE: MPAA (2003, pp. 4-5).

- TV-PG—containing some elements that may be inappropriate for young children
- TV-14—containing material that may be unsuitable for children under 14
- TV-MA—programming appropriate for people over 17

However, the ratings are typically assigned by the producers of the programming, and there is no independent board responsible for standardizing or enforcing these ratings. Moreover, although the networks rate programs, only conscientious use of the "v-chip" by parents serves to block programming.

The main criteria governing ratings under the prescribed categories are sexual content, violence, coarse language, and suggestive dialogue; if these elements are present, a notice is displayed on the screen at the beginning of the program, as well as in most television programming guides. While depictions of underage alcohol use or abuse may be rated as TV-14 or TV-MA, no specific criterion governs this type of content under existing standards, and, as a result, alcohol content is not one of the special criteria communicated to parents in advance (see www.tvguidlines.org).[1]

Recommendation 8-4: Television broadcasters and producers should take appropriate precautions to ensure that programs do not portray underage drinking in a favorable light and that unsuitable alcohol content is included in the category of mature content for purposes of parental warnings.

ACCOUNTABILITY

The committee believes that standards to minimize underage exposure to lyrics, images and depictions with unsuitable alcohol content should be implemented on a voluntary basis by the pertinent industry trade associations and individual companies. However, as with the alcohol industry, some independent oversight of these standards is warranted. In both contexts, the committee believes that the most promising strategy is to promote industry accountability by facilitating public awareness of industry practices. Accordingly, the committee recommends that the U.S. Department of Health and Human Services be authorized and funded to monitor these media practices and report to Congress and the public.

Recommendation 8-5: Congress should appropriate the necessary funds to enable the U.S. Department of Health and Human Services to conduct a periodic review of a representative sample of movies, television programs, and music recordings and videos that are offered at times or

[1]Direct regulation of content by the FCC is exercised only for obscene and indecent material, which has been interpreted almost exclusively to cover sexual depictions (http://www.fcc.gov/eb/broadcast/obscind.html, accessed November 15, 2002).

in venues likely to have a significant youth audience (e.g., 15 percent) to ascertain the nature and frequency of lyrics or images pertaining to alcohol. The results of these reviews should be reported to Congress and the public.

The Secretary of Health and Human Services should include this information in the Annual Report on Underage Drinking recommended in Chapter 12.

9

Access

This chapter addresses components of the strategy to reduce access to alcohol by youths under 21. Most developed societies that permit alcohol consumption by adults prescribe a minimum legal drinking age. Laws ban distribution of alcohol to underage persons and usually also proscribe underage purchase and possession of alcohol. As discussed in Chapter 1, these laws rest primarily on an instrumental rationale rather than a moral one—that is, they aim less to condemn immoral behavior than to protect young people from the potentially serious negative consequences of engaging in a behavior for which they may not be developmentally prepared. Their moral force lies mainly in the efforts to hold adults accountable for the harms caused by underage drinkers to whom they give or sell alcohol.

The prescribed minimum age differs substantially among countries; see Table 9-1. Whatever the prescribed minimum age, countries must decide what measures will be used to curtail access by minors through the otherwise lawful channels of distribution. Naturally, this is a daunting challenge, especially in countries like the United States, in which alcohol is widely available to adults through a multitude of outlets.

There is ample evidence that raising the minimum drinking age in the United States reduced drinking and its associated harms among youth. In all likelihood, these effects on underage consumption were mediated in part through the reduced accessibility of alcohol to youths. It is also clear that significant rates of noncompliance impede the effectiveness of the laws that restrict the provision of alcohol to underage youths. The question is what

TABLE 9-1 Minimum Legal Drinking or Purchase Age Across 64 Countries

Minimum Age	Number of Countries
None	5
< 16	4
16	6
17	1
18	38
19	1
20	2
21	7

NOTE: Some countries have different minimum legal ages for the purchase and consumption of alcoholic beverages or for different beverage types (e.g., beer and wine versus spirits), and in some cases there are regional variations within countries. The numbers in this table reflect the lowest minimum age for purchase or consumption of any alcoholic beverage in any state, province, or region within a country.
SOURCE: International Center for Alcohol Policies (2002).

can be done to increase compliance and, thereby, alcohol's availability to underage youths. In order to promote compliance with any laws, they must be communicated to, and understood by, the intended audiences (in this case, primarily adults), and there must be a credible threat of enforcement to deter violations by those who have strong incentives to offend—in this case, by selling or giving alcohol to underage drinkers. Maximizing the incentives for voluntary compliance will minimize the need for enforcement.

The effectiveness of laws to restrict access to alcohol by youths can be increased by closing gaps in coverage, promoting compliance, and strengthening enforcement. Although particular methods for increasing effectiveness along these lines have been tried in various jurisdictions, and some data are available regarding their success, others have not been evaluated. The strength of the evidence in support of any particular intervention varies, and in some cases the available evidence is contradictory. However, the committee believes that the preponderance of the available evidence, including recent evidence from studies on the prevention of youth smoking, supports an emphasis on efforts designed to increase the effectiveness of restrictions on youth access to alcohol.

Given that youth usually obtain alcohol—directly or indirectly—from adults, the committee also believes that the focus of these efforts should be on adults. A key component of the committee's strategy is the proposed

media campaign to help strengthen public commitment to the goal of reducing underage drinking and to promote adult compliance with youth access restrictions (see Chapter 6).

This chapter begins with a discussion of minimum drinking age laws and specific recommendations about the scope of the laws. It then moves to a discussion of how youths obtain alcohol. Given that youths obtain alcohol from a variety of venues, the committee believes that a range of approaches targeting different venues is necessary. The remainder of the chapter reviews various approaches to improving the effectiveness of access restrictions and summarizes the available evidence in four domains: (1) reducing access through commercial sources; (2) reducing access through noncommercial sources; (3) focused efforts to reduce drinking and driving by underage drinkers; and (4) prescribing and enforcing penalties directly against underage consumers.

Given that it is unreasonable to expect a measurable effect on consumption for any one isolated change in the fabric of access restrictions, most evaluations rely on measuring changes in enforcement behavior or in compliance on the assumption that, over time, increased enforcement will result in increased compliance, and that increased compliance (whether or not attributable to increased enforcement) will lead to reduced access, and in turn to reduced consumption. The level of evidence for specific recommendations varies, as discussed through this chapter. The committee has used its judgment in assessing the plausibility of these connections. In some cases, the committee's general recommendations include specific details that are based on the informed judgment of the committee. As with all aspects of the proposed strategy, particular interventions should be subjected to ongoing research to enable continued refinement of the strategy based on new empirical evidence.

The committee has assessed the potential value of each intervention not in isolation, but rather as part of a comprehensive set of steps that can be taken to curtail alcohol access to minors—mainly by promoting voluntary compliance, in both commercial and noncommercial contexts, but also by establishing and sustaining a credible threat of enforcement. Although there is robust evidence concerning the effects on consumption of increasing the legal minimum drinking age (and the accompanying, but unspecified, efforts to implement it), there is less evidence on the effects on youth consumption of comprehensive multipronged efforts to strengthen implementation of the underage drinking laws on the kind envisioned in this chapter.[1]

[1]An evaluation of the effects of the Enforcing the Underage Drinking Laws program on law enforcement and youth drinking behavior in the jurisdictions funded by the program is in the very early stages. The funded jurisdictions have wide latitude in the type of activities they can

IMPLEMENTING LAWS ON THE MINIMUM DRINKING AGE

Effectiveness

Strategies aimed at reducing youth access to alcohol focus on the nature and scope of the access restrictions and the policies and practices used to implement and enforce them (Holder, 2004; Grube and Nygaard, 2001; Toomey and Wagenaar, 1999). Overall, the purpose of these policies and practices is to raise the "full price" of alcohol by increasing the effort and resources necessary to obtain it or by increasing the threatened consequences for its use. Importantly, such policies and procedures can also communicate community norms—to young people regarding the unacceptability of their drinking and to adults about the unacceptability of providing alcohol to minors (Bonnie, 1986). These aims are analogous to those sought by laws curtailing youth access to tobacco (see Institute of Medicine, 1994a) and restricting nonmedical access to marijuana, cocaine, and other illegal drugs (see National Research Council, 2001).

Limiting youth access to alcohol has been shown to be effective in reducing and preventing underage drinking and drinking-related problems. Studies routinely show that increasing the minimum drinking age significantly decreased the number of fatal traffic crashes, the number of arrests for "driving under the influence" (DUI), and self-reported drinking by young people (Klepp et al., 1996; O'Malley and Wagenaar, 1991; Saffer and Grossman, 1987a, 1987b; Wagenaar, 1981, 1986; Wagenaar and Maybee, 1986; Voas et al., 1999; Yu et al., 1997). Similarly, implementation of zero tolerance laws—which ban underage youths from driving with a blood alcohol content (BAC) above measurable levels (usually 0.01-0.02)—has been shown to significantly reduce underage drinking and driving (Hingson et al., 1994; Voas et al., 1999; Wagenaar et al., 2001; Zwerling and Jones, 1999). Community interventions also provide evidence for the effectiveness of comprehensive approaches to reduce drinking and drinking

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implement, and there is significant variation in the type and intensity of interventions implemented across communities; moreover, the evaluation was not designed to consider the effectiveness of a particular intervention or set of interventions within individual communities. The outcomes evaluation reported to date was also based on a single year of intervention (future evaluation reports will include 2 years of data), which is highly unlikely to affect alcohol use outcomes. Not surprisingly, the evaluation documents increases in enforcement activities, but no significant decreases in youth alcohol use (Wolfson et al., 2003). For the current fiscal year, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) has shifted toward a more prescriptive approach that will require local communities participating in the discretionary grant component to implement identified best and most promising practices (OJJDP, 2003). If continued, this would better enable the evaluation to assess the effectiveness of particular interventions and further refine the program.

problems, including reducing underage access to alcohol (Holder et al., 1997a, 1997b, 2000; Wagenaar et al., 1999, 2000a; Wagenaar and Perry, 1994).

To some extent, merely declaring that alcohol should not be sold or given to underage youths will curtail access because many adults support the prohibition and are in the habit of complying with the law (Tyler, 1992; Tyler and Huo, 2002). However, these "declarative" effects of the law (Bonnie, 1982) can easily be eroded if youthful drinking is regarded as an unimportant or expected deviance and if no meaningful efforts are taken to enforce the prohibition. For example, bans against selling tobacco to minors became trivialized over decades of inattention until the public, and the government, began to take them seriously in the 1990s (Institute of Medicine, 1994a). Although youth access restrictions to alcohol have never fallen into such complete disregard, they are easily evaded because alcohol is so widely available through so many channels and because the adult world is ambivalent about how forcefully they should be enforced. In this context, the declarative effects of the law cannot be expected to do all the work; deterrence through threatened sanctions, both legal and social, is needed. In this sense, enforcement, and public awareness of enforcement, are essential if restrictions on youth access to alcohol are to be effectively implemented.

It is clear from the available research that the effectiveness of youth access restrictions and other alcohol control policies depends heavily on the intensity of implementation and enforcement and on the degree to which the intended targets are aware of both the policy and its enforcement (Grube and Nygaard, 2001; Hingson et al., 1988a, 1988b; Voas et al., 1998). Another potentially important element in increasing the effectiveness of youth access restrictions or other alcohol control policies is public support. Implementing effective polices will be very difficult if law enforcement officers and community leaders believe that there is little community support for such activities (Wagenaar and Wolfson, 1994, 1995). The strategic use of media can help overcome such resistance and elicit public support for limiting access (Holder and Treno, 1997).

Scope

Alcohol control is primarily a state responsibility under the 21st Amendment to the Constitution. In some states, counties and municipalities are permitted to take steps to control drinking that may be stricter than those required by state law. However, the National Minimum Drinking Age Act, enacted by the Congress in 1984, requires states to adopt a minimum drinking age of 21 for "purchase or public possession" of alcohol as a condition for receiving federal highway funds. As a result, all 50 states and the District of Columbia now set the minimum drinking or purchase age at 21.

A preliminary question concerns designation of the minimum age. Some experts in the field have suggested that the United States would be better off by lowering it (Hanson, 1990). A key argument made in favor of lowering the minimum age is that although the legal purchase age is 21, a majority of young people under this age consume alcohol anyway. Thus, the current age is seen as forcing young people to flout the law, thus undermining its legal authority and credibility. Furthermore, according to this perspective, the current age might actually encourage abusive drinking by young people by making alcohol use a rite of passage to adulthood or a symbol of rebellion and by forcing it to occur in uncontrolled and risky environments.

European countries are frequently held up as examples of societies in which young people can drink at an early age and thus learn to consume alcohol responsibly within a controlled and safe environment (e.g., the family). The facts, however, do not support this argument. Research clearly shows that most European countries not only have higher levels of consumption (an expected consequence of the lower drinking age), but also higher levels of problematic drinking (e.g., intoxication) among youth (Grube, 2001). Analyses of data from a 1999 survey of 15-year-old European school children (Hibell et al., 2000) and the 1999 Monitoring the Future U.S. survey of tenth graders (Johnston et al., 2002) show that U.S. students are less likely than young people from most European countries to report alcohol use in the past 30 days; see Figure 9-1. Similarly, U.S. adolescents are less likely than those from a majority of European countries to report becoming intoxicated in the past year; see Figure 9-2. In several countries—the United Kingdom, Ireland, Poland, and Denmark—the proportion of teenagers reporting drinking heavily on at least three occasions in the last month is substantially greater than the proportion of U.S. teenagers who report drinking that much on at least one occasion during the past two weeks (Room, 2004). In short, there is no evidence that the lower drinking ages in Europe are protective. Finally, and most importantly as noted above, raising the minimum drinking age in the United States significantly decreased self-reported drinking, fatal traffic crashes, alcohol-related crashes, and arrests for DUI among young people (Klepp et al., 1996; O'Malley and Wagenaar, 1991; Saffer and Grossman, 1987; Wagenaar, 1981, 1986; Wagenaar and Maybee, 1986; Yu et al., 1997).[2] The 21-year-old minimum drinking age may also moderate drinking beyond adolescence (O'Malley and Wagenaar, 1991).

Although every state now sets the legal age at 21, state laws vary greatly in the scope of the restrictions relating to underage purchase, pos-

[2]Research showing these effects led Congress in 1984 to use the leverage of highway funds to induce all the states to raise the drinking age to 21.

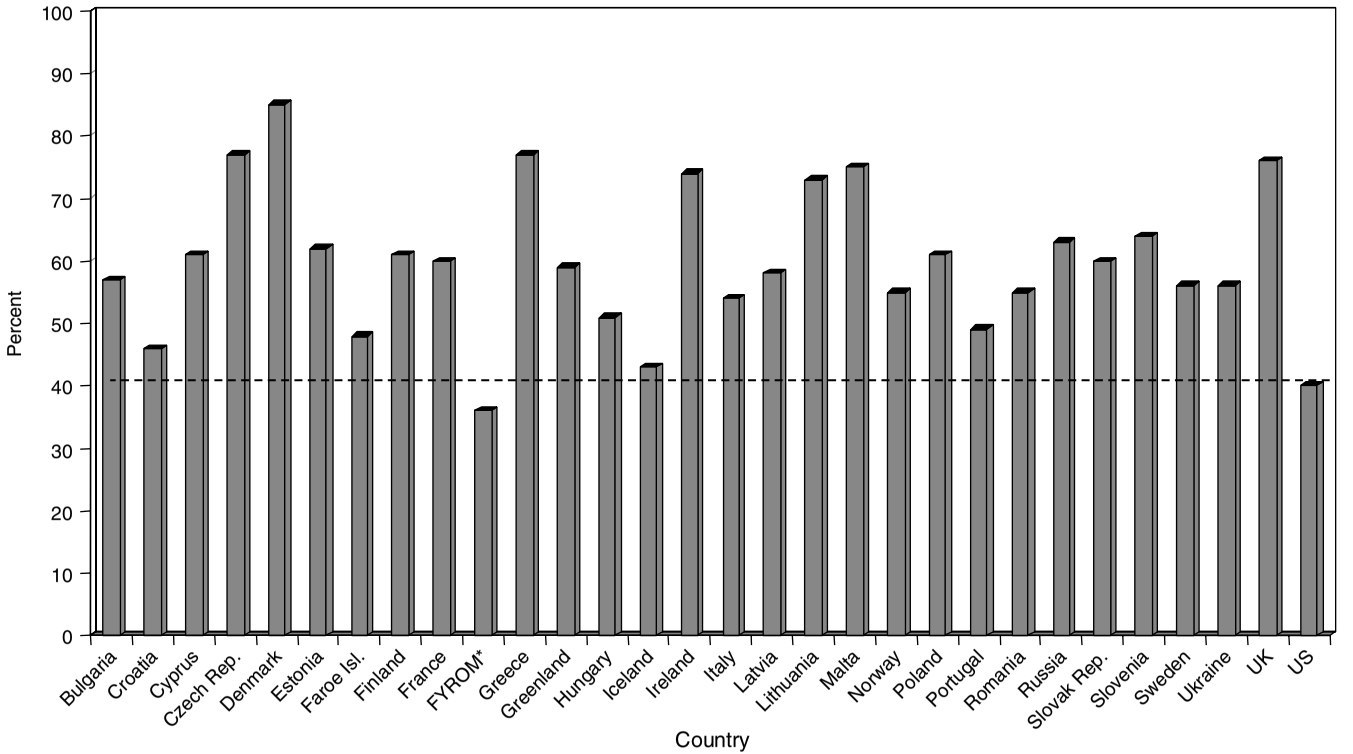

FIGURE 9-1 Drinking in past 30 days among European and U.S. adolescents.
SOURCE: Data from Hibell et al. (2000) and Johnston et al. (2002).
*FYROM is the accepted abbreviation for The Former Yugoslav Republic of Macedonia.

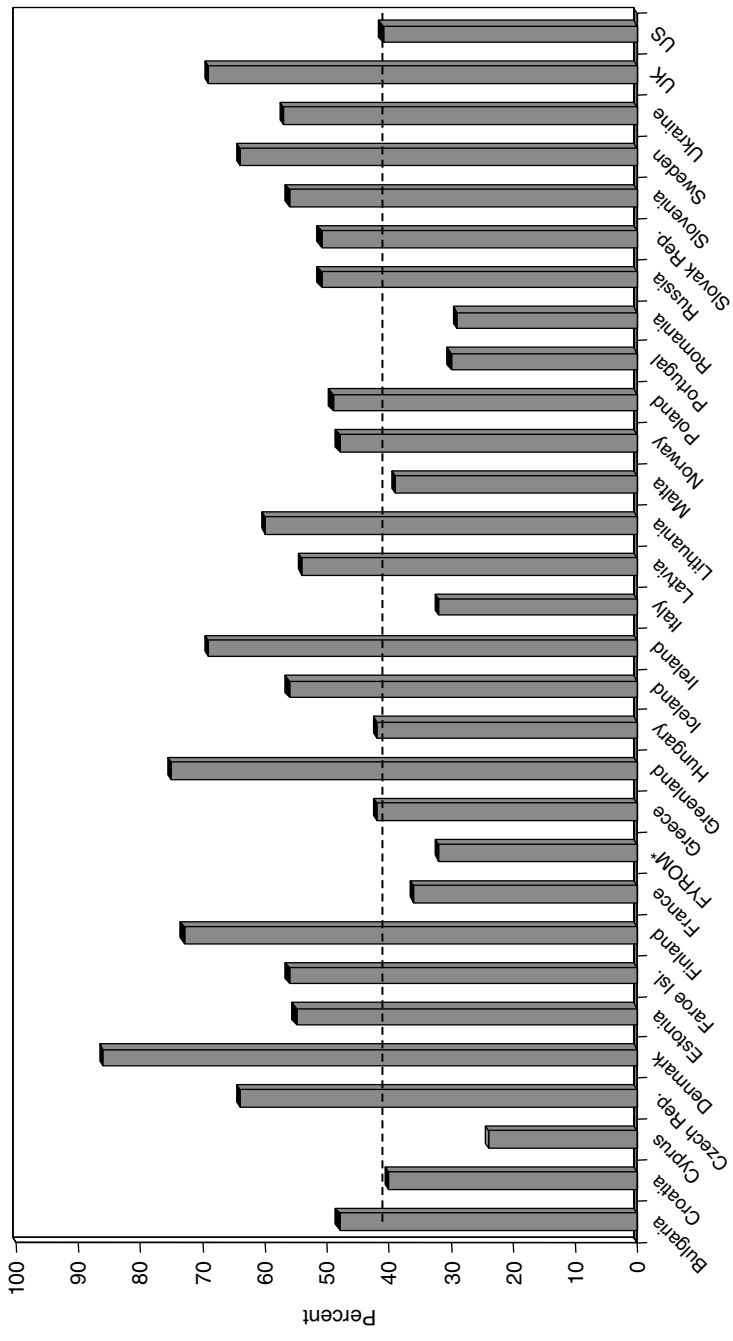

FIGURE 9-2 Intoxication during past year among European and U.S. adolescents.
SOURCE: Data from Hibell et al. (2000) and Johnston et al. (2002).
*FYROM is the accepted abbreviation for The Former Yugoslav Republic of Macedonia.

session, or consumption of alcohol and for the use of false identification to purchase alcohol. In 1993, the President's Commission on Model State Drug Laws (1993) recommended that states prohibit all of these activities. Moreover, although it is generally illegal to provide alcohol to minors, some states allow parents or guardians to give alcohol to minors or for underage drinking to take place in a private residence or private club. These weaknesses can compromise the effectiveness of minimum age laws.

Recommendation 9-1: The minimum drinking age laws of each state should prohibit

- **purchase or attempted purchase, possession, and consumption of alcoholic beverages by persons under 21;**
- **possession of and use of falsified or fraudulent identification to purchase or attempt to purchase alcoholic beverages;**
- **provision of any alcohol to minors by adults, except to their own children in their own residences; and**
- **underage drinking in private clubs and establishments.**

HOW YOUNG PEOPLE OBTAIN ALCOHOL

Young people obtain alcohol from a variety of sources; see Tables 9-2 and 9-3. Parties, friends, and adult purchasers are the most frequent sources of alcohol among college students and older adolescents (Harrison et al., 2000; Preusser et al., 1995; Schwartz et al., 1998; Wagenaar et al., 1996), and younger adolescents also often obtain alcohol from family members. Use of friends under 21 and adult strangers as sources for alcohol appears to increase with age while reports of parents or other family members as sources decrease with age. Thus, in a study in Minnesota (Harrison et al., 2000), 39 percent of drinkers in the sixth grade, 69 percent of drinkers in the ninth grade, and 72 percent of drinkers in the twelfth grade reported getting alcohol from friends within the past 30 days. The comparable figures for family members as sources for alcohol were 49 percent, 29 percent, and 18 percent, respectively. Purchase of alcohol was relatively low in this sample, with only 8 percent, 8 percent, and 9 percent of drinkers at the three grade levels, respectively, reporting buying alcohol from stores. Similarly, another Minnesota survey (Wagenaar et al., 1996) found that 46 percent of ninth graders, 60 percent of twelfth graders, and 68 percent of 18- to 20-year-olds obtained alcohol on their last drinking occasion from a friend over 21, 29 percent, 29 percent, and 10 percent of these age groups, respectively, obtained alcohol from a friend under 21. Only 3 percent, 9 percent, and 14 percent of respondents in each age group, respectively, reported purchasing alcohol; 27 percent, 6 percent, and 11 percent, respectively, obtained alcohol from home.

TABLE 9-2 Sources of Alcohol Used by Underage Drinkers in Minnesota During Past 30 Days (in percent)

Source	Grade 6	Grade 9	Grade 12
Friends	39.3	69.3	72.3
Family	48.7	28.8	18.2
Parties	32.1	55.6	59.8
Took from home	33.1	33.2	11.8
Took from friend's home	15.9	17.7	5.0
Got someone to buy it for me	14.0	35.3	52.6
Bought at store	8.3	7.6	8.5
Bought at bar or restaurant	8.1	4.6	7.5
Took from store	10.0	6.5	2.5

SOURCE: Data from Harrison et al. (2000).

TABLE 9-3 Sources of Alcohol for Underage Drinkers (in percent)

Study and Measure	Sample Population	Source Person			
		Purchased	Person Under 21	21 or Older	Parent
Preusser et al. (1995); ever used	New York College	75	69	73	31
	Pennsylvania College	59	64	76	22
	New York High School	43	67	44	23
	Pennsylvania High School	30	55	50	14
Schwartz et al. (1998); ever used	Virginia Pediatrician's Office	30	—	—	—
	Virginia College	44	—	—	—
	New York High School	35	—	—	—
	Southeast Substance Abuse Program	52	—	—	—
Wagenaar et al. (1996); used past 30 days	9th Graders	3	29	46	27
	12th Graders	9	29	60	6
	18- to 20-year-olds	14	10	68	11

Use of commercial sources appears to be much higher among college students, in urban settings, and where possession and purchase laws are relatively weak or unenforced. Thus, for example, in one survey, 75 percent of college students from New York—where the purchase and possession of alcohol by minors were not illegal at the time of the study and where the use of false identification was punishable by a relatively small fine—reported

ever having tried to purchase alcohol, in comparison with 59 percent of college students in Pennsylvania where the laws regarding purchase, possession, and the use of false identification of alcohol were much stricter (Preusser et al., 1995). Similarly, 43 percent of New York high school students and 30 percent of Pennsylvania high school students reported ever having tried to purchase alcohol.

Ultimately, adults are responsible for young people obtaining alcohol by selling, providing, or otherwise making it available to them. Given the fact that young people use multiple sources for alcohol, efforts to target underage access should not focus exclusively on commercial access to alcohol, but should also address social availability through parents, friends, and strangers (Holder, 1994).

ACCESS TO ALCOHOL THROUGH COMMERCIAL SOURCES

Commercial access to alcohol takes place primarily through on-license and off-license establishments. On-license establishments are permitted to sell alcohol for consumption at the location where the sale is made; they include bars, restaurants, roadhouses, theaters, and similar places of business. Off-license establishments are permitted to sell alcohol for consumption at other locations; they include liquor stores, markets, convenience stores, and similar venues. In addition to on- and off-license establishments, some states allow home delivery and Internet sales of alcohol.

States differ considerably in their regulatory practices, ranging from those with complete state-run retail or wholesale monopolies and distribution systems to those where retail and wholesale alcohol sales and distribution are completely private. To some extent, retail alcohol sales can also be regulated at the local or municipal level through the use of local ordinances, conditional use permits, and zoning. Some states also allow for a "local option" through which municipalities or counties can prohibit or limit alcohol sales. Local ordinances can send a very strong message about what a community considers to be acceptable norms concerning underage drinking.

As noted above, young people under 21 can and do purchase alcohol in commercial settings, notwithstanding the fact that such sales are illegal everywhere. Purchase surveys in the United States show that anywhere from 40 percent to 90 percent of outlets sell to underage buyers, depending on location (e.g., Forster et al., 1994, 1995; Preusser and Williams, 1992; Grube, 1997). In part, these high sales rates result from low and inconsistent levels of enforcement against adults who sell or provide alcohol to minors and from perceptions on the part of law enforcement officers that there is little community support for such prevention efforts (Wagenaar and Wolfson, 1994, 1995).

Compliance Checks

Increasing enforcement against retailers who sell to minors can have a substantial effect on sales of alcohol to young people. Even moderate increases in enforcement can reduce sales of alcohol to minors by as much as 35 percent to 40 percent, especially when combined with media and other community activities (Grube, 1997; Wagenaar et al., 2000a). Effective compliance checks are conducted on an on-going basis, with regular enforcement actions (e.g., two or more times per year) against all outlets, rather than sporadic actions against "problem" outlets (Willingham, n.d.).

Further support for the importance of reducing retail access to alcohol can be obtained from the literature on tobacco control and youth smoking. Most notably, recent research suggests that increasing compliance with age identification for the purchase of tobacco not only reduced tobacco sales to minors and youth smoking, but also reduced underage drinking (Biglan et al., 2000). In a variation of compliance checks, the primary intervention in this research comprised repeated visits to tobacco outlets in which underage youth attempted to purchase tobacco. These young people gave a reminder of the law to clerks who agreed to sell. Clerks who refused to sell received a gift certificate worth $5 to $10, and local media publicized their refusal. This intervention was implemented within the context of a community-wide proclamation against selling to youth, visits to each merchant with information about the proclamation and the law, community-wide publicity about outlet refusals, and feedback to outlets about their rate of sales to young people. Across all communities, the average percent of outlets willing to sell decreased from 57 percent to 22 percent, a 61 percent relative decline. Although the community-based interventions focused on limiting youth access to tobacco products, a 60 percent relative reduction in weekly alcohol use among ninth graders also was achieved (Biglan et al., 2000). Whereas prevalence of weekly alcohol use increased from about 10 percent to 18 percent in the control communities, it remained virtually unchanged in the intervention communities, increasing from about 13 percent to 14 percent. The significant effect on ninth grade alcohol consumption may have been due to the intervention sensitizing clerks not to sell either tobacco or alcohol to minors.

Recommendation 9-2: States should strengthen their compliance check programs in retail outlets, using media campaigns and license revocation to increase deterrence.

- **Communities and states should undertake regular and comprehensive compliance check programs, including notification of retailers concerning the program and follow-up communication to them about the outcome (sale/no sale) for their outlet.**

- **Enforcement agencies should issue citations for violations of underage sales laws, with substantial fines and temporary suspension of license for first offenses and increasingly stronger penalties thereafter, leading to permanent revocation of license after three offenses.**
- **Communities and states should implement media campaigns in conjunction with compliance check programs detailing the program, its purpose, and outcomes.**

States may need to consider the adequacy of funding for their alcohol control agencies including how efficiently resources are utilized, to enable the agencies to undertake the committee's recommended enforcement efforts. Communities might also consider programs that reward retailers for compliance and remind them of the law, as a complement to law enforcement compliance checks (Biglan et al., 2000).

A model for enforcing compliance with underage alcohol sales laws at the national level can be found in the Synar Amendment, which applies to tobacco. The Synar Amendment, enacted in 1992, requires states to enact and enforce effective laws prohibiting the sale of tobacco products to children under 18 years of age. States failing to comply lose a portion of their block grant funds for substance abuse prevention.

Recommendation 9-3: The federal government should require states to achieve designated rates of retailer compliance with youth access prohibitions as a condition of receiving relevant block grant funding, similar to the Synar Amendment's requirements for youth tobacco sales.

Specifically, under this requirement, all states, as a prerequisite for receiving funds under one or more block grants (e.g., substance abuse prevention and treatment, enforcing the underage drinking laws), would be expected to:

- enforce effective laws prohibiting sales of alcohol to persons under 21 years of age in a manner that can reasonably be expected to reduce the availability of alcohol products to individuals under the age of 21;
- conduct annual random, unannounced inspections of both on- and off-license outlets to ensure compliance with the law;
- conduct these inspections in such a way as to provide a valid sample of outlets accessible to youth;
- develop a strategy and a time frame for achieving an inspection failure rate of less than 20 percent of outlets; and
- submit an annual report detailing (a) the state's activities to enforce their law, (b) the overall success the state has achieved during the previous year in reducing alcohol availability to youth, (c) how inspections were

conducted and the methods used to identify outlets, and (d) plans for enforcing the law in the coming fiscal year.

Responsible Beverage Service and Sales

Responsible beverage service and sales programs implement a combination of outlet policies (e.g., requiring clerks or servers to check identification for all customers appearing to be under the age of 30; requiring all servers to be over 21), manager training (e.g., policy development and enforcement), and server training (e.g., teaching clerks and servers to recognize altered or false identification). Such programs can be implemented at both on-license and off-license establishments and have been shown to be effective in some circumstances. They have been found to reduce the number of intoxicated patrons leaving a bar (e.g., Dresser and Gliksman, 1998; Gliksman et al., 1993; Saltz, 1987, 1989) and to reduce the number of car crashes (e.g., Holder and Wagenaar, 1994).

Few studies have evaluated the effects of responsible beverage service and sales programs on underage drinking. In one study of an off-license program, voluntary clerk and manager training were found to have a negligible effect on sales to minors above and beyond the effects of increased enforcement (Grube, 1997). Similarly, a study in Australia found that, even after training, age identification was rarely checked in bars, although decreases in the number of intoxicated patrons were observed (Lang et al., 1996, 1998). In at least one study, however, training was associated with an increase in self-reported checking of identification by servers (Buka and Birdthistle, 1999), and the apparent changes in behavior persisted among trained servers for as long as 4 years. Another study reported an 11.5 percent decrease in sales to minors and a 46.0 percent decrease in sales to intoxicated patrons following individual manager training and policy development (Toomey et al., 2001). Voluntary programs appear to be less effective than mandatory programs or programs using incentives such as reduced liability (Dresser and Gliksman, 1998).

How responsible beverage service and sales programs are implemented and what elements are included in a particular program may be important determinants of their effectiveness. Policy development and implementation within outlets may be as important, if not more so, than server training (Saltz, 1997). Research indicates, for example, that establishments with firm and clear policies (e.g., checking ID for all patrons who appear under the age of 30) and a system for monitoring staff compliance are less likely to sell alcohol to minors (Wolfson et al., 1996a, 1996b). There are six key elements of successful outlet policies: (1) minimum age of 21 for all servers and sellers; (2) staff awareness of legal responsibility; (3) staff awareness of outlet policies and consequences for violating those policies; (4) identifica-

tion required for all patrons who appear to be under 30;[3] (5) guidelines and training as to what constitutes acceptable and valid identification; and (6) retailer-initiated compliance checks and enforcement of consequences for violation of policies.

Recommendation 9-4: States should require all sellers and servers of alcohol to complete state-approved training as a condition of employment.

State alcohol agencies should prescribe responsible beverage service and sales training, including all of the elements described above as a condition of licensing for retail outlets, and could consider using server licensing fees to offset the cost of this training. Aside from state alcoholic beverage control (ABC) regulatory requirements, all managers or owners of retail outlets have a social responsibility to develop and implement alcohol service policies to prevent sales to minors, to train their staff on these policies, and to enforce them. As discussed below, implementation of such a program might also serve as a defense against civil liability.

Dram Shop Liability

Dram shop liability laws allow individuals injured by a minor who is under the influence of alcohol to recover damages from the alcohol retailer who served or sold the alcohol to the minor who caused the injury (Mosher, 1979; Mosher et al., 2002; Sloan et al., 2000). In some states, the retailer can also be liable for the damages the minor causes to himself or herself. Owners and licensees can be held liable for their employees' actions under most or all dram shop liability laws (Mosher et al., 2002). Many state courts have recognized dram shop liability as a common law cause of action—that is, the courts themselves establish the plaintiff's right to sue under ordinary principles of common law negligence. The plaintiff must show that the retailer knew or should have known that the person being served was a minor, that the minor in fact consumed the alcohol, and that the consumption was a contributing cause of the harm.

Many courts recognized common law dram shop claims during the 1980s and early 1990s, overruling the traditional rule that the drinker was solely liable for any damage that he or she caused as a result of drinking. State legislatures have become increasingly active in this policy area, estab-

[3]Electronic scanning of driver's licenses is a promising method of assuring that IDs are valid. However, not all states currently issue scannable licenses, and the cost and inconvenience of scanning devices may reduce the willingness of some retailers to use them (National Highway Traffic Safety Administration, 2001).

lishing statutory-based claims that typically supersede and extinguish a plaintiff's right to sue under common law negligence principles. The general legislative trend has been to limit the scope of liability (Mosher, 2002; Holder et al., 1993). California, for example requires that the plaintiff show that the minor was obviously intoxicated at the time of sale (California Business and Professions Code § 25602.1). Other state legislatures have required proof of reckless, rather than negligent, conduct on the part of the retailer or have imposed caps on the amount of damages that can be collected (Mosher et al., 2002). Some states do not recognize dram shop liability at all, either because a court has ruled that common law negligence principles do not impose liability in this situation or because the legislature has overridden a judicial ruling finding retailers liable. Currently, 44 states permit dram shop liability suits (Mothers Against Drunk Driving [MADD], 2002b). However, a simple count does not adequately describe the wide variation in state approaches. Many state laws are so restrictive that they effectively preclude or severely limit plaintiffs' right to sue (see Mosher et al., 2002).

Dram shop liability laws and common law rights of action are a potentially powerful tool for changing the environment in which alcohol is sold (Mosher, 1979; Holder et al., 1993). Research suggests that the threat of liability may lead to a significant increase in checking age identification and to greater care in service practices (e.g., Sloan et al., 2000). The available studies also suggest that dram shop liability laws can significantly reduce single vehicle nighttime crash deaths, alcohol-related traffic crash deaths, and total traffic crash deaths among minors (Chaloupka et al., 1993; Sloan et al., 1994, 2000). Other research indicates that such laws also reduce alcohol-related traffic crashes, total traffic crashes, homicides, and other unintentional injuries in the general population (Chaloupka et al., 1993; Sloan et al., 1994, 2000). Overall, dram shop liability has been estimated to reduce alcohol-related traffic fatalities among underage drivers by 3 to 4 percent (Chaloupka et al., 1993). The perceived likelihood of being successfully sued under dram shop liability statutes may be important. Thus, two highly publicized successful dram shop liability lawsuits in Texas were found to be related to decreases of 6.5 percent and 5.3 percent, respectively, in single vehicle nighttime crashes, which is a surrogate measure for drinking and driving (Wagenaar and Holder, 1991). These presumably occurred because owners, managers, and servers changed serving practices as a result of the suits and accompanying publicity.

Three states—Maine, New Hampshire, and Rhode Island—have passed key elements of the Model Alcoholic Beverage Retail Licensee Liability Act of 1985 (reprinted in Mosher et al., 2002), developed under a grant from the National Institute on Alcohol Abuse and Alcoholism. The model act includes a "responsible business practices" defense. This provision allows

retailers to avoid liability if they can establish that they took reasonable steps to avoid serving minors and obviously intoxicated adults. Key to the defense is evidence that the retailer trained his or her staff, including both servers and managers, established management policies designed to deter such sales and service, and that the training procedures and policies were fully implemented at the time of the illegal sale or service.[4] The model act seeks to establish a positive incentive for retailers to implement prevention policies and enhance the positive public health benefits of dram shop liability policies.

Recommendation 9-5: States should enact or strengthen dram shop liability statutes to authorize negligence-based civil actions against commercial providers of alcohol for serving or selling alcohol to a minor who subsequently causes injury to others, while allowing a defense for sellers who have demonstrated compliance with responsible business practices. States should include in their dram shop statutes key portions of the Model Alcoholic Beverage Retail Licensee Liability Act of 1985, including the responsible business practices defense.

Internet Sales and Home Delivery

Surveys of underage purchase of alcohol over the Internet or through home delivery show that small percentages (10 percent) of young people report obtaining alcohol in this manner (Fletcher et al., 2000); however, increasing use of the Internet may increase the percentage. Although an argument can certainly be made for banning Internet and home delivery sales altogether in light of the likelihood that these methods will be used by underage purchasers, the committee recognizes that some states may not be willing to curtail legitimate access to alcohol through these means and so recommends, instead, tightening access.

Recommendation 9-6: States that allow Internet sales and home delivery of alcohol should regulate these activities to reduce the likelihood of sales to underage purchasers. States should

- **require all packages for delivery containing alcohol to be clearly labeled as such;**

[4]States allowing retailers to recover their fines and other costs by suing underage drinkers who use false identification should also condition the retailers' recovery on proof of compliance with responsible business practices, including electronic scanning of driver's licenses if the state issues scannable licenses.

- **require persons who deliver alcohol to record the recipient's age identification information from a valid government-issued document (such as a driver's license or ID card); and**
- **require recipients of home delivery of alcohol to sign a statement verifying receipt of alcohol and attesting that they are of legal age to purchase alcohol.**

ACCESS THROUGH NONCOMMERCIAL SOURCES

As noted above, young drinkers most often obtain alcohol from social sources, through friends, acquaintances, family members, and other adults who buy or provide alcohol to them. It is thus important for any effective strategy to reduce social access to alcohol for minors. In this regard, it is essential to communicate strong norms about the unacceptability of adults providing alcohol to minors or facilitating alcohol use by minors. Media campaigns highlighting the responsibility of adults in preventing young people from obtaining alcohol are one means of communicating such norms that should be implemented. Similarly, using media to increase awareness of laws prohibiting adults from providing alcohol to minors and drawing attention to enforcement efforts can further increase the effectiveness of legal approaches to preventing social provision of alcohol to minors and may help establish or reinforce community norms against this behavior. Such media activities are thus an important part of any enforcement activities to reduce provision of alcohol to minors (see Chapter 6).

Third-Party Transactions

Third-party transactions occur when young people ask adults to purchase alcohol for them. Third-party transactions are a common means through which underage drinkers, especially older teens, obtain alcohol (see Tables 9-2 and 9-3 above), partly because young people may believe it is less risky than trying to purchase alcohol themselves. Often, young people wait outside outlets and approach strangers whom they ask to buy alcohol.

"Shoulder tap" interventions are a strategy to directly reduce third-party transactions of alcohol by enforcing laws prohibiting provision of alcohol to minors. Underage decoys who are working with the police wait outside outlets and ask randomly selected passing strangers to buy alcohol (usually beer) for them. A plainclothes police observer is stationed nearby to witness the transaction. If a stranger agrees to make a purchase, he or she is given money to do so by the decoy. The buyer is cited or warned for providing alcohol to a minor when he or she completes the transaction and gives the alcohol to the decoy. Although rigorous evidence for effectiveness is lacking, case studies suggest that such programs can generate a relatively

large number of citations and thus may have a deterrent value (Powell and Willingham, n.d.). Such programs, when accompanied by sufficient media coverage, may also help instill or reinforce community norms against buying alcohol for minors or otherwise providing it to them. Retailers should be involved in shoulder tap operations. In many states, retailers might be held responsible for allowing minors to solicit adults to purchase alcohol within the immediate vicinity of their outlet. In such cases, the retailer has legal responsibility to curb such activities.

Recommendation 9-7: States and localities should implement enforcement programs to deter adults from purchasing alcohol for minors. States and communities should

- **routinely undertake shoulder tap or other prevention programs targeting adults who purchase alcohol for minors, using warnings, rather than citations, for the first offense;**
- **enact and enforce laws to hold retailers responsible, as a condition of licensing, for allowing minors to loiter and solicit adults to purchase alcohol for them on outlet property; and**
- **use nuisance and loitering ordinances as a means of discouraging youth from congregating outside of alcohol outlets in order to solicit adults to purchase alcohol.**

Keg Registration

Keg registration laws require the purchaser of a keg of beer to complete a form that links his or her name to a number on the keg. It is seen primarily as a tool for prosecuting adults who supply alcohol to young people at parties. Keg registration laws have become increasingly popular in local communities in the United States. The committee found only one published study on the effectiveness of these laws in reducing underage drinking problems. In that study of 97 U.S. communities, it was found that requiring keg registration was significantly and negatively correlated with traffic fatality rates (Cohen et al., 2001). Although the effectiveness of keg registration has not yet been convincingly established, the committee believes that the evidence is sufficient to endorse it as a potentially valuable tool for strengthening the enforcement of underage drinking laws at relatively little additional cost.

Recommendation 9-8: States and communities should establish and implement a system requiring registration of beer kegs that records information on the identity of purchasers.

Social Host Liability

Some courts have expanded the dram shop liability principles so that they apply to noncommercial servers, including social hosts, employers, fraternities, and other alcohol providers that are not licensed to sell or serve by the state. Under social host liability laws, adults who provide alcohol to a minor or serve an intoxicated adult can be sued through civil actions for injury caused by that minor or intoxicated adult. Social host liability laws may deter adults from hosting underage parties and purchasing alcohol for or providing alcohol to minors. Currently, 30 states have some form of social host liability law (MADD, 2002b). Many state legislatures have placed strict limits on social host liability and courts have historically been reluctant to impose it absent clear statutory authority. There is some evidence that this trend is changing. State legislatures are more willing to consider at least some form of social host liability for service to minors, and courts in recent years have been more willing to construe statutory limitations narrowly and impose social host liability, relying on common law negligence principles (Mosher et al., 2002).

There is very little research on the effectiveness of social host liability laws and what evidence exists is conflicting. In one study across all 50 states for 1984-1995, the presence of social host liability laws was associated with lower rates of alcohol-related traffic death among adults, but not with such deaths among minors (Whetten-Goldstein et al., 2000), and it was not related to single vehicle nighttime crashes for either group. Surprisingly, the presence of social host liability laws was related to *increases* in total motor vehicle fatalities among minors in this study. In a second study, however, using self-reported drinking data spanning the 1980s to 1995, social host liability laws were associated with decreases in self-reported heavy drinking and in self-reported drinking and driving by lighter drinkers, but not in self-reported drinking and driving by heavier drinkers (Stout et al., 2000). Separate data were not presented for minors.

The conflicting findings on social host liability laws may reflect the lack of a comprehensive program that ensures that social hosts are aware of their potential liability exposure. The prospect of liability for social hosts could send a powerful normative message to adults that providing alcohol to underage youth is unacceptable. However, that message must be effectively disseminated before it can have a preventive effect, either as a deterrent or as a moral injunction (see Holder and Treno, 1997). Media campaigns to educate the public would have to be an integral part of implementing social host liability laws. As a practical matter, imposing a criminal sanction, especially a jail sentence, on a parent who hosts a drinking party for minors may be more likely to attract media attention than a civil award of damages. For this reason, direct enforcement of the prohibi-

tion may be a more effective way of reinforcing the social norm than the rare and often invisible imposition of social host liability. Nonetheless, states may want to consider enacting or strengthening civil social host liability statutes that allow negligence-based civil actions against non-commercial providers of alcohol for serving or providing alcohol to a minor who subsequently causes injury to others.

Restricting Drinking in Public Places

Allowing the service of alcohol at child- and family-oriented public events may promote underage drinking. One way to control alcohol at public events, in parks, beaches, sports arenas, public recreation facilities, parking lots, and other publicly accessible locations is through the use of conditional use permits. Conditional use permits, used by a city or county, allow local communities to set standards for how and when alcohol will be sold and served. These local ordinances can reduce sales to minors by such means as requiring the use of responsible beverage sales and service practices at public events, limiting advertising, and restricting hours of sale. Conditional use permits allow communities to enforce laws and exact penalties locally. Case studies suggest that they can be used effectively to reduce sales to minors and excessive drinking at public events (Streiker, 2000; Reynolds, n.d.). Little or no rigorous research has been conducted on the effectiveness of conditional use permits. However, cities and counties may want to use conditional use permits to set standards for how and when alcohol will be sold and served at public events.

YOUNG DRINKERS AND DRIVING

Zero Tolerance

Zero tolerance laws specify a lower BAC for underage drivers. Usually this limit is set at the minimum that can be reliably detected by breath testing equipment (i.e., 0.01 to 0.02). Zero tolerance laws commonly invoke administrative penalties, such as automatic confiscation of a driver's license for driving after consuming even small amounts of alcohol.

Zero tolerance laws have now been enacted in all 50 states. There is strong evidence that zero tolerance laws can reduce underage drinking and driving and crash fatalities. Differences in effectiveness are thought to be related to differences in enforcement and in awareness among young people (Balmforth, 1999; Ferguson et al., 2000; Hingson et al, 1994). Impediments to the enforcement of these laws include requirements that zero tolerance citations be supported by evidential BAC testing, undue costs to police (e.g., paperwork, court appearances), and lack of behavioral cues for stopping

young drivers at very low BACs. The most effective zero tolerance laws are those that allow passive breath testing, are implemented in combination with sobriety checkpoints, involve streamlined administrative procedures, and invoke administrative penalties (e.g., immediate loss of driver's license). Education and media can significantly increase the effectiveness of zero tolerance laws by increasing awareness of them on the part of young people.

Recommendation 9-9: States should facilitate enforcement of zero tolerance laws in order to increase their deterrent effect. States should:

- **modify existing laws to allow passive breath testing, streamlined administrative procedures, and administrative penalties and**
- **implement media campaigns to increase young peoples' awareness of reduced BAC limits and of enforcement efforts.**

Graduated Driver Licensing

Graduated driver licensing places limits on the driving circumstances of new or young drivers, such as restrictions on nighttime driving or driving with young passengers. Graduated driver licensing policies also often include zero tolerance provisions. There is strong evidence that graduated licensing programs are associated with reductions in car crashes (Boase and Tasca, 1998; Langley et al., 1996; Smith, 1986; Ulmer et al., 2000), self-reported drinking and driving (Mann et al., 1997), and alcohol-related crashes (Boase and Tasca, 1998) among young people. Recent evidence, however, suggests that they may have limited effects on alcohol use and alcohol-related crashes, above and beyond that of zero tolerance laws (Shope et al., 2001). Nonetheless, graduated driver licensing may be an important adjunct to zero tolerance laws, for example, by providing cause for stopping young drivers who may be drinking.

Recommendation 9-10: States should enact and enforce graduated driver licensing laws.

Sobriety Check Points and Random Breath Testing

Research strongly suggests that intensive use of sobriety checkpoints or mobile random breath testing can substantially reduce drinking and driving. In the United States, these policies can be implemented only under prescribed circumstances as determined by state laws, often involving prenotification about when and where they will be instituted. Breath tests at checkpoints can usually be given only if there is probable cause to suspect that a driver has been drinking. Even under these restricted circumstances, there is evidence that sobriety checkpoints can reduce alcohol-related

crashes, injuries, and fatalities (Lacey et al., 1999; Stuster and Blowers, 1995). However, the committee did not find any studies addressing the effects of these programs on drinking or drinking and driving among adolescents. Sobriety checkpoints may be a particularly important component of zero tolerance laws, given the difficultly of detecting young drinking drivers with very low BAC levels. Public awareness and publicity appear to be important factors in the success of sobriety checkpoints.

Recommendation 9-11: States and localities should routinely implement sobriety checkpoints.

POSSESSION AND PURCHASE

Underage Drinking Parties

One major way that underage drinkers gain access to alcohol is at parties. In one study, for example, 32 percent of sixth graders, 56 percent of ninth graders, and 60 percent of twelfth graders reported obtaining alcohol at parties (Harrison et al., 2000). Underage drinking parties frequently involve large groups and are commonly held in a home, an outdoor area, or a hotel room. Law enforcement can respond to noise complaints to investigate such gatherings. Even when it is not possible to cite underage drinkers or the person who supplied the alcohol, awareness of increased police activity in this regard can act as a deterrent and can express community norms to adults regarding the unacceptability of providing alcohol to minors.

Recommendation 9-12: Local police, working with community leaders, should adopt and announce policies for detecting and terminating underage drinking parties, including:

- **routinely responding to complaints from the public about noisy teenage parties and entering the premises when there is probable cause to suspect underage drinking is taking place;**
- **routinely checking, as a part of regular weekend patrols, open areas where teenage drinking parties are known to occur; and**
- **routinely citing underage drinkers and, if possible, the person who supplied the alcohol when underage drinking is observed at parties.**

Cops in Shops

"Cops in Shops" is a voluntary program developed by the Century Council, a prevention organization sponsored by the alcohol industry. In this program, police or ABC agents pose as employees or customers in retail

outlets in order to apprehend underage persons who attempt to buy alcoholic beverages or adults who attempt to purchase alcohol for minors. The program often includes prominent signs that warn that the establishment is participating in the Cops in Shops program. The participating officers can also use the program to review a retailer's policies and procedures and identify risky practices. Case studies indicate that Cops in Shops programs can generate a large number of citations, both against minors attempting purchase or using false identification and against adults who are purchasing for minors. The effects of the programs on underage drinking are unknown. Media coverage to increase public awareness again seems to be important for the success of these programs. In light of the greater importance of assuring retailer compliance, enforcement programs that focus on purchasers, including "Cops in Shops" programs, should be used only to supplement compliance check enforcement against retailers, not to displace it.

False Identification

The use of false identification for alcohol purchases is significant although there is a great deal of variability from study to study; see Table 9-4. In one survey, for example, only 7 percent of New York state high school students and 14 percent of Virginia college students indicated that they had

TABLE 9-4 Use of False Identification (ID) to Obtain Alcohol by Young People

Study and Measure	Sample Population	Age	Used False ID (percent)
Durkin et al. (1996); ever used	Virginia College	18-20	46
Preusser et al. (1995); ever used	Pennsylvania High School	16-18*	14
	New York High School	16-18*	28
	Pennsylvania College	18-20	37
	New York College	18-20	59
Schwartz et al. (1998); used in past 2 years	Virginia Pediatrician's Office	Mean, 17.2	13
	Virginia College	Mean, 8.5	14
	New York High School	Mean, 17.2	7
	Southeast Substance Abuse Programs	Mean, 16.9	9

*Complete age data not available: age ranges provided for 95 percent of high school students from Pennsylvania and New York combined and 92 percent of college students from the two states combined.

used false identification to purchase alcohol at least once in the previous 2 years (Schwartz et al., 1998). In another study, however, 28 percent of New York and 14 percent of Pennsylvania high school students and 59 percent and 37 percent of college students from those states, respectively, reported ever using false identification to purchase alcohol (Preusser et al., 1995). In a third study, nearly one-half (46 percent) of Virginia college students reported that they had ever used a false ID to purchase alcohol.

The reported use of false identification appears to be greater in urban areas and in states where enforcement is lax or penalties for purchasing alcohol, possessing alcohol, or using false identification are absent or minimal (Preusser et al., 1995). In Pennsylvania, where fines for using false identification were substantial ($500 fine and driver license suspension) and where purchase, attempted purchase, possession, and transportation of alcohol were prohibited at the time of the study, use of false identification was relatively infrequent. In contrast, in New York, where it was not illegal for a minor to possess or purchase alcohol and where the penalties for using false identification for purchase of alcohol were substantially less ($100 fine), use of false identification for alcohol purchase was more frequent.

Other factors also seem to be related to use of false identification for purchase of alcohol. In a survey of Virginia college students (Durkin et al., 1996), those who were members of fraternities or sororities were more likely to report use of false identification to purchase alcohol than other students (70 and 39 percent, respectively) and African American students were less likely to report use of false identification than students of other ethnicities (10 and 48 percent, respectively). False identification can be easily obtained in the United States through magazine advertisements and mail order or from acquaintances or friends who manufacture it (Schwartz et al., 1998). Use of false identification may increase as it becomes more easily available through the Internet. A recent search on the key words "novelty id," for example, turned up 21 web sites offering falsified identification or templates for producing false identification. Electronic scanning is potentially an effective tool for verifying the validity of driver's license IDs. Although it is premature to require universal use of this technology, due in part to resistance among some retailers because of the cost and perceived inconvenience (see National Highway Traffic Safety Administration, 2001), states should facilitate and encourage its use.

Recommendation 9-13: States should strengthen efforts to prevent and detect use of false identification by minors to make alcohol purchases. States should:

- **prohibit the production, sale, distribution, possession, and use of false identification for attempted alcohol purchase;**

- **issue driver licenses and state identification cards that can be electronically scanned;**
- **allow retailers to confiscate apparently false identification for law enforcement inspection; and**
- **implement administrative penalties (e.g., immediate confiscation of a driver's license and issuance of a citation resulting in a substantial fine) for attempted use of false identification by minors for alcohol purchases.**

Penalties

The overriding purpose of prescribing and enforcing penalties against underage youth for possession of or attempted purchase of alcohol, and using a false ID for this purpose, is to serve as a deterrent. The deterrent effect of the penalties is affected by their severity, the probability of their imposition, and the swiftness with which they are imposed (e.g., Ross, 1982). Severe, criminal penalties for minors in possession of alcohol or attempting to purchase alcohol are seldom enforced and thus generate, at best, only a modest deterrent effect (Hafemeister and Jackson, in press), and the limited deterrent effects most likely affects the location of drinking (e.g., drinking in public places, which is more likely to be detected) than its occurrence. Arrest of minors appears to be rare for these offenses (Wagenaar and Wolfson, 1994), in part because of the burden of prosecuting them as criminal violations and the reluctance of law enforcement officials and courts to enforce criminal penalties in such cases (Little and Bishop, 1998; Wolfson et al., 1995). This reluctance stems from a widespread belief that giving a young person a criminal record for drinking or possessing alcohol is excessive and unfair. Moreover, because criminal proceedings are often lengthy and removed in time from the infraction, the punishment is seldom swift or certain (Hafemeister and Jackson, in press).

In the committee's view, a less severe sanction would be more likely to be enforced and would generate a greater deterrent than an under-enforced criminal penalty. Possession, consumption, and attempted purchase of alcohol by minors, and use of false IDs for this purpose, should be treated as noncriminal infractions punishable by fines, community service, and similar sanctions, and should not lead to a criminal record that may ruin the life chances of a young person. Moreover, alcohol infractions should be handled administratively through citations issued at the time of apprehension, without requiring court appearances. The size of the fines and length of community service should be sufficiently substantial to register social disapproval and to generate a meaningful deterrent effect. Models for designing sanctions for such noncriminal transgressions are available, including youth-

only offenses punishable in juvenile courts and the civil penalties created in some states for possession of marijuana (Bonnie, 1977).

Recommendation 9-14: States should establish administrative procedures and noncriminal penalties, such as fines or community service, for alcohol infractions by minors.

States might also want to consider immediate administrative driver license revocation, not just for driving-related alcohol infractions, but also for consumption, possession, or attempted purchase of alcohol by minors. However, the use of license revocation as a penalty for offenses unrelated to driving raises constitutional concerns and also would be accompanied by higher litigation costs than other penalties (see Hafemeister and Jackson, 2004).

In summary, the committee believes that state access restrictions, and their enforcement, should be strengthened, with existing ambiguities clarified, and loopholes removed. At the same time, however, the penalties for violations by underage drinkers should be reduced, thereby facilitating the use of less costly procedures and more widespread and consistent enforcement. Overall, this approach should be welcomed by parents because it will solidify and clarify the legal prohibitions, while removing the fear of excessive punishment.

10

Youth-Oriented Interventions

In 1994 the Institute of Medicine proposed a framework for prevention of mental health illnesses that included three broad classes of prevention strategies—universal measures, selective measures, and indicated preventive measures: that framework is instructive in considering the approaches outlined in this chapter. Although developed in the context of mental health, the framework is applicable to most public health problems not caused primarily by biological agents.

Consistent with the population health orientation of the overall strategy, the approaches discussed in this chapter are predominately universal measures—those that are appropriate and cost-effective for a broad population (e.g., all adolescents who might use alcohol). Media messages that encourage young people to avoid alcohol use are an example of a universal measure: if the media message has been demonstrated to have the desired effect of dissuading young people from using alcohol, it would be cost-effective and appropriate to deliver to all adolescents in the U.S. population.

Selective preventive measures are desirable for the population subgroup whose risk of developing a certain health problem is greater than that for the general population. In the context of alcohol problems, a selective preventive measure would target a population known to be at greater risk for experiencing alcohol-related problems. An example would be a subset of college students who are white, male, fraternity members under the age of 24 who have a tendency to socialize, characteristics that research has shown to be associated with heavy drinking. The third intervention ap-

proach, indicated preventive measures, applies to "individuals who are found to manifest a risk factor, condition, or abnormality that identifies them, individually, as being at high-risk for the future development of a disease" (Institute of Medicine, 1994b, p. 21). For example, a young person who during an interview with a physician (or through some other screening method) indicates having used alcohol at a very young age (e.g., at 11 or 12) may not yet have a problem with alcohol (i.e., is not yet in need of treatment) but because of the risks associated with early onset of use would be a candidate for an intervention that deters further alcohol use. Thus, selective measures focus on a subgroup of the population that has an increased risk of mental health problems and indicated measures focus on individuals who clearly demonstrate a specific risk factor.

The approaches outlined in this chapter, consistent with the committee's overall task of developing a strategy to reduce underage drinking across a wide range of youth populations, are by and large universal measures. We discuss the possible value of a youth-oriented media campaign aimed at changing youth drinking behaviors; school-based approaches; approaches at residential colleges and universities; and potential opportunities in other settings, including healthcare and faith-based institutions, the workplace, and the military. We do not discuss the literature regarding family-based interventions, although we recognize the importance of family involvement in the interventions mentioned above and in responses developed by communities to address community-specific problems.

We also do not discuss other selective and targeted interventions with specific subsets of youth who may be at increased risk of developing alcohol problems, with two exceptions: interventions on residential campuses and treatment for adolescents. The underage drinking problem on residential campuses has been well documented and a cause of public concern for years. Given the unique concentration of underage youth and the major problems of underage drinking, residential campuses are a necessary target for intervention. Our discussion of treatment recognizes that some youths have developed or will develop alcohol abuse and dependence problems. While we believe the emphasis should be on prevention, some attention must be paid to those youths.

A YOUTH-FOCUSED MEDIA CAMPAIGN

A key element of the committee's charge was to assess the potential effectiveness of a youth-focused media campaign built on the models of the youth components of the anti-drug campaign of the Office of National Drug Control Policy or of the American Legacy Foundation's Truth™ Campaign. For that reason, we consider in some detail what such a youth-

focused campaign would involve and the available evidence about the potential effectiveness of such a campaign.

Supporting Evidence

We begin with evidence favoring such a campaign. There is good evidence that youth who disapprove of heavy alcohol use and who see great harm in alcohol use are less likely to drink. For example, among twelfth-grade students in the Monitoring the Future (MTF) Survey in 1998, about half said that there is "great risk" of physical or other harms in having five or more drinks once or twice each weekend. Of those who said there was great risk, about 16 percent said they had had five or more drinks at least once in the previous 2 weeks. Of those who said there was only a moderate, slight, or no risk, 48 percent said they had had five or more drinks in this time frame. This finding leads to the hypothesis that a campaign to convince more youth that there is great risk in heavy drinking would result in a reduction in the amount of heavy drinking. This argument is less relevant regarding any use of alcohol: few youth of any age believe that "any use" of alcohol carries great risk (12 percent of eighth and tenth graders and 8 percent of twelfth graders). Thus, on its face, it would seem quite difficult to convince most youth that such drinking carries great risk.

Support for a youth-focused approach also comes from the latest results from the MTF Survey in 2002, which shows a decline in drinking between 2000 and 2002 for eighth and tenth graders (see Chapter 2). For example, for tenth graders, heavy drinking in the past 30 days declined from 24 percent to 18 percent. Until the past 2 years there had been stability in both any drinking and heavy drinking at all age levels. The recent decline raises the possibility that youth are reconsidering drinking behavior and might be open to further persuasion. This hypothesis might be supported by the idea that it is easier to ride with the current (reinforcing a trend already under way) than to row against it (trying to suppress an emerging or established behavioral trend).

A third support for directly addressing youth and persuading them not to drink comes from the positive evidence from antismoking efforts by individual states and by the American Legacy Foundation. There has been a substantial decline in the prevalence of youth smoking, with 30-day prevalence among twelfth graders declining from a high of 37 percent in 1997 to the 2002 level of 27 percent. There is credible although not definitive evidence that the mass media campaigns have been a substantial force in this decline (Siegel and Biener, 2000; Sly et al., 2001; Siegel, 2002). If it worked for tobacco, why wouldn't it work for alcohol? (We return to this issue below.)

Contrary Evidence

Although there is a substantial logic favoring a youth campaign approach, there are also some contrary arguments. First, the hypothesis that increasing the proportion of youths who perceive great risk in heavy drinking will reduce heavy drinking among youths by an equivalent amount may be unfounded. The hypothesis rests on the assumption that the oft-demonstrated relationship between risk perception for heavy drinking and actual heavy drinking is a causal one. However, since most of the available data are cross-sectional, one cannot be confident of that causal relationship. Not being a drinker and not perceiving increased risk are correlates, but neither may "cause" the other; to some extent, at least, they are both manifestations of an underlying set of causal influences that tend to produce both decisions about drinking and positive or negative attitudes toward alcohol use. Thus, to the extent that a youth-focused campaign would aim mainly to increase perception of drinking-related risks, it might not rest on a strong foundation.

A second, and related, concern is that the recent survey data may not be as persuasive as they seem in supporting a risk-oriented campaign. Although the recent decline in drinking is worth attention, the decline may be merely an anomaly (see Chapter 5). And even if the decline is real, it may not reflect the influence of changes in perceived harmfulness. Indeed, the data about harmfulness of heavy drinking do not show a consistent parallel improvement (Johnston et al., 2003). Thus, any decline in behavior may reflect the influence of changes in the environment around drinking, rather than a change in underlying beliefs about drinking.

Strikingly, the long-term stability in heavy drinking rates contrasts with the sharp reduction in one form of harm associated with such behavior—fatal alcohol-related crashes among teenage drivers. The Centers for Disease Control and Prevention reports that such crashes have declined by nearly 60 percent for 16- to 17- year-olds and 55 percent for 18- to 20-year-olds between 1982 and 2001. However, the decline ended in 1997. Since that time the levels are stable or perhaps rising slightly (Elder and Shults, 2002). These data suggest that preventing alcohol-related harms may have more potential to be effective than those aiming to discourage drinking (or even heavy drinking) per se. This finding parallels the evidence for adult drinking and adult drinking and driving.

The lack of any longer-term downward trend in drinking or heavy drinking, despite the presence of a wide variety of public efforts to address these issues, is then one concern about initiating a major campaign against youth alcohol use, though not by itself sufficient to reject such an effort. If there have been negative alcohol messages directed toward youth, they likely pale before the pro-alcohol onslaught that surrounds youth (see Chap-

ter 7). Perhaps the lack of a longer-term downward trend reflects the competition between positive and negative alcohol messages, which has turned into a standoff. Perhaps a focused and substantially larger effort would better counterbalance the positive alcohol-related messages.

A third concern about launching a youth-directed campaign arises from the few specific efforts that have been evaluated. There is some evidence for effects of designated driver campaigns directed to youth (DeJong and Hingson, 1998). However, there are very few studies of youth-focused media campaigns that deal with alcohol consumption as the main outcome variable for evaluating results, particularly for youths not yet in college. The evaluation of the Australian National Alcohol Campaign measured consumption before and after its focused launch and booster campaigns; it did not find consistent evidence of reduced consumption (Ball et al., 2002). The teen-focused part of the Winners Campaign had a quite weak evaluation component (with only 100 respondents per city); it, too, did not detect behavioral effects (Wallack, 1979; Wallack and Barrows, 1982). Some successful programs, like Project Northland (Perry et al., 2002) and the Midwestern Prevention Project (Pentz et al., 1989) made use of community media as part of a multifaceted campaign, but one cannot separate the effects of media from other components of the strategy. There are two additional field trials now approaching completion, each of which has incorporated a discrete mass media component, but those results have not yet been published (Robert Hornik personal communications with Michael Slater and Brian Flynn, 2003). As of this writing, the committee does not have evidence of success in reducing youth alcohol use from any evaluated campaign (excluding limited evidence on specific college campuses). There is no alcohol-focused program that can be used as a prototype for a youth-focused national mass media campaign effort.

Comparisons with the Anti-Tobacco and Anti-Drug Campaigns

Our fourth concern relates to whether the apparently successful anti-tobacco effort can be used as a prototype. In contrast to that success, there are, thus far, problematic results from the National Youth Anti-drug Media Campaign. Since 1999, the White House Office of National Drug Control Policy (ONDCP) has sponsored this campaign to reduce youths' use of illegal drugs, particularly marijuana. The program has spent close to $1 billion on mass media advertising and other outreach programs, both to youth and their parents. Results through mid-2002 do not show positive effects on youth. Indeed, some evidence suggests that the campaign might be having an unfavorable effect, with the youth most exposed to the campaign messages more likely than others to form attitudes and intentions favoring marijuana use (Hornik et al., 2002). This effect is sometimes called

a boomerang effect. At the end of 2002, the message focus of the anti-drug campaign was redefined with additional attention to the negative consequences of marijuana use. The effectiveness of that new campaign focus is not yet known. There are published results, based on a much earlier period of the anti-drug campaign sponsored by the Partnership for a Drug-Free America, which show positive effects (Block et al., 2002), and there is also evidence of success for a field experimental anti-drug campaign in Kentucky (Palmgreen et al., 2001). Thus, the appropriate conclusion is that the national ONDCP-sponsored campaign has not been successful, through mid-2002, not that the general approach is always unsuccessful.

If the anti-tobacco efforts are a positive model and the anti-drug efforts are not encouraging, wouldn't it be possible to model a campaign against youth alcohol use on the first and avoid the mistakes of the second? This question requires a careful consideration of how the tobacco and drug campaigns were different from one another and how the behaviors they addressed are different from alcohol use.

The expenditures for advertising expenditures for the youth parts of both national campaigns were in the range of $60 to 100 million per year. But there are a number of important differences in the two campaigns. First, the styles of the two campaigns have been quite different. The anti-tobacco campaigns have focused on a variety of messages, but a particularly striking set focused on anti-industry arguments—the tobacco industry kills people and is trying to manipulate you. The anti-drug messages focused (through the end of 2002) on positive alternatives to drug use—"What's your anti drug?"—and on the negative consequences of drug use.

Second, the American Legacy Foundation's anti-tobacco advertising has adopted an edgy style, with youth apparently in control. The anti-drug advertising has had a more conventional style, with clear sponsorship by ONDCP and the Partnership for a Drug-Free America.

Third, the tobacco messages were launched in the context of broad media coverage of tobacco issues as Congress and the states' attorneys general struggled with the tobacco industry toward legislation and the eventual master settlement of 1997. In contrast, anti-drug general media coverage was likely declining during the period of the national anti-drug campaign directed toward youth.

Fourth, there were important changes in the environment surrounding youth tobacco use that were complementary to campaign efforts, including price changes related to tax increases, increasing public concern with second-hand smoke, and increased restrictions on where smoking was permitted. There also was substantial change in public norms about the acceptability of smoking. While these other changes do not completely account for the reduction in tobacco use among youth, they had some direct effects

and likely reinforced the media messages about smoking. In contrast, there is little parallel environmental change around the use of drugs (or alcohol).

It is tempting to point to the anti-tobacco campaign and call it a good model for an anti-underage drinking campaign. However, the differences between an anti-tobacco campaign and a campaign against youth alcohol use are too substantial too ignore. Even if some of the lessons about edgy, youth-controlled message development could be borrowed from the anti-tobacco campaigns, other lessons could not: no campaign against youth alcohol use, much less a federally sponsored one, could successfully replicate the anti-industry tactics that have been the hallmark of the California, Florida, and Legacy Foundation campaigns, not only because moderate alcohol use is widely accepted among adults, but also because the claims about industry duplicity and misrepresentation are rooted in the tobacco industry's unique history.

There are other important differences as well. The context of broad media coverage in which the anti-tobacco campaigns have been mounted would not likely be matched by a campaign against youth alcohol use. Similarly, the complementary changes in the normative, legal, and regulatory environments around tobacco do not apply to an effort aimed at youthful alcohol consumption. In addition, the sharp contrast in the nature of the behaviors would remain. The ban on underage drinking struggles with its nearly universal trial use among youth, the majority view that moderate daily use is not high-risk, and acceptability for use among adults. Tobacco use contrasts with alcohol use on each of these points.

Next Steps

These observations do not show that a youth-focused media campaign would surely fail, only that it would be premature to mount one given what is known today. It would certainly not be sensible to mount a large campaign, at significant cost, based on wishful thinking. It is tempting to suggest going ahead with a modest campaign on the grounds that it cannot hurt but the example of the anti-drug campaign and its possible boomerang effects raises doubts about this idea. The most sensible course, at this time, is to begin to test a serious prototype for a youth-focused campaign. One possible model for this exploratory effort would be to fund one or more campaigns in geographically well-defined areas, put substantial resources both into message development and transmission, sustain them for 2 to 4 years, and evaluate them carefully.

The appropriate message focus for such prototype campaigns would need to be researched, developed, and carefully tested before launch. At a minimum, a campaign would have to focus on the specific messages that

can convince youths of the high risk of heavy drinking. This research would balance epidemiological evidence about the risks with evidence from research with vulnerable youth as to what risks are of concern. There are a variety of other possible focuses, including beliefs about the outcomes of drinking, social norms about drinking, and skills to avoid drinking. The potential for each of these approaches would likely vary with age and other characteristics of the target populations. The most promising strategy, as well as the best ways to implement it, would have to be developed through intensive formative research with the target populations. Care must be taken to avoid a boomerang effect of any campaign that is mounted. A particular concern would be if heavy exposure to messages about the risks of alcohol use carried with them the implied idea that many youths are using alcohol. It is possible that a resulting increase in the "descriptive norm" could lead youths to feel it was okay to use alcohol since large numbers of young people do so (Cialdini et al., 1990; see Chapter 4).

In considering the development of a campaign against youth alcohol use, whether as part of the larger societywide campaign the committee recommends or as a stand-alone program, careful research and development should be at the core of these efforts. These efforts should be conceived as similar in logic to the efforts to develop in-school or community interventions that have been effective. Multiple efforts have been funded with the recognition that only some of them were likely to be effective. A similar approach would need to be taken with the development of underage drinking communication interventions. Some interventions should focus on reducing heavy drinking and some on discouraging all underage drinking; some interventions should focus on perceived risk and negative consequences, while others should focus on changing perceived norms or increasing skills at resisting peer pressure to drink. Some interventions will incorporate more than one of these elements. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) and National Institute on Drug Abuse have funded some of these types of test programs but there need to be enough of them and with sufficient resources to really learn how to construct youth-focused campaigns that will address underage alcohol use successfully. Once the evidence is in, assuming that one or more successful approaches have been identified, it might be possible to launch a large-scale national campaign with a good expectation for success.

Recommendation 10-1: Intensive research and development for a youth-focused national media campaign relating to underage drinking should be initiated. If this work yields promising results, the inclusion of a youth-focused campaign in the strategy should be reconsidered.

SCHOOL-BASED APPROACHES

School-based approaches designed to prevent substance use among students are common in the United States (see Hansen and Dusenbury, 2004, for descriptions of specific programs). Delivery of such programming through schools offers the benefits of reaching a wide (and captive) audience, as most young people (especially elementary and middle-school-aged children) are enrolled in school. In addition, schools offer the potential to ensure that intervention programs are institutionalized and run by trained staff members and that boosters to initial exposure to programs are delivered at specific developmental intervals. School-based intervention programs represent an important opportunity to prevent and reduce alcohol use among youth.

Overall Results

Meta-analyses of school-based interventions (e.g., Gottfredson and Wilson, 2003) have shown that they vary widely in their ability to effect alcohol-related outcomes. Positive effects are small to modest. Research has shown, however, that some school-based approaches are more effective than others at reducing youth alcohol use. The goal of delaying the onset of alcohol use is most effective with students who have not yet begun drinking, and given that American adolescents tend to have their first drink between ages 12 and 14, education with this age group and those slightly younger is sensible (Paglia and Room, 1999). Programs (and evaluations of these programs) that seek to affect students who are already drinking are somewhat less common. In addition, the objectives for this population are less clear—should one try to encourage them to abstain (which may be difficult to achieve), get them to engage in less risky drinking behaviors (e.g., fewer episodes of heavy drinking), or minimize the harm from alcohol use (e.g., no driving after drinking)? Further research on school-based interventions with students already using alcohol is needed.

Programs relying on provision of information alone, fear tactics, or messages about not drinking until one is "old enough" have consistently been found to be ineffective in reducing alcohol use and, in some cases, produce boomerang effects (Botvin, 1995; Swisher and Hoffman, 1975; D'Emidio-Caston and Brown, 1998; Gottfredson and Wilson, 2003; Tobler, 1992). Many early drug education curricula that relied on factual information about alcohol and other drugs, including information on the negative consequences of use, or fear arousal were based on the theory that adolescents who used alcohol and drugs had insufficient knowledge about the consequences of use and that increased information would make them more likely to decide not to use drugs. While these types of interventions

may increase knowledge, they do not affect behavior. There are several possible explanations: information-only approaches focusing on risks and dangers may arouse curiosity; fear tactics that overemphasize the potential negative consequences of drinking may be viewed as alarmist and lacking in credibility; moral lecturing can backfire with rebellion-oriented youths who are seeking to establish independence; and messages that tell youth to wait until they are "old enough" may serve to make alcohol a symbol of maturity and independence (Paglia and Room, 1999).

Strategies focused on increasing self-esteem also have not proven to be effective, perhaps because of the low correlation between self-esteem and alcohol use or the lack of a specific focus on substance use (Donaldson et al., 1995; Gottfredson and Wilson, 2003; Hawthorne et al., 1995; Paglia and Room, 1999; Tobler, 1992). Programs that focus on strategies to resist peer pressure have also not been demonstrated to be effective (Donaldson et al., 1994). Although among some peer groups alcohol use may represent a social norm, it is less common for peers to directly pressure each other to use alcohol; peer influence is more likely to be subtle. As a result, strategies to resist direct pressure may not be very helpful (Paglia and Room, 1999). Many of these strategies have been long used in prevention programming; since research has shown them to be ineffective, they should not be continued.

It has been a common practice to identify youths who have problems with alcohol use and other high-risk behaviors and put them together in groups. Results of studies of such programs, usually done for the purposes of simplifying interventions, have met with mixed results (Eggert et al., 1994). Some research has indicated that high-risk behaviors have actually increased among such groups (Dishion and Andrews, 1995). It is possible that in such circumstances, deviant norms become established and youth inadvertently adopt those norms rather than learn about and adopt positive norms.

School-based interventions that use normative education to undermine youth beliefs that alcohol use is prevalent among their peers and that their peers universally approve of this behavior appear to have promise. Efforts to establish nonuse norms—implemented in conjunction with a critical look at both alcohol advertising and media and other cultural messages that make alcohol use symbolic of qualities youth want to attain (e.g., maturity, independence, popularity)—may also be promising. Gottfredson and Wilson (2003), Tobler (1992), Tobler and Stratton (1997), and Botvin et al. (1995) have found that programs using such approaches, especially when they are delivered in an interactive manner, may produce reductions in alcohol use for several years after the initial program delivery. In addition, there is some evidence that these approaches may be effective with a broad range of youths, including ethnic minorities (Perry and Kelder, 1992). A

limited number of studies (Austin and Johnson, 1997a, 1997b) have shown some positive effects of media literacy programs aimed at affecting perceptions of alcohol advertising and alcohol norms, but there is insufficient evidence to make conclusions about the application of this approach in the context of underage alcohol use.

Approaches that have been demonstrated to reduce youth alcohol use have many program elements in common. However, similar to other approaches recommended in this report, the committee believes that education-oriented interventions should be implemented in the context of a comprehensive approach.

Attributes of Effective Interventions

A considerable amount of research (Gottfredson and Wilson, 2003; Hansen and Dusenbury, 2004; Tobler and Strattan, 1997), primarily in primary and secondary schools, has identified several critical elements of successful school-based educational interventions. In addition, research on communitywide alcohol prevention programming (see Chapter 11), such as Project Northland and family-based approaches like the Michigan State University Multiple Risk Outreach Program, offer additional critical elements that can make education interventions more effective (Williams et al., 1999; Nye et al., 1995). Research on such interventions offers a number of lessons about what educational strategies are important for preventing alcohol use and alcohol problems among minors. These lessons, or critical elements, offer a starting place for innovative education interventions and for developing priorities about what kinds of education interventions should be funded. The interventions need to be multicomponent and integrated; sufficient in "dose" and follow-up; establish norms that support nonuse; stress parental monitoring and supervision; be interactive; be implemented with fidelity; include limitations in access; be institutionalized; avoid an exclusive focus on information and avoid congregating high-risk youth; and promote social and emotional skill development among elementary school students.

Multicomponent and Integrated Schools provide a captive population for the delivery of prevention programs and effects can last for 3 to 4 years. Similarly, family and community-based interventions have also produced reductions in the prevalence and intensity of alcohol use. However, prevention effects are maximized when all of these venues are used in concert in a coordinated and mutually supporting manner. For example, meta-analyses (Gottfredson and Wilson, 2003; Tobler et al., 2000) revealed that systemwide change interventions were most effective. Project Northland (see Chapter 11), which included school-based education programs, com-

munity activities and outreach, and environmental strategies that reduced the availability of alcohol to youth, is regarded as a highly effective program (Perry et al, 1996; Williams and Perry, 1998). These interventions use a community component involving family and other community leaders (e.g., teachers, counselors) or may strive to change the school or community environment. Communities should adopt prevention interventions that include school, family, and community components.

Sufficient in Dose and Follow-Up Significant developmental changes occur during adolescence. For educational interventions to be effective, they must be delivered throughout this period. Educational and family programs usually focus most heavily on the first part of adolescence. The increased use of boosters and multiyear programs should be encouraged. Community interventions also tend to focus on discrete portions of the adolescent years. However, a combined and consistently implemented approach to prevention has been shown to yield stronger results.

Norms That Support Nonuse Extensive research demonstrates that establishing norms that support nonuse is a key component of approaches to prevent alcohol use and misuse. During adolescence, it is common for youth who engage in inappropriate drinking behaviors to grossly overestimate the prevalence and acceptability of alcohol use among peers. As a result, these young people choose to use alcohol in a manner that matches these misperceived norms. Establishing beliefs in conventional norms among students—or, in other words, making young people's estimates about their peers' alcohol use more realistic—has significant potential to reduce alcohol use among young people. For example, the normative education element in interventions like the Adolescent Alcohol Prevention Trials significantly deterred use of alcohol, tobacco, and marijuana among middle and high school students (Hansen and Graham, 1991).

Parental Monitoring and Supervision Parents are a powerful source of influence on their children, and, using the right practices, parents can significantly decrease the likelihood that their children will drink. Research on prevention with families consistently demonstrates that parental monitoring of children—including monitoring their free time and time with friends and actively supervising them by being present during youth activities—is highly effective as a strategy for preventing the onset of alcohol use and misuse (Dusenbury, 2000; Vicary et al., 2000). Monitoring can make gaining access to alcohol more difficult and can help to reinforce family rules and policies prohibiting the use of alcohol. Programs can provide parents with skills and motivation for actively monitoring and supervising their children.

Interactive Educational programs demonstrated to reduce alcohol use and abuse have all been highly interactive. That is, they did not rely on didactically presented messages, but used teaching techniques that encouraged participants to be actively engaged in the process of forming social norms. Meta-analyses (Gottfredson and Wilson, 2003; Tobler et al., 2000) revealed that interactive programs that delivered more hours of programming were more effective than interactive programs that delivered fewer hours. This trend was not evident among noninteractive programs.

Implemented with Fidelity There is strong evidence that the quality of program delivery is highly related to successful outcome (Dusenbury et al., 2003). Training for providers is crucial. It is also essential for providers to have sufficient time to become fluent in delivering the program. On their initial attempt, program providers typically focus on understanding the mechanics of a program. It is only after they have mastered the mechanics of program delivery that they are able to focus on underlying psychological and sociological constructs that define quality implementation.

Access Limitations Family and community interventions that have been shown to be effective included a focus on limiting youth access to alcohol (see also Chapter 9). Such approaches need to include not only the adoption of laws and ordinances, but also their enforcement and the development of a strong social norm that supports the intent of such legislation. For example, Project Northland (Komro et al., 1994), Day One Community Partnership (Rohrbach et al., 1997), Communities Mobilizing for Change (CSAP model program), and Community Trials Intervention to Reduce High-Risk Drinking (a model program of the Substance Abuse and Mental Health Services Administration [SAMHSA]) all included efforts to reduce underage access to alcohol, and in each case these efforts were found to have significant effects on reducing drinking (see also Chapter 11).

Institutionalized Institutionalization is crucial for prevention to realize its full potential. It can ensure that new social norms in a community are perpetuated by exposing new community members (e.g., every fifth grade class in a school) to the norms, that well-trained professionals facilitate the intervention, and that programs are regularly evaluated and adjusted to meet the changing needs of the community. This kind of consistency and rigor has the potential to ensure that programs shown to reduce underage drinking can have long-lasting effects. However, schools and communities are often funded to implement these programs through temporary mechanisms and often at a level that does not allow sustained implementation.

Avoiding a Focus on Information and on Congregating High-Risk Youth As discussed above, programs with an exclusive focus on information are ineffective at changing behavior and programs that congregate high-risk youth have had mixed and, in some cases, negative effects.

Social and Emotional Skill Development There has been limited research on alcohol prevention among preschool and elementary school children. Norm-setting approaches, discussed above, are promising for older elementary school students (Donaldson et al., 1995). In addition, there is evidence that good academic achievement and such characteristics as good school climate, cooperative learning, and strong bonds between children and school have the potential to help prevent subsequent alcohol use (Battistich et al., 1996; Hawkins et al., 1999). Research has clearly shown that the causes of early alcohol use are related to the failure to develop social and personal competencies. These competencies include the ability to make good decisions and solve problems, set and achieve goals, effectively manage emotions and stress, communicate effectively, and build relationships that support a positive peer group.

In sum, although more research on education interventions is needed, these programmatic elements can be adopted with confidence. In addition, there are some programmatic elements that have not shown desired effects (e.g., didactic information sessions and scare tactics) and in some cases produce boomerang effects. Programs that rely heavily on these elements should not be funding priorities.

Recommendation 10-2: The U.S. Department of Health and Human Services and the U.S. Department of Education should fund only evidence-based education interventions, with priority given both to those that incorporate elements known to be effective and those that are part of comprehensive community programs.

These funding priorities should promote the key elements of prevention described in the principles of effectiveness defined by the Department of Education. Namely, funding decisions should be based on (1) demonstrated need, (2) defined behavior change goals, (3) clear objectives for how behavior change will be accomplished, and (4) the adoption of approaches with demonstrated effectiveness. As part of this approach, the Department of Education and SAMHSA list of evidence-based programs should be reviewed and revised annually. Funding should give priority to programs that have been independently demonstrated to be effective at deterring the onset of alcohol use and misuse or having an effect on other meaningful outcomes.

Regional conferences should be held for program developers, evaluators, schools currently using programs, and potential grantees to bridge the

gap between research and practice. In addition, funds should be provided to support independent local and national evaluations that should include both the assessment of self-reports of alcohol consumption and assessments of changes in key outcomes of successful alcohol prevention, such as truancy, motor vehicle accidents, and academic performance. A specific, uniform percent of grant funding should be earmarked for local evaluation. Additional funding, equal perhaps to 10 percent of all local awards, should be provided for a national evaluation. A consortium of evaluators should be established to inform the Departments about the impact of programs on alcohol prevalence and consumption.

Identifying and selecting model programs are only part of the process in launching a successful education strategy. Experience over the past two decades reveals that most schools do not implement research-based programs as intended or do not continue to use them over time. Failure to institutionalize interventions is likely to prevent them from realizing their full potential. Federal and state policies are needed to encourage and support the institutionalization of research-based programs. Most research and funding has been conducted in secondary/middle schools; additional focus should be directed at primary and high schools. In addition, funding is needed to support program champions at the school and district level who provide the organizational memory as well as the necessary training resources to sustain prevention intervention. Finally, additional research is needed to determine how schools, families, and communities can be supported as they implement promising strategies and how effective strategies in these areas can be institutionalized.

RESIDENTIAL COLLEGES AND UNIVERSITIES

Educational interventions with underage drinkers at colleges and universities present a unique set of challenges. By the time they reach college, the majority of students have tried alcohol, and the majority of students who report current use also drink heavily (Flewelling et al., 2004). Furthermore, 31 percent of college students meet diagnostic criteria for alcohol abuse and 6 percent meet criteria for alcohol dependence; these data suggest that individual-based strategies for screening and intervention or referral may need to be a component of a comprehensive college based approach (Knight et al., 2002).

All residential college and university students should be exposed to alcohol education interventions—indeed, the transition to college offers an important opportunity in which expectations about alcohol use and nonuse on campus can be established and in which young people may be more receptive to messages about nonuse and harm reduction (Pandina, 2003). Recent studies suggest that working with parents and students, rather than

with students alone, regarding transition difficulties at college is an effective approach (Wintre and Sugar, 2000). However, in addition to universal prevention approaches, interventions that selectively target heavy drinkers have the potential to reduce harm to the individual, the college community, and the neighborhood in which the college resides (NIAAA, 2002). According to NIAAA's recent report on college drinking, programs that target heavy drinkers through unified education interventions that include cognitive behavioral skills, norm clarification, and motivational enhancement interventions in conjunction with environmental and policy changes is the approach most likely to be effective at addressing college student drinking (NIAAA, 2002).

Interventions focused on students who drink heavily may have significant positive effects on the health and well-being of students and the quality of the college environment (Knight et al., 2002; Park, 1967; Perkins et al., 1980). Nationally, only one in five students report frequent heavy drinking, yet this group accounts for two-thirds of all the alcohol consumed by college students, more than half of all the alcohol-related problems other students experience, and more than 60 percent of all the reported injuries, vandalism, and problems with the police (Wechsler et al., 1998).

Despite public concern and media attention describing the problems associated with college student alcohol consumption, there is a relative lack of well-developed and evaluated intervention programs designed to assist college service providers. The Center for the Advancement of Public Health (CAPH) at George Mason University, based on data from their annual College Alcohol Survey, has created a sourcebook of strategies used by colleges across the United States, as well as recommendations for future college endeavors. Although CAPH notes that a number of campuses have developed innovative approaches for addressing college drinking, few strategies are applied on campuses with fidelity or consistency, and rarely are these approaches evaluated (CAPH, 2001).

Although a majority of colleges and universities have established campus alcohol prevention programs (Wechsler et al., 1999), survey data from the past decade show that the rates of heavy drinking on college campuses have not declined in the past 10 years. Part of this may be the lack of evaluations of college-based interventions and lack of dissemination about programs that are effective. Other deficiencies related to university alcohol policy and intervention may also contribute to the ineffectiveness of current programs (Wechsler, 1996; Cohen and Rogers, 1997; Ziemelis, 1998; Black and Coster, 1996; Smith, 1989), including:

- lack of data intended to identify specific campus problems for the "rational planning" of services;

- inconsistent enforcement of university policies and codes for student conduct;
- continued institutional reliance on informational approaches as a primary prevention strategy;
- limited student exposure to prevention activities;
- lack of use of counseling and treatment resources by students who may need those services the most; and
- failure to screen and provide services for students through regular physician visits to college health clinics and emergency room visits, and for students who violate alcohol policies.

Research does provide guidance to colleges' approaches to alcohol use on their campuses.

Education-Based Intervention Strategies

As with school-based programs, research on college-based programs demonstrates that programs primarily using information-only and scare tactic strategies concerning alcohol consequences and local laws and policies are ineffective or are insufficient on their own (Larimer and Cronce, 2002; Wechsler et al., 2002; Perry et al., 1996; Moskowitz, 1989; NIAAA, 2002). The NIAAA report on college drinking also found that values clarification about alcohol, when used alone and when providing blood alcohol content feedback to students, were ineffective.

Interventions with High-Risk Heavy Drinkers

Three education approaches—cognitive-behavioral skills, norm clarifications, and motivational enhancement interventions—have been found to be effective with heavy alcohol users on campus (NIAAA, 2002). The skills training approach uses a cognitive behavioral model to address problem or heavy alcohol use by altering beliefs associated with alcohol use. This approach may also involve general life-skills development, including assertiveness training and stress management training. The goal of this approach is to change an individual's expectations about alcohol's effects, monitor alcohol use over time, and develop effective coping techniques. Alcohol expectancies have been found to predict drinking behavior among college students (Christiansen et al., 1989; Stacy et al., 1990), and research suggests that interventions that challenge the behaviors students expect to result from drinking can decrease alcohol consumption (Darkes and Goldman, 1998), at least for some students.

Normative feedback or norm challenging is a strategy designed to address an individual's misperceptions regarding the rates of alcohol use on

campus, as well as perceptions regarding the role of alcohol on campus (Schroeder and Prentice, 1998; Baer et al., 1991). In such interventions, a student's alcohol use patterns are assessed, and the student is provided feedback regarding the rates of alcohol use by his or her peers. Often, the student is also provided information regarding the prevalence of his or her alcohol use pattern. Prevention strategies have used different modalities to provide this feedback, including one-on-one interviews, small groups, and such media as online web-based programs (Marlatt et al., 1995; Borsari and Carey, 2000). The variety of modalities through which this approach can be delivered may make it a viable option for wide use on campuses, rather than only with identified heavy drinkers. Additional research in this area, especially concerning the comparative effectiveness of different modes of delivery, is needed.

Motivational interviewing techniques associated with alcohol use are designed to provide an assessment of student use and provide nonjudgmental feedback regarding a person's alcohol consumption and the negative consequences associated with use. Such techniques also often include normative feedback on peer alcohol use rates. Such interventions are designed to initiate an individual's desire to change behavior (Miller et al., 1992). Brief motivational enhancement interventions have been found to affect problems associated with alcohol consumption, including driving after drinking, riding with an intoxicated driver, and injuries (Marlatt et al., 1998; Monti et al., 1999). Opportunities for motivational interviews are available when heavy drinkers are identified through the campus judicial system or through screening at campus health care facilities. Few campuses have programs that link heavy drinkers—even when they are identified through campus systems—to such interventions.

The integration of skills training, normative feedback, and motivational interviewing techniques has been applied to one-on-one and small group interventions in order to reduce drinking rates. These education strategies may be applied in a universal fashion with a general student population, such as first-year students who may be forming ideas (and misperceptions) about how alcohol fits into college life. In addition, these education approaches could be incorporated into programs that specifically target groups at risk for heavy drinking and individuals who, through the college judicial system or screening provided through university health care systems (see below), are identified as heavy drinkers. Research has demonstrated that this general integrated approach also reduces the negative consequences of alcohol use (Baer et al., 2001; Larimer and Cronce, 2002; Marlatt et al., 1998).

Broad Interventions

One educational approach that has received considerable attention and that is directed at a general college population (rather than just heavy drinkers) is the social norms approach. A fundamental premise of this approach is that a majority of college students do not accurately perceive the rates of alcohol use on campus and may drink to the level of this misperception in order to fit in. Perceptions regarding the amount and frequency of substance use on campus are often greater than actual use (Perkins and Berkowitz, 1986; Perkins, 2002). Several institutions have reported reduction in high-risk drinking over a relatively short time using such approaches (Berkowitz, 1997; DeJong and Linkenbach, 1999; Haines and Spear, 1996; Johannessen et al., 1999, 2002).

Research on social norms campaigns has indicated some promise, although research has generally been limited to case studies of individual campuses, generally without appropriate comparison or control groups, and they often do not control for other interventions aimed at reducing drinking problems. Given the limitations of social norms evaluations, such interventions should be further evaluated. If implemented, social norms approaches should be one component of a comprehensive effort and should not be used as a single strategy.

Environmental Factors On and Off Campuses

A growing body of evidence points to the importance of addressing the multiple environmental contributors to alcohol use and abuse, both on and off campus. Research has demonstrated that changes in the normative environment within which students reside can influence drinking behavior. Specific environmental elements on campus—including fraternity or sorority participation, living on campus, and the ready availability of alcoholic beverages—have been identified as the most important determinants of drinking and heavy drinking among college students (Chaloupka and Wechsler, 1996). Research has demonstrated the importance of several environmental factors: access (Wechsler et al., 2002; Weitzman et al., 2003; Bormann and Stone, 2001); cost (Williams et al., 2002; Clapp, 2001); exposure to high-use residential climates (Sher et al., 2001); contextual factors that are predictive and protective of heavy drinking (Clapp and Shillington, 2001); and alcohol policies and enforcement procedures (Eigen, 1991; Palmer et al., 2001). Examples of protective measures include new campus alcohol policies (e.g., no kegs at on-campus parties), legal regulations, alcohol server training programs, and the restriction of low-cost alcohol promotions or "happy hours." Some studies have shown that

college policies affecting access to alcohol on campus—for instance, whether a residence hall is wet or dry and whether a college has an alcohol ban on the campus—generally decrease the frequency of student alcohol use, heavy drinking, and frequent heavy drinking (Wechsler et al., 2001a, 2001c; Weitzman et al., 2003a).

Consistent Policy Enforcement and Application of Sanctions

Research investigating student sentiment toward alcohol policies and laws consistently documents support for policies that control underage drinking (Wechsler et al., 2002). Within the college environment there are multiple agents for enforcement, including campus police and safety officers, residence housing personnel, residence-based student paraprofessionals, athletic team coaches, academic advisers, sponsors of student organizations, and fraternity and sorority advisers. Despite these multiple opportunities for intervention, enforcement is often left to one or two of these groups (e.g., campus police, residential life professional staff), or enforcement occurs only among some staff within a group. Often these individuals are hesitant to hold college students accountable for their behavior, as they may view the university sanctioning process as punitive or inconsistent with their roles as mentors and advisers for students. Such a circumstance creates inconsistent enforcement of policies and sends mixed messages to students.

Colleges should pursue strategies to strengthen linkages between policy and enforcement. The judicial process on many college campuses offers an important—and underutilized—opportunity to send consistent messages to students and ensure that intervention programs reach students whose drinking has become a problem for the campus. Interventions based upon motivational enhancement, skill development, and normative clarification can promote values that are consistent with the values already found within the university culture.

Parental Notification

The Higher Education Amendments of 1998 provide assistance to colleges and universities in their efforts to address student alcohol and other drug use. Section 952 clarified that institutions of higher education are allowed (but not required) to notify parents if a student under the age of 21 at the time of notification commits a disciplinary violation involving alcohol or a controlled substance. The U.S. Department of Education's final regulations issued in 2000 further clarified the intent of the 1998 amendment, stating that campus officials may notify parents whenever they determine that a disciplinary violation has occurred and that those determina-

tions can be made without conducting a formal disciplinary proceeding or hearing.

Research has begun to document the extent of parental notification practices used by colleges. One survey (Palmer et al., 2001) involving 189 colleges and universities found that 58 percent of the colleges indicated having parental notification policies (77 percent of private institutions and 43 percent of public institutions). An additional 24 percent were considering integrating parental notification as part of their sanctioning process. Of the campuses reporting they use parental notification as a sanction, 59 percent use mail correspondence as the vehicle to notify parents. This survey also reported that campus officials rated the response of parents who received notification of their child's alcohol or drug violation as very supportive (72 percent) and supportive (6 percent).

Although no well-controlled research has been conducted, the campuses that use parental notification procedures report reductions of more than one-half in the number of alcohol violations following implementation of the parental notification policies. Several colleges, such as the University of Delaware, have adopted parental notification within a comprehensive approach to prevention. The integration of parental notification as part of a system to increase the monitoring, enforcement, and publicity associated with the institution's alcohol and other drug polices, has resulted in fewer suspensions, a decrease in disciplinary cases, less vandalism, and reductions in high-risk drinking behavior.

If the notification of parents is integrated into the institution's sanctioning process, the notification response should be one of several approaches serving to deter student misbehavior. A comprehensive approach needs to involve education, screening, and intervention. Ongoing publicity of a parental notification policy may be necessary in order for this sanction to be applied as an effective deterrent. Information regarding the goals of the parental notification response and how and when it is to be used should be clearly articulated before implementation. The institution should also develop means to consider issues that may warrant exceptions for the use of parental notification (for example, students who may experience undue hardship, history of abuse in the family, or students who do not have dependent status). Students should also be provided the opportunity to discuss the incident with their parent prior to the institution's contact.

Availability of Alcohol-Free Social Activities

Several universities offer alcohol-free social and recreational activities, often on Friday and Saturday nights, when students often consume alcohol. These activities cover a broad range, including late-night intramural tournaments, concerts, theatrical performances, movie showings, dances, ice

skating, trivia bowls, and laser tag. These activities are developed and offered by student activities departments and by student organizations. Although such approaches have not been evaluated, alcohol-free, late-night activities are an alcohol prevention strategy with theoretical promise.

Screening for High-Risk and Heavy Drinkers

Research on college student subcultures has identified specific student groups that accept and promote heavy substance use among their members (Astin, 1993; Dean, 1982). If a campus can identify these groups, selective prevention programming could be targeted to these subcultures as a way to reduce underage drinking.

College health service agencies and the judicial discipline system are two primary contact points for substance abuse screening and intervention on college campuses. These systems are positioned to link students who are heavy drinkers or show signs of early alcohol dependence to intervention programming and, in some cases, needed treatment.

The university's judicial response to violations in alcohol policy is also part of the educational lesson the institution can provide to students (Smith, 1989). By providing a network through which university alcohol policies are clearly communicated and consistently applied to student misconduct by all parts of the university community, then addressed through a screening and brief intervention, a university can provide students an effective and efficient response to high-risk drinking and associated behaviors. This system simultaneously allows students to evaluate their alcohol use and its role in their lives while holding them accountable for their behavior. Brief motivational interventions may be the best response for policy infractions. It has been proven to effectively reduce high-risk behaviors associated with alcohol consumption, is sensitive to the developmental and psychological characteristics found among traditionally aged college students (18 to 22 years of age), provides a supportive, personally reflective, and educational opportunity for students, and has values that are consistent with the values found within institutions of higher education (NIAAA, 2002).

The challenge for the judicial process is in balancing responsibilities in several different areas—enforcing the university's policy, encouraging health-promoting behavior, and protecting the rights of students who drink moderately or choose not to drink at all. Research has noted that effective early intervention strategies rely on consistent enforcement of policies on the campus, which is essential to the quality of the educational environment (Wechsler and Davenport, 1999).

The active involvement of college student healthcare professionals in alcohol prevention is supported by the *Guidelines for Adolescent Preventive Services* (Elster and Kuznets, 1994), which recommend that healthcare

providers ask all adolescent patients annually about their alcohol and other drug use as part of routine care. Given the prevalence of drinking among 18- to 20-year-olds, it is reasonable to also expect college healthcare professionals to conduct similar screening with their patients. Like the campus judicial process, healthcare services offer an important and underutilized opportunity to link services for heavy alcohol users to students who could benefit from such interventions.

While an overwhelming majority of colleges and universities indicate they have an alcohol and other drug prevention program (Wechsler et al., 1999), very little data exist on the organizational characteristics of these programs, the scope of their prevention efforts, their financial support, and the financial resources needed to effectively implement the empirically validated and multiple prevention strategies recommended in this document and by NIAAA (2002). There also is inadequate evaluation of approaches, such as social norms marketing, parental notification, interventions in healthcare settings, and other innovative approaches. Future research should also consider institutional characteristics associated with alcohol outcomes, including the effects of size of student enrollment, type of institution (2- or 4-year college, residential or commuter), location in either an urban or rural setting, and organizational properties of colleges, including affiliations such as historically black or women's institutions.

Recommendation 10-3: Residential colleges and universities should adopt comprehensive prevention approaches, including evidence-based screening, brief intervention strategies, consistent policy enforcement, and environmental changes that limit underage exposure and access to alcohol. They should use universal education interventions, as well as selective and indicated approaches with relevant populations.

Recommendation 10-4: The National Institute on Alcohol Abuse and Alcoholism and the Substance Abuse and Mental Health Services Administration should continue to fund evaluations of college-based interventions, with a particular emphasis on targeting of interventions to specific college characteristics, and should maintain a list of evidence-based programs.

OTHER INTERVENTION OPPORTUNITIES

Research on educational approaches has focused on primary and secondary schools and college settings. Faith-based organizations and health care settings have frequent contact with young people and may offer important intervention opportunities. Similarly, many young people either join the military or enter the labor maker rather than attending college or finish-

ing school. However, interventions with youth in these settings, and evaluation of the few interventions that do exist, are scarce.

Available research does not allow recommendation of particular approaches in these settings. However, future strategies would benefit from the development and evaluation of interventions in these areas (see Chapter 12). Research on educational approaches in schools, colleges and communities may offer some lessons that may reasonably be applied to these settings.

Faith-Based Interventions

Research on the effectiveness of faith-based initiatives for preventing alcohol use and alcohol problems is very limited. However, family involvement in faith-based institutions, religiosity, and spirituality all have been shown in research to reduce the risk for adolescent substance use. According to Miller (1998), there is a consistent effect of commitment to religion and reduced alcohol use. Young people whose families are active in religious activities are less likely to drink beer and distilled alcohol (Hardesty and Kirby, 1995).

Interventions delivered through faith-based organizations represent a new area of exploration for prevention research. Such research might include examining what faith-based groups currently do that addresses alcohol, with the goal of understanding how involvement in faith-based institutions moderates alcohol use and developing and evaluating innovative strategies for alcohol prevention in faith-based settings. However studies of faith-based interventions must be carefully designed to account for the possibility that selection bias, rather than program effects, accounts for any positive outcomes (Miller, 1998; Hardesty and Kirby, 1995).

The Department of Health and Human Services should apply the same standards for providing care and determining the effectiveness of faith-based interventions as has been established for school- and community-based interventions. Innovative approaches should be independently evaluated using standard approaches for documenting effectiveness.

Health System Interventions

Doctors are viewed as authorities for all health issues by adolescents and parents (Mullen and Katayama, 1985) and therefore should be actively involved in assisting with prevention. There are national guidelines for physicians' provision of comprehensive preventive services to adolescent patients. In general, these clinical guidelines recommend that all adolescents have an annual, confidential, preventive services visit during which they are screened, educated, and counseled on a number of biomedical, emotional,

and sociobehavioral topics, including alcohol use (e.g., Werner, 1995). There is a growing interest in drawing healthcare providers into alcohol and substance abuse prevention with youth, and healthcare systems and providers represent an as yet untapped resource in prevention programming. Cavanaugh and Henneberger (1996) reported that more than nine out of ten parents in their study thought that pediatricians should discuss alcohol with their children during routine visits. Research also suggests that adolescents are more willing to disclose information about alcohol use to physicians who assure them of complete confidentiality (Ford et al., 1997).

In spite of the existing guidelines, physicians do not screen or educate the majority of their adolescent patients regarding alcohol. Only 25 percent of physicians educate their patients on the basis of the standards established by the American Medical Association for screening (Millstein and Marcell, 2003). Even when physicians do counsel adolescents regarding alcohol use, they predominantly use ineffective interventions (Millstein and Marcell, 2002). Although, on average, physicians report screening 70 percent of their adolescents about alcohol use, only 47 percent of patients are asked about drinking and driving (Halpern-Felsher et al., 2000). Furthermore, only about half of patients are educated about the risks of alcohol use.

Emerging research suggests that physicians' rates of screening adolescents for alcohol use can be improved (from an average of 59 percent to 76 percent) by training physicians on the knowledge, attitudes, and skills that are necessary to create behavior change (Lustig et al., 2001). Ozer et al. (2001) also showed that physicians' alcohol-related screening and counseling rates could increase significantly following training, the implementation of charting forms, and if an on-site health educator is available. Preliminary data are beginning to suggest that implementing preventive services does reduce adolescents' risk behavior (Ozer et al., 2003).

Healthcare facilities have significant and promising, but as yet unproven, potential to influence alcohol use and alcohol problems among adolescents. Interventions using a variety of media might be developed for patients to be implemented during time spent in the waiting room and during follow-up visits. Future research should promote the development and evaluation of innovative interventions that target adolescents in healthcare settings. Additional research and evaluation are needed to determine whether interventions implemented by physicians or other healthcare professionals are effective with adolescents and whether and how training can enhance effectiveness.

Workplaces

Young people who work full or part time while attending school are more likely than their peers to use alcohol and drink heavily (McMorris

and Uggen, 2000; Mortimer and Johnson, 1998), and most heavy drinkers of any age are in the workforce (Cook and Schlenger, 2002). A full- or part-time job provides discretionary money that young people may choose to spend on alcohol. Workplace social norms may facilitate drinking behavior and additional exposure to adults who are of the legal drinking age may provide a mode of access for underage drinkers to procure alcohol.

There are compelling reasons to expand workplace prevention programming. Workplaces may offer a key site in efforts to reduce underage drinking because of the potential to interrupt the relationship between employment and youth alcohol use. Such interventions may also serve to reach a population of young people who are not exposed to school-based interventions.

Workplace alcohol prevention programs have existed for the past 50 years, no doubt because alcohol use and abuse can result in accidents, lost productivity, and worker turnover. Workplace drug testing and prevention programs have become more prevalent in the past 10 years, as has research evaluating the effectiveness of primary prevention strategies. There is some evidence to suggest that workplace drug testing has helped to reduce drug use but additional research on effectiveness is needed. In addition, it is not clear if a deterrent effect extends beyond the drugs tested for to a substance like alcohol.

Although little research has been conducted on workplace prevention programs with underage youth, at least two program characteristics appear to have the potential to have positive effects (Cook and Schlenger, 2002; National Research Council and Institute of Medicine, 1994). First, programs that seek to change workplace culture and social norms around alcohol use may be particularly effective in work settings that support or have a permissive culture around drinking. A second characteristic is that intervention programs must avoid the stigma of alcohol abuse in order to encourage worker participation. For example, a workshop on alcohol abuse is not likely to be well attended, but a stress management program that addresses alcohol use as a part of its curriculum may be appealing to employees. There are likely other characteristics that will contribute to the design and implementation of effective workplace interventions.

Unfortunately, the available research about prevention programs does not include any program that specifically targets or seeks to address the needs and concerns of underage workers. In fact, the committee is unaware of any workplace programs that address the specific needs of underage employees.

Workplace prevention programming has the potential to disrupt the relationship between youth employment and drinking and may reach young people who would not otherwise be reached. More evaluations of existing general workplace programs are needed, including whether underage em-

ployees participate in such programs, the factors that influence their participation, and whether the programs meet the needs and concerns of young workers. Other creative new programs specifically targeting underage populations also should be developed and evaluated. Employers with large concentrations of workers under age 21 are one possible venue for testing intervention approaches.

The Military

Alcohol use in the military has historically been widespread and commonly accepted, provided that it did not result in irresponsible behavior or harm. A study by Ames et al. (2002) suggests that the military environment does not serve as a protective factor for heavy drinking. Over the past several decades, the military has increased efforts to test for drug and alcohol use, developed interventions aimed at decreasing risky health behaviors, including alcohol use, and increased efforts to provide treatment for those with identified drug and alcohol problems. For example, the navy began drug testing in 1981. At that time, 50 percent of enlisted personnel tested positive; by 1984, only 5 percent tested positive. Yet many employers who instituted drug testing also initiated other prevention programs at a similar time—this was certainly true of the navy's approach to substance abuse prevention—and research has not been conducted to separate the relative influence of the effects of drug testing and other programming (Cook and Schlenger, 2002).

Most military-based interventions have focused on the military audience at large and have not had a specific focus on the underage, primarily enlisted, audience. Though approaches aimed at changing the military culture around drinking have value, more attention should be paid to approaches that specifically target underage personnel. Such approaches will admittedly face unique challenges in terms of the inconsistency between policies that allow young men and women to be put in harm's way but do not allow them to drink, as well as their living in countries that may have minimum legal drinking age policies that differ from those in the United States. Nonetheless, the military setting provides an important opportunity for exploring prevention interventions with underage personnel.

Prevention programs at colleges offer resources from which the military can develop innovative interventions with underage personnel but these programs would need to be adapted to the specific context and culture of the military. One program—PREVENT (Personal Responsibility and Values: Education and Training)—developed for and implemented in the navy, has a number of components that parallel college programs and that make use of some of the known critical elements (see Chapter 11). PREVENT is a multifaceted education curriculum that seeks to link knowledge of health

behaviors and risks to behavioral changes. It addresses a number of issues (drug and alcohol use, decision-making, and financial management) and builds knowledge and skills.

An interesting element to this program is that it uses values traditionally associated and promoted by the military (e.g., personal responsibility, integrity, minimizing risk to other sailors, mission readiness) as a way to encourage sailors to reduce alcohol use and alcohol-related consequences. This element capitalizes on military culture for health promotion and alcohol prevention—something that might be uniquely possible in the military. Based on reports issued by the U.S. Navy, PREVENT appears to be a promising program. For example, graduates reported a 45 percent reduction in heavy drinking days per month and an 82 percent decrease in driving after drinking. Costs associated with alcohol-related incidents and lack of readiness were also decreased (U.S. Navy, 2003). Additional evaluations of military-based programs, including the extent to which they reach underage populations, are warranted.

TREATMENT PROGRAMS

Despite efforts to prevent underage drinking, some youth will drink at a level that requires clinical treatment. Findings from the National Household Survey on Drug Abuse indicate that about 10 percent of 12- to 17-year-olds (about 2.3 million) are heavy users of alcohol. The proportion of users who are clinically dependent is not known, but it is believed to be unacceptably high. Treatment for underage alcohol dependency is scarce. The juvenile justice system is the major route through which most adolescents get into treatment. Although estimates of the cost-effectiveness of early treatment are speculative, research suggests that early treatment has the potential to be cost-effective, especially in comparison with incarceration or treatment for a long-term alcohol abuse problem. For instance, cost-benefit research on drug and alcohol treatment generally (Office of National Drug Control Policy, 2001) suggests that the range of savings is between $2.50 and $9.60 for every dollar spent on treatment. Although these savings were calculated on the basis of adult treatment, and included drugs as well as alcohol, it is reasonable to assume that savings for effective youth alcohol treatment would be at least this high. Unfortunately, only one person in seven who would qualify for treatment was admitted to treatment in 1999 (National Institute on Drug Abuse Community Epidemiology Work Group, 1999). The proportion of youth who are admitted to treatment is undocumented but believed to be even smaller.

Research on treating underage alcohol abusers reveals that nine elements are crucial to success: matching treatment to needs; comprehensive

and integrated treatment; family involvement; developmental appropriateness; recognition of gender and cultural differences; continuing care; and assessment (Hansen and Dusenbury, 2004).

Matching Treatment to Needs Assessment is important to determine the type of treatment approach to which an adolescent may respond (Pickens and Fletcher, 1991; Bergmann et al., 1995; Jainchill et al., 1995; Werner, 1995). Because the severity of adolescents' alcohol use varies considerably, matching the severity of their problem to intensity of treatment is important (Jenson et al., 1995). Treatment formats range in intensity and include:

- brief intervention, typically delivered by physicians, counselors, or others who do not specialize in drug and alcohol abuse treatment per se;
- outpatient treatment, which includes programs that can range from 2 to 20 hours per week;
- day treatment or partial hospitalization, including professionally directed treatment after school, in the evenings, or on weekends, often combining individual, group, and family therapy;
- inpatient treatment; and
- detoxification, a 3- to 5-day period of intensive medical monitoring and management that is often part of a 28-day intensive inpatient treatment program.

Comprehensive and Integrated Treatment is more effective if it is fully integrated into all aspects of an adolescent's life—school, home, family, peer group, and workplace. For example, treatment programs should actively help students keep up with their schoolwork and feel integrated in the school environment.

Involvement of Families Family development research clearly supports the need for understanding an adolescent's relationship with his or her family and including families in therapy wherever possible. Families can be either a source of strength or a risk for continued alcohol abuse. For instance, family involvement can be particularly important in retaining teenagers in treatment, while alcohol problems among other family members can influence youths to continue engaging in heavy drinking. Family involvement usually includes education about treatment and how families can support the treatment process. Families sometimes need intervention in order to change the environment or structure they provide to the underage drinker in treatment (Spoth et al., 2001). In addition, family interventions need to be prepared to address familial alcoholism, which represents a significant risk factor for youth alcohol use and future dependence.

Developmental Appropriateness Program models specifically designed for adolescents are more effective than programs based on adult regimens. Adolescent treatment needs to emphasize maturational issues, psychological issues, and emotional and sexual issues. Treatment programs should be tailored to the different cognitive abilities of older and younger adolescents and deal differently with concrete versus abstract styles of thinking.

Retention Underage drinkers are often less motivated than adults to participate in treatment. They are often referred through delinquent acts at school or through the criminal justice system; they rarely self-refer. Programs need to develop strategies that engage and retain teenagers in treatment. Retaining underage abusers in treatment often requires the application of age-appropriate sanctions and rewards.

Gender and Cultural Issues It is important to recognize issues that are particular to some groups. For instance, there is a correlation between childhood trauma and substance abuse for girls and women. Often, female substance abusers have been sexually abused. For these reasons, it is contraindicated to put girls in a coed setting for treatment. Other differences along race and ethnicity must also be considered and attended to as a part of treatment. Alcohol use is often defined as part of a cultural context and certain cultural attitudes may affect use patterns as well as how an adolescent understands his or her alcohol use. Treatment programs that can attend to these differences may have greater potential to produce successful outcomes compared to those that do not.

Continuing Care Continuing care is crucial to achieving positive long-term outcomes (McKay et al., 2002). Underage drinkers who require intense treatment will also require intense continuing care. Currently, continuing care for adolescent drug and alcohol problems is rarely available. There is little research on continuing care to provide guidance regarding what kinds of continuing care are the most effective for these adolescents. Additional research in this area would be useful.

Assessment of Outcomes Most adolescent treatment programs have not been rigorously evaluated, though many keep track of outcome data and are able to provide statistics that suggest the effectiveness of the treatment and recovery strategies (SAMSHA, 2000; Pickens and Fletcher 1991; Bergmann et al., 1995; Jainchill et al., 1995; Werner, 1995). One of the challenges for treatment providers is that evaluation of treatment programs is costly and difficult (Kaminer and Bukstein, 1989; Milby, 1981). However, evaluation not only validates effective approaches, it also provides

information that is essential for improving treatment strategies (Kaminer and Bukstein, 1989).

It is crucial to the success of adolescent treatment that referral to service is coordinated within communities. Strategies that increase coordination among institutions in the community including schools, workplaces that employ teenagers, law enforcement, courts, faith-based institutions, and public and private treatment providers that may refer teens to treatment should be developed, disseminated, and evaluated. Training should be provided for key individuals all of these institutions about indicators of risk and procedures for referral.

Recommendation 10-5: The U.S. Department of Health and Human Services and states should expand the availability of effective clinical services for treating alcohol abuse among underage populations and for following up on treatment. The U.S. Department of Education, the U.S. Department of Health and Human Services, and the U.S. Department of Justice should establish policies that facilitate diagnosing and referring underage alcohol abusers and those who are alcohol dependent for clinical treatment.

Adolescents often enter alcohol treatment through the criminal justice system. The Department of Justice should facilitate the development of a coordinated approach that encourages the use of effective approaches for dealing with adjudicated youth. In addition, these approaches should also be designed in a manner that will allow them to address alcohol use when it occurs in conjunction with other drug use. The criminal justice system should establish policies that ensure that referral to alcohol treatment is appropriate and accomplished systematically.

Schools do not yet systematically identify and refer students in need of diagnosis and treatment for alcohol problems. State agencies should encourage schools, health care providers, and other professionals to access state-of-the-art resources to help them identify youth who may need help and make referrals to appropriate agencies for diagnosis and treatment. In addition, policies and programs should support screening and referral that matches the needs of adolescent alcohol abusers with appropriate treatment options.

11

Communities

In a democratic society, the mobilization of communities in civic life is in and of itself of significant value. Democratic life relies on civic participation and an active, informed citizenry. Community-based groups facilitate the formation of diverse constituencies and support their work with organizational, material, technical, financial, and training assistance. Coalitions also enhance dialogue and cooperation by bringing together stakeholders for strategy development and mobilization on critical issues.

Although most community coalitions have not been rigorously evaluated, several community trials provide evidence that community coalitions can affect alcohol-related outcomes and also document the elements that make community initiatives successful. In addition, numerous case studies and substantial qualitative research attest to the effectiveness of community coalitions. On the basis of this evidence, combined with the strong logical reasoning behind the value of community-level interventions, the committee concludes that community mobilization specific to underage drinking is an attractive complement to national- and state-level interventions. Future evaluations should continue to refine the critical elements of these initiatives.

COMMUNITY-BASED ACTIVITIES

While community mobilization has been studied as an intervention in itself, it also provides a context within which interventions can occur, thereby increasing the likelihood that those interventions will succeed. It is

a tool that can be used to implement and support various interventions, especially those that target community-level policies and practices. It can help to create the political will and organizational support for developing and implementing proven strategies for decreasing underage drinking (such as minimum age drinking laws, zero tolerance laws, and measures to reduce physical availability and outlet concentration). It can help to change the normative climate surrounding the acceptability of underage drinking, and create greater awareness of, and publicity about, enforcement activities, such as random breath testing and sting operations. It also helps establish the idea that alcohol and other drugs are a community problem that local people can solve, thereby increasing the likelihood that people will support and sustain efforts they help create.

There is a long and varied history of community mobilization around alcohol problems in the United States, dating back to the nineteenth century. In recent years, community mobilization has been recognized, documented, and evaluated in efforts to reduce alcohol-related problems, including underage drinking. Case studies have documented how communities have organized and used the news media to support changes in alcohol availability, reductions in outdoor advertising of alcohol, increased compliance checks on retailers regarding service and sales of alcohol to minors, keg registration laws, and campaigns to eliminate alcohol sponsorship from ethnic holiday events.

It is important for communities to rely on scientifically based strategies to reduce underage drinking. For example, research shows that positive outcomes can be achieved by combining environmental and institutional change with theory-based health education programs (Hingson and Howland, 2002). Community-based prevention research points to the importance of broad efforts to reshape the physical, social, economic, and legal environment affecting alcohol use. Promising evidence suggests that coalitions can effectively address youth access to alcohol and high-risk behaviors associated with alcohol consumption (Hingson and Howland, 2002; Manger et al., 1992).

Concerns about the prevalence and effects of alcohol use by underage youth have led to a large proliferation of community-based coalitions across the country (Butterfoss et al., 1996; Lerner and Miller, 1993; Robert Wood Johnson Foundation, 1993). These coalitions have engaged community residents, advocacy groups, representatives of nongovernmental organizations, government agencies, and universities in collaborative activities to address youth risk behaviors, particularly those associated with alcohol and other drug use (Fawcett et al., 1997; Hawkins et al., 1992; Mansergh et al., 1996). Having the flexibility to choose one's partners has been an important ingredient in the success of many effective coalitions. Some coalitions have included local alcohol retailers, while others have limited their mem-

bership to public health, safety, and other noncommercial organizations. There is some evidence that coalition partners with strong ties to alcohol producers may not support effective environmental interventions. Government agencies may or may not play a major role.

Community-driven initiatives should be tailored to the specific problems and resources in a community. Different communities will therefore have different priorities based on their particular needs. For example, some research suggests that minority communities may be targeted by some alcohol advertisers (Alaniz and Wilkes, 1995; Altman et al., 1991; Hackbarth et al., 2001) and that outlet density in these communities is particularly high (LaVeist and Wallace, 2000; Gorman and Spear, 1997). Although a specific relationship between advertising and underage drinking has not been shown, recent cross-sectional research has shown a correlation between outlet density and underage drinking. For example, outlet density has been associated with increased incidence of youth driving under the influence (Treno, Grube, and Martin, 2003), ease of alcohol purchase (Freisthler et al., 2003) and heavy and frequent drinking and alcohol problems (Weitzman et al., 2003a). Similarly, Wechlser and Wuethrich (2002) suggest that controlling outlet density can help alleviate market pressures that result in discounted pricing, a factor in underage drinking.

Research has also shown that while newly arrived immigrants have lower rates of alcohol use than others, their consumption increases and they develop more liberal attitudes toward drinking as they become more acculturated (National Institute on Alcohol Abuse and Alcoholism, 1994; National Women's Health Information Center, 2002). Communities should consider the variety of factors that may affect underage drinking, as well as the specific characteristics of underage drinking in their communities in developing community-specific strategies.

In large states, such as California, local coalitions have sometimes had greater success than statewide efforts. Other successful coalition efforts across the United States have been supported by statewide organizations or systems. States have organized regional coalitions consisting of representatives from institutions of higher education, city and state political officials, liquor control and licensing officials, state and local law enforcement officials, restaurant and tavern proprietors, state health officials, and researchers to support the development and implementation of broad and comprehensive strategies. The National Highway Traffic Safety Administration (2002) recently sponsored a project by the Pennsylvania Liquor Control Board to develop a manual to help alcohol beverage control (ABC) agencies identify opportunities and initiatives to reduce underage drinking.

Statewide initiatives can begin in a number of ways. Some are the result of the leadership of state agencies, such as the state department of public health or the state liquor control board. Others emerge through college and

university administrations or statewide college task forces, as found in the states of Missouri and California. Still others may be the result of grassroots organizations from a number of localities realizing that they have common interests at the state level, and banding together for coordinated and more effective action.

Recommendation 11-1: Community leaders should assess the underage drinking problem in their communities and consider effective approaches—such as community organizing, coalition building, and the strategic use of the mass media—to reduce drinking among underage youth

SUCCESSFUL COMMUNITY COALITIONS: TWO PORTRAITS

Successful community coalitions include the use of multiple program strategies, such as education programs, community organization, environmental policy changes, strategic use of the news media, and heightened enforcement of existing policies (Hingson and Howland, 2002). Strategic use of the mass media by communities is an important component of community mobilization and can support other interventions. It can be an effective vehicle for publicizing new or existing policies and gaining public support for alcohol control policies and increased enforcement efforts (Casswell and Gilmore, 1989; Stewart and Casswell, 1993). Skillful use of media resources can support community organization and public education about successful strategies, as well as influence those who have the power to make changes in enforcement practices or in policies. Community groups that have developed the skills to use the news media strategically to support their objectives for changes in the environments contributing to public health problems can influence public opinion and public policy (Wallack et al., 1996; Wallack, 2000; Seevak, 1997).

Two examples of coalition-building in communities comprised primarily of racial and ethnic minority groups provide instructive lessons. Oakland, California, achieved successful alcohol policy outcomes through the work of a single coalition consisting primarily of professionals and government officials. The central focus of the coalition was to develop legislation that would tax all alcohol outlets in the city to provide funds for improving neighborhood safety and beautification. The major strategy relied much more on skillful use of the media than on grassroots organizing. The "Deemed Approved Ordinance," enacted by the city in 1993, charged alcohol outlets an annual fee of $600 for monitoring establishments. At the same time, the city also enacted a 1-year moratorium on new licenses and required a 1,000-foot separation between alcohol outlets citywide except for the downtown area. A year later, in 1994, Oakland received a $100,000

grant from the state alcoholic beverage control agency to hire a police officer and other personnel to deal specifically with alcohol-related enforcement; they became known as the alcohol beverage action team (ABAT). ABAT set up many decoy operations with minors to buy alcohol and cigarettes, which put retail establishments on notice. The police also built a closer relationship with the ABC agency, building records against problem alcohol outlets and sending that information to the agency. Community respondents also reported that working together on these alcohol-related issues has led to more general improvements on community life and personal empowerment.

Los Angeles provides another instructive example. For 20 years, public concern has focused on the proliferation of alcohol outlets and the role they played in the city's well-known neighborhood and social problems, especially the drug trade. The Community Coalition for Substance Abuse Prevention and Treatment began in the early 1990s conducting research on the problem, initiating a community dialogue, and highlighting a history of alcohol activism in the city. These efforts were invigorated by the overnight destruction of almost a third of the alcohol outlets in the infamous south central area during the riots following the Rodney King decision. The coalition relied on grassroots community organizing, which led to the involvement of city council members, as well as networking with decision makers and other activists at the state level. Their efforts led to state legislation permitting local control of alcohol outlets. Coalition efforts also decreased the number of retail outlets operating in south central Los Angeles, improved environmental standards for outlet operation, increased awareness of alcohol policy issues at the local level, and increased empowerment and participation of neighborhood residents in the process of local governance.

EVIDENCE OF EFFECTIVENESS

The effectiveness of community activities to combat underage drinking has been a focus of national and international efforts since the early 1980s. One rigorous evaluation provides lessons about what does not work. Evaluation of a demonstration project investigating the effectiveness of a comprehensive coalition-building model in reducing alcohol and other drug problems, the Fighting Back Initiative funded by the Robert Wood Johnson Foundation, found little positive effect on youth or adult substance use. However, two flaws may have doomed the project from the start. First, the coalition organizers sought to include all major community stakeholders, including those who were members of or closely aligned with commercial interests in alcohol production or sales. Controversial interventions, such as those affecting the availability of alcohol, were not even considered almost from the start in many of the coalitions. Second, the interventions used had

not been proven to be effective. The easiest interventions to achieve politically are often the least effective in reducing alcohol-related problems. Reliance on the scientifically proven interventions though potentially more difficult to implement can prevent years of wasted effort.

Examples of What Works

In contrast, four other major experimental studies of community mobilization have demonstrated what does work. Project Northland in Minnesota was a randomized community trial implemented in 24 communities with a study population in early adolescence and in the final years of high school. There were three phases. In the early phase, the project's interventions included school curricula, parent involvement, peer leadership, and community task forces. During the second phase, there were no interventions. In the third phase, the interventions were classroom curriculum, parent education, a print media campaign, and youth development and community organizing. The evaluation measured the tendency to use alcohol, to drink heavily, and to obtain alcoholic beverages. The project had its greatest success in the early years; the progress eroded during the period of no intervention and showed modest success in the final phase. The failure of the project to maintain its effectiveness during the interim phase demonstrates the importance of intervention throughout adolescence, and it also points to the significance of community-level policy and other actions that change community norms around youthful drinking (Perry et al., 2002). The Project Northland team has increased their focus on community-level change in a replication of the program that is currently under way in 61 schools and communities in the Chicago area.

A 5-year community alcohol trauma prevention trial, the Community Trials Program, involving a quasi-experimental design with three experimental communities and matched controls in California and in South Carolina, used community mobilization and strategic use of the mass media. It addressed all alcohol use, not only that of underage youth. Two of three communities were composed primarily of ethnic minority residents, which may have implications for implementing prevention efforts in other minority communities. The program had five mutually reinforcing components:

1. Community mobilization addressed support for public policy interventions by increasing general awareness, knowledge, and concern about alcohol-related trauma. Program initiatives were jointly planned by project organizers and local residents and implemented by the residents.
2. The responsible beverage service component sought to reduce sales to intoxicated patrons and increase enforcement of local alcohol laws by

working with restaurants, bar and hotel associations, beverage wholesalers, the Alcohol Beverage Control Commission, and local law enforcement.

3. Another component sought to decrease driving after drinking by increasing the number of DWI (driving while intoxicated) arrests through a combination of special officer training, deployment of passive alcohol sensors, and the use of sobriety checkpoints. News coverage publicized these activities.

4. A component directed toward underage drinking sought to reduce alcohol sales to minors by enforcing underage sales laws; the training of sales clerks, owners, and managers to prevent sales of alcohol to minors; and the strategic use of the news media to bring media attention to the issue of underage drinking.

5. Local zoning and other municipal powers that determine alcohol outlet density were used to reduce availability of alcohol.

This multicomponent approach resulted in a 43 percent decline in alcohol-related assault admissions to hospitals and decreases in heavy drinking. There was strong support for the efficacy of a coordinated, comprehensive community-based intervention to reduce high-risk alcohol consumption and alcohol-related trauma, although frequency of drinking did not change and there was a slight increase in the number of persons who reported any drinking in the intervention communities (Holder et al., 2000).

Intermediate outcomes also indicated success, including decreases in alcohol outlet sales to underage-appearing pseudo-patrons without identification. Local regulations of alcohol outlets and public sites for drinking were changed in all three experimental communities. Changes in the Northern California intervention city were typical. The city council implemented a proposal to eliminate special land use conditions for alcohol outlets, adopted restrictions on the availability of alcohol in city parks, denied a new alcohol license, revoked a retailer's conditional use permit because of liquor sales violations, and instituted a citywide ordinance requiring new owners of offsite and onsite alcohol outlets to complete a responsible server course. In addition, the Hispanic Chamber of Commerce voted to make its annual festival alcohol free.

The DWI reduction component resulted in an increase in news coverage of DWI arrests, additional police enforcement, greater use of breathalyzer equipment, and increased public perceptions of risk of arrest for DWI. Alcohol-related crash involvement as measured by single vehicle night crashes declined 10 to 11 percent more among program than comparison communities.

Communities Mobilizing for Change on Alcohol (CMCA) was a 6-year project designed to test creative approaches to reducing drinking by young people. The project was implemented in seven small to mid-sized communi-

ties in Minnesota and Wisconsin in 1993; eight other communities in the region served as a control group. CMCA emphasized environmental factors that affect the supply of alcohol to youth and used a community organization approach to achieve policy changes among local institutions. The community coalitions included a variety of citizens with differing connections to the community and the issue: parents, youth involved in school service activities, and social service workers, as well as law enforcement officers and politicians. Adults and young people in each community identified and promoted a variety of issues designed to change the local environment in ways that made alcohol more difficult to obtain and made underage drinking less acceptable (Wagenaar et al., 1999, 2000a, 2000b).

The specific objectives of the project were to change community policies and procedures to reduce: access to alcohol by underage youth, whether through retail sales to youth or purchase or provision by parents, other adults, or older youth; number and proportion of alcohol outlets selling to underage individuals; youth and adult support for or tolerance of underage purchase and consumption of alcohol; prevalence, quantity, and frequency of alcohol consumption among youths aged 15 to 20; and incidence of alcohol-related health and social problems among youths aged 15 to 20 (Wagenaar and Perry, 1994).

Outcomes included increases in intervention communities of age identification checking by retailers and reduced sales to minors, especially in on-sale establishments. Young people aged 18 to 20 reduced their propensity to provide alcohol to other teens and were less likely to try to buy alcohol, drink in a bar, or consume alcohol. However, there were no effects on drinking by high school seniors (Wagenaar et al., 1999, 2000a).

Additional analyses of arrest and traffic crash data indicated that DUI violations declined in the intervention communities. Again, this effect was most marked for college-age youth and only approached significance for youth aged 15 to 17. There were no differences in arrests for disorderly conduct or traffic crashes for either age group. Collectively, findings from the CMCA project indicate that a community-organization approach to limiting youth access to alcohol can be effective for college-age youth (18- to 20-year-olds) (Wagenaar et al., 1999, 2000a, 2000b).

The Massachusetts Saving Lives Program (Hingson et al., 1996) sought to reduce drunk driving and speeding through community mobilization. Communities introduced media campaigns, drunk driving checkpoints, business information programs, speeding and drunk driving awareness days, speed watch telephone hotlines, police training, high school peer-led education, Students Against Drunk Driving chapters, college prevention programs, alcohol-free prom nights, beer keg registration, and increased liquor outlet surveillance by police to reduce underage alcohol purchase. To increase pedestrian safety and safety belt use, program communities con-

ducted media campaigns and police checkpoints, posted crosswalk signs warning motorists of fines for failure to yield to pedestrians, added crosswalk guards, and offered preschool education programs and training for hospital and prenatal staff. Coordinators engaged in numerous activities designed to help local news outlets move beyond reporting only the specifics of motor vehicle crash injuries and deaths to explaining trends in local traffic safety problems and strategies communities were implementing to reduce traffic injury and death (Hingson et al., 1996).

During the 5 years of the program, the proportion of drivers under age 20 who reported driving after drinking in random-digit dial telephone surveys declined from 19 percent during the final year of the program to 9 percent in subsequent years. The proportion of vehicles observed speeding (through use of radar from unmarked cars) was cut in half, and safety belt use increased from 22 percent to 29 percent. (Differences between intervention and comparison communities were statistically significant.) Alcohol-related traffic deaths declined 42 percent more in the program cities than in cities in the rest of the state during the 5 years of the program, when compared with the previous five years. This decline was also seen among 16- to 25-year-olds, many of whom may have been college students (Hingson et al., 1996).

Ingredients of Success

Assessments of public awareness of problems related to underage drinking, and of existing support for policies and programs to reduce those problems, can provide measures of baseline community knowledge as well as readiness for change. To maximize the effects of limited human and financial capital, previous community-based efforts have emphasized the importance of conducting assessments of community needs and resources to help develop coalition goals and strategies (Mills and Bogenschneider, 2001). This approach was used in the three successful community mobilization projects discussed above.

Support for effective strategies may in fact be higher than is often assumed by organizers at the outset of community mobilization efforts. For instance, research investigating student sentiment toward alcohol policies and laws consistently documents support for policies that control underage drinking (Wechsler et al., 2002). In a 1998 national opinion poll on how to control alcohol-related problems in the United States, the Robert Wood Johnson Foundation reported that 69 percent of young adults said they did not want to see the minimum drinking age lowered from 21 to 19. It appears that the true level of support for alcohol policies that have been shown to be effective (e.g., the minimum drinking age, alcohol excise taxes

to pay for programs designed to prevent underage drinking) is significantly underestimated by students, as well as by administrators and other key members of college communities. Most college students support more strict and consistent enforcement of existing policies, as well (DeJong et al., 2001).

A clear mission is critical to the success of community mobilization efforts. Different objectives may lead to different compositions of community coalitions. For instance, successful adoption of server training requires the cooperation and collaboration of local alcoholic beverage retailers. This constituency, however, may oppose keg registration. Having the flexibility to build coalitions or implementation teams on the basis of the goals is important to success. Strategic planning of coalition initiatives may also include establishing measurable objectives, creating target timelines, clearly defining member responsibilities, and developing leadership to maintain coalition efforts and membership involvement.

Qualitative results from an evaluation of the 37 colleges across Ohio involved in the Ohio College Initiative to Reduce High Risk Drinking indicate that strong, well-trained leadership, active involvement of key campus leaders, and committed resources are the components sustaining organized efforts to change attitudes and behaviors. Turnovers in leadership appeared to have a negative affect on sustainability: coalitions were twice as likely to be sustained when there were no leadership turnovers (Peters, 2002), although it is difficult to determine to what extent leadership stability as opposed to other factors contributed to success. Project directors and coalition chairs from participating institutions indicated being a member of the Ohio College Initiative to Reduce High-Risk Drinking was helpful through the initiative's provision of training, technical assistance and a forum for exchange of information. Training (see recommendation five below) in the environmental model was identified as critical to the success of implementation of environmental management strategies. Coalition longevity was also closely associated with the number of designated staff, both full and part time, working on the prevention effort.

Grassroots participation is essential to the success of some community mobilization efforts. It is important for ensuring that local community interests are represented, thereby enhancing the acceptability and feasibility of implementing prevention efforts. Youth development and behavior may be shaped by factors that are unique to a specific environment, including the structure and dynamics of a family, neighborhood, community, and culture (Lerner, 1995). Community participants provide essential knowledge of their environment that can yield the most accurate assessments of the problem and a menu of possible solutions that are sensitive to local conditions (Mills and Bogenschneider, 2001). Such a locally

driven process also gives the local participants a vested interest in developing resources to support coalition initiatives, and strengthens their commitment to and support for coalition initiatives.

Finally, the involvement of gatekeepers and key community leaders and institutions is an important aspect of adopting and implementing successful community mobilization strategies. The role of key leaders is to develop support for and cooperation with different institutional components of interventions (e.g., cooperation between law enforcement, educators, city council members, and retailers) on strategies to enforce existing laws regarding eliminating sales to minors. For instance, the involvement of college officials and presidents (see below) is also important in communicating the importance of policy enforcement. Involvement of key community leaders can be an essential ingredient for success, provided that they have access to training and information regarding approaches to reducing underage drinking whose effectiveness has been scientifically demonstrated. Strong key leaders combined with substantial grassroots support can provide the community and social capital necessary to undertake effective interventions.

Collaboration Between Communities and Colleges

Institutions of higher education can play a critical role in community mobilization efforts. Comprehensive college-based approaches to address underage alcohol consumption and high-risk drinking should be predicated on a model of student drinking that incorporates the environment and student campus culture, as well as individual factors (Presley et al., 2002) (see also Chapter 10). Building a coalition between campus and community is a vital component of effective alcohol and other drug prevention efforts of colleges (Wechsler, 1996; Presidents Leadership Group, 1997; DeJong et al., 1998; DeJong and Langford, 2002) and is a promising vehicle for promoting environmental change (DeJong et al., 1998). College campuses and local communities have a reciprocal influence on one another in relation to college student alcohol use. Communities within the immediate proximity of college campuses are more likely to report a lowered quality of neighborhood life due to alcohol related behaviors, including noise, public disturbance, and vandalism (Wechsler et al., 1995). Similarly, effective restrictions on underage access to alcohol in a community may be severely undermined by the ease of alcohol access in the campus living communities. The reverse is also true: even a substantial campus-based alcohol prevention strategy cannot succeed if it is surrounded by a community with easy access to alcohol.

Institutions of higher education influence the local environment, with a potential to offer either a positive or adverse climate regarding underage

alcohol consumption. Colleges working with local police can enhance the consistency of enforcement efforts by notifying one another of alcohol-related incidents and by seeking timely and meaningful sanctions. Shared initiatives require few university resources, but they can lead to policy reforms and changes in enforcement that can significantly change the drinking environment.

A campus and community partnership can substantially affect relationships overall, improving the coordination between student affairs offices and local police or other agencies related to student concerns (Gebhardt et al., 2000). Three elements are critical to the development, maintenance, and success of community and university partnerships: (1) the development of consistent support, with associated financial and human resources, (2) the identification of goals and focused planning efforts based on an assessment of local needs and problems and available resources, and (3) the application of assessment and evaluation to measure the effect of partnership activities.

Resource identification and development is often the central challenge of health-based prevention efforts. Needed resources include not only financial support, but also human capital, community capital, in-kind contributions, and partnerships among groups and agencies. Previous college-community coalition initiatives have relied on regionally based assessment, planning, and training in order to effectively address local needs (Gebhardt et al., 2000).

The inclusion of colleges and universities as members of local or statewide coalitions may offer significant contributions in terms of leadership, organization, and resources. Colleges and universities can assist in the development of financial resources, the locality or state, and they can also be a valuable partner in the pursuit of grant and foundation resources. Institutions of higher education may also provide research and evaluation resources for the assessment of partnership efforts. Program evaluation functions as an important component in monitoring the implementation and impact of coalition efforts. College-community coalitions may also function as the best instrument to support recommendations from the National Institute on Alcohol Abuse and Alcoholism associated with future research, including the implementation of a national surveillance and data system for all U.S. colleges and universities and the evaluation of the effectiveness of joint campus-community coalitions.

New laws and regulations that affect the general community will also affect college student alcohol use, making institutions of higher education natural allies for coalition efforts. The coalition model not only allows colleges and universities in any one region or state the opportunity to pool and share resources, but also provides a venue for campuses to make a clear statement that underage drinking and high-risk alcohol use are not con-

fined to any single campus. Issues associated with alcohol use are shared problems that require a collaborative effort to generate shared solutions. Given the increased media attention often gained by both statewide efforts and college student alcohol consumption, this high visibility can help raise awareness of the issue and mobilize additional support in a community or state for the coalition's initiatives.

To develop financial support, coalition partnerships can cosponsor fundraising events and develop joint grant proposals. The development of partnerships between multiple groups allows for the effective coordination of resources. Such partnerships can provide a sharing of resources, facilities, and personnel. Interagency cooperation also allows for the pooling of resources to provide opportunities for sponsoring joint programs and for technical assistance and training. Community partnerships help to identify and express common goals, resulting in consistent and unified messages within the community.

College students may benefit from communitywide efforts. Several coalition efforts have been designed to address underage alcohol use (Hingson et al., 1996; Hingson and Howland, 2002; Gebhardt et al., 2000; Saltz and Stanghetta, 1997). These community efforts have led to reductions in underage alcohol use and alcohol-related problems. College students are not the primary focus of these coalitions, but are likely to benefit from the broader, communitywide aspects of the program designed to reduce such behaviors as drinking and driving and sales to minors. The Higher Education Center for Alcohol and Other Drug Prevention, a primary national resource center for institutions of higher education funded by the United States Department of Education, recommends a comprehensive approach to prevention that includes strategies designed to change the campus and community environment in which students make decisions about alcohol use (DeJong et al., 1998). The Higher Education Center has reported more than 42 statewide coalition efforts that include institutions of higher education in varying degrees of development and activity.

Ongoing efforts in this arena include the Ohio College Initiative to Reduce Underage Drinking, the Memorandum of Understanding Program recently undertaken by the campuses of California State University, the Committee on Community and University Relations begun in 1990 by the State University of New York at Albany, and the Matter of Degree Program developed by the American Medical Association and the Robert Wood Johnson Foundation. Based in part on the findings of the original Harvard School of Public Health College Alcohol Study (Wechsler et al., 1994), the ultimate goals of this 8-year, $10 million national demonstration project are to reduce heavy episodic drinking rates and to test the public health model on which the program is based, as well as to share the lessons learned with other colleges and universities. The Harvard School of Public Health is

conducting an evaluation of the program to identify successful interventions and to track reductions in alcohol consumption. Program interventions include: (1) controlling the proliferation of bars and other alcohol outlets in proximity to campuses; (2) working with neighborhood associations, law enforcement, and landlords to address loud house parties and the disruption they create; (3) eliminating alcohol-industry sponsorship of athletics and other campus social events; (4) limiting tailgate parties to pregame time only, creating alcohol-free tailgate zones, and restricting alcohol sales at concerts and other campus events; and (5) establishing higher standards—including academic achievement, community service, and compliance with campus and community alcohol policies—for fraternities and sororities and linking rush privileges to their adherence.

The early achievements (Weitzman et al., 2003a, 2003b) of some of the campuses involved in the program to date point to the potential of such interventions (Alcohol Policy Solutions, n.d.):

- The University of Nebraska saw a decline in heavy episodic drinking rates from 64 percent in 1997 to 55 percent in 2001, and more students are drinking less when they choose to drink; in 2001, 71 percent said they drank four or fewer drinks per occasion, compared with 53 percent in 1997.
- Lehigh University has reported a dramatic reduction in alcohol-related crimes on campus. Overall, crime is down 51 percent—from 418 reports in 1998-1999, to 204 in 2000-2001. The percentage of Lehigh students negatively affected by high-risk drinking is declining: students reporting that they got into a fight with a student using alcohol dropped 21 percent, and the percentage of students who had study or sleep interrupted dropped 13 percent.
- The University of Colorado and the city of Boulder banned beer sales in the university's football stadium, which has resulted in a 69 percent reduction in fans being kicked out of the stadium and a 75 percent decline in arrests.
- Georgia Institute of Technology and the city of Atlanta supported a successful statewide effort to create a keg registration law, to help reduce underage access to alcohol. The campus has seen a 9 percent reduction in heavy episodic drinking, and 12 percent fewer students report driving after drinking.
- The University of Iowa and Iowa City succeeded in preventing a landmark soda fountain near campus from becoming a liquor store, and the city council enacted an ordinance to improve the enforcement of state laws regarding sales to minors and intoxicated persons. The new law also prohibits some drink specials, such as free alcohol, 2-for-1, and all-you-can-drink specials.

- The University of Wisconsin prohibited alcohol sales in the university's Kohl Center, representing a forfeiture of $500,000 in alcohol revenues every hockey season. The project worked with the Madison Alcohol License Review Committee to allow new liquor licenses in the campus area only if the establishment generates at least 50 percent of its revenue from food, effectively prohibiting large-capacity "drinking barns."
- Florida State University and the city of Tallahassee eliminated alcohol advertising on campus and developed a strategic plan to reduce the effects of high-risk drinking in the community, including suspension of driver's licenses for underage drinking and providing incentives to owners of bars and other alcohol outlets to maintain responsible business practices.
- The University of Delaware and the city of Newark are members of the Mayor's Alcohol Commission, which has developed policy recommendations on the sale and consumption of alcohol in the community, particularly in the areas of law enforcement, land use, and zoning.
- The University of Vermont and the city of Burlington led the effort to develop a responsible alcohol beverage service training for bar owners, managers, and servers, which is now part of the city's alcohol licensing review process.
- Louisiana State University (LSU), the LSU Campus-Community Coalition for Change, and the Baton Rouge Metropolitan Council unanimously agreed to restrict underage house parties, which members expect will reduce high-risk drinking at off-campus rental properties, which essentially operate as uncontrolled "bars" for underage students.

Reviews of campus and community coalition efforts have identified several strategies that contribute success of both on and off campus: (1) control of alcohol availability for underage youth, (2) increase in the level and consistency of policy and law enforcement and the development of new policies, and (3) attention to the irresponsible sale, promotion, and marketing of alcohol.

FUNDING

Just as community mobilization provides an essential context for effective interventions to reduce underage drinking, a strong and ongoing commitment on behalf of public and private funders to provide resources for community mobilization is critical to the success of the overall strategy recommended in this report.

One existing model of federal support is the Drug Free Communities Program, originally authorized by Congress in 1997 and reauthorized in 2001. This national initiative awards a maximum of $100,000 per year in federal funds directly to community anti-drug coalitions in the United States

to combat youth substance abuse. After 5 years of the program, annual national competitions have awarded 531 grants to coalitions in 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. These coalitions work to reduce substance abuse among youth and strengthen collaboration among organizations and agencies in both the private and public sectors.

The Drug-Free Communities Program (DFC) represents a collaborative effort involving the White House Office of National Drug Control Policy, the Department of Justice's Office of Juvenile Justice and Delinquency Prevention, and the Department of Health and Human Services' Center for Substance Abuse Prevention. An 11-member expert advisory commission appointed by the president provides guidance.

DFC coalitions are required to include members from various sectors of the community working on multiple community prevention strategies. Members include youths, parents, businesses, the media, schools, youth organizations, law enforcement, religious or fraternal organizations, civic groups, health care, state, local or tribal governmental agencies, and other organizations. The DFC program represents a useful model for a national program to reduce underage drinking.

Recommendation 11-2: Public and private funders should support community mobilization to reduce underage drinking. Federal funding for reducing and preventing underage drinking should be available under a national program dedicated to community-level approaches to reducing underage drinking, similar to the Drug Free Communities Act, which supports communities in addressing substance abuse with targeted, evidence-based prevention strategies.

12

Federal and State Governments

The federal and state governments have several roles to play in implementing the proposed strategy. However, as emphasized throughout this report, responsibility for preventing and reducing underage drinking lies with everyone, as a national community. For example, although minimum drinking age laws enacted and enforced by government underpin society's efforts, their effectiveness depends on the active support of parents and other adults, businesses, and many other organizations in every community. In addition to their roles in enacting and enforcing pertinent laws, federal and state governments have many other important opportunities to stimulate and solidify the strategy. They can fund statewide or national media campaigns, provide financial support and other assistance to communities to help them mobilize to reduce underage drinking, set up the necessary apparatus to monitor trends in underage drinking and the effectiveness of efforts to reduce it, and support necessary research. In this chapter we lay out the roles for the federal and state governments in the overall strategy. Two of these roles are to coordinate and monitor the various components, including providing the data and research needed to assess and improve the strategy. The third role is to increase alcohol excise taxes to both reduce consumption and provide funds to support the strategy. There is strong and well-documented evidence of the effects of raising taxes on consumption, particularly among youth.

FEDERAL AND STATE ACTIVITIES

Federal Programs

Multiple federal agencies play a role in preventing underage drinking. According to a recent report by the U.S. General Accounting Office (GAO) (2001) that reviewed federal funding targeted at preventing underage drinking, the U.S. Departments of Justice, Health and Human Services, Transportation, Labor, Defense, Treasury, Agriculture, and Interior, as well as the Executive Office of the White House and the Corporation for National Service funded efforts that include underage alcohol use within broader mandates that target alcohol and other drug use. Of the total amount reported ($1.09 billion), almost all ($1.01 billion) included alcohol as part of a larger undifferentiated category relating to alcohol and other drug use; thus, it was not possible to determine what portion of the funds were targeted specifically to alcohol prevention activities. A relatively small proportion—less than 7 percent of the total amount–in three federal departments both had a specific focus on alcohol and identified youth or youth and the broader community as the specific target population.

Specifically, the Departments of Justice, Health and Human Services (HHS), and Transportation reported a combined $71.1 million focusing on alcohol and youth or alcohol and youth and the broader community. According to the GAO report, within HHS, resources are split between the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the Substance Abuse and Mental Health Services Administration (SAMHSA), and the Centers for Disease Control and Prevention (CDC). The majority of HHS resources that specifically target underage drinking are in NIAAA, (part of the National Institutes of Health) that "conducts and supports biomedical and behavioral research in order to provide science-based approaches to the prevention and treatment of alcohol abuse and alcoholism (General Accounting Office, 2001, p. 11)." The GAO report provides no specific information about how these funds are used to prevent underage drinking; NIAAA staff report that the preponderance of their resources are used for research. Research is primarily investigator-initiated and includes such topics as the effectiveness of various media campaigns; education interventions, and environmental strategies, as well as research on the epidemiology and causes of underage drinking.

NIAAA also has supported two notable efforts to influence local action. The first is a comprehensive effort to review approaches to drinking on college campuses, which resulted in the publication of *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (NIAAA, 2002) which outlines strategies for addressing drinking on college campuses. NIAAA is currently in the process of conducting regional meetings to disseminate the

report's findings nationwide. NIAAA also is one of the leading funders, with SAMHSA and the Robert Wood Johnson Foundation, of Leadership to Keep Children Alcohol Free, a major national effort involving governors' spouses to reduce alcohol use among children aged 9 to 15. SAMHSA staff reported funding a wide variety of interventions including initiatives aimed at education and awareness, supporting community-based initiatives, developing guides and toolkits, and furthering research objectives. Several of these initiatives involve collaboration with other HHS agencies (e.g., NIAAA, CDC).

The largest single targeted program included in the GAO report is in the Department of Justice's Office of Juvenile Justice and Delinquency Prevention (OJJDP). According to the report (U.S. GAO, 2001, p. 12), OJJDP funds "retail compliance initiatives, prevention programs, and fostering a juvenile justice system that, among other things, provides appropriate sanctions, treatment and rehabilitative services based on the needs of the individual juvenile." OJJDP's Enforcing the Underage Drinking Laws Program is "designed to reduce the availability of alcoholic beverages to minors and prevent the consumption of alcoholic beverage by minors." The funds are distributed through block and discretionary grants. A national training and technical assistance center, the Center for Enforcing the Underage Drinking Laws Program is funded through this program.

A relatively small program at the National Highway Traffic Safety Administration (NHTSA) funds interventions that "address the problems of drunk and drugged driving and prevention programs targeting zero tolerance for alcohol and drug use among youth. They administer a formula and incentive grant program, award discretionary grants and contracts and enter into cooperative agreements with other entities (U.S. GAO, 2001, p. 14)." Formula grants to states fund highway safety programs, which may include underage drinking programs.

Several agencies also provide resources to advance efforts to prevent underage drinking. Both NIAAA and SAMHSA have published several technical assistance documents highlighting various aspects of underage drinking and approaches to reducing underage drinking and have multiple mechanisms in place to disseminate this information. OJJDP provides both training and technical assistance through its Center for the Enforcement of Underage Drinking Laws. NHTSA has published several documents aimed at reducing drinking and driving. In addition, the Department of Education, through its Higher Education Center for Alcohol and Other Drug Prevention, provides training and technical assistance related to reducing drinking on college campuses. However, there is no coordinated, central mechanism for disseminating research findings or providing technical assistance to grantees or others interested in developing strategies that target underage drinking.

In sum, numerous federal agencies fund multiple research, intervention, and technical assistance efforts to reduce underage drinking. Although coordination mechanisms are in place for specific initiations, and agency staff report regular staff-level communication, the committee is not aware of any ongoing effort to coordinate all of the various federal efforts either within or across departments. The multitude of agencies and initiatives involved suggests the need for an interagency body to provide national leadership and provide a single federal voice on the issue of underage drinking.

Recommendation 12-1: A federal interagency coordinating committee on prevention of underage drinking should be established, chaired by the secretary of the U.S. Department of Health and Human Services.

Membership on the coordinating committee should include senior officials from each of the agencies included in the GAO report. The coordinating committee also should periodically consult with the range of national nongovernmental organizations—including National Alcohol Beverage Control Association, Mothers Against Drunk Driving, Students Against Destructive Decisions, Distilled Spirits Council of the United States, Century Council, National Beer Wholesalers Association—who sponsor initiatives aimed at preventing underage drinking to facilitate a coordinated, research-based approach by all key players. Once the recommended nonprofit foundation is established, the foundation should also be regularly consulted.

The committee recommends that the secretary of HHS chair the coordinating committee for several reasons. First, HHS plays the federal government's lead role in the prevention of substance abuse. Although other agencies have programs that target underage drinking, their primary missions are not related to substance abuse. The initiatives funded by and evaluated by HHS have the widest scope. HHS also administers the major national surveys that are likely to be used to monitor changes in the prevalence or intensity of youth drinking and has the greatest resources available to fund the research necessary for continued improvement of the strategy. Which HHS agency should have operational responsibility for the coordinating committee should be determined by the secretary.

Recommendation 12-2: A National Training and Research Center on Underage Drinking should be established in the U.S. Department of Health and Human Services. This body would provide technical assistance, training, and evaluation support and would monitor progress in implementing national goals.

To the greatest possible extent, interventions aiming to prevent or reduce underage drinking should be science based. In addition, as discussed in Chapter 11, community efforts are most likely to succeed if they have

strong and informed leadership. For this reason, resources are needed for training and leadership development for coalition and task force members as well as key decision makers. The recommended center would complement HHS's existing activities on underage drinking.

This report sets forth a comprehensive set of recommendations for the reduction of underage drinking, and community mobilization will provide the context for many of these interventions. Thus the mission of the new center would include the provision of technical assistance and training in community assessment, leadership development, policy development, community organizing, strategic use of the news media, and community-based evaluation to support the program of action laid out in this committee's recommendations.

Currently the federal government does not report regularly on activities across the various agencies that fund targeted underage drinking activities, and evaluating the effect of those activities, as it does for illegal drugs through an annual report issued by the Office of National Drug Control Policy.

Recommendation 12-3: The secretary of the U.S. Department of Health and Human Services should issue an annual report on underage drinking to Congress summarizing all federal agency activities, progress in reducing underage drinking, and key surveillance data.

At a minimum, this report should include

- amount and sources of funds targeted at underage drinking;
- activities funded;
- results of activities funded;
- data on key indicators of underage drinking to monitor progress in reaching stated objectives (discussed below);
- data on brand preferences and source of alcohol (discussed below);
- data on the extent to which alcohol advertising or entertainment with alcohol content reaches underage populations (discussed below); and
- future planned activities and modifications in strategy.

State Programs

Numerous state-level agencies are also involved in administering programs to reduce underage drinking. The precise role of various agencies and their relative contributions vary from state to state. However, in most states, the health or human service, transportation, and criminal justice departments play some role. Those roles include administration of a variety of federal block grants that target underage drinking. In addition, in states

that control the sale and distribution of alcohol, the state alcohol beverage control (ABC) body likely plays an important role.

Currently, each state and Washington, D.C., receives a block grant under OJJDP's Enforcing the Underage Drinking Laws Program for activities related to preventing underage drinking. According to OJJDP staff, these funds are administered by a variety of agencies, including those for health and human services, traffic safety, criminal justice, and law enforcement, ABC agencies and other agencies. Each state also receives block grants that include underage drinking from HHS (substance abuse prevention and treatment) and from the Department of Transportation (highway safety and drunk driving). The diversity of agencies involved in administering the OJJDP block grant illustrates the fact that there is no clear lead agency across the states. In the committee's view, the identity of the lead agency is unimportant as long as there is one within each state.

Recommendation 12-4: Each state should designate a lead agency to coordinate and spearhead its activities and programs to reduce and prevent underage drinking.

Coordinating the efforts of all the participating state agencies is particularly important to local communities that are trying to create strong coalitions. The committee also suggests that states be encouraged to produce annual reports on their activities and progress based on those activities.

SURVEILLANCE AND MONITORING

In order to assess the overall public health effects of the strategy proposed by the committee—to reduce underage drinking and the harms it causes—the strategy must include an adequate surveillance and monitoring system. Such a system can provide a significant portion of the information necessary to make informed policy decisions. In the context of this report, a surveillance system should include information on:

- the onset and prevalence of underage drinking;
- the patterns and consequences of underage drinking;
- the amounts and types of alcohol products consumed by underage populations; and
- the availability of alcohol to underage populations and the exposure of this population to messages regarding alcohol in alcohol advertising and in the entertainment media.

National Indicators

There are three national surveys commonly used to report on the prevalence of underage drinking: the National Survey on Drug Use and Health (NSDUH, formerly the National Household Survey on Drug Abuse, NHSDA), the Youth Risk Behavior Survey (YRBS), and Monitoring the Future (MTF). The NHSDA was an annual household-based survey of individuals 12 and older funded by SAMHSA. YRBS and MTF are school-based surveys. YRBS, conducted in conjunction with the states on a voluntary basis, and funded by CDC, surveys high school students (grades 9-12) on a biannual basis. MTF, a survey of eighth, tenth, and twelfth-graders, has been conducted annually since 1975 by the University of Michigan, funded by the National Institute on Drug Abuse.

Differences in the estimates produced by these various surveys have been publicly acknowledged and widely debated. There has been no consensus, however, on the preferable survey to use or the best set of questions to include. In fact, a recent series of articles (Harrison, 2001; Fendrich and Johnson, 2001; Fowler and Stringfellow, 2001; Cowan, 2001) analyzing differences in the surveys generally concluded that each has merit in its own right and did not recommend one over the other. The articles did report, however, that while the overall trends are generally consistent across the three surveys, the NHSDA tended to provide the lowest estimates and may underestimate youth consumption. One unique aspect of the NHSDA was the inclusion of adults in the sample, which allows comparison of adult and youth consumption patterns. The NSDUH is continuing the format.

Recommendation 12-5: The annual report of the secretary of the U.S. Department of Health and Human Services on underage drinking should include key indicators of underage drinking.

The key indicators should include:

- (average) age of first use;
- prevalence of (current) use among pertinent age groups;
- intensity (frequency and quantity) of drinking among pertinent age groups; and
- harmful consequences of alcohol use among pertinent age groups.

The committee does not believe it matters which data source is used for these indicators, provided it is used consistently over time.

Quantity Consumed and Brand Preferences

As discussed in Chapter 3, none of the major surveys currently include adequate items on the amount (number of drinks) and type of alcohol (beer,

wine, liquor) consumed on specific occasions or during specific time periods to allow direct estimates of quantity of underage consumption. Moreover, there are currently no national data on the brands of alcohol consumed by youth. MTF data provides general evidence that youth tend to consume beer more often than other types of alcohol, but the data do not allow more in-depth analysis. For alcohol, MTF does not collect information on the preferred brand. In contrast, MTF asks respondents the brand of cigarette usually smoked which revealed that three cigarette brands account for nearly all teen smoking and that one of those brands alone accounts for the majority of the underage tobacco market (Johnston et al., 1999). While a logical hypothesis is that a small number of brands also account for the underage drinking market, available monitoring systems do not provide the data necessary to make this conclusion.

Recommendation 12-6: The Monitoring the Future (MTF) Survey and the National Household Survey on Drug Use and Health (NSDUH) should be revised to elicit more precise information on the quantity of alcohol consumed and to ascertain brand preferences of underage drinkers.

Although questions could be added to any of the three relevant national surveys, the committee recommends that parallel questions be added to the MTF survey and the NSDUH. The MTF survey already includes a question on type of beverage, and the administrators of the survey have experience developing a similar question related to preferred tobacco brands, so the MTF should be able to serve as a model in developing a consistent approach across the two surveys. Questions should be added to the NSDUH as well as MTF to include underage drinkers not in school and allow comparisons to adults.

Groups that represent alcohol producers consistently emphasize their commitment to reducing underage drinking. This new data would help target industry efforts toward specific producers. The monitoring of specific brands, coupled with information on advertising and marketing by specific producers, would also provide the public and policy makers with information necessary to hold alcohol producers accountable for profits made from persons who are illegally using their product.

Monitoring of Advertising and Entertainment Media

As discussed in Chapter 7, abundant evidence shows that alcohol advertising and other promotional activities now reach large underage audiences, and it is reasonable to expect more aggressive self-regulatory efforts by the alcohol industry to restrain marketing practices that tend to encourage underage drinking, even in the absence of clear evidence that such

exposures cause underage drinking. Similarly, Chapter 8 shows that movies, television, video, and musical recordings are awash with images appealing to youth. Although research does not indicate that these media have a causal impact on underage drinking, the entertainment industries also share a social responsibility to refrain from glamorizing alcohol use. The committee believes that standards to minimize underage exposure should be implemented on a voluntary basis, similar to the alcohol industry. However, some independent oversight of these standards is warranted. In both contexts, the committee believes that the most promising strategy is to promote industry accountability by facilitating public awareness of industry practices. Accordingly, the committee recommends that DHHS be authorized and funded to monitor these media practices and report to Congress and the public.

EXCISE TAXES

As discussed in Chapter 1, one approach to reducing underage consumption is to reduce the overall level of alcohol consumption in the society. Although such an approach has its advocates, the committee decided that primary reliance on such a strategy would not be compatible with the congressional mandate to which this report responds. Instead, we took the view that broad interventions (those that would tend to affect overall consumption rather than underage consumption alone) should be included in the strategy only if they could be expected to have a particularly strong effect on the harms associated with underage consumption.

We have concluded that there is one such intervention—increasing alcohol excise taxes. There are three arguments for higher taxes to combat underage drinking. First, underage drinking imposes particularly high average social costs, as discussed below. Second, raising excise tax rates, and hence prices, is a strategy that has strong and well-documented prevention effects on underage drinking. Third, a designated portion of the funds generated by the taxes can be earmarked for preventing and reducing underage drinking.

Around the world, historically and currently, alcoholic beverages have been singled out for special taxes. Indeed, the first inland-revenue measure enacted by the first U.S. Congress was a tax on whiskey. Currently, special excise taxes are imposed on alcoholic beverages by the federal and all state governments. The federal tax rates are at $2.14 per 750 milliliter bottle of 80 proof spirits, $0.33 per six-pack of beer, and $0.21 per bottle of table wine.

By the standards of recent history, current tax rates are low; see Figure 12-1. Congress has not legislated increases in these taxes, so their real costs have been eroded by inflation. Restoring the federal excise tax on beer to its

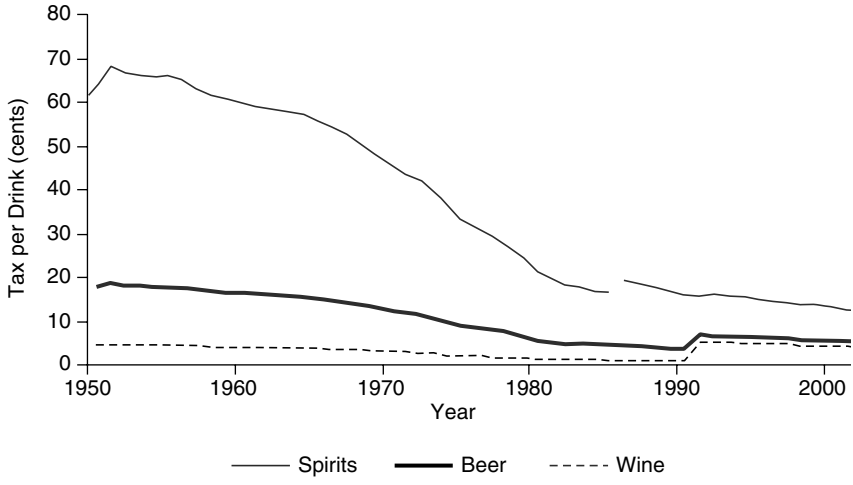

FIGURE 12-1 Historical trends, federal taxes on beer, wine, and spirits 1950-2002, with tax per drink in 2002 dollars.
SOURCE: Adapted from the Bureau of Alcohol, Tobacco, and Firearms web site (2003) and the Bureau of Labor Statistics web site (2003).

value in, say, 1960, would require that it be increased by a factor of three. The same lack of adjustment to inflation has occurred at the state level. One result was a long steep slide in the prices of distilled spirits relative to the price of other goods. Beer prices also declined in inflation-adjusted terms until the early 1980s. Alcohol prices have kept roughly even with overall inflation since then. Overall, alcoholic beverages are far cheaper today than they were in the 1960s and 1970s.

Current excise taxes and prices are low not only by historical standards, but also and more importantly by the standard that prices (inclusive of tax) should reflect the full social cost of production and consumption: if an item is underpriced, then too much will be purchased and consumed. A much-cited study of the costs of heavy drinking by Willard Manning and his associates documented this gap between social cost and price (Manning et al., 1989). They used the economists' normative framework, distinguishing between internal costs (those that are borne by the drinker and therefore presumably taken into account in the drinking decision) and external costs (inflicted by drinkers on bystanders and not therefore taken fully into account in the drinking decision). If the principle of consumer sovereignty is accepted, they argue, then it is only the external costs that are relevant for tax-policy purposes. On the basis of data from the mid-1980s, they found that the external cost per ounce of ethanol consumed was about 48 cents,

double the average combined state and federal tax per ounce that was then in place. Much of the external costs of alcohol consumption are borne by victims of intoxicated drivers. A subsequent study amplified this conclusion by noting that Manning and colleagues had failed to account for nonfatal highway injuries (Miller and Blincoe, 1994); including injuries increased the estimate of external costs to 63 cents per ounce.

Such cost-per-drink numbers are averages over all consumption. The social costs for drinks consumed by teenagers are higher than for older drinkers. While there are no estimates for teen drinking that are directly comparable to those cited above, there is a more recent and comprehensive estimate (Pacific Institute for Research and Evaluation, 1999), discussed in Chapter 3. According to that estimate, the total social costs of underage drinking are $53 billion. Given that underage youths account for at least 10.8 percent of total consumption, that works out to $0.91 per ounce of ethanol.[1] One explanation for the high social costs per drink is the abusive style of teen drinking. By one estimate, based on the National Household Survey on Drug Abuse, 91 percent of all drinks consumed by teenagers are consumed by those who drink heavily (Biglan et al., 2003). Furthermore, alcohol abuse amplifies what tend to be high baseline (that is, when sober) rates of risky and harmful activity, including reckless driving, violent crime, and unsafe sex. Of course, as discussed in Chapter 1, these are precisely the arguments that support minimum drinking age laws and accompanying restrictions on youthful access to alcohol: the social costs of drinking by youths are unacceptably high.

Higher taxes would bring alcohol prices closer to the average social costs of consumption by youths (and others) and create an incentive for youths to consume less alcohol. Despite various arguments that alcohol is somehow the exception to the economists' principle of downward-sloping of demand (that is, that for any commodity, the quantity consumed is inversely related to price) the empirical evidence demonstrates that alcoholic beverages are not exceptional in this respect (Chaloupka, 2004; Cook and Moore, 2002). The overall quantities of beer, wine, and distilled spirits that are sold respond to changes in price in the expected way. The extensive published research on youthful drinking is quite consistent in reporting that the prevalence of drinking by underage youths, and the prevalence of heavy

[1]This figure is not directly comparable with the cost figures in the preceding paragraph, which are for a different year and which omit costs incurred by the drinker. One reason to include the internal costs is that the principle of consumer sovereignty is less applicable to adolescents than adults—that some degree of adult control is appropriate for those with such limited experience—so that the *internal* damage from youthful drinking should be included in the calculation of social cost.

drinking, are responsive to even small changes in tax rates (Chaloupka, 2004; Cook and Moore, 2002). The evidence also supports a conclusion that an increase in alcohol excise taxes leads to a reduction in alcohol-related harms (Coate and Grossman, 1988; Kenkel, 1998; Saffer and Grossman, 1987; Chesson et al., 1997).

One interesting question is whether youthful drinking is more or less responsive to changes in price than adult drinking. Responsiveness is usually measured by the price elasticity of demand, defined as the percentage reduction in alcohol consumed in response to a 1 percent increase in price. A typical estimate of the overall price elasticity of demand for beer, for example, is –0.3, which is to say that beer purchases decline by about 0.3 percent in response to a 1 percent increase in price. Estimated elasticities for wine and spirits are higher than for beer (Cook and Moore, 2000). In a state in which excise taxes (federal and state combined) constitute 10 percent of the average price of a six-pack, doubling the tax would increase the average price by about 10 percent, which would result in a 3 percent reduction in sales.

There are reasons to believe that underage drinking is more responsive to price changes than adult drinking: youths tend to have less discretionary income, and they are more likely to buy their drinks from package stores rather than at bars and restaurants (where the large mark-up makes the excise tax proportionately less important). Although there are a range of estimates for the price elasticity for youths and adults, there are no studies that provide evidence on the relative elasticities using comparable data and methods. However, on the basis of evidence available for other goods, including tobacco (Chaloupka and Warner, 2001), it seems highly likely that youthful drinking is more responsive to price changes, in a proportional sense, than adult drinking.

There is stronger evidence on the effects of excise taxes (reflecting presumed differences in price) on the *harms* associated with youthful alcohol abuse. An analysis of state-level highway fatality rates during the 1980s (Chaloupka et al., 1993, pp. 161-162) concluded that "significant increases in alcoholic beverage excise taxes are among the most effective policies for reducing drinking and driving in all segments of the population, with the largest reductions occurring among teens and young adults." This result was confirmed by Ruhm (1996)[2] and is in accord with studies of survey

[2]Ruhm used annual state-level data for the continguous 48 states for the period 1982-1988. In Table 4, he reports the results of four different regression specifications. All include fixed effects for the states, and motor vehicle miles driven. The specifications differ with respect to which socioeconomic variables are included, but the estimated coefficients on beer tax are quite consistent. They are –0.3462, –0.4231, –0.4258, and –0.4398. We have used the value –0.40 in our calculations.

data on self-reported drinking and driving (Kenkel, 1993; Chaloupka and Laixuthai, 1997). Other studies have documented the influence of alcohol excise taxes on such predominantly youthful activities as robbery, rape, and the transmission of gonorrhea through unprotected sex (Chaloupka, 2004).

A focus on the beer excise tax is warranted by the fact that beer is the most popular form of alcoholic beverage with underage drinkers by a wide margin. The fact that the federal excise tax on beer is less than half that on distilled spirits (per ounce of ethanol) reflects a traditional belief that more dilute beverages (beer) are less harmful than "hard" liquor. But, the predominant beverage of use and abuse by youths is beer.

Of course the conventional reason to raise tax rates is to increase tax revenues. Alcohol excise taxes contribute $12 billion to the federal and state treasuries, and raising the rates would lead to a near-proportional increase in that revenue, despite the fact that higher tax rates will reduce consumption. The arithmetic here is simple. If, as in the example presented earlier, the combined state and federal beer excise rate is doubled, beer sales would decrease by about 3 percent, and tax revenue would almost double. These calculations depend to some extent on the mark-up applied to tax increases by beer sellers—a large mark-up would result in a somewhat larger reduction in sales and a correspondingly smaller increase in revenue. Under commonsense assumptions about the mark-up (i.e. that the mark-up is about 20 percent), it remains true that a doubling of the tax will result in a near-doubling of revenue.

The committee concludes that state and federal excise taxes are potentially important instruments for preventing underage drinking and its harmful consequences and for generating revenue to fund a broad prevention strategy. We believe the long downward slide in the actual cost of these taxes to consumers has considerably exacerbated the underage drinking problem. Raising these tax rates at both the federal and state level is justified by established principles of public finance, by public health considerations, and by the specific goals of Congress in creating this committee. Of course, the amount of any increase is not a scientific question; rather it is a policy question.

Recommendation 12-7: Congress and state legislatures should raise excise taxes to reduce underage consumption and to raise additional revenues for this purpose. Top priority should be given to raising beer taxes, and excise tax rates for all alcoholic beverages should be indexed to the consumer price index so that they keep pace with inflation without the necessity of further legislative action.

RESEARCH AND EVALUATION

The committee believes that rigorous research and evaluation is necessary to ensure that any national strategy is based on the most effective approaches.

Recommendation 12-8: All interventions, including media messages and education programs, whether funded by public or private sources, should be rigorously evaluated, and a portion of all federal grant funds for alcohol-related programs should be designated for evaluation.

To ensure that activities are adequately evaluated and that interventions are research based, the committee recommends that a specific standard portion, perhaps 15 percent, of grant funds be set aside for independent evaluations. Currently, the proportion set aside for evaluation varies from program to program. There is an obvious tension between the need for resources to fund services and the need for evaluation. Both SAMHSA and the Department of Education have demonstrated a commitment to funding research-based interventions. The committee believes that this interest, and the effectiveness of funded programs, would be enhanced by a standard evaluation expectation across all funded programs. Programs also need to be provided with tools for conducting research and evaluation.

Chapter 6 outlines the need for prototype development for the proposed adult media campaign. This research activity is a core component of the strategy outlined in this report. There are several other approaches discussed throughout this report that may have promise, but where the evidence is insufficient to make definitive recommendations. We therefore recommend several areas for continued research.

Youth Media Messages

As discussed in Chapter 10, careful research should be conducted to identify specific messages to use in a youth-oriented media campaign that would demonstrate the risks of alcohol use, especially of heavy drinking. In the short-term, this should include testing a serious prototype for a youth-focused campaign. For example, the research design might include funding one or more 2- to 4-year campaigns in geographically focused areas, with substantial resources both in message development and transmission and in careful evaluation. The appropriate message focus for such prototype campaigns would need to be researched, developed, and tested before launching the campaigns.

Access

Numerous interventions have been designed to reduce underage access to alcohol. Some have not yet been extensively evaluated and could be further improved by continued research. States and the federal government should study the effect of a range of access-oriented interventions on underage drinking and drinking problems:

- dram shop liability laws;
- shoulder tap and similar programs;
- keg registration laws;
- social host liability laws;
- conditional use permits; and
- sobriety checkpoints.

Youth-Oriented Interventions

Further research and evaluation is necessary to identify successful approaches for reaching populations generally not included in school-based education approaches and refine assessments of interventions on college campuses.

Recommendation 12-9: States and the federal government—particularly the U.S. Department of Health and Human Services and the U.S. Department of Education—should fund the development and evaluation of programs to cover all underage populations.

Such programs should consider a wide range of issues:

- preschool, early elementary, and high school strategies for preventing alcohol use, and, for high school, additional emphasis on programs targeted at individuals with apparent drinking problems;
- characteristics of colleges and universities that may be associated with intervention effectiveness, including the size of student enrollment, type of institution (e.g., 2- or 4-year college, residential or commuter campus, single gender), and urban versus rural setting;
- effectiveness of social norms approaches, parental notification, and other college-based interventions;
- continuing care approaches for treatment;
- interventions implemented within healthcare settings (including campus-based health care) and whether and how training for health professionals can enhance effectiveness of screening and referral for underage populations;
- faith-based approaches to prevention and treatment;

- workplace-based and military-based interventions that target underage populations;
- interventions with youth who are currently drinking; and
- research to further refine understanding of the multiple interrelated factors that affect underage drinking and long-term outcomes.

COSTS AND COST-EFFECTIVENESS OF THE STRATEGY

Some of the committee's recommendations, especially those in Chapters 7 and 8, are addressed to the private sector; they do not entail any public expenditure and, for the most part, require little more than commercial self-restraint. Similarly, some of the recommendations directed to the government in this chapter do not involve significant new expenditures. The data collection and monitoring needed to implement the overall strategy are unlikely to entail substantial new costs, although the proposed data collection efforts may require consideration of the value and opportunity costs of the data proposed in comparison with the data that are currently collected. Similarly, the committee's recommendation (in Chapter 10) that resources for school-based programs be explicitly targeted at programs with elements of proven effectiveness will entail a shift of funding rather than significant new expense. And the committee's recommendations for research are an effort to identify policy-relevant priorities for research funding agencies, both private and public, and do not necessarily involve new funding.

Several components of the proposed strategy will require new investment, at the federal, state, or community levels: the adult-centered media campaign (Chapter 6); improved enforcement of existing laws at the state and local levels (Chapter 9); community mobilization grants (Chapter 11); funding for prevention and treatment of adolescent alcohol use and abuse (above); and resources for HHS to monitor adolescent exposure to alcohol messages in advertising and entertainment media (above). Responsibility for funding the strategy could be shared by the federal and state governments and the industry-funded nonprofit foundation envisioned by the committee (Chapter 7). The necessary government contribution could be offset by revenue generated by increased federal and state alcohol excise taxes (above).

Available data do not allow the committee to make specific estimates of the costs of developing and implementing individual components of the strategy or the strategy as a whole. However, the actual costs of similar programs provide a starting point for gauging the likely cost of some components. For example, the Office of National Drug Control Policy's anti-drug campaign and the American Legacy Foundation's anti-tobacco campaign each cost approximately $100 million per year for production and

advertising for a single audience[3] during full implementation. The campaign proposed in this report is likely to be larger and to entail more outreach work than either of these campaigns, but the 3-year developmental phase is likely to be less costly since it will not require national media time.

A possible model for new community mobilization grants that are specific to underage drinking is the Drug-Free Communities Support Program, which provides grants to community coalitions of up to $100,000 per year with a dollar-for-dollar match from nonfederal sources. The number of such grants would depend, of course, on the strength of the proposals as well as the availability of funds. The committee is not aware of a model on which to base an estimate of the cost for HHS to monitor alcohol advertising messages and entertainment media. The Center on Alcohol Marketing and Youth, a private organization, receives foundation funding to conduct similar activities, but its mandate is broader than what the committee has proposed. We do not anticipate that the monitoring will be necessary on an annual basis, however, or that it will continue to be necessary over the long term.

The level of new expenditure required for state and local enforcement activities (e.g., compliance checks) and substance abuse prevention and treatment will vary, depending on how much is currently spent on those activities and how those resources are used. States currently receive block grant funds and some states receive discretionary funds targeted at enforcing the underage drinking laws through the Department of Justice, but there is wide variability in how those funds are used. States also receive block grant funds for substance abuse prevention and treatment through the Department of Health and Human Services, but there is no information on how much of this is spent on youth-specific activities. These block grant funds are often supplemented with other state, local, or private resources. For example, state alcohol beverage control agencies often dedicate resources to such activities as compliance checks to enforce underage drinking laws. It is worth emphasizing, however, that the committee anticipates that much of the effort to promote compliance will be undertaken though education and communication approaches rather than direct enforcement activities.

The lack of precise data with which to determine program costs, to predict the level of effects, or to quantify likely outcomes also preclude a prospective determination of the cost-effectiveness of the proposed strat-

[3]The ONDCP campaign included both a parent and a youth component, with about half spent on each: the $100 million figure is an estimate of the single-audience cost since the committee's proposed campaign is for an adult audience only.

egy. Nonetheless, the committee believes that the proposed strategy, if adequately implemented, could reasonably be expected to achieve a significant reduction in underage drinking and the associated social costs. The exact decrease that could be expected is speculative. Available information on the social costs of underage drinking is a starting point for gauging the potential cost-effectiveness of the recommended strategy. If annual social costs attributable to underage drinking (conservatively estimated to be $53 billion per year in 1996; most likely higher now due to inflation) were reduced by only 2 percent after 10 years, or if a 1 percent reduction were sustained for 2 years, an expenditure of approximately $1 billion over that period would be economically justified. If social costs were reduced by 5 or 10 percent after 10 years, the economically justifiable cost would be significantly higher. While the committee believes that the enormous social costs of underage drinking warrant an investment in the proposed strategy, specific efforts to collect cost data and to quantify the proposed outcome measures should be built into strategy implementation in order to obtain more precise measures of cost-effectiveness.

References

Aas, H., and Klepp, K.I. (1992). Adolescents' alcohol use related to perceived norms. *Scandinavian Journal of Psychology*, *33*(4), 315-325.

Abbey, A., Ross, L.T., McDuffie, D., and McAuslan, P. (1996). Alcohol and dating risk factors for sexual assault among college women. *Psychology of Women Quarterly*, *20*, 147-169.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211.

Alaniz, M.L, and Wilkes, C. (1995). Reinterpreting Latino culture in commodity form: The case of alcohol advertising in the Mexican American community. *Hispanic Journal of Behavioral Sciences*, *17*(4), 430-451.

Alcohol Policy Solutions. (2003). *A matter of degree: The national effort to reduce high-risk drinking on college campuses, creating solutions by changing environments.* Available: http://www.alcoholpolicysolutions.net/bi_amod.htm [October, 2003].

Allen, J.P., and Hauser, S.T. (1996). Autonomy and relatedness in adolescent-family interactions as predictors of young adults' states of mind regarding attachment. *Development and Psychopathology*, *8*(4), 793-809.

Altman, D.G., Schooler, C., and Basil, M.D. (1991). Alcohol and cigarette advertising on bill boards. *Health Education Research, 6*(4), 487-490.

American Academy of Pediatrics. (1995). Children, adolescents, and advertising. *Pediatrics, 95*, 295-297.

Ames, G.M., Cunradi, C.B., and Moore, R.S. (2002, June). Alcohol, tobacco, and drug use among young adults prior to entering the military. *Prevention Science, 3*(2), 135-144.

Anderson, D.S., and Cohen, A.Y. (2001, June). *A technology-based intervention for preventing college alcohol abuse: Evaluation of the alcohol 101 program.* Fairfax, VA: George Mason University.

Anderson, R.N. (2002, September). Deaths: Leading causes for 2000. *National Vital Statistics Report, 50*(16), 1-85.

Arnett, J., and Balle-Jensen, L. (1993). Cultural bases of risk behavior: Danish adolescents. *Child Development*, *64*(6), 1842-1855.

Ary, D.V., Tildesley, E., Hops, H., and Andrews, J. (1993). The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International Journal of the Addictions*, *28*(9), 853-880.

Astin, A. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.

Atkin, C. (1987). Alcoholic-beverage advertising: Its content and impact. In H. Holder (Ed.), *Control issues in alcohol abuse prevention: Strategies for states and communities* (pp. 267-287). Greenwich, CT: JAI Press.

Atkin, C. (1995). Survey and experimental research on effects of advertising. In S.E. Martin (Ed.), *The effects of the mass media on the use and abuse of alcohol* (pp. 39-68). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Atkin, C. (2004). Media intervention impact: Evidence and promising strategies. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Atkin, C.K., and Block, M. (1981). *Content and effects of alcohol advertising* (Report No. PB-82-123141). Washington, DC: Bureau of Tobacco, Alcohol, and Firearms.

Atkin, C.K., Hocking, J., and Block, M. (1984). Teenage drinking: Does advertising make a difference? *Journal of Communication*, *28*, 71-80.

Austin, E.W., and Johnson, K.K. (1997a). Effects of general and alcohol-specific media literacy training on children's decision making about alcohol. *Journal of Health Communication*, *2*(1), 17-42.

Austin, E.W., and Johnson, K.K. (1997b). Immediate and delayed effects of media literacy training on third graders' decision making for alcohol. *Health Communication*, *9*(4), 323-349.

Austin, E.W., and Nach-Ferguson, B. (1995). Sources and influences of young school-age children's general and brand-specific knowledge about alcohol. *Health Communications*, *7*, 1-20

Bachman, J.G., and Schulenberg, J. (1993). How part-time work intensity relates to drug use, problem behavior, time use, and satisfaction among high school seniors: Are these consequences or just correlates? *Developmental Psychology*, *29*, 220-235.

Bachman, J.G., Wadsworth, K.N., O'Malley, P.M., Johnston, L.D., and Schulenberg, J.E. (1997). *Smoking, drinking, and drug use in young adulthood: The impacts of new freedoms and new responsibilities*. Mahwah, NJ: Lawrence Erlbaum.

Baer, J.S., Stacey, A., and Larimer, M. (1991). Biases in the perception of drinking norms among students. *Journal of Studies on Alcohol, 52*, 580-586.

Baer, J.S., Barr, H.M., Bookstein, F.L., Sampson, P.D., and Streissguth, A.P. (1998). Prenatal alcohol exposure and family history of alcoholism in the etiology of adolescent alcohol problems. *Journal of Studies on Alcohol, 59*(5), 533-543.

Baer, J.S., Kivlahan, D.R., Blume, A.W., McKnight, P., and Marlatt, G.A. (2001). Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. *American Journal of Public Health*, *91*(8), 1310-1316.

Ball, J., Barbir, N., Carroll, T., Lum, M. (2002). *Evaluation report for the Launch and Booster Phases of the National Alcohol Campaign*. Prepared for the Department of Health and Ageing by the Research and Marketing Group, Population Health Division, Sydney, Australia.

Balmforth, D. (1999). *National survey of drinking and driving, attitudes and behavior: 1997*. (DOT HS 808 844). Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of self-control*. New York: W.H. Freeman.

Barnes, G.M., Farrell, M.P., and Banerjee, S. (1995). Family influences on alcohol abuse and other problem behaviors among black and white Americans. In G.M. Boyd, J. Howard, and R.A. Zucker (Eds.), *Alcohol problems among adolescents*. Hillsdale, NJ: Lawrence Erlbaum.

Barnes, G.M., Reifman, A.S., Farrell, M.P., and Dintcheff, B.A. (2000). The effects of parenting on the development of adolescent alcohol misuse: A six-wave latent growth model. *Journal of Marriage and the Family, 62*(1), 175-186.

Basch, C.E., DeCicco, I.M., and Malfetti, J.L. (1989). A focus group study on decision processes of young drivers: Reasons that may support a decision to drink and drive. *Health Education Quarterly*, *16*, 389-396.

Battistich, V., Schaps, E., Watson, M., and Solomon, D. (1996). Prevention effects of the Child Development Project: Early findings from an ongoing multisite demonstration trial. *Journal of Adolescent Research, 11*, 12-35.

Bauman, K.E., Fisher, L.A., and Koch, G.G. (1989). External variables, subjective expected utility, and adolescent behavior with alcohol and cigarettes. *Journal of Applied Social Psychology, 19,* 789-804.

Baumeister, R.F., and Muraven, M. (1996). Identity as adaptation to social, cultural, and historical context. *Journal of Adolescence*, *19*, 405-416.

Beck, K.H., and Lockhart, S.J. (1992). A model of parental involvement in adolescent drinking and driving. *Journal of Youth and Adolescence, 21*, 35-51.

Beck, K.H., and Treiman, K.A. (1996). The relationship of social context of drinking, perceived social norms, and parental influence to various drinking patterns of adolescents. *Addictive Behaviors*, *21*(5), 633-644.

Beck, K.H., Scaffa, M., Swift, R., and Ko, M. (1995). Survey of parent attitudes and practices regarding underage drinking. *Journal of Youth and Adolescence*, *24*(3), 315-334.

Bell, R.M., Ellickson, P.L., and Harrison, E.R. (1993). Do drug prevention effects persist into high school? How Project ALERT did with ninth graders. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, *22*, 463-483.

Benthin, A., Slovic, P., and Severson, H. (1993). A psychometric study of adolescent risk perception. *Journal of Adolescence*, *16*, 153-168.

Bergmann, P.E., Smith, M.B., and Hoffman, N.G. (1995). Adolescent treatment: Implications for assessment, practice guidelines, and outcome management. *Pediatrics Clinical North America*, *42*, 453-472.

Berkowitz, A. (1997). From reactive to proactive prevention: Promoting an ecology of health on campus. In P. Rivers, E. Shore (Eds.), *Substance abuse on campus: A handbook for college and university personnel* (pp. 119-139). Westport, CT: Greenwood Press.

Beyth-Marom, R., Austin, L., Fischhoff, B., and Palmgren, C. (1993). Perceived consequences of risky behaviors: Adults and adolescents. *Developmental Psychology*, *29*, 549-563.

Biddle, B.J., Bank, B.J., and Marlin, M.M. (1980). Parental and peer influence on adolescents. *Social Forces*, *58*, 1057-1079.

Bierness, D.J., Foss, R.D., Wilson, R.J., and Mercer, G.W. (2000, May). *Roadside breath testing surveys to assess the impact of an enhanced DWI enforcement campaign in British Columbia*. Presented at the International Conference of Alcohol, Drugs and Traffic Safety (ICADTS), Stockholm, Sweden.

Biglan, A., Ary, D.V., Smolkowski, K., Duncan, T., and Black, C. (2000). A randomized controlled trial of a community intervention to prevent adolescent tobacco use. *Tobacco Control, 9*, 24-32.

Biglan, A., Brennan, P.A., Foster, S.L., Holder, H.D., Miller, T.L., Cunningham, P.B. (2003). *Multiproblem youth: Prevention, intervention, and treatment*. New York: Guilford.

Black, D.R., and Coster, D.C. (1996). Interest in a stepped approach model (SAM): Identification of recruitment strategies for university alcohol programs. *Health Education Quarterly, 23*(1), 98-114.

Blanton, H., Gibbons, F.X., Gerrard, M., Conger, K.J., and Smith, G.E. (1997). Role of family and peers in the development of prototypes associated with substance use. *Journal of Family Psychology*, *11*(3), 271-288.

Block, L.G., Morwitz, V.G., Putsis, W.P., Jr., and Sen, S.K. (2002). Assessing the impact of antidrug advertising on adolescent drug consumption: Results from a behavioral economic model. *American Journal of Public Health*, *92*(8), 1346-1351.

Boase, P., and Tasca, L. (1998). *Graduated licensing system evaluation: Interim report '98*. Toronto: Ministry of Transportation of Ontario.

Bogenschneider, K., Wu, M.-Y., Raffaelli, M., and Tsay, J.C. (1998). "Other teens drink, but not my kid": Does parental awareness of adolescent alcohol use protect adolescents from risky consequences? *Journal of Marriage and the Family*, *60*, 356-373.

Bonnie, R. (1977). Decriminalizing the marijuana user: A drafter's guide. *Michigan Journal of Law Reform*, *11*, 3-50.

Bonnie, R. (1982). Discouraging the use of alcohol, tobacco and other drugs: The effects of legal controls and restrictions. In N.K. Mello (Ed.), *Advances in substance abuse research, Volume II* (pp. 145-184). Greenwich, CT: JAI Press.

Bonnie, R. (1985). Regulating conditions of alcohol availability: Possible effects on highway safety. *Journal of Studies on Alcohol, 29*(Supp. #10), 129-143.

Bonnie, R. (1986). The efficacy of law as a paternalistic instrument. In G. Melton (Ed.), *Nebraska symposium on motivation, 1985, volume 33: The law as a behavioral instrument* (pp. 131-211). Lincoln, NE: University of Nebraska Press.

Boots, K., and Midford, R. (1999). "Pick-a-Skipper": An evaluation of a designated driver program to prevent alcohol-related injury in a regional Australian city. *Health Promotion International*, *14*, 337-345.

Bormann, C.A., and Stone, M.H. (2001). The effects of eliminating alcohol in a college stadium: The Folsom Field beer ban. *Journal of American College Health, 50*(2), 81-88.

Borsari, B., and Carey, K.B. (2000). Effects of a brief motivational intervention with college student drinkers. *Journal of Consulting and Clinical Psychology, 68,* 728-733.

Botvin, G.J., Baker, E., Dusenbury, L., Botvin, E.M. and Diaz, T. (1995). Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association*, *273*(14), 1106-1112.

Brannigan, R., Falco, M., Dusenbury, L., and Hansen, W.B. (2004). Teen treatment: Addressing alcohol problems among adolescents. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Brody, G.H., and Forehand, R. (1993). Prospective associations among family form, family processes, and adolescents alcohol and drug-use. *Behaviour Research and Therapy*, *31*(6), 587-593.

Brooks II, J.H., and DuBois, D.L. (1995). Individual and environmental predictors of adjustment during the first year of college. *Journal of College Student Development, 36*(4), 347-360.

Brown, B.B., Mory, M., and Kinney, D.A. (1994). Casting adolescent crowds in relational perspective: Caricature, channel, and context. In R. Montemayor, G.R. Adams, and T.P. Gullotta (Eds.), *Advances in adolescent development: Vol. 6. Personal relationships during adolescence*. Newbury Park, CA: Sage.

Brown, S.A., and Tapert, S.F. (2004). Health consequences of adolescent alcohol involvement. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers.* [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Brown, S.A., Tapert, S.F., Granholm, E., and Delis, D.C. (2000). Neurocognitive functioning of adolescents: Effects of protracted alcohol use. *Alcoholism: Clinical and Experimental Research, 24*(2), 164-71.

Buka, S.L., and Birdthistle, I.J. (1999). Long-term effects of a community-wide alcohol server training intervention. *Journal of Studies on Alcohol, 60,* 27-36.

Bureau of Alcohol, Tobacco, and Firearms. (2003). *Historical tax rates—alcoholic beverages.* Available: http://www.ttb.gov/alcohol/stats/historical.htm [August 5, 2003].

Bureau of Labor Statistics. (2003). *Consumer price index rate for urban consumers since 1913.* Available: http://www.bls.gov/cpi/home.htm#data [August 5, 2003].

Butterfoss, F.D., Goodman, R.M., and Wandersman, A. (1996). Community coalitions for prevention and health promotion: Factors predicting satisfaction, participation, and planning. *Health Education Quarterly, 23*(1), 65-79.

Caetano, R., and Clark, C.L. (1998). Trends in alcohol consumption patterns among whites, blacks, and Hispanics: 1984-1995. *Journal of Studies on Alcohol, 59*(6), 659-668.

Calfee, J.E., and Scheraga, C. (1994). The influence of alcohol advertising on alcohol consumption: A literature review and econometric analysis of four European nations. *International Journal of Advertising, 13*, 287-310.

Cameron, L.A. (1999). Understanding alcohol abuse in American Indian/Alaskan Native youth. *Pediatric Nursing, 25*(3), 297-300.

Cameron, M., and Newstead, S. (1996). Mass media publicity supporting police enforcement and its economic value. In *Proceedings of the symposium on mass media campaigns in road safety, Scarborough Beach, Western Australia.* Medlands: Road Accident Prevention Unit, Department of Public Health, University of Western Australia.

Carlson, J.M., Chudley, Werch, C.E., Owen, D.M., Moore, M.J., Kolomeyer, I., Jobli, E.C., and Provencher, L. (2001). *Recruitment and retention in a longitudinal study to prevent binge drinking among residential college students.* Jacksonville: Center for Drug Prevention and Health Promotion, University of North Florida.

Casswell, S., and Gilmore, L. (1989). An evaluated community action project on alcohol. *Journal of Studies on Alcohol, 50*(4), 339-346.

Casswell, S., and Zhang, J.F. (1998). Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: A longitudinal study. *Addiction, 93*, 1209-1217.

Cavanaugh, R.M., and Henneberger, P.K. (1996, February). Talking to teens about family problems: An opportunity for prevention. *Clinical Pediatrics, 35*(2), 67-71.

Center for Science in the Public Interest. (2002). *Alcohol policies project, alcohol advertising: Are our kids collateral or intended targets?* Washington, DC: Author.

Center for the Advancement of Public Health. (2001). *Sourcebook 2001. Promising Practices: Campus Alcohol Strategies.* Fairfax, VA: Author, George Mason University.

Center on Alcohol Marketing and Youth. (2002a). *Overexposed: Youth a target of alcohol advertising in magazines.* Washington, DC: Author, Georgetown University.

Center on Alcohol Marketing and Youth. (2002b). *Television: Alcohol's vast adland.* Washington, DC: Author, Georgetown University.

Center on Alcohol Marketing and Youth. (2003). *Drops in the bucket: Alcohol industry "responsibility" advertising on television in 2001.* Washington, DC: Author, Georgetown University.

Centers for Disease Control and Prevention. (2001). *Injury statistics query and reporting system (WISQARS)*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (producer). Available: http://webapp.cdc.gov/sasweb/ncipc/leadcaus10.html [September, 2003].

Century Council. (2001). *Promising practices sourcebook 2001: Campus alcohol strategies*. Washington, DC: Author.

Chaloupka, F.J. (2004). The effects of price on alcohol use, abuse, and their consequences. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Chaloupka, F.J., and Laixuthai, A. (1997). Do youths substitute alcohol and marijuana? Some econometric evidence. *Eastern Economic Journal*, *23*(3), 253-276.

Chaloupka, F.J., and Warner, K.E. (2001). The economics of smoking. In J.P. Newhouse and A.J. Cuyler (Eds.), *The handbook of health economics* (pp. 1539-1627). New York: North-Holland, Elsevier Science.

Chaloupka, F.J., and Wechsler, H. (1996). Binge drinking in college: The impact of price. *Contemporary Economic Policy*, *14*, 112-124.

Chaloupka, F.J., Saffer, H., and Grossman, M. (1993). Alcohol control policies and motor vehicle fatalities. *Journal of Legal Studies*, *22*, 161-186.

Chen, M.J., Grube, J.W., and Madden, P.A. (1994). Alcohol expectancies and adolescent drinking: Differential prediction of frequency, quantity, and intoxication. *Addictive Behaviors, 19*(5), 521-529.

Chesson, H.W., Harrison, P., and Kassler, W.J. (1997). Alcohol, youth, and risky sex: The effect of beer taxes, and the drinking age on gonorrhea rates in teenagers and young adults. Working Paper. Atlanta: CDC.

Christensen, P.G., Henriksen, L., and Roberts, D.F. (2000). *Substance use in popular prime-time television*. Washington, DC: Office of National Drug Control Policy.

Christiansen, B.A., and Smith, G.T. (1991). Alcoholism and memory: Broadening the scope of alcohol-expectancy research. *Psychology Bulletin, 110,* 137-146.

Christiansen, B.A., Goldman, M.S., and Inn, A. (1982). Development of alcohol-related expectancies in adolescents: Separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology*, *50*(3), 336-344.

Christiansen, B.A., Roehling, P., Smith, G., and Goldman, M. (1989). Using alcohol expectancies to predict adolescent drinking behavior after one year. *Journal of Consulting and Clinical Psychology*, *57*(1), 93-99.

Chudley E.W., Pappas, D.M., Carlson, J.M., and DiClemente, C.C. (2000). *Longitudinal effects of a tailored alcohol preventive*. Jacksonville: Center for Drug Prevention and Health Promotion, University of North Florida.

Cialdini, R.B., Reno, R.R., and Kallgren, C.A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58,* 1015-1026.

Clapp, J.D. (2000). Deconstructing contexts of binge drinking among college students. *The American Journal of Drug and Alcohol Abuse, 26*(1), 139.

Clark, D.B., Kirisci, L., and Moss, H. (1998). Early adolescent gateway drug use in sons of fathers with substance use disorders. *Addictive Behavior*, *49*(2), 115-121.

Clark, D.B., Neighbors, B.D., Lesnick, L.A., Lynch, K.G., and Donovan, J.E. (1998). Family functioning and adolescent alcohol use disorders. *Journal of Family Psychology*, *12*(1), 81-92.

Cloninger, C.R. (1991). *Personality traits and alcoholic predisposition.* Paper presented at the conference of the National Institute on Drug Abuse, University of California at Los Angeles.

Coate, D., and Grossman, M. (1988). Effects of alcoholic beverage prices and legal drinking ages on youth alcohol use. *Journal of Law and Economics*, *31*(1), 145-171.

Cohen, D.A., Mason, K., and Scribner, R.A. (2001). The population consumption model, alcohol control practices, and alcohol-related traffic fatalities. *Preventive Medicine*, *34*, 187-197.

Cohen, D.A., Richardson, J., and LaBree, L. (1994). Parenting behaviors and the onset of smoking and alcohol use: A longitudinal study. *Pediatrics*, *94*(3), 368-375.

Cohen, F., and Rogers, D. (1997). Effects of alcohol policy change. *Journal of Alcohol Drug Education, 42*(2), 69-82.

Community Anti-Drug Coalitions of America and Center for Science in the Public Interest. (n.d.). *Alcohol advertising: Its impact on communities, and what coalitions can do to lessen that impact*. Alexandria, VA: Community Anti-Drug Coalitions of America.

Connell, J.P., and Halpern-Felsher, B.L. (1997). How neighborhoods affect educational outcomes in middle childhood and adolescence: Conceptual issues and an empirical example. In J. Brooks-Gunn, G. Duncan, and J.L. Aber (Eds.), *Neighborhood poverty volume I: Context and consequences for children* (pp. 174-199). New York: Russell Sage Foundation.

Connell, J.P., Halpern-Felsher, B.L., Clifford, E., Crichlow, W., and Usinger, P. (1995). Hanging in there: Behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high school. *Journal of Adolescent Research, 10*, 41-63.

Connor, J.P., Young, R.M., Williams, R.J., and Ricciardelli, L.A. (2000). Drinking restraint versus alcohol expectancies: Which is the better indicator of alcohol problems? *Journal of Studies on Alcohol*, *61*(2), 352-359.

Cook, P.J. (1981). The effect of liquor taxes on drinking, cirrhosis, and auto fatalities. In M. Moore and D. Gerstein (Eds.), *Alcohol and public policy: Beyond the shadow of prohibition* (pp. 255-285). Washington, DC: National Academy Press.

Cook, P.J. (1991). The social costs of drinking. In *The expert meeting on the negative social consequences of alcohol abuse.* Oslo: Norwegian Ministry of Health and Social Affairs.

Cook, P.J., and Ludwig, J. (2000). *Gun violence: The real costs.* New York: Oxford University Press.

Cook, P.J., and Moore, M.J. (1993a). Economic perspectives on alcohol-related violence. In S.E. Martin (Ed.), *Alcohol-related violence: Interdisciplinary perspectives and research directions* (pp. 193-212). NIH Publication No. 93-3496. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Cook, P.J., and Moore, M.J. (1993b). Drinking and schooling. *Journal of Health Economics*, *12*, 411-429.

Cook, P.J., and Moore, M.J. (2000). Alcohol. In A.J. Culyer and J.P. Newhouse (Eds.), *Handbook of health economics* (pp. 1629-1673). New York: Elsevier.

Cook, P.J., and Moore, M.J. (2001). Environment and persistence in youthful drinking patterns. In J. Gruber (Ed.), *Risky behavior among youths: An economic analysis.* Chicago: The University of Chicago Press.

Cook, P.J., and Moore, M.J. (2002). The economics of alcohol abuse and alcohol-control policies. Price levels, including excise taxes, are effective at controlling alcohol consumption: Raising excise taxes would be in the public interest. *Health Affairs*, *21*(2), 120-133.

Cook, P.J., and Tauchen, G. (1982). The effect of liquor taxes on heavy drinking. *Bell Journal of Economics*, *13*(2), 379-390.

Cook, P.J., and Tauchen, G. (1984). The effect of minimum drinking age legislation on youthful auto fatalities, 1970-77. *Journal of Legal Studies*, *13*, 169-190.

Cook, R., and Schlenger, W. (2002). Prevention of substance abuse in the workplace: Review of research on the delivery of services. *Journal of Primary Prevention*, *31*(1), 115-142.

Cowan, C.D. (2001). Coverage, sample design, and weighting in three federal surveys. *Journal of Drug Issues, 31*(3), 12-239.

Crews, F.T., Braun, C.J., Hoplight, B., Switzer III, R.C., and Knapp, D.J. (2000). Binge ethanol consumption causes differential brain damage in young adolescent rats compared with adult rats. *Alcoholism, Clinical and Experimental Research, 24*(11), 1712-1723.

Csikszentmihalyi, M., and Larson, R. (1984). *Being adolescent*. New York: Basic Books.

Curry, C., Trew, K., Turner, I., and Hunter, J. (1994). The effect of life domains on girls' possible selves. *Adolescence*, *29*(113), 133-150.

Dalton, M.A., Sargent, J.D., Beach, M.L., Titus-Ernstoff, L., Gibson, J.J., Ahrens, M.B., Tickle, J.J., and Heatherton, T.F. (2003). Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. *The Lancet, 362,* July 26.

Darkes, J., and Goldman, M.S. (1998). Expectancy challenge and drinking reduction: Process and structure in the alcohol expectancy network. *Experimental and Clinical Psychopharmacology*, *6*(1), 64-76.

Dean, J. (1982). Approaches to alcohol abuse prevention. In J. Dean and W. Bryan (Eds.), *Alcohol programming for higher education* (pp. 82-84). Carbondale, IL: ACPA Media Southern Illinois University Press.

De Bellis, M.D., Clark, D.B., Beers, S.R., Soloff, P.H., Boring, A.M., Hall, J., Kersh, A., and Keshavan, M.S. (2000). Hippocampal volume in adolescent-onset alcohol use disorders. *American Journal of Psychiatry, 157*(17), 737-744.

DeJong, W., and Hingson, R. (1998). Strategies to reduce driving under the influence of alcohol. *Annual Reviews Public Health*, *19*, 359-378.

DeJong, W., and Langford, L.M. (2002). A typology for campus-based alcohol prevention: Moving toward environmental management strategies. *Journal of Studies on Alcohol, 14*, 140-147.

DeJong, W., Langford, L.M., and Pryor, J.H. (2001). College students' support for tougher alcohol policies: A silent majority. *Alcohol, Tobacco, and Other Drugs Spring, 16*(2), 9-12.

DeJong, W., and Linkenbach J. (1999). Telling it like it is: Using social norms marketing campaigns to reduce student drinking. *American Association for Higher Education Bulletin, 32*(4), 11-16.

DeJong, W., Vince-Whitman, C., Colthurst, T., Cretella, M., Gilbreath, M., Rosati, M., and Zweig, K. (1998). *Environmental management: A comprehensive strategy for reducing alcohol and other drug use on college campuses* (HEC 113). Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention.

D'Emidio-Caston, M., and Brown, J.H. (1998). The other side of the story: Student narratives on the California Drug, Alcohol, and Tobacco Education Programs. *Evaluation Review, 22*, 95-117.

DiClemente, R.J., Wingood, G.M., Crosby, R., Sionean, C., Cobb, B.K., Harrington, K., Davies, S., Hook III, E.W., and Oh, M.K. (2001). Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics*, *107*(6), 1363-1368.

Dishion, T.J., and Andrews, D.W. (1995). Preventing escalation in problem behaviors with high-risk young adolescents: Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology*, *63*, 538-548.

Dishion, T.J., Kavanagh, K., Schneiger, A., Nelson, S., and Kaufman, N.K. (2002). Preventing early adolescent substance use: A family-centered strategy for the public middle school. *Prevention Science*, *3*(3), 191-201.

Donaldson, S.I., Graham, J.W., and Hansen, W.B. (1994). Testing the generalizability of intervening mechanism theories: Understanding the effects of adolescent drug use prevention interventions. *Journal of Behavioral Medicine*, *17*(2), 195-216.

Donaldson, S.I., Graham, J.W., Piccinin, A.M., and Hansen, W.B. (1995). Resistance-skills training and onset of alcohol use: Evidence for beneficial and potentially harmful effects in public schools and in private Catholic schools. *Health Psychology, 14*(4), 291-300.

Donohew, R.L., Hoyle, R.H., Clayton, R.R., Skinner, W.F., Colon, S.E., and Rice, R.E. (1999). Sensation seeking and drug use by adolescents and their friends: Models for marijuana and alcohol. *Journal of Studies on Alcohol*, *60*(5), 622-631.

Dresser, J., and Gliksman, L. (1998). Comparing statewide alcohol server training systems. *Pharmacology, Biochemistry, and Behavior, 61*, 150.

Dunn, M.E., and Goldman, M.S. (1996). Empirical modeling of an alcohol expectancy memory network in elementary school children as a function of grade. *Experimental and Clinical Psychopharmacology*, *4*(2), 209-217.

DuRant, R.H., Rome, E.S., Rich, M., Allred, E., Emans, S.J., and Woods, E.R. (1997). Tobacco and alcohol use behaviors portrayed in music videos: A content analysis. *American Journal of Public Health, 87*, 1131-1135.

Durkin, K.F., Wolfe, T.W., and Phillips III, D.W. (1996). College students' use of fraudulent identification to obtain alcohol: An exploratory analysis. *Journal of Alcohol and Drug Education*, *41*, 92-104.

Dusenbury, L. (2000). Family-based drug abuse prevention programs: A review. *Journal of Primary Prevention*, *20*, 337-352.

Dusenbury, L., Brannigan, R., Falco, M., and Hansen, W.B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, *18*, 237-256.

Eccles, J.S., and Barber, B.L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Youth and Adolescence*, *6*(3), 281-294.

Eggert, L.L., Thompson, E.A., Herting, J.R., and Nicholas, L.J. (1994). A prevention research program: Reconnecting at-risk youth. *Issues in Mental Health Nursing*, *15*, 107-135.

Eigen, L. (1991). *Alcohol practices, policies, and potentials of American colleges and universities*. An OSAP White Paper. Rockville, MD: Office for Substance Abuse Prevention.

Elder, R.W., and Shults, R.A. (2002, December). Involvement by young drivers in fatal alcohol-related motor-vehicle crashes—United States, 1982-2001. *Morbidity and Mortality Weekly Report, 51*(48), 1089-1091.

Ellickson, P.L., Bell, R.M., and Harrison, E.R. (1993). Changing adolescent propensities to use drugs: Results from Project ALERT. *Health Education Quarterly*, *20*, 227-242.

Elster, A.B., and Kuznets, N.J. (1994). *American Medical Association guidelines for adolescent preventive services*. Baltimore: Williams and Wilkins.

Engelberts, A.C., De Jonge, G.A., and Kostense, P.J. (1991). An analysis of trends in the incidence of sudden infant death in the Netherlands 1969 to 1989. *Journal of Pediatrics and Child Health*, *27*(6), 329-333.

Ennett, S.T., and Bauman, K.E. (1991). Mediators in the relationship between parental and peer characteristics and beer drinking by early adolescents. *Journal of Applied Social Psychology*, *21*(20), 1699-1711.

Entertainment Software Review Board. (2003). *ESRB game ratings, game rating and descriptor guide*. Available: http://www.esrb.com/esrbratings_guide.asp [August, 2003].

Everett, S.A., Schnuth, R.L., and Tribble, J.L. (1998). Tobacco and alcohol use in top-grossing American films. *Journal of Community Health*, *23*, 317-324.

Fagan, J., and Zimring, F. (Eds.). (2000). *The changing borders of juvenile justice: Transfer of adolescents to the criminal court.* Chicago: John D. and Catherine T. Macarthur Foundation Series on Mental Health and Development, University of Chicago Press.

Fawcett, S.B., Lewis, R.K., Paine-Andrews, A., Francisco, V.T., Richter, K.P., Williams, E.L., and Copple, B. (1997). Evaluating community coalitions for prevention of substance abuse: The case of Project Freedom. *Health Education and Behavior, 24,* 812-828.

Feldman, S.S., and Rosenthal, D.A. (1990). The acculturation of autonomy expectations in Chinese high schoolers residing in two Western nations: Effects of length of residence. *International Journal of Psychology, 25*, 259-281.

Fendrich, M., and Johnson, T.P. (2001). Examining prevalence differences in three national surveys of youth: Impact of consent procedures, mode, and editing rules. *Journal of Drug Issues, 31*(3), 615-642.

Ferguson, S.A., Fields, M., and Voas, R.B. (2000, May). *Enforcement of zero tolerance laws in the United States*. Paper presented at the 15th International Conference on Alcohol, Drugs, and Traffic Safety, Stockholm, Sweden.

Finken, L.L., Jacobs, J.E., and Laguna, K. (1998). The role of age, experience, and situational factors in the drinking and driving decisions of college students. *Journal of Youth and Adolescence*, *27*, 493-511.

Fischhoff, B., Parker, A.M., de Bruin, W., Downs, J., Palmgren, C., Dawes, R., and Manski, C. (2000). Teen expectations for significant life events. *Public Opinion Quarterly*, *64*, 189-205.

Fletcher, A.C., Darling, N.E., Steinberg, L., and Dornbusch, S. (1995). The company they keep: Relation of adolescents' adjustment and behavior to their friends' perceptions of authoritative parenting in the social network. *Developmental Psychology*, *31*, 300-310.

Fletcher, L.A., Toomey, T.L., Wagenaar, A.C., Short, B., and Willenbring, M.L. (2000). Alcohol home delivery services: A source of alcohol for underage drinkers. *Journal of Studies on Alcohol*, *61,* 81-84.

Flewelling, R.L., Paschall, M.J., and Ringwalt, C. (2004). The epidemiology of underage drinking in the United States: An overview. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Flores-Ortiz, Y.G. (1994). The role of cultural and gender values in alcohol use patterns among Chicana/Latina high school and university students: Implications for AIDS prevention. *International Journal of the Addictions, 29*(9), 1149-1171.

Flynn, B.S., Worden, J.K., Secker-Walker, R.H., Pirie, P.L., Badger, G.J., Carpenter, J.H., and Geller, B.M. (1994). Mass media and school interventions for cigarette smoking prevention: Effects two years after completion. *American Journal of Public Health, 84*(7), 1148-1150.

Ford, C.A., Millstein, S.G., Halpern-Felsher, B.L., and Irwin, C.E., Jr. (1997). Influence of physician confidentiality assurances on adolescents' willingness to disclose information and seek future health care: A randomized controlled trial. *Journal of the American Medical Association*, *278*, 1029-1034.

Forster, J.L., McGovern, P.G., Wagenaar, A.C., Wolfson, M., Perry, C.L., and Anstine, P.S. (1994). The ability of young people to purchase alcohol without age identification in northeastern Minnesota, USA. *Addiction, 89*, 699-705.

Forster, J.L., Murray, D.M., Wolfson, M., and Wagenaar, A.C. (1995). Commercial availability of alcohol to young people: Results of alcohol purchase attempts. *Preventive Medicine*, *24*, 342-347.

Foster, S.E., Vaughan, R.D., Foster, W.H., and Califano, J.A. (2003). Alcohol consumption and expenditures for underage drinking and adult excessive drinking. *Journal of the American Medical Association, 26*(8), 989-995.

Fowler, F.J., Jr., and Stringfellow, V.L. (2001). Learning from experience: Estimating teen use of alcohol, cigarettes, and marijuana from three survey protocols. *Journal of Drug Issues, 31*, 643-664.

Garfield, C.F., Chung, P.J., and Rathouz, P.J. (2003). Alcohol advertising in magazines and adolescent readership. *Journal of the American Medical Association*, *289*(18), 2424-2429.

Gebhardt, T., Kaphingst, K., and DeJong, W. (2000). A campus-community coalition to control alcohol-related problems off campus: An environmental management case study. *Journal of American College Health, 48*(5), 211-215.

Giancola, P.R., and Mezzich, A.C. (2000). Neuropsychological deficits in female adolescents with a substance use disorder: Better accounted for by conduct disorder? *Journal of Studies on Alcohol, 61*(6), 809-817.

Gliksman, L., McKenzie, D., Single, E., Douglas, R., Brunet, S., and Moffatt, K. (1993). Role of alcohol providers in prevention: An evaluation of a server intervention programme. *Addiction, 88*, 1195-1203.

Goldberg, J.H., Halpern-Felsher, B.L., and Millstein, S.G. (2002). Beyond invulnerability: The importance of benefits in adolescents' decision to drink alcohol. *Health Psychology*, *21*, 477-484.

Goldman, M.S., Brown, S.A., Christiansen, B.A., and Smith, G.T. (1991). Alcoholism and memory: Broadening the scope of alcohol-expectancy research. *Psychological Bulletin, 110*, 137-146.

Gorman, D.M., and Speer, P.W. (1997). Concentration of liquor outlets in an economically disadvantaged city in the Northeastern United States. *Substance Use and Misuse, 32*(14), 2033-2046.

Gottfredson, D.C., and Wilson, D.B. (2003). Characteristics of effective school-based substance abuse prevention. *Prevention Science, 4*(1), 23-38.

Grant, B.F., and Dawson, D.F. (1997). Age of onset of alcohol use and its association with DSM IV alcohol abuse and dependence: Results from the national longitudinal alcohol epidemiologic survey. *Journal of Substance Abuse, 9,* 103-110.

Greenberger, E., and Steinberg, L. (1986). *When teenagers work: The psychological and social costs of adolescent employment*. New York: Basic Books.

Grube, J.W. (1995). Television alcohol portrayals, alcohol advertising, and alcohol expectancies among children and adolescents. In S.E. Martin (Ed.), *The effects of mass media on use and abuse of alcohol.* Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Grube, J.W. (1997). Preventing sales of alcohol to minors: Results from a community trial. *Addiction, 92*(Suppl. 2), S251-S260.

Grube, J.W. (2001). *Comparison of drinking rates and problems: European countries and the United States*. Calverton, MD: Pacific Institute for Research and Evaluation, Office of Juvenile Justice Enforcing the Underage Drinking Laws Program.

Grube, J.W. (2004). Alcohol in the media: Drinking portrayals, alcohol advertising, and alcohol consumption among youth. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Grube, J.W., and Nygaard, P. (2001). Adolescent drinking and alcohol policy. *Contemporary Drug Problems, 28,* 87-131.

Grube, J.W., Chen, M., Madden, P., and Morgan, M. (1995). Predicting adolescent drinking from alcohol expectancy values: A comparison of additive, interactive, and nonlinear models. *Journal of Applied Social Psychology*, *25*(10), 839-857.

Grube, J.W., and Wallack, L. (1994). Television beer advertising and drinking knowledge, beliefs, and intentions among schoolchildren. *American Journal of Public Health*, *84*, 254-259.

Gruber, E., DiClemente, R.J., Anderson, M.M., and Lodico, M. (1996). Early drinking onset and its association with alcohol use and problem behavior in late adolescence. *Preventive Medicine, 25*, 293-300.

Grunbaum, J.A., Kann, L., Kinchen, S.A., Williams, B., Ross, J.G., Lowry, R., and Kolbe, L. (2002, June). Youth risk behavior surveillance, United States, 2001. *Morbidity and Mortality Weekly Report, 51*(SS04), 1-64.

Hackbarth, D.P., Schnopp-Wyatt, D., Katz, D., Williams, J., Silvestri, B., and Pfleger, M. (2001). Collaborative research and action to control the geographic placement of outdoor advertising of alcohol and tobacco products in Chicago. *Public Health Reports, 116*(6), 558-567.

Hafemeister, T.L., and Jackson, S.L. (2004). Effectiveness of sanctions and law enforcement practices targeted at underage drinking not involving operation of a motor vehicle. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Haines, M., and Spear, S. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health*, *45*, 134-140.

Hallfors, D., Cho, H., Livert, D., and Kadushin, C. (2002). Fighting back against substance abuse: Are community coalitions winning? *American Journal of Preventive Medicine*, *23*(4), 237-245.

Halpern-Felsher, B.L., and Cauffman, E. (2001). Costs and benefits of a decision: Decision making competence in adolescents and adults. *Journal of Applied Developmental Psychology*, *22*, 257-273.

Halpern-Felsher, B.L., Connell, J.P., Spencer, M.B., Aber, J.L., Duncan, G.P., Clifford, E., Crichlow, W.E., Usinger, P.A., Cole, S.P., Allen, L., and Seidman, E. (1997). Neighborhood and family factors predicting educational risk and attainment in African American and white children and adolescents. In J. Brooks-Gunn, G. Duncan, and J.L. Aber (Eds.), *Neighborhood poverty volume I: Context and consequences for children* (pp. 146-173). New York: Russell Sage Foundation.

Halpern-Felsher, B.L., Ozer, E.M., Millstein, S.G., Wibbelsman, C.J., Fuster, C.D., Elster, A.B., and Irwin, C.E. (2000). Preventive services in a health maintenance organization: How well do pediatricians screen and educate adolescent patients? *Archives of Pediatrics and Adolescent Medicine*, *154*, 173-179.

Hansen, W., and Dusenbury, L. (2004). Alcohol use and misuse prevention strategies with minors. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Hansen, W., and Graham, J.W. (1991). Preventing alcohol, marijuana, and cigarette use among adolescents: Peer resistance training versus establishing conservative norms. *Preventive Medicine, 20*, 414-430.

Hanson, D.J. (1990). The drinking age should be lowered. In R.C. Engs (Ed.), *Controversies in the addictions field: Volume 1* (pp. 85-95). Baltimore, MD: American Council on Alcoholism.

Hardesty, P.H., and Kirby, K.M. (1995). Relation between family religiousness and drug use within adolescent peer groups. *Journal of Social Behavior and Personality, 10*(2), 421-430.

Harford, T.C. (1984). Situational factors in drinking: A developmental perspective on drinking contexts. In P.M. Miller and T.D. Nirenburg (Eds.), *Prevention of alcohol abuse* (pp. 119-156). New York: Plenum Press.

Harford, T.C., Wechsler, H., and Muthen, B.O. (2002). The impact of current residence and high school drinking on alcohol problems among college students. *Journal of Studies on Alcohol*, *63*(3), 271-279.

Harrington, N.T., and Leitenberg, H. (1994). Relationship between alcohol consumption and victim behaviors immediately preceding sexual aggression by an acquaintance. *Violence and Victims*, *9*(4), 315-324.

Harrison, L.D. (2001). Understanding the differences in youth drug prevalence rates produced by the MTF, NHSDA, and YRBS studies. *Journal of Drug Issues, 31*(3), 665-694.

Harrison, P.A., Fulkerson, J.A., and Park, E. (2000). Relative importance of social versus commercial sources in youth access to tobacco, alcohol, and other drugs. *Preventive Medicine*, *31*, 39-48.

Harter, S., Marold, D.B., Whitesell, N.R., and Cobbs, G. (1996). A model of the effects of perceived parent and peer support on adolescent false self behavior. *Child Development, 67*, 360-374.

Harwood, H.J., Fountain, D., and Livermore, G. (1998). *The economic cost of alcohol and drug abuse in the United States, 1992*. Rockville, MD: National Institute on Drug Abuse and National Institute on Alcohol Abuse and Alcoholism.

Hawkins, J.D., Catalano, R.F., Kosterman, R., Abbott, R., and Hill, K.G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatric Adolescent Medicine, 153,* 226-234.

Hawkins, J.D., Catalano, R.F., and Miller, J.Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance-abuse prevention. *Psychological Bulletin, 112*(1), 64-105.

Hawthorne, G., Garrard, J., and Dunt, D.R. (1995). The Trojan Horse: Life education's drug education program, does it have public health benefit. *Addiction, 90*(2), 205-215.

Hays, R.D., and Ellickson, P.L. (1996). What is adolescent alcohol misuse in the United States according to the experts? *Alcohol and Alcoholism*, *31*(3), 297-303.

Herd, D. (1993). Contesting culture: Alcohol-related identity movements in contemporary African-American communities. *Contemporary Drug Problems*, *20*, 739-758.

Herd, D. (2003). Changes in the prevalence of alcohol use in rap song lyrics, 1979-1997. Unpublished.

Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., and Morgan, M. (2000). *The 1999 ESPAD report: Alcohol and other drug use among students in 30 European countries*. Stockholm: Swedish Council for Information on Alcohol and Other Drugs.

Higher Education Center. (1998). *Planning campus events* (HEC 712). Newton, MA: The Higher Education Center for Alcohol and Other Drug Prevention.

Hingson, R.W., Heeren, T., and Winter, M. (1994). Effects of lower legal blood alcohol limits for young and adult drivers. *Alcohol, Drugs and Driving*, *10*, 243-252.

Hingson, R.W., Heeren, T., Zakocs, R.C., Kopstein, A., and Wechsler, H. (2002). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24. *Journal of Studies on Alcohol*, *63*(2), 136-144.

Hingson, R.W., and Howland, J. (2002). Comprehensive community interventions to promote health: Implications for college-age drinking problems. *Journal of Studies on Alcohol*, *Suppl. 14*, 226-240.

Hingson, R.W., Howland, J., and Levenson, S. (1988a). Effects of legislative reform to reduce drunken driving and alcohol-related traffic fatalities. *Public Health Reports*, *103*(6), 659-667.

Hingson, R.W., Howland, J., Morelock, S., and Heeren, T. (1988b). Legal interventions to reduce drunken driving and related fatalities among youthful drivers. *Alcohol, Drugs and Driving*, *4*, 87-98.

Hingson, R.W., and Kenkel, D. (2004). Social, health, and economic consequences of underage drinking. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Hingson, R.W., McGovern, T., Howland, J. Heeren, T., Winter, M., and Zakocs, R. (1996). Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program. *American Journal of Public Health, 86*(6), 791-797.

Holder, H.D. (1994). Alcohol availability and accessibility as part of the puzzle: Thoughts on alcohol problems and young people. In R. Zucker, G. Boyd, and J. Howard (Eds.), *The development of alcohol problems: Exploring the biopsychosocial matrix of risk* (pp. 249-254). (NIAAA Research Monograph #26). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Holder, H.D. (2004). Supply side approaches to reducing underage drinking: An assessment of the scientific evidence. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Holder, H.D., Gruenewald, P.J., Ponicki, W.R., Grube, J.W., Saltz, R.F., Voas, R.B., Reynolds, R., Davis, J., Sanchez, L., Gaumont, G., Roeper, P., and Treno, A.J. (2000). Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *Journal of the American Medical Association*, *284*(18), 2341-2347.

Holder, H.D., Janes, K., Mosher, J., Saltz, R.F., Spurr, S., and Wagenaar, A.C. (1993). Alcoholic beverage server liability and the reduction of alcohol-involved problems. *Journal of Studies on Alcohol, 54*, 23-36.

Holder, H.D., Saltz, R.F., Grube, J.W., Treno, A.J., Reynolds, R.I., Voas, R.B., and Gruenewald, P.J. (1997a). Summing up: Lessons from a comprehensive community prevention trial to reduce alcohol-involved trauma. *Addiction*, *92*(Suppl. 2), S293-S301.

Holder, H.D., Saltz, R.F., Grube, J.W., Voas, R.B., Gruenewald, P.J., and Treno, A.J. (1997b). A community prevention trial to reduce alcohol-involved accidental injury and death: Overview. *Addiction*, *92*(Suppl. 2), S155-S172.

Holder, H.D., and Treno, A.J. (1997). Media advocacy in community prevention: News as a means to enhance policy change. *Addiction*, *92*(Suppl. 2), S189-S199.

Holder, H.D., and Wagenaar, A.C. (1994). Mandated server training and reduced alcohol-involved traffic crashes: A time series analysis of the Oregon experience. *Accident Analysis and Prevention*, *26*, 89-97.

Hornik, R., Maklan, D., Cadell, D., Prado, A., Barmada, C., Jacobsohn, L., Orwin, R., Sridharan, S., Zador, P., Southwell, B., Zanutto, E., Baskin, R., Chu, A., Morin, C., Taylor, K., and Steele, D. (2002, May). *Evaluation of the National Youth Anti-Drug Media Campaign: Fourth semi-annual report of findings: Executive summary*. Bethesda, MD: National Institutes of Health, National Institute on Drug Abuse.

Hu, T.W., Sung, H.Y., and Keeler, T.E. (1995). Reducing cigarette consumption in California: Tobacco taxes vs. an anti-smoking media campaign. *American Journal of Public Health, 85*, 1218-1222.

Humphrey, J., and Friedman, J. (1986). The onset of drinking and intoxication among university students. *Journal of Studies on Alcohol*, *47*, 455-458.

Hurst, P.M., and Wright, P.G. (1981). Deterrence at last: The Ministry of Transport's alcohol blitzes. In L. Goldberg (Ed.), *Alcohol, drugs and traffic safety*, *Volume III*. Stockholm: Almqvist and Wiksell International.

Institute of Medicine. (1994a). *Growing up tobacco-free: Preventing nicotine dependence in children and youths*. In B. Lynch and R. Bonnie (Eds.), Committee on Preventing Nicotine Addiction in Children and Youths. Washington, DC: National Academy Press.

Institute of Medicine. (1994b). In P.J. Mrazek and R.J. Haggerty (Eds.), *Reducing risks for mental disorders: Frontiers for prevention intervention*. Committee on Prevention of Mental Health Disorders. Washington, DC: National Academy Press.

Institute of Medicine. (2002). *Speaking of health: Assessing health communication strategies for diverse populations*. Committee on Communication for Behavior Change in the 21st Century: Improving the Health of Diverse Populations, Board on Neuroscience and Behavioral Health. Washington, DC: The National Academies Press.

Institute of Medicine and National Research Council. (2001). *Adolescent risk and vulnerability: Summary of a workshop*. In B. Fischhoff, E.O. Nightingale, and J.G. Iannotta (Eds.), Board on Children, Youth, and Families. Washington, DC: National Academy Press.

International Center for Alcohol Policies. (2002). *Drinking age limits*. (ICAP Reports 4), revised. Washington, DC: International Center for Alcohol Policies.

Jaccard, J., and Turrisi, R. (1987). Cognitive processes and individual differences in judgments relevant to drunk driving. *Journal of Personality and Social Psychology*, *53*, 135-145.

Jacobs, J.E. (2004). Perceptions of risk and social judgments: Biases and motivational factors. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Jacobs, J.E. (2000). *Everyone else is doing it: Relations between bias in base rate estimates and involvement in problem behaviors*. Paper presented at the Society for Research on Adolescence, Chicago, IL.

Jacobs, J.E., and Ganzel, A.K. (1994). Decision making in adolescence: Are we asking the wrong question? In M.L. Maehr and P.R. Pintrich (Eds.), *Advances in achievement and motivation* (Vol. 8) (pp. 1-31). Greenwich, CT: JAI Press.

Jacobs, J.E., Greenwald, J.P., and Osgood, D.W. (1995). Developmental differences in base rate estimates of social behaviors and attitudes. *Social Development*, *4*, 165-181.

Jacobs, J.E., and Klaczynski, P.A. (2002). The development of judgment and decision making during childhood and adolescence. *Current Directions in Psychological Science*, *11*, 145-149.

Jainchill, N., Bhattacharya, G., and Yagelka, J. (1995). Therapeutic communities for adolescents. *NIDA Research Monograph*, *156*, 190-217.

Jenson, J.M., Howard, M.O., and Yaffe, J. (1995). Treatment of adolescent substance abusers: Issues for practice and research. *Social Work in Health Care, 21,* 1-18.

Jernigan, D., and O'Hara, J. (2004). Alcohol advertising and promotion. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Jernigan, D., and Wright, P.A. (1994). *Making news, changing policy: Case studies of media advocacy on alcohol and tobacco issues*. Rockville, MD: University Research Corporation, Marin Institute, Center for Substance Abuse Prevention.

Jernigan, D., and Wright, P.A. (1996). Media advocacy: Lessons from community experiences. *Journal of Public Health Policy*, *17*(3), 306-329.

Jessor R., and Jessor S. (1980). A social-psychological framework for studying drug use. *NIDA Research Monograph*, *30*, 102-109.

Johannessen, K., Collins, C., Mills-Novoa, B., and Glider, P. (1999). *A practical guide to alcohol abuse prevention: A campus case study in implementing social norms and environmental management approaches*. Tucson, AZ: Campus Health Services, University of Arizona.

Johannessen, K., Glider, P., Collins, C., Hueston, H., and DeJong, W. (2001). Preventing alcohol-related problems at the University of Arizona's homecoming: An environmental management case study. *American Journal of Drug and Alcohol Abuse, 27*(3), 587-597.

Johnson, V., and Pandina, R.J. (1993). A longitudinal examination of the relationships among stress, coping strategies, and problems associated with alcohol use. *Alcoholism: Clinical and Experimental Research*, *17*, 696-702.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2002). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2001.* (NIH Publication No. 02-5105). Bethesda, MD: National Institute on Drug Abuse.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2003). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2002.* (NIH Publication No. 03-5374). Bethesda, MD: National Institute on Drug Abuse.

Johnston, L.D., O'Malley, P.M., Bachman, J.G., and Schulenberg, J.E. (1999). *Cigarette brands smoked by American teens: One brand predominates; three account for nearly all of teen smoking*. Ann Arbor, MI: University of Michigan News and Information Services.

Jones, B.T., Corbin, W., and Fromme, K. (2001). A review of expectancy theory and alcohol consumption. *Addiction*, *96*(1), 427-436.

Jones, N., Pieper, C., and Robertson, L. (1992). The effect of the legal drinking age on fatal injuries of adolescents and young adults. *American Journal of Public Health*, *82*, 112-114.

Jones-Webb, R., Toomey, T.L., Short, B., Murray, D.M., Wagenaar, A., and Wolfson, M. (1997). Relationships among alcohol availability, drinking location, alcohol consumption, and drinking problems in adolescents. *Substance Use and Misuse*, *32*, 1261-1285.

Kallgren, C.A., Reno, R.R., and Cialdini, R.B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*, 1002-1012.

Kaminer, Y., and Bukstein, O. (1989). Adolescent chemical use and dependency: Current issues in epidemiology, treatment and prevention. *Acta Psychiatr Scand, 79*, 415-424.

Kandel, D.B. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology*, *84*, 427-436.

Kandel, D.B., and Logan, J.A. (1984). Patterns of drug use from adolescence to young adulthood: I. Periods of risk for initiation, continued use, and discontinuation. *American Journal of Public Health*, *74*(7), 660-666.

Kellogg. (1999). *Binge drinking on college campuses*. Washington, DC: Office of Educational Research and Improvement.

Kelly, J.J., Slater, M.D., and Karan, D. (2002). Image advertisements' influence on adolescents' perceptions of the desirability of beer and cigarettes. *Journal of Public Policy and Marketing*, *21*(2), 295-304.

Kenkel, D.S. (1993). Drinking, driving and deterrence: The effectiveness and social costs of alternative policies. *Journal of Law and Economics*, *36*(2), 877-914.

Kenkel, D.S. (2000). Effects of changes in alcohol prices and taxes. In National Institute on Alcohol Abuse and Alcoholism, *10th special report to the U.S. Congress on alcohol and health* (pp. 341-354). Bethesda, MD: Author.

Kenny, M.E., and Donaldson, G.A. (1991). Contributions of parental attachment and family structure to the social and psychological functioning of first-year college students. *Journal of Counseling Psychology*, *38*, 479-486.

Kessler, R.C., Crum, R.M., Warner, L.A., and Nelson, C.B. (1997). Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry*, *54*(4), 313-321.

Kett, J. (1977). *Rites of passage: Adolescence in America 1790 to the present*. New York: Basic Books.

Kiley, J. (1998). *Pressing on: Citizen action and the Oakland alcohol outlet ordinance*. San Rafael, CA: Marin Institute.

Klepp, K.I., Schmid, L.A., and Murray, D.M. (1996). Effects of the increased minimum drinking age law on drinking and driving behavior among adolescents. *Addiction Research*, *4*, 237-244.

Knight, J.R., Wechsler, H., Kuo, M., Seibring, M., Weitzman, E.R., and Schuckit, M.A. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol, 63*(3), 263-270.

Komro, K.A., Hu, F.B., and Flay, B.R. A public health perspective on urban adolescents. In H.J. Walberg, O. Reyes, and R.P. Weissberg (Eds.), *Children and youth: Interdisciplinary perspectives* (pp. 253-298). Thousand Oaks, CA: Sage.

Komro, K.A., Perry, C.L., Veblen-Mortenson, S., and Williams, C.L. (1994). Peer participation in Project Northland: A community-wide alcohol use prevention project. *Journal of School Health*, *64*, 318-322.

Kruglanski, A.W. (1989). The psychology of being right: The problem of accuracy in social perception and cognition. *Psychological Bulletin*, *106*, 395-409.

Kuther, T.L. (2002). Rational decision perspectives on alcohol consumption by youth: Revising the theory of planned behavior. *Addictive Behaviors*, *27*(1), 35-47.

Lacey, J.H., Jones, R.K., and Smith, R.G. (1999). *Evaluation of checkpoint Tennessee: Tennessee's statewide sobriety checkpoint program*. Washington, DC: National Highway Traffic Safety Administration.

Lang, E., Stockwell, T., Rydon, P., and Beel, A. (1996). Use of pseudo-patrons to assess compliance with laws regarding underage drinking. *Australian and New Zealand Journal of Public Health, 20,* 296-300.

Lang, E., Stockwell, T., Rydon, P., and Beel, A. (1998). Can training bar staff in responsible serving practices reduce alcohol-related harm? *Drug and Alcohol Review*, *17*, 39-50.

Langley, J.D, Wagenaar, A.C., and Begg, D.J. (1996). An evaluation of the New Zealand graduated driver licensing system. *Accident Analysis and Prevention*, *28*, 139-146.

Lantz, P.M. (2004). Youth smoking prevention policy: Lessons learned and continuing challenges. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Larimer, M.E., and Cronce, J.M. (2002). Identification, prevention and treatment: A review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol*, *14*, 148-163.

Larson, R., and Kleiber, D. (1990). Free-time activities as factors in adolescent adjustment. In P. Tolan and B. Choler (Eds.), *Handbook of clinical research and practice with adolescents*. New York: Oxford University Press.

Lastovicka, J.L. (1995). Methodological interpretation of the experimental and survey research evidence concerning alcohol adverting effects. In S.E. Martin (Ed.), *The effects of the mass media on the use and abuse of alcohol* (pp. 69-81). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

LaVeist, T.A., and Wallace, J.M. (2000). Health risk and inequitable distribution of liquor stores in African American neighborhoods. *Social Science and Medicine, 51*(4), 613-617.

Lee, C.Y., and Halpern-Felsher, B.L. (2001). Parenting of adolescents. In *Parenthood in America: An Encyclopedia*. Santa Barbara, CA: ABC-CLIO.

Lee, J.A., Jones-Webb, R.J., Short, B.J., and Wagenaar, A.C. (1997). Drinking location and risk of alcohol-impaired driving among high school students. *Addictive Behaviors*, *22*, 387-393.

Lee, M. (1998). *Drowning in alcohol: Retail outlet density, economic decline, and revitalization in South L.A.* San Rafael, CA: Marin Institute.

Leigh, B.C. (1989). Confirmatory factor analysis of alcohol expectancy scales. *Journal of Studies on Alcohol*, *50*, 268-277.

Lerner, R.M. (1995). *America's youth in crisis*. Thousand Oaks, CA: Sage.

Lerner, R.M., and Miller, J.R. (1993). Integrating human development research and intervention for America's children: The Michigan State University model. *Journal of Applied Developmental Psychology*, *14*, 347-364.

Levy, D.T., Miller, T.R., Stewart, K., Spicer, R., and Cox, K. (1999, July). *Underage drinking: Immediate consequences and their costs*. Pacific Institute for Research and Evaluation, working paper, unpublished.

Lewis, R.K., Paine-Andrews, A., Fawcett, S.B., Francisco, V.T., Richter, K.P., Copple, B., and Copple, J.E. (1996). Evaluating the effects of a community coalition's efforts to reduce illegal sales of alcohol and tobacco products to minors. *Journal of Community Health, 21*, 429-436.

Light, J.M., Grube, J.W., Madden, P.A., and Gover, J. (2003). Adolescent alcohol use and suicidal ideation: A nonrecursive model. *Addictive Behaviors*, *28*, 705-724.

Little, B., and Bishop, M. (1998). Minor drinkers/major consequences: Enforcement strategies for underage alcoholic beverage law violators. *FBI Law Enforcement Bulletin, 67*(6), 1-4.

Lustig, J.L., Ozer, E.M., Adams, S.H., Wibbelsman, C.J., Fuster, C.D., Bonar, R.W., and Irwin, C.E. (2001). Improving the delivery of adolescent clinical preventive services through skills-based training. *Pediatrics*, *107*, 1100-1107.

Manger, T.H., Hawkins, J.D., Haggerty, K.P., and Catalano, R.F. (1992). Mobilizing communities to reduce risks for drug abuse: Lessons on using research to guide prevention practice. *Journal of Primary Prevention, 13*(1), 3-22.

Mann, R.E., Stoduto, G., Anglin, L., Pavic, B., Fallon, F., Lauzon, R., and Amitay, O.A. (1997). Graduated licensing in Ontario: Impact of the 0 BAL provision on adolescents' drinking-driving. In C. Mercier-Guyon (Ed.), *Alcohol, drugs, and traffic safety: Volume 3* (pp. 1055-1060). Annecy, France: Centre d'Etudes et de Recherches en Médecine du Trafic.

Manning, W.G., Keeler, E.B., Newhouse, J.P., Sloss, E.M., and Wasserman, J. (1989). The taxes of sin: Do smokers and drinkers pay their way? *Journal of the American Medical Association, 261*, 1604-1609.

Mansergh, G., Rohrbach, L., Montgomery, S.B., Pentz, M.A., and Johnson, C.A. (1996). Evaluation of community coalitions for alcohol and other drug prevention: A comparison of researcher and community-initiated models. *Journal of Community Psychology, 24*, 118-135.

Marlatt, G.A., Baer, J.S., Kivlahan, D.R., Dimeff, L.A., Larimer, M.E., Quigley, L.A., Somers, J.M., and Williams, E. (1998). Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology, 66(*4), 604-615.

Marlatt, G.A., Baer, J.S., and Larimer, M.E. (1995). Preventing alcohol abuse in college students: A harm-reduction approach. In G.M. Boyd, J. Howard, and R. Zucker (Eds.), *Alcohol problems among adolescents: Current directions in prevention research* (pp. 147-172). Hillsdale, NJ: Lawrence Erlbaum.

Martin, C.A., Kelly, T.H., Rayens, M.K., Brogli, B.R., Brenzel, A., Smith, W.J., and Omar, H.A. (2002). Sensation seeking, puberty, and nicotine, alcohol, and marijuana use in adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*, *41*(12), 1495-1502.

Mathios, A., Avery, R., Bisogni, C., and Shanahan, J. (1998). Alcohol portrayal on prime-time television: Manifest and latent messages. *Journal of Studies on Alcohol*, *59*, 305-310.

McGue, M., Sharma, A., and Benson, P. (1996). Parent and sibling influences on adolescent alcohol use and misuse: Evidence from a U.S. adoption cohort. *Journal of Studies on Alcohol*, *57*(1), 8-18.

McGuire, A. (1992). The art (and necessity) of coalition building: The California alcohol tax initiative. In A.B. Bergman (Ed.), *Political approaches to injury control at the state level* (pp. 37-45). Seattle: University of Washington Press.

McKay, J.R., Pettinati, H.M., Morrison, R., Feeley, M., Mulvaney, F.D., and Gallop, R. (2002). Relation of depression diagnoses to 2-year outcomes in cocaine-dependent patients in a randomized continuing care study. *Psychology of Addictive Behaviors, 16*(3), 225-235.

McMorris, B., and Uggen, C. (2000). Alcohol and employment in the transition to adulthood. *Journal of Health and Social Behavior*, *41*, 276-294.

Milby, J.B. (1981). *Addictive behavior and its treatment*. New York: Springer.

Miller, P.M., Smith, G.T., and Goldman, M.S. (1990). Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol*, *51*, 343-349.

Miller, T.R., and Blincoe, L.J. (1994). Incidence and cost of alcohol-involved crashes in the United States. *Accident Analysis and Prevention, 26*(5), 583-591.

Miller, W.R. (1998). Researching the spiritual dimensions of alcohol and other drug problems. *Addiction, 93*(7), 979-990.

Miller, W.R., Zweben, A., DiClemente, C.C., and Rychtarik, R., (1992). *Motivational enhancement therapy manual: A clinical research guide for therapists treating individuals with alcohol abuse and dependence*. DHHS Publication No. (ADM) 92-1984. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Mills, J., and Bogenschneider, K. (2001). Can communities assess support for preventing adolescent alcohol and other drug use? Reliability and validity of a community assessment inventory. *Family Relations, 50*(4), 355-375.

Millstein, S.G., and Halpern-Felsher, B.L. (2002). Judgments about risk and perceived invulnerability in adolescents and young adults. *Journal of Research on Adolescence*, *12*, 399-422.

Millstein, S.G., and Marcell, A.V. (2003). Screening and counseling for adolescent alcohol use among primary care physicians in the United States. *Pediatrics, 111*(1), 114-122.

Moffitt, T.E. (1993). Life-course-persistent and adolescence-limited antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*, 654-701.

Montemayor, R. (1982). The relationship between parent, adolescents, conflict, and the amount of time adolescents spend alone and with parents and peers. *Child Development*, *53*, 1512-1519.

Monti, P.M., Colby, S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M., Woolard, R., and Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology, 67*(6), 989-994.

Mortimer, J.T., Finch, M., Shanahan, M., and Ryn, S. (1992). Work experience, mental health, and behavioral adjustment in adolescence. *Journal of Research on Adolescence*, *2*, 24-57.

Mortimer, J.T., and Johnson, M.K. (1998). New perspectives on adolescent work and the transition to adulthood. In R. Jessor (Ed.), *New perspectives on adolescent risk behavior*. New York: Cambridge University Press.

Mosher, J. (1979). Dram shop law and the prevention of alcohol-related problems. *Journal of Studies on Alcohol*, *40*, 773-798.

Mosher, J. and other contributors. (2002). *Liquor liability law*. Newark, NJ: Lexis Nexis.

Mosher, J.F., and Works, R.M. (1994). *Confronting Sacramento: State preemption, community control, and alcohol-outlet blight in two inner-city communities*. San Rafael, CA: Marin Institute.

Moskowitz, J.M. (1989). The primary prevention of alcohol problems: A critical review of the research literature. *Journal of Studies on Alcohol, 50*(1), 54-88.

Mothers Against Drunk Driving. (2002a). *It's time to get MADD all over again: Resuscitating the nation's efforts to prevent impaired driving*. A report from the MADD Impaired Driving Summit, June.

Mothers Against Drunk Driving. (2002b). *MADD online: Rating the states' 2002 report card*. Available: http://www.madd.org/activism/0,1056,5545,00.html [August 2003].

Motion Picture Association of America. (2003). Movie ratings, how it works. Available: http://www.mpaa.org/movieratings/about/content4.htm [August 2003].

Mullen, P.D., and Katayama, C.K. (1985). Heath promotion in private practice: An analysis. *Family Community Health, 8*(1), 79-87.

Murray, J.P., Jr. (1991). Youthful drinking and driving: Policy implications from mass media research. *Advances in Consumer Research, 18*, 120-122.

National Center on Addiction and Substance Abuse. (1994). *Rethinking rites of passage: Substance abuse on America's campuses*. New York: Columbia University.

National Center on Addiction and Substance Abuse. (2002). *Teen tipplers: America's underage drinking epidemic*. New York: Columbia University.

National Center on Addiction and Substance Abuse. (2003). *The economic value of underage drinking and adult excessive drinking to the alcohol industry: A CASA white paper*. New York: Columbia University.

National Highway Traffic Safety Administration. (1998). *Traffic safety facts 1998—Overview*. (DOT HS 808 956). Washington, DC: U.S. Department of Transportation.

National Highway Traffic Safety Administration. (2002a). *Traffic safety facts 2001—Alcohol*. (DOT HS 809 470). Washington, DC: U.S. Department of Transportation.

National Highway Traffic Safety Administration. (2002b). *Youth fatal crash and alcohol facts 2000*. (DOT HS 809 406). Washington, DC: U.S. Department of Transportation.

National Household Survey on Drug Abuse. (2001). *Results from the 2001 National Household Survey on Drug Abuse: Volume I. Summary of national findings*. (Office of Applied Studies, NHSDA Series H-17, DHHS Publication No. SMA 02-3758). Rockville, MD: Substance Abuse and Mental Health Services Administration.

National Household Survey on Drug Abuse. (2002, April 11). *Binge drinking among underage persons*. Rockville, MD: Author.

National Institute on Alcohol Abuse and Alcoholism. (1990, October). *Alcohol alert no. 10 PH 290: Alcohol and women*. Bethesda, MD: Author.

National Institute on Alcohol Abuse and Alcoholism. (1994, January). *Alcohol alert no. 23 PH 347: Alcohol and minorities*. Bethesda, MD: Author.

National Institute on Alcohol Abuse and Alcoholism. (1997, July). *Alcohol alert no. 37: Youth drinking: Risk factors and consequences*. Bethesda, MD: Author.

National Institute on Alcohol Abuse and Alcoholism. (2002). *A call to action: Changing the culture of drinking at U.S. colleges*. (NIH Publication No. 02-5010). Bethesda, MD: Author.

National Institute on Drug Abuse Community Epidemiology Work Group. (1999, December). *Epidemiologic trends in drug abuse, advance report*. Bethesda, MD: National Institute on Drug Abuse.

National Research Council. (2001). *Informing America's policy on illegal drugs: What we don't know keeps hurting us*. C.F. Manski, J.V. Pepper, and C.V. Petrie (Eds.), Committee on Data and Research for Policy on Illegal Drugs, Committee on Law and Justice and Committee on National Statistics. Washington, DC: National Academy Press.

National Research Council and Institute of Medicine (1994). *Under the influence? Drugs and the American workforce*. J. Normand, R.O. Lempert, and C.P. O'Brien (Eds.), Committee on Drug Use in the Workplace. Washington, DC: National Academy Press.

National Research Council and Institute of Medicine (2004). *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

National Women's Health Information Center. (2002). *Women of color health data book. 2nd edition*. Bethesda, MD: Office of the Director, National Institutes of Health.

Nienstedt, B. (1990). The policy effects of a DWI law and a publicity campaign. In R. Surette (Ed.), *Mass media and criminal justice policy: Recent research and social effects* (pp. 193-203). Springfield, IL: C.C. Thomas.

Nisbett, R., and Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*, 231-259.

Novins, D.K., Spicer, P., Beals, J., and Manson, S.M. (2004). Preventing underage drinking in American Indian and Alaska Native communities: Contexts, epidemiology, and culture. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers*. [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Nucci, L., Guerra, N., and Lee, J. (1991). Adolescent judgments of the personal, prudential, and normative aspects of drug usage. *Developmental Psychology*, *27*, 841-848.

Nye, C., Zucker, R., and Fitzgerald, H. (1995). Early intervention in the path to alcohol problems through conduct problems: Treatment involvement and child behavior change. *Journal of Consulting and Clinical Psychology*, *63*, 831-840.

Oei, T.P., Fergusson, S., and Lee, N.K. (1998). The differential role of alcohol expectancies and drinking refusal self-efficacy in problem and nonproblem drinkers. *Journal of Studies on Alcohol*, *59*(6), 704-711.

Office of National Drug Control Policy. (2001). *The economic costs of drug abuse in the United States: 1992-1998*. Publication No. NCJ-19-636. Washington, DC: Executive Office of the President.

Office of National Drug Control Policy. (2003, February). *National drug control strategy: FY 2004 budget summary*. Washington, DC: Executive Office of the President.

Ohsfeldt, R.L., and Morrisey, M.A. (1997). Beer taxes, workers' compensation, and industrial injury. *Review of Economics and Statistics*, *79*(1), 155-160.

Olds, R.S., and Thombs, D.L. (2001). The relationship of adolescent perceptions of peer norms and parent involvement to cigarette and alcohol use. *Journal of School Health*, *71*(6), 223-228.

O'Malley, P.M., and Johnston, L.D. (1999). Drinking and driving among American high school seniors: 1984-1997. *American Journal of Public Health, 89*, 678-684.

O'Malley, P.M., and Wagenaar, A.C. (1991). Effects of minimum drinking age laws on alcohol use, related behaviors and traffic crash involvement among Americans youth: 1976-1987. *Journal of Studies on Alcohol*, *52*, 478-491.

Osgood, D.W. (1998). Hanging out with the gang: Routine activities, gang membership, and problem behavior. Poster session presented at the meeting for the Society for Research on Adolescence, San Diego.

Osgood, D.W., Wilson, J.K., O'Malley, P.M., Bachman, J.G., and Johnson, L.D. (1996). Routine activities and individual deviant behavior. *American Sociological Review*, *61*(4), 635-655.

Ozer, E.M., Adams, S.H., Lustig, J.L., Millstein, S.G., Camfield, K., El-Diwany, S., Volpe, S., and Irwin, C.E. (2001). Can it be done? Implementing adolescent clinical preventive services. *Health Services Research*, *36*, 150-165.

Ozer, E., Adams, S., Lustig, J., Millstein, S., Wibbelsman, C., Babb, J., Doyle, T., Redmond, N., and Irwin, C.E. (2003). The effect of preventive services on adolescent behavior. *Pediatric Research*, *53*, 265A.

Pacific Institute for Research and Evaluation. (1999, October). *Costs of underage drinking* (updated edition). Report prepared for Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs, U.S. Department of Justice.

Pacula, R.L. (1998). Does increasing the beer tax reduce marijuana consumption? *Journal of Health Economics*, *17*(5), 557-586.

Paglia, A., and Room, R. (1999). Preventing substance use problems among youth: A literature review and recommendations. *Journal of Primary Prevention*, *20*(1), 3-50.

Palmer, C.J., Lohman, G., Gehring, D.D., Carlson, S., and Garrett, O. (2001). Parental notification: A new strategy to reduce alcohol abuse on campus. *NASPA Journal, 38*(3), 372-385.

Palmgreen, P., Donohew, L., Lorch, E.P., Hoyle, R.H., and Stephenson, M.T. (2001, February). Television campaigns and adolescent marijuana use: Tests of sensation seeking targeting. A*merican Journal of Public Health, 91*(2), 292-296.

Pandina, R.J., and Johnson, V. (1989). Familial drinking history as a predictor of alcohol and drug consumption among adolescent children. *Journal of Studies on Alcohol*, *50*, 245-253.

Pandina, R.J., and Johnson, V. (1990). Serious alcohol and drug problems among adolescents with a family history of alcoholism. *Journal of Studies on Alcohol*, *51*, 278-282.

Park, P. (1967). Dimensions of drinking among male college students. *Social Problems*, *14*(4), 473-482.

Parke, P.D., and Ladd, G.W. (1992). *Family-peer relationships: Modes of linkages*. Hillsdale, NJ: Lawrence Erlbaum.

Parker, R.N., and Rebhun, L.A. (1995). *Alcohol and homicide: A deadly combination of two American traditions*. Albany: State University of New York Press.

Pentz, M.A., Dwyer, J.H., MacKinnon, D.P., Flay, B.R., Hansen, W.B., Wang, E.Y.I., and Johnson, C.A. (1989). A multicommunity trial for primary prevention of adolescent drug abuse: Effects on drug use prevalence. *Journal of the American Medical Association*, *261*(22), 3259-3266.

Perkins, H.W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol, 14*, 164-172.

Perkins, H.W., and Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of Addiction, 21,* 961-976.

Perkins, R.A., Jenkins, S.E., and McCullough, M.B. (1980). A look at drinking on a university campus. *College Student Journal, 14*(3), 222-229.

Perry, C.L., and Kelder, S.H. (1992). Prevention. In J.W. Langenbucher (Ed.), *Review of addictions: Research and treatment, volume 2* (pp. 453-472). New York: Pergamon Press.

Perry, C.L., Williams, C.L., Veblen-Mortenson, S., Toomey, T., Komro, K., Anstine, P.S., Wagenaar, A.C., and Wolfson, M. (1996). Project Northland: Outcomes of a communitywide alcohol use prevention program during early adolescence. *American Journal of Public Health*, *86*(7), 956-965.

Perry, C.L., Williams, C.L., Komro, K.A., Veblen-Mortenson, S., Forster, J.L., Bernstein-Lachter, R., Pratt, L.K., Dudovitz, B., Munson, K.A., Farbakhsh, K., Finnegan, J., and McGovern, P. (2000). Project Northland high school interventions: Community action to reduce adolescent alcohol use. *Health Education and Behavior*, *27*(1), 29-49.

Perry, C.L., Williams, C.L., Komro, K.A., Vebeln-Mortensen, S., Stigler, M.H., Munson, K.A., Farbadhsh, K., Jones, R.M., and Forster, J.L. (2002). Project Northland: Long-term outcomes of community action to reduce adolescent alcohol use. *Health Education Research Theory and Practice*, *17*(1), 117-123.

Peters, C. (2002). Ohio college initiative to reduce high risk drinking: Evaluation report. Columbus, OH: Office of Criminal Justice Services.

Peterson, P.L., Hawkins, J.D., Abbott, R.D., and Catalano, R.F. (1994). Disentangling the effects of parent drinking, family management, and parental alcohol norms on current drinking by Black and White adolescents. *Journal of Research on Adolescence*, *4*, 203-228.

Pickens, R.W., and Fletcher, W.W. (1991). Overview of treatment issues. *NIDA Research Monograph*, *106*, 1-19.

Pierce, J., Emery, S., and Gilpin, E. (2002). The California Tobacco Control Program: A long term health communication project. In R. Hornik (Ed.), *Public health communication: Evidence for behavior change*. Mahwah, NJ: Lawrence Erlbaum.

Powell, A., and Willingham, M. (n.d.). *Strategies for reducing third party transactions of alcohol to underage youth*. Calverton, MD: OJJDP Underage Drinking Enforcement Training Center. Available: http://www.udetc.org/documents/Reducing%203rd%20Party.pdf [August, 2003].

Prendergast, L. (1994). Substance use and abuse among college students: A review of the recent literature. *Journal of American College Health*, *43*, 99-113.

Prentice, D.A., and Miller, D.T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, *64*, 243-256.

President's Commission on Model State Drug Laws (1993). *Drug-free families, schools, and workplaces (Model Underage Alcohol Consumption Reduction Act)*. Washington, DC: The White House.

Presidents Leadership Group. (1997). *Be vocal, be visible, be visionary: Recommendations for college and university presidents on alcohol and other drug prevention*. Washington, DC: The Higher Education Center for Alcohol and Other Drug Prevention.

Presley, C.A., Meilman, P.W., and Leichliter, J.S. (2002). College factors that influence drinking. *Journal of Studies on Alcohol*, *14*, 82-90.

Preusser, D.F., and Williams, A.F. (1992). Sales of alcohol to underage purchasers in three New York counties and Washington DC. *Journal of Public Health Policy*, *13*, 306-317.

Preusser, D.F., Ferguson, S.A., Williams, A.F., and Farmer, C.M. (1995). *Underage access to alcohol: Sources of alcohol and use of false identification*. Arlington, VA: Insurance Institute for Highway Safety.

Prinstein, M.J., Fetter, M.D., and La Greca, A.M. (1996, March). Can you judge adolescents by the company they keep? Peer group membership, substance use, and risk-taking behaviors. Paper presented at the meeting of the Society for Research on Adolescence, Boston, MA.

Pruitt, B.E., Kingery, P.M., Mirzaee, E., Heuberger, G., and Hurley, R.S. (1991). Peer influence and drug use among adolescents in rural areas. *Journal of Drug Education*, *21*, 1-11.

Quadrel, M.J., Fischhoff, B., and Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist*, *48*(2), 102-116.

Reifman, A., Barnes, G.M., Dintcheff, B.A., Farrell, M.P., and Uhteg, L. (1998). Parental and peer influences on the onset of heavier drinking among adolescents. *Journal of Studies on Alcohol*, *59*(3), 311-317.

Rice, K.G. (1992). Separation-individuation and adjustment to college: A longitudinal study. *Journal of Counseling Psychology*, *39*, 203-213.

Robert Wood Johnson Foundation. (1993). *Substance abuse: The nation's number one health problem. Key indicators for policy.* Princeton, NJ: Author.

Roberts, D.F., Foehr, U.G., Rideout, V.J., and Brodie, M. (1999a). *Kids and media @ the new millennium.* Palo Alto, CA: Kaiser Family Foundation.

Roberts, D.F., Henriksen, L., and Christensen, P.G. (1999b). *Substance use in popular movies and music.* Washington, DC: Office of National Drug Control Policy.

Roccella, E.J. (2002). The contributions of public health education toward reduction of cardiovascular disease mortality: Experiences from the National High Blood Pressure Education Program. In R. Hornik (Ed.), *Public health communication: Evidence for behavior change* (pp. 73-84). Mahwah, NJ: Lawrence Erlbaum.

Rohrbach, L.A., Johnson, C.A., Mansergh, G., Fishkin, S.A., and Neumann, F.B. (1997). Alcohol-related outcomes of the day one community partnership. *Evaluation and Program Planning*, *20*(3), 315-322.

Room, R. (1989). *Community action and alcohol problems: Some historical perspectives.* Berkeley, CA: Alcohol Research Group.

Room, R. (2004). Drinking and coming of age in a cross-cultural perspective. In National Research Council and Institute of Medicine, *Reducing underage drinking: A collective responsibility, background papers.* [CD-ROM]. Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Room, R., Jernigan, D., Carlini-Marlatt, B., Gurege, O., Mäkelä, K., Marshall, M., Medina-Mora, M.E., Monteiro, M., Parry, C., Partanen, J. Riley, L., and Saxena, S. (2002). *Alcohol in developing societies: A public health approach.* Helsinki: Hakapaino Oy: Finnish Foundation for Alcohol Studies in collaboration with World Health Organization.

Rootman, I., and Moser, J. (1985). *Community response to alcohol-related problems: A World Health Organization project.* (DHHS Publication No. ADM 85-1371). Washington, DC: U.S. Government Printing Office.

Roper Center at University of Connecticut. (1987, September). Public opinion online, accession # 0025861, question 001, Gallup Poll. Available: http://www.ropercenter.uconn.edu/ipoll.html [February, 2003].

Roper Center at University of Connecticut. (1988, September). Public opinion online, accession # 0150315, question 005, Gallup Poll. Available: http://www.ropercenter.uconn.edu/ipoll.html [February, 2003].

Roper Center at the University of Connecticut. (2003a). Public opinion online, accession #0412701, Question 031. Available: http://www.ropercenter.uconn.edu/ipoll.html [February, 2003].

Roper Center at the University of Connecticut. (2003b). Public opinion online, accession #0412675, CASA National Underage Drinking Survey. Available: http://www.ropercenter.uconn.edu/ipoll.html [February, 2003].

Rose, G. (1985). Sick individuals and sick populations. *International Journal of Epidemiology, 14,* 32-38.

Ross, H.L. (1982). *Deterring the drinking driver*. Lexington, MA: Lexington.

Ruhm, C.J. (1996). Alcohol policies and highway vehicle fatalities. *Journal of Health Economics*, *15*, 435-454.

Saffer, H. (1997). Alcohol advertising and motor vehicle fatalities. *Review of Economics and Statistics*, *79*, 431-442.

Saffer, H., and Grossman, M. (1987). Beer taxes, the legal drinking age, and youth motor vehicle fatalities. *Journal of Legal Studies*, *16*, 351-374.

Saltz, R.F. (1987). Roles of bars and restaurants in preventing alcohol-impaired driving: An evaluation of server intervention. *Evaluation and Health Professions*, *10*, 5-27.

Saltz, R.F. (1989). Research needs and opportunities in server intervention programs. *Health Education Quarterly, 16*, 429-438.

Saltz, R.F. (1997). Prevention where alcohol is sold and consumed: Server intervention and responsible beverage service. In M. Plant, E. Single, and T. Stockwell (Eds.), *Alcohol: Minimizing the harm. What works?* (pp. 72-84). New York: Free Association.

Saltz, R.F., and Stanghetta, P. (1997). A community-wide responsible beverage service program in three communities: Early findings. *Addiction*, *92*(Suppl. 2), S237-S249.

Schoen, C., Davis, K., Collins, K.S., Greenberg, L., Des Roches, C., and Abrams, M. (1997, November). *The Commonwealth Fund survey of the health of adolescent girls*. New York: Commonwealth Fund.

Schroeder, C., and Prentice, D. (1998). Exposing pluralistic ignorance to reduce alcohol use among college students. *Journal of Applied Social Psychology, 28,* 2150-2180.

Schulenberg, J., O'Malley, P., Bachman, J., Wadsworth, K., and Johnston, L. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol*, *57*, 289-304.

Schwartz, R.H., Farrow, J.A., Banks, B., and Giesel, A.E. (1998). Use of false ID cards and other deceptive methods to purchase alcoholic beverages during high school. *Journal of Addictive Diseases, 17*, 25-34.

Seevak, A. (1997, December). *Oakland shows the way: The coalition on alcohol outlet issues and media advocacy as a tool for policy change.* Berkeley: Berkeley Media Studies.

Sher, K.J., Bartholow, B.D., and Nanda, S. (2001). Short- and long-term effects of fraternity and sorority membership on heavy drinking: A social norms perspective. *Psychology of Addictive Behaviors, 15*(1), 42-51.

Shope, J.T., Molnar, L.J., Elliott, M.R., and Waller, P.F. (2001). Graduated driver licensing in Michigan: Early impact on motor vehicle crashes among 16-year-old drivers. *Journal of the American Medical Association*, *286*, 1593-1598.

Siegel, M. (2002). The effectiveness of state-level tobacco control interventions: A review of program implementation and behavioral outcomes. *Annual Review of Public Health*, *23*, 45-71.

Siegel, M., and Biener, L. (2000). The impact of an antismoking media campaign on progression to established smoking: Results of a longitudinal youth study. *American Journal of Public Health*, *90*(3), 380-386.

Sieving, R.E. (1997). Process of parental influence on alcohol use among young adolescents. *Dissertation Abstracts International*, *57*(8), 5006-B.

Sieving, R.E., Perry, C.L., and Williams, C.L. (2000). Do friendships change behaviors, or do behaviors change friendships? Examining paths of influence in young adolescents' alcohol use. *Journal of Adolescent Health*, *26*(1), 27-35.

Slater, M.D., Rouner, D., Domenech-Rodriguez, M.M., Beauvais, F., Murphy, K., and Van Leuven, J. (1997). Adolescent responses to TV beer ads and sports content/context: Gender and ethnic differences. *Journalism and Mass Communication Quarterly, 74,* 108-122.

Sloan, F.A., Reilly, B.A., and Schenzler, C. (1994). Effects of prices, civil and criminal sanctions, and law enforcement on alcohol-related mortality. *Journal of Studies on Alcohol*, *55*, 454-465.

Sloan, F.A., Stout, E.M., Whetten-Goldstein, K., and Liang, L. (2000). *Drinkers, drivers, and bartenders: Balancing private choices and public accountability*. Chicago: University of Chicago Press.

Slovic, P. (2000). What does it mean to know a cumulative risk? Adolescents' perceptions of short-term and long-term consequences of smoking. *Journal of Behavioral Decision Making*, *13*(2), 259-266.

Sly, D.F., Hopkins, R.S., Trapido, E., and Ray, S. (2001). Influence of a counter-advertising media campaign on initiation of smoking: The Florida truth campaign. *American Journal of Public Health*, *91*(2), 233-238.

Small, S.A., Silverburg, S.B., and Kerns, D.T.I. (1993). Adolescents' perceptions of the costs and benefits of engaging in health-compromising behaviors. *Journal of Youth and Adolescence*, *22*(1), 73-87.

Smart, R.G. (1988). Does alcohol advertising affect overall consumption? A review of empirical studies. *Journal of Studies on Alcohol, 49*(4), 314-323.

Smith, D.I. (1986). Effect of low proscribed blood alcohol levels (BALs) on traffic accidents among newly licensed drivers. *Medical Science and the Law*, *26*, 144-148.

Smith, G., Goldman, M., Greenbaum, P., and Christiansen, B. (1995). Expectancy for social facilitation from drinking: The divergent paths of high-expectancy and low-expectancy adolescents. *Journal of Abnormal Psychology*, *104*(1), 32-40.

Smith, M. (1989). Students, suds, and summonses: Strategies for coping with campus alcohol abuse. *Journal of College Student Development, 30*(2), 118-122.

Snow, R.W., and Landrum, J.W. (1986). Drinking locations and frequency of drunkenness among Mississippi DUI offenders. *American Journal of Drug and Alcohol Abuse*, *12*(4), 389-402.

Snyder, L.B., and Hamilton, M.A. (2002). A meta-analysis of U.S. health campaign effects on behavior: Emphasize enforcement, exposure and new information and beware the secular trend. In R. Hornik (Ed.), *Public health communication: Evidence for behavior change* (pp. 357-384). Mahwah, NJ: Lawrence Erlbaum.

Spear, L.P. (2002). The adolescent brain and the college drinker: Biological basis of propensity to use and misuse alcohol. *Journal on Studying Alcohol Suppl. 14*, 71-81.

Spoth, R.L., Redmond, C., and Shin, C. (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*, *69*(4), 627-642.

Stacy, A.W., Widaman, K.F., and Marlatt, G.A. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology, 58*, 918-928.

Steinberg, L., and Cauffman, E. (1996). Maturity of judgment in adolescence: Psychosocial factors in adolescent decision making. *Law and Human Behavior*, *20*, 249-272.

Steinberg, L., Fegley, S., and Dornbusch, S.M. (1993). Negative impact of part-time work on adolescent adjustment: Evidence from a longitudinal study. *Developmental Psychology*, *29*, 171-180.

Steinberg, L.D., Fletcher, A., and Darling, N. (1994). Parental monitoring and peer influences on adolescent substance use. *Pediatrics, 93,* 1060-1064.

Stewart, L., and Casswell, S. (1993). Media advocacy for alcohol policy support: Results from the New Zealand Community Action Project. *Health Promotion International, 8*(3), 167-175.

Stice, E., Barrera, M., and Chassin, L. (1998). Prospective differential prediction of adolescent alcohol use and problem use: Examining the mechanisms of effect. *Journal of Abnormal Psychology*, *107*(4), 616-628.

Stout, E.M., Sloan, F.A., Liang, L., and Davies, H.H. (2000). Reducing harmful alcohol-related behaviors: Effective regulatory methods. *Journal of Studies on Alcohol*, *61*, 402-412.

Strategic Marketing Services. (2002). *Your teen and alcohol, Do you really know?* Portland, ME: Maine Office of Substance Abuse. Available: http://www.maineparents.net [March 3, 2003].

Streicker, J. (Ed.). (2000). *Case histories in alcohol policy*. San Francisco, CA: Trauma Foundation.

Strunge, H. (1998). Danish experiences of national campaigns on alcohol 1990-1996. *Drugs: Education, Prevention and Policy*, *5*(1), 73-79.

Strunin, L., and Hingson, R. (1992). Alcohol, drugs, and adolescent sexual behavior. *International Journal of the Addictions, 27*(2), 129-146.

Stuster, J.W., and Blowers, P.A. (1995). *Experimental evaluation of sobriety checkpoint programs*. Washington, DC: National Highway Traffic Safety Administration.

Substance Abuse and Mental Health Services Administration. (2000). *Substance abuse treatment in adult and juvenile correctional facilities: Findings from the uniform facilities data set 1977 survey of correctional facilities*. (Drug and Alcohol Services Information System Series S-9). Rockville, MD: Author, Office of Applied Studies.

Substance Abuse and Mental Health Services Administration. (2001). *Summary of findings from the 2000 National Household Survey on Drug Abuse*. (NHSDA Series H-13, DHHS Publication No. SMA 01-3549). Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (2002, April 11). *Binge drinking among underage persons*. Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (2002, September 13). *Low rates of alcohol use among Asian youths*. Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (2003, April 13). *Alcohol use*. Rockville, MD: Author

Swendsen, J.D., Conway, K.P., Rounsaville, B.J., and Merikangas, K.R. (2002). Are personality traits familial risk factors for substance use disorders? Results of a controlled family study. *American Journal of Psychiatry*, *159*(10), 1760-1766.

Swisher, J.D., and Hoffman, A. (1975). Information: The irrelevant variable in drug education. In B.W. Corder, R.A. Smith, and J.D. Swisher (Eds.), *Drug abuse prevention: Perspectives and approaches for educators*. Dubuque, IA: William C. Brown.

Tapert, S.F., and Brown, S.A. (1999). Neuropsychological correlates of adolescent substance abuse: Four-year outcomes. *Journal of the International Neuropsychological Society, 5*, 481-493.

Tapert, S.F., Brown, G., Meloy, M., Dager, A., Cheung, E., and Brown, S. (2001). MRI measurement of brain function in alcohol use disordered adolescents. *Alcoholism: Clinical and Experimental Research, 25*, 80A.

Tay, R. (2000). Methodological issues in evaluation models: The New Zealand Road Safety Advertising Campaign revisited. *Road and Transportation Research*, *10*(2), 29-39.

Taylor, T.K., and Biglan, A. (1998). Behavioral parenting skills programs: A review of the literature for clinicians. *Clinical Child and Family Psychology Review*, *1*, 41-60.

Thompson, K., and Yokota, F. (2001). Depiction of alcohol, tobacco, and other substances in G-rated animated feature films. *Pediatrics*, *107*, 1369-1374.

Thorson, E. (1995). Studies on the effects of alcohol advertising: Two underexplored aspects. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Tobler, N.S. (1992). Drug prevention programs that can work: Research findings. *Journal of Addictive Diseases, 11*(3), 1-28.

Tobler, N.S., Roona, M.R., Ochshorn, P., Marshall, D.G., Streke, A.V., and Stackpole, K.M. (2000). School-based adolescent drug prevention programs: 1998 meta-analysis. *The Journal of Primary Prevention, 20*, 275-336.

Tobler, N.S., and Stratton, H.H. (1997). Effectiveness of school-based drug prevention programs: A meta-analysis of research. *Journal of Primary Prevention*, *18*, 71-128.

Toomey, T.L., and Wagenaar, A.C. (1999). Policy options for prevention: The case of alcohol. *Journal of Public Health Policy*, *20*, 193-212.

Toomey, T.L., Wagenaar, A.C., Gehan, J.P., Kilian, G., Murray, D.M., and Perry, C.L. (2001). Project ARM: Alcohol Risk Management to prevent sales to underage and intoxicated patrons. *Health Education and Behavior*, *28*, 186-199.

Tyler, T.R. (1992). *Why people obey the law*. New Haven: Yale University Press.

Tyler, T.R., and Huo, Y.J. (2002). *Trust in the law: Encouraging public cooperation with the police and courts*. New York: Russell Sage Foundation.

Ulmer, R.G., Ferguson, S.A., Williams, A.F., and Preusser, D.F. (2000). *Teenage crash reduction associated with delayed licensure in Connecticut*. Arlington, VA: Insurance Institute for Highway Safety.

U.S. Federal Trade Commission. (1999, September). *Self-regulation in the alcohol industry: A review of industry efforts to avoid promoting alcohol to underage consumers*. Washington, DC: Author.

U.S. Federal Trade Commission. (2000, September). *Marketing violent entertainment to children: A review of self-regulation and industry practices in the motion picture, music recording and electronic game industries. A report of the Federal Trade Commission*. Washington, DC: Author.

U.S. Federal Trade Commission. (2001, December). *Marketing violent entertainment to children: A one-year follow-up review of industry practices in the motion picture, music recording and electronic game industries. A report to Congress*. Washington, DC: Author.

U.S. Federal Trade Commission. (2002, June). *Marketing violent entertainment to children: A twenty-one month follow-up review of industry practices in the motion picture, music recording and electronic game industries. A report to Congress*. Washington, DC: Author.

U.S. General Accounting Office. (1987). *Drinking-age laws: An evaluation synthesis of their impact on highway safety*. GAO/PEMD-87-10. Washington, DC: Author.

U.S. General Accounting Office. (2001, May). *Underage drinking: Information on federal funds targeted at prevention*. GAO-01-503. Washington, DC: Author.

U.S. Navy. (n.d.). PREVENT: Personal Responsibility and Values: Education and Training; Knowledge to Action. Available: http://www.preventonline.org [February, 2003].

Vicary, J.R., Snyder, A.R., and Henry, K.L. (2000). The effects of family variables and personal competencies on the initiation of alcohol use by rural seventh grade students. *Adolescent and Family Health*, *1*(1), 11-20.

Voas, R.B., Holder, H.D., and Gruenewald, P.J. (1997). The effect of drinking and driving interventions on alcohol-involved traffic crashes within a comprehensive community trial. *Addiction*, *92*(Suppl. 2), 221-236.

Voas, R.B., Lange, J.E., and Tippetts, A.E. (1998). Enforcement of the zero tolerance law in California: A missed opportunity? In *42nd Annual Proceedings of the Association for the Advancement of Automotive Medicine* (pp. 369-383). Des Plaines, IL: Association for the Advancement of Automotive Medicine.

Voas, R.B., Tippetts, A.S., and Fell, J. (1999, September). *United States limits drinking by youth under age 21: Does this reduce fatal crash involvements*? Paper presented at the annual meeting of the Association for the Advancement of Automotive Medicine, Barcelona, Spain.

Wagenaar, A.C. (1981). Effects of an increase in the legal minimum drinking age. *Journal of Health Policy*, *2*, 206-225.

Wagenaar, A.C. (1986). Preventing highway crashes by raising the legal minimum age for drinking: The Michigan experience 6 years later. *Journal of Safety Research, 17,* 101-109.

Wagenaar, A.C., Finnegan, J.R., Wolfson, M., Anstine, P.S., Williams, C.L., and Perry, C.L. (1993). Where and how adolescents obtain alcoholic beverages. *Public Health Reports*, *108*(4), 459-464.

Wagenaar, A.C., Gehan, J.P., Jones-Webb, R., Toomey, T.L., and Forster, J. (1999). Communities mobilizing for change on alcohol: Lessons and results from a 15-community randomized trial. *Journal of Community Psychology*, *27*, 315-326.

Wagenaar, A.C., Harwood, E., and Bernat, D. (2002). *The Robert Wood Johnson Foundation 2001 youth access to alcohol survey: Summary report*. Minneapolis: University of Minnesota, Alcohol Epidemiology Program.

Wagenaar, A.C., and Holder, H.D. (1991). Effects of an alcohol beverage server liability law on traffic crash injuries. *Alcoholism: Clinical and Experimental Research*, *15*, 942-947.

Wagenaar, A.C., and Maybee, R.G. (1986). Legal minimum drinking age in Texas: Effects of an increase from 18 to 19. *Journal of Safety Research, 17,* 165-178.

Wagenaar, A.C., Murray, D.M., Gehan, J.P., Wolfson, M., Forster, J.L., Toomery, T.L., Perry, C.L., and Jones-Webb, R. (2000a). Communities mobilizing for change on alcohol: Outcomes from a randomized community trial. *Journal of Studies on Alcohol*, *61,* 85-94.

Wagenaar, A.C., Murray, D.M., and Toomey, T.L. (2000b). Communities mobilizing for change on alcohol (CMCA): Effects of a randomized trial on arrests and traffic crashes. *Addiction*, *95*(2), 209-217.

Wagenaar, A.C., O'Malley, P.M., and LaFond, C. (2001). Very low legal BAC limits for young drivers: Effects on drinking, driving, and driving-after-drinking behaviors in 30 states. *American Journal of Public Health*, *91*, 801-804.

Wagenaar, A.C., and Perry, C.L. (1994). Community strategies for the reduction of youth drinking: Theory and application. *Journal of Research on Adolescence*, *4*, 319–345.

Wagenaar, A.C., and Toomey, T.L. (2002). Effects of minimum drinking age laws: Review and analyses of the literature from 1960 to 2000. *Journal of Studies on Alcohol, 14*, 206-225.

Wagenaar, A.C., Toomey, T.L., Murray, D.M., Short, B.J., Wolfson, M., and Jones-Webb, R. (1996). Sources of alcohol for underage drinkers. *Journal of Studies on Alcohol*, *57*, 325-333.

Wagenaar, A.C., and Wolfson, M. (1994). Enforcement of the legal minimum drinking age in the United States. *Journal of Public Health Policy*, *15*, 37-53.

Wagenaar, A.C., and Wolfson, M. (1995). Deterring sales and provision of alcohol to minors: A study of enforcement in 295 counties in four states. *Public Health Reports, 110*, 419-427.

Walker, S., Grube, J., Chen, M.J., Light, J. and Treno, A. (2001, June). *Driving under the influence and riding with drinking drivers: The importance of ethnicity, gender and drinking context*. Presented at the annual meeting of the Research Society on Alcoholism, Montréal, Canada.

Wallack, L. (1992). Editorial: Warning: The alcohol industry is not your friend. *British Journal of Addiction*, *87*, 175-177.

Wallack, L. (1993). Editorial reply: Some proposals for the alcohol industry. *Addiction*, *88*, 167-178.

Wallack, L. (2000). The role of mass media in creating social capital: A new direction for public health. In B.D. Smedley and S.L. Syme (Eds.), *Promoting health: Intervention strategies from social and behavioral research* (pp. 337-365). Committee on Capitalizing on Social Science and Behavioral Research to Improve the Public's Health, Division of Health Promotion and Disease Prevention, Institute of Medicine. Washington, DC: National Academy Press.

Wallack, L., and Barrows, D. (1982). Evaluating primary prevention: The California "Winners" Alcohol Program. *International Quarterly of Community Health Education*, *3*(4), 307-335.

Wallack, L., Dorman, L., Jernigan, D., and Themba, M. (1996). *Media advocacy and public health: Power for prevention*. Thousand Oaks, CA: Sage.

Wallack, S. (1979). *The California Prevention Demonstration Program evaluation: Description, methods, and findings*. Berkeley: University of California, Social Research Group, School of Public Health.

Warner, K.E. (1981). Cigarette smoking in the 1970's: The impact of the antismoking campaign on consumption. *Science*, *211*(4483), 729-731.

Webb, J.A., and Baer, P.R. (1995). Influence of family disharmony and parental alcohol-use on adolescent social skills, self-efficacy, and alcohol-use. *Addictive Behaviors*, *20*(1), 127-135.

Webster, R.A., Hunter, M., and Keats, J.A. (1994). Personality and sociodemographic influences on adolescents substance use: A path-analysis. *International Journal of the Addictions*, *29*(7), 941-956.

Wechsler, H. (1996). Alcohol and the American college campus: A report from the Harvard School of Public Health. *Change, 28*(4), 20-25.

Wechsler, H., and Wuethrich, B. (2002). *Dying to drink: Confronting binge drinking on college campuses*. New York: Rodale, Inc.

Wechsler, H., Davenport, A., Dowdall, G.W., Moeykens, B., and Castillo, S. (1994). Health and behavioral consequences of binge drinking in college: A national survey of students at 140 campuses. *Journal of the American Medical Association, 272*(21), 1672-1677.

Wechsler, H., Moeykens, B., Davenport, A., Castillo, S., and Hansen, J. (1995). The adverse impact of heavy episodic drinkers on other college students. *Journal of Studies on Alcohol*, *56*, 628-634.

Wechsler, H., Molnar, B.E., Davenport, A., and Baer, J. (1999). College alcohol use: A full or empty glass? *Journal of American College Health*, *47*(6), 247-252.

Wechsler, H., Lee, J.E., Kuo, M., and Lee, H. (2000). College binge drinking in the 1990's: A continuing problem, results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health*, *48*(5), 199-210.

Wechsler, H., Lee, J.E., Gledhill-Hoyt, J., and Nelson, T.F. (2001a). Alcohol use and problems at colleges banning alcohol: Results of a national survey. *Journal of Studies on Alcohol*, *62*(2), 133-141.

Wechsler, H., Lee, J.E., Nelson, T.F., and Kuo, M. (2001b). Underage college students' drinking behavior, access to alcohol, and the influence of deterrence policies: Findings from the Harvard School of Public Health College Alcohol Study. *Journal of American College Health*, *50*(2), 223-236.

Wechsler, H., Lee, J.E., Nelson, T.F., and Lee, H. (2001c). Drinking levels, alcohol problems and secondhand effects in substance-free college residences: Results of a national study. *Journal of Studies on Alcohol*, *62*(1), 23-31.

Wechsler H., Lee, J.E., Kuo, M., Seibring, M., Nelson, T.F., and Lee, H.P. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health study surveys, 1993-2001. *Journal of American College Health*, *50*(5), 203-217.

Weinberg, N.Z., Dielman, T.E., Mandell, W., and Shope, J.T. (1994). Parental drinking and gender factors in the prediction of early adolescent alcohol-use. *International Journal of the Addictions*, *29*(1), 89-104.

Weitzman, E.R., Folkman, A., Folkman, K.L., and Wechsler, H. (2003a). The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health and Place*, *9*(1), 1-6.

Weitzman, E.R., Nelson, T.F., and Wechsler, H. (2003b). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health, 32*(1), 26-35.

Werch, C.E., Pappas, D.M., Carlson, J.M., DiClemente, C.C., Chally, P.S., and Snider, J.A. (2000). Results of a social norm intervention to prevent binge drinking among first-year residential college students. *Journal of American College Health, 49*(2), 85-92.

Werner, M.F. (1995). Principles of brief intervention for adolescent alcohol, tobacco, and other drug use. *Pediatric Clinical of North America*, *42*, 335-349.

Whetten-Goldstein, K., Sloan, F.A., Stout, E., and Liang, L. (2000). Civil liability, criminal law, and other policies and alcohol-related motor vehicle fatalities in the United States: 1984-1995. *Accident Analysis and Prevention*, *32*, 723-733.

White, A.M., Ghia, A.J., Levin, E.D., and Swartzwelder, H.S. (2000). Binge pattern ethanol exposure in adolescent and adult rats: differential impact on subsequent responsiveness to ethanol. *Alcoholism, Clinical and Experimental Research, 24(*8), 1251-1256.

Williams, A.F., Wells, J.K., and Reinfurt, D.W. (1996). Increasing seat belt use in North Carolina. *Journal of Safety Research*, *27*(1), 33-41.

Williams, C.L., and Perry, C.L. (1998). Lessons from project Northland: Preventing alcohol problems during adolescence. *Alcohol Health and Research World*, *22*(2), 107-116.

Williams, C.L., Perry, C.L., Farbakhsh, K., and Veblen-Mortenson, S. (1999). Project Northland: Comprehensive alcohol use prevention for young adolescents, their parents, schools, peers and communities. *Journal of Studies on Alcohol*, *13*, 112-124.

Williams, J., Chaloupka, F.J., and Wechsler, H. (2002). Higher alcohol prices and student drinking. *National Bureau of Economic Research*, *50*(5), 223-236.

Willinger, M., Ko, C.W., Hoffman, H.J., Kessler, R.C., and Corwin, M.J. (2000). Factors associated with caregivers' choice of infant sleep position, 1994 to 198: The National Infant Sleep Position Study. *Journal of the American Medical Association*, *283*(16), 2135-2142.

Willingham, M. (n.d.). *Reducing alcohol sales to underage purchasers A practical guide to compliance investigations*. Calverton, MD: OJJDP Underage Drinking Enforcement Training Center.

Wine Institute. (2003). *Code of advertising standards*. Available: http://www.wineinstitute.org/ [June, 2003].

Winsten, J.A. (1994). Promoting designated drivers: The Harvard Alcohol Project. *American Journal of Preventive Medicine*, *10*(Suppl. 3), 11-14.

Wintre, M.G., and Sugar, L.A. (2000). Parenting, personality and the university transition. *Journal of College Student Development, 41*, 202-214.

Wolfson, M., Altman, D., DuRant, R., Shrestha, A., Patterson, T.E., Williams, A., Hensberry, R., Zaccaro, D., Foley, K., Champion, H., Preisser, J., Vitale, J., and Garner, G. (2003). Impact evaluation: Impact of a large nonrandomized community trial on enforcement of underage drinking laws and underage drinking. In *National Evaluation of the Enforcing Underage Drinking Laws Program: Year 3 Report* (Chapter 3). Winston-Salem, NC: Wake Forest University School of Medicine, Department of Public Health Sciences.

Wolfson, M., Toomey, T.L., Forster, J.L., Wagenaar, A.C., McGovern, P.G., and Perry, C.L. (1996a). Characteristics, policies and practices of alcohol outlets and sales to underage persons. *Journal of Studies on Alcohol*, *57*, 670-674.

Wolfson, M., Toomey, T.L., Murray, D.M., Forster, J.L., Short, B.J., and Wagenaar, A.C. (1996b). Alcohol outlet policies and practices concerning sales to underage people. *Addiction*, *91*, 589-602.

Wolfson, M., Wagenaar, A.C., and Hornseth, G.W. (1995). Law officer's views on enforcement of the minimum drinking age: A four-state study. *Public Health Reports, 110*, 428-438.

Wood, M.D., Nagoshi, C.T., and Dennis, D.A. (1992). Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse, 18*(4), 461-476.

Wright, P.A. (n.d.). *Organizing for change: Confronting alcohol, tobacco, and other drug issues at the grassroots levels.* Center for Substance Abuse Prevention. Rockville, MD: University Research Corporation.

Wyllie, A., Zhang, J.F., and Casswell, S. (1998a). Responses to televised alcohol advertisements associated with drinking behavior of 10–17-year-olds. *Addiction, 93*(5), 361–371.

Wyllie, A., Zhang, J.F., and Casswell, S. (1998b). Positive responses to televised beer advertisements associated with drinking and problems reported by 18 to 29 year olds. *Addiction*, *93*(5), 749-760.

Yu, J., Varone, R., and Shacket, R.W. (1997). *Fifteen-year review of drinking age laws: Preliminary findings of the 1996 New York State Youth Alcohol Survey.* New York: Office of Alcoholism and Substance Abuse.

Ziemelis, A. (1998, January). *Drug prevention in higher education: Efforts, evidence, and promising directions*. Paper presented at the Higher Education Center for Alcohol and Other Drug Prevention Annual Meeting, Charleston, SC.

Zimring, F.E. (1982). *The changing legal world of adolescence*. New York: Free Press.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Lawrence Erlbaum.

Zwerling, C., and Jones, M.P. (1999). Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine, 16*(Suppl. 1), 76-80.

Appendix A

Statement of Task

The Board on Children, Youth, and Families of the National Research Council and the Institute of Medicine will form a new committee to review existing federal, state and nongovernmental programs, including media-based programs, designed to change the attitudes and health behaviors of youth. The review will include programs that focus directly on behavior change as well as those designed to change underage drinking behavior through reduction of adolescent access to alcohol (such as through increased excise taxation, aggressive enforcement of age and identification checks, and restriction of alcohol on college campuses). The committee shall produce a consensus panel report based on this review. The report will provide a cost-effective strategy to prevent and reduce underage drinking, including: an outline and implementation plan, message points that will be effective in changing the attitudes and health behaviors of youth concerning underage drinking, target audience identification, goals and objectives, and the estimated costs of development and implementation.

The committee will meet several times during the course of this study. It will begin by developing a general approach to conducting this project, including the identification of criteria for selection of appropriate programs for review. The committee will plan and oversee a public forum to obtain input from all relevant stakeholders and will hear presentations from a variety of experts regarding various aspects of substance abuse prevention and youth behavior change. These presentations may be accompanied by additional independent analyses or commissioned work that addresses various components of the overall committee charge.

The committee will produce a consensus report that will be widely disseminated to interested stakeholders.

Appendix B

Agenda and Participants October 10-11, 2002 Public Workshop

Agenda

Thursday, October 10, 2002

11:00 a.m. **Welcome and Purpose of the Workshop**

Richard J. Bonnie, Committee and Workshop Chair
University of Virginia Law School

11:15 **Underage Drinking: The Scope and Consequences of the Problem**

Epidemiology of Underage Drinking
Robert Flewelling, Pacific Institute for Research and Evaluation

Health Consequences
Sandra Brown, University of California, San Diego

Social Costs and Consequences
Ralph Hingson, Boston University School of Public Health

12:00 p.m. Open Discussion

12:30 LUNCH

1:15 **Risk Factors, Risk Perception, and Youth Decision Making**

Risk and Protective Factors and Cognitive Development
Bonnie Halpern-Felsher, University of California, San Francisco

Risk Perception and Decision Making
Janis Jacobs, Pennsylvania State University

Respondent: Robert Pandina, Rutgers

2:00 Open Discussion

2:30 **The Special Case of the Military**

Kenneth Hoffman, United States Army Medical Corps

2:45 Open Discussion

3:00 **Media and Advertising**

Media-Based Interventions
Charles Atkin, Michigan State University

Industry Marketing and Advertising Strategies
James O'Hara, Center on Alcohol Marketing and Youth

The Effect of Advertising on Youth
Joel Grube, Prevention Research Center

4:00 Open Discussion

4:30 **Alcohol Use and Misuse Prevention Strategies for Minors**

William Hansen and Linda Dusenbury, Tanglewood Research Inc.

5:00 Open Discussion

5:30 Adjourn

Friday, October 11, 2002

8:00 a.m. Continental Breakfast

8:30 Welcome and Brief Recap

Richard J. Bonnie

8:45 **The Special Case of College Drinking**

A Call To Action
Ralph Hingson, Boston University School of Public Health

Respondent: Daniel Trujillo, Massachusetts Institute of Technology

9:15 Open Discussion

9:45 BREAK

10:00 **Drinking and Coming of Age in a Cross-Cultural Perspective**

Robin Room, Center for Social Research on Alcohol and Drugs
Stockholm University

10:30 Open Discussion

11:00 **Environmental Approaches**

Supply-Side Approaches
Harold Holder, Prevention Research Center

The Effect of Pricing
Frank Chaloupka, University of Illinois at Chicago

11:30 Open Discussion

12:00 p.m. LUNCH

1:00 **Lessons Learned from Youth Smoking Prevention**

Paula Lantz, University of Michigan School of Public Health

1:30 Discussion

2:00 Closing Remarks

2:30 Workshop Adjourns

OTHER PARTICIPANTS

Kimberly Ball, The Century Council
Jeff Becker, Beer Institute
Gayle Boyd, National Institute on Alcohol Abuse and Alcoholism
John Calfree, American Enterprise Institute
Shannon Campagna, National Beer Wholesalers Association
Sharon Cantelon, Office of Juvenile Justice and Delinquency Prevention
Joan Corboy, Remove Intoxicated Drivers
Johnneta Davis-Joyce, Pacific Institute for Research and Evaluation
Arthur DeCelle, Beer Institute
Gary Decker, The Century Council
Andy Dobson, National Beer Wholesalers Association
Gwyndolyn Ensley, Department of Health and Human Services
Susan Ferguson, Insurance Institute for Highway Safety
James Frank, National Highway Traffic Safety Administration
David French, Mothers Against Drunk Driving
D. St. George, Center for Substance Abuse and Prevention
Monica Gourovitz, Distilled Spirits Council of the U.S.
Pat Green, The CDM Group
Susan Haney, Beer Institute
Roberta Hochberg, Leadership to Keep Children Alcohol Free
Kelly Kahn, National Institute on Alcohol Abuse and Alcoholism
Geoffrey Laredo, National Institute on Alcohol Abuse and Alcoholism
Laurie Knight, National Beer Wholesalers Association
Stephanie Manning, Mothers Against Drunk Driving
Mina McDaniel, Greer, Margolis, Mitchell, Burns, and Associates
Michael Miguel, representative of Congressman Dan Miller
Kimberly Miller, Center for Science in the Public Interest
Thomas Murphy, Department of Justice
Cheryl Neverman, National Highway Traffic Safety Administration
Patricia Powell, National Institute on Alcohol Abuse and Alcoholism

Craig Purser, National Beer Wholesalers Association
Amber Reed, Beer Institute
Rebecca Reeve, Governor's Institute on Alcohol and Substance Abuse
Cynthia Simms, National Capital Coalition to Prevent Underage Drinking
Joe Stanton, Beer Institute
Erik Strickland, Mothers Against Drunk Driving
Leslie Snyder, association not known
Will Taliaferro, Greer, Margolis, Mitchell, Burns, and Associates
Kyndel Turvaville, Beacon Consulting Group
Judith Vicary, Pennsylvania State University
Allan Williams, Insurance Institute for Highway Safety
Steve Wing, Substance Abuse and Mental Health Services Administration
Donald Zeigler, American Medical Association

Appendix C

Agenda and Participants, November 18, 2002 Open Committee Meeting and Public Forum

Agenda

This meeting is being held to gather information to help the committee conduct its study. This committee will examine the information and material obtained during this, and other public meetings, in an effort to inform its work. Although opinions may be stated and lively discussion may ensue, no conclusions are being drawn at this time; no recommendations will be made. In fact, the committee will deliberate thoroughly before writing its draft report. Moreover, once the draft report is written, it must go through a rigorous review by experts who are anonymous to the committee, and the committee then must respond to this review with appropriate revisions that adequately satisfy the Academy's Report Review committee and the chair of the NRC before it is considered an NRC report. Therefore, observers who draw conclusions about the committee's work based on today's discussions will be doing so prematurely.

Furthermore, individual committee members often engage in discussion and questioning for the specific purpose of probing an issue and sharpening an argument. The comments of any given committee member may not necessarily reflect the position he or she may actually hold on the subject under discussion, to say nothing of that person's future position as it may evolve in the course of the project. Any inference about an individuals position regarding findings or recommendations in the final report are therefore also premature.

11:30 a.m. Cultural/Community Panel:
Presentation of Working Papers

Matthew Taylor, University of Wisconsin-La Crosse
Felipe Castro, Arizona State University
Douglas Novins, University of Colorado,
Health Sciences Center

12:30 p.m. LUNCH (on your own)

1:15 **Research on Youth Perspectives**

Jeff Arnett, University of Maryland

1:45 **The Role of Sanctions in Underage Drinking**

Thomas Hafemeister, University of Virginia

2:15 BREAK

2:30 Public Forum, Speakers

Wesley Perkins (Hobart and William Smith Colleges)
Jeff Linkenbach (Montana State University)
John Nelson (American Medical Association)
Jeff Becker (Beer Institute)
Adam Chafetz (Health Commission)
Chris Curtis (Virginia Dept. of Alcoholic Beverage Control)
Justin Saint Cyr (Youth Activist)
William Georges (The Century Council)
Monica Gourovitz (Distilled Spirits Council of the U.S.)
Kimberly Miller (Center for Science in the Public Interest)
Wendy Hamilton (Mothers Against Drunk Driving)
David Mitchell (Greer, Margolis, Mitchell, Burns, and Associates)
Murphy Painter (Louisiana Office of Alcohol and Tobacco Control)
Jasmine Pickner (Student Activist)
Theresa Racicot (Leadership to Keep Children Alcohol Free)
David Rehr (National Beer Wholesalers Association)

Gary Stapleton (Student Activist-Students Against Drunk Driving)
Penny Wells (Students Against Drunk Driving)

5:30/6:00 Adjourn

OTHER PARTICIPANTS

Gayle Boyd, National Institute on Alcohol Abuse and Alcoholism
Shannon Campagna, National Beer Wholesalers Association
Joan Corboy, Remove Intoxicated Drivers
Jacquelyn D'Addams, Greer, Margolis, Mitchell, Burns, and Associates
Johnneta Davis-Joyce, Pacific Institute for Research and Evaluation
Arthur DeCelle, Beer Institute
Andy Dobson, National Beer Wholesalers Association
Susan Ferguson, Insurance Institute for Highway Safety
James Frank, National Highway Traffic Safety Administration
Stacy Harbison, Arent, Fox, Kintner, Plotkin, and Kahn
Shelly Jackson, National Institute of Justice, Washington, DC
Michael Johnson, Wine and Spirits Association of America
Laurie Knight, National Beer Wholesalers Association
Jennifer Loukissas, National Institute on Alcohol Abuse and Alcoholism
Stephanie Manning, Mothers Against Drunk Driving
Suzanne Medgycsi-Mistchang, Institute on Alcohol Abuse and Alcoholism
Thomas Murphy, Department of Justice
Geoffrey Laredo, National Institute on Alcohol Abuse and Alcoholism
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Appendix D

Other Public Contributors

The committee commissioned numerous papers to synthesize the scientific literature and inform the committee's deliberations. Some of the papers had multiple authors, although only the lead author presented the papers to the committee at their meetings (see Appendixes B and C). The work of all of the authors is appreciated; they are all listed below under paper authors.

Multiple other organizations or individuals provided written information to the committee or responded to specific requests for information from the committee. Those individuals are listed below as other contributors. Individuals listed in earlier appendixes are not repeated here.

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Appendix E

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Richard J. Bonnie (*Chair*) is John S. Battle professor of law and professor of psychiatric medicine at the University of Virginia and director of the university's Institute of Law, Psychiatry, and Public Policy. He writes and teaches in the fields of criminal law and procedure, mental health law, bioethics, and public health law. Active in public service throughout his academic career, he served as associate director of the National Commission on Marijuana and Drug Abuse (1971-1973); as a member of the National Advisory Council on Drug Abuse (1975-1980); as chair of Virginia's State Human Rights Committee, responsible for protecting rights of persons with mental disabilities (1979-1985); and as adviser for the American Bar Association's Criminal Justice Mental Health Standards Project (1981-1988). He was a member of the John D. and Catherine T. MacArthur Foundation Research Network on Mental Health and the Law (1988-1996), and is currently on the MacArthur Research Network on Mandated Community Treatment. He is a member of the Institute of Medicine.

Marilyn Aguirre-Molina is a professor of population and family health at the Mailman School of Public Health at Columbia University. Previously, she served as the executive vice president of the California Endowment and as a senior program officer at the Robert Wood Johnson Foundation. Her work focuses on program development and applied research that address policy and public health approaches to the prevention of health problems among young people (alcohol and tobacco use), particularly among ethnic and racial minority populations. She is a member of various

national boards and committees that focus on public health issues, including the National Advisory Council of the National Institute on Alcohol Abuse and Alcoholism and the Subcommittee on College Drinking at the National Institutes of Health. In addition to her interest in health promotion for youth, she has worked extensively on Latino health policy issues. Her most recent book is *Latina Health in the U.S.: A Public Health Reader*.

Philip J. Cook is the ITT/Terry Sanford distinguished professor of public policy studies, professor of economics, and professor of sociology at Duke University. His research has focused on the costs and consequences of the widespread availability of guns, the prevention of alcohol-related problems through restrictions on alcohol availability, the efficacy of minimum-purchase-age laws in preventing fatal crashes, and the causes and consequences of the growing inequality of earnings. He is a member of the Institute of Medicine.

Judith A. Cushing is president and chief executive officer of the Oregon Partnership, a statewide nonprofit organization dedicated to substance abuse prevention and treatment referral services. Previously, she served as project coordinator of the Oregon Office of Alcohol and Drug Abuse Programs' Oregon Together Project responsible for all aspects of strategy implementation using the risk and protective factor model for 75 community coalitions throughout Oregon. That project became the national model for Communities That Care, a research-based model for community based prevention and mobilization. She is a lecturer, adviser, and consultant to national, state, and community organizations, including the White House Office of National Drug Control Policy, the Substance Abuse and Mental Health Services Administration, and the National Institute on Alcohol Abuse and Alcoholism. A member of national advisory boards at the Drug Enforcement Administration and Community Anti-Drug Coalitions of America, she also serves on the executive board of the National Family Partnership. She is a 1994 fellow of the Join Together National Leadership Fellows Program.

Joel W. Grube is director of the Prevention Research Center of the Pacific Institute for Research and Evaluation. Previously, he was coordinator of the Public Opinion Laboratory (1977-1978) and assistant director of the Social Research Center at Washington State University (1978-1981); senior research officer at the Economic and Social Research Institute in Dublin, Ireland (1981-1983); and a postdoctoral research fellow in alcohol studies at the School of Public Health of the University of California, Berkeley (1985-1986). His research focuses on social-psychological and environmental influences, including advertising and the media, on drinking and other problem behaviors among adolescents and young adults. His current research projects include a longitudinal study of the effects of alcohol outlet density on underage drinking and drinking problems, a longitudinal study

on the effects of alcohol advertising on the drinking beliefs and behaviors of children and adolescents, and a longitudinal study on the effects of exposure to sexuality in the media on adolescents' sexual risk taking.

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William B. Hansen has been president of Tanglewood Research since 1993. He received an honors B.A. degree from the University of Utah and M.S. and Ph.D. degrees in social psychology from the University of Houston. He has served on the faculty at UCLA (1978-1984), the University of Southern California (1980-1989), and Bowman Gray School of Medicine (1989-1996). A widely recognized expert in alcohol and drug prevention, he has written numerous curricula for school and community-based prevention, including Project SMART, Project STAR, and All Stars. He has authored more than 80 articles in scientific journals on research and evaluation methods, prevention theory, and strategies for successful prevention practice. The goal of his research has been to identify and evaluate evidence-based approaches to prevention that can achieve reductions in the onset of use and that can be applied in everyday settings. He has been the principal investigator on major studies to test norm setting and refusal skills strategies for preventing the onset of alcohol use and the development of alcohol problems among young adolescents, the basis of common alcohol and drug abuse education efforts, and projects designed to translate knowledge about prevention into practice. He has been an adviser to the U.S. Office of Technology Assessment, the U.S. Department of Education, the National Institute on Drug Abuse, the Center for Substance Abuse Prevention, numerous state agencies, numerous foundations, the United Nations, the Swiss, Spanish, Mexican, and Portuguese Departments of Health, and the U.S. Information Agency.

Denise Herd is associate professor of behavioral sciences in the Division of Health and Social Behavior of the School of Public Health at the University of California, Berkeley. Her research focuses on drinking and drug use patterns and problems, images of alcohol and violence in rap music, activism regarding local alcohol policy in African American commu-

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Janis Jacobs is professor of human development and family studies, professor of psychology, and vice provost for Undergraduate Education and International Programs at Pennsylvania State University. Her research and writing focus on the development of social cognitive processes during childhood and adolescence. One major area of study focuses on the formation of judgment biases in real-world decisions, emphasizing developmental trends during childhood and adolescence, and the role of social influences on judgment and decision making. Her second major area of study also involves social cognition, but is focused on gender differences in achievement motivation, self-perceptions of achievement, and parents' influence on achievement. She has worked on two longitudinal survey studies, one in which the self-perceptions, achievement attitudes, and choices of a group of individuals were tracked between ages 6 and 18, and the other in which the self-perceptions and achievement choices of a group were tracked between ages 12 and 28. In her role as vice provost, she has been involved in the university's efforts to prevent underage and binge drinking.

Mark H. Moore is the Guggenheim Professor of criminal justice policy and management and director of the Hauser Center for Non-Profit Organizations at the Kennedy School of Government at Harvard University. He was the founding chairman of the Kennedy School's Committee on Execu-

tive Programs and served in that role for over a decade. He is also the faculty chair of the school's Program in Criminal Justice Policy and Management. His research interests are in public management and leadership, in criminal justice policy and management, and in the intersection of the two. In the intersection of public management and criminal justice, he has written (with others) *From Children to Citizens: Vol. I., The Mandate for Juvenile Justice and Beyond 911: A New Era for Policing.*

Mary Ellen O'Connell is a senior program officer with the Board on Children, Youth, and Families. She is the study director for the Committee on Developing a Strategy to Reduce and Prevent Underage Drinking and the Committee on Evaluation of Children's Health: Measures of Risk, Protective and Promotional Factors for Assessing Child Health in the Community. Mary Ellen also developed two standalone workshops for the board on welfare reform and children and gun violence. She came to the board from the U.S. Department of Health and Human Services (HHS), where she spent 8 years in the Office of the Assistant Secretary for Planning and Evaluation (ASPE), most recently as director of State and Local Initiatives. During her tenure in ASPE, Mary Ellen focused on data, research, and policy related to homelessness and community-based health decision making. Prior to HHS, Mary Ellen worked at the U.S. Department of Housing and Urban Development on homeless policy and program design issues. She also was a member of an R.O.W. Sciences' team conducting the national evaluation of an NIAAA research demonstration project and worked for several years at the department of public welfare in the Commonwealth of Massachusetts as the director of field services. Mary Ellen received her bachelor's degree with distinction from Cornell University and a master's degree in the management of human services from the Heller School at Brandeis University.

Daniel A. Trujillo is the associate dean for Community Development and Substance Abuse programs at the Massachusetts Institute of Technology. He also serves as a center associate for the U.S. Department of Education's Higher Education Center for Alcohol and Other Drug Prevention. His major areas of research have focused on environmental and individual strategies for alcohol and other drug prevention and intervention. Previously, while at the University of Missouri-Columbia, the State University of New York-Albany, and the Massachusetts Institute of Technology, he directed the development, implementation, and evaluation of social norm marketing campaigns targeting alcohol use, sexual behavior, and health protective behavior; the development of university-community coalitions to work with city and state agencies and local tavern owners to end alcohol advertising and promotions on campus, to end drink specials offered in local licensed establishments, and to increase the enforcement of underage

drinking laws; and the revision, implementation, and evaluation of policy and sanction initiatives, including the use of parental notification. He is currently working with the Massachusetts Department of Public Health on the implementation and evaluation of a statewide coalition project to address underage and problem drinking.

Index

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

W

Y

Z

1

The Epidemiology of Underage Drinking in the United States: An Overview

*Robert L. Flewelling, Mallie J. Paschall, and Christopher Ringwalt**

Alcohol is by far the most widely used psychoactive substance in the United States. This is true for both adults and adolescents, even though the minimum legal age for drinking is 21 in all states. Underage drinking is a pressing public health and safety concern because of the high prevalence of this behavior and the correspondingly high costs it exacts, either directly or indirectly, in terms of lost lives, injury and disability, illness, damaged interpersonal relationships, and lost productivity. In addition, early involvement with drinking has been shown to increase the likelihood of alcohol-related problems as an adult (Grant and Dawson, 1997; Hingson, Heeren, Levenson, and Voas, 2002).

The purpose of this chapter is to provide an overview of what is known about the prevalence, patterns, and trends of underage drinking in this country from an epidemiological perspective. The information presented is based primarily on data that are available from large-scale national surveys that have been conducted regularly for many years. It also focuses on what might be considered fairly basic measures and patterns of alcohol use, and breakdowns in these measures according to standard demographic characteristics such as age, gender, and race/ethnicity. These demographic characteristics should not be viewed as the causes of observed differences in alcohol use patterns across subgroups. Rather, they serve as easily identified markers for subgroups of the population that may share relatively

*The authors of this chapter thank Teresa Russell and Melinda Pankratz for their assistance with data management and analysis tasks, and with preparation of graphic displays.

similar experiences, accumulated over the life course, that help to shape alcohol-related attitudes, beliefs, and drinking behaviors.

Creditable information on the scope, demographic patterns, and trends in underage drinking behaviors provides an important empirical foundation in helping to justify and prioritize needs for policies and programmatic efforts to address this problem and reduce its negative public health consequences. Rigorous analysis of even more detailed epidemiologic data can also contribute to our understanding of the factors that influence this behavior and help suggest more specific strategies for preventing it.[1] Because the purpose of this chapter is to provide a broad overview of underage drinking patterns and trends, rather than examine etiological factors, it does not include complex analyses that simultaneously involve or control for multiple variables. Research based on such strategies, however, will be cited in a number of the more substantively focused chapters in this volume in order to support particular perspectives on underage drinking and approaches for addressing the problem.

Underage Drinking: Measures and Data Sources

Measures of Alcohol Use

Since 1988, and as a direct consequence of the passage of the National Minimum Drinking Age Act in 1984, the minimum legal drinking age for every state in the nation has been 21. In this context, the term "underage drinking" refers to alcohol consumption by persons less than 21 years of age, and is the focus of this volume. Statistics presented in this chapter, therefore, focus primarily on persons under the age of 21. Furthermore, because there appears to be very little alcohol use by persons under the age of 12, and because surveillance data are generally not available for persons younger than 12 anyway, the age range of interest is further delimited by a lower bound of 12 years. Some of the information presented here, however, is based on somewhat different or more restricted age ranges because readily available epidemiological data do not always coincide precisely with this age range, or they pertain to only subsets within this range. Such circumstances are noted accordingly.

In attempting to quantify "drinking" behavior, whether with respect to an individual person or in aggregate, it is clear that no single measure or dimension can adequately capture all the meaningful attributes of this behavior. For example, both the amounts of alcohol consumed and the tem-

[1]For a pertinent discussion of ways in which epidemiologic studies contribute to the substance abuse prevention field, see Johnston (1991).

poral patterns of consumption within a specified time frame describe important aspects of underage drinking, or drinking by persons of any age for that matter, that are directly linked with the extent and seriousness of potential problems due to that behavior. A number of different measures, therefore, have been developed and are routinely used in epidemiologic surveys to measure patterns of alcohol use.

There are currently no universally accepted measures of alcohol use, and patterns of use, even among researchers. Even a standard dichotomous measure of lifetime use must deal with such methodologically vexing issues as whether and how to exclude alcohol used in religious services. More sophisticated measures of quantity and frequency of alcohol consumption are still confounded by variations in the alcohol content of different types of beverages, and differences in the sizes of standard drinks.

With these limitations in mind, the types of survey instrumentation used to assess alcohol consumption generally may be categorized as follows. "Frequency" measures ask the respondent to report typical drinking frequency over a specified reference period (e.g., a month or year); response categories vary, but may include options such as "never," "once a month," "once a week," and "daily." "Quantity/frequency" (QF) measures tap both drinking frequency and the average quantity of alcohol consumed on any given occasion, yielding a measure of the total amount of alcohol consumed. Frequency and QF measures may be obtained for alcohol use in general (i.e., any type or alcoholic beverage), or separate responses may be solicited for each specific type of beverage (e.g., beer, wine, hard liquor). "Graduated frequency" measures, a subset of QF, begin with a question concerning the greatest amount of alcohol consumed within a given referent period (and the number of occasions on which this amount of alcohol was consumed), then ask about the number of occasions on which each progressively smaller amount of alcohol was imbibed. Although there is evidence that such measures yield more accurate estimates of drinking patterns and the volume of alcohol consumed (Greenfield, 2000), the number of questions necessary limits the utility of this approach in large, multipurpose surveys. Two other types of alcohol consumption questions, which are less well suited for a survey format, include "short-term recall methods" in which respondents are asked to remember each drink consumed over a several-day period, and "diary methods," in which participants record their alcohol consumption prospectively. In general, the more detailed the questions, the greater the estimates (Dufour, 1999).

Measures of "heavy" or "binge" drinking, concepts used by the Monitoring the Future (MTF) and National Household Survey on Drug Abuse (NHSDA) studies respectively, also vary in their specific definitions. Heavy or binge drinking is customarily defined as having five or more drinks on any one occasion during a specific period, although for women that number

is sometimes reduced to four or more drinks. More sophisticated still are measures that take into account the respondent's body weight in calculating a ratio of consumption to mass. Generally speaking, however, the consumption rates and patterns that are employed by epidemiologists interested in surveillance, and reported here, are more straightforward. The simplest of these measures, including any use and "heavy use" in the respondent's lifetime or the previous 30 days and the frequency of consumption within these periods, may be relatively crude but still are widely used due to their ease of measurement and straightforward interpretation.

Measures of Alcohol Abuse and Dependence

In addition to measures of drinking per se, such as frequency of use and quantity of alcohol consumed, another important dimension of drinking behavior is whether it causes significant problems for the user or is indicative of physiological dependency. Diagnostic criteria have been developed for assessing symptoms of alcohol dependence and various other problems stemming from alcohol use. Recent attempts to construct survey-based measures for these conditions have been based on criteria for alcohol dependence and abuse as stipulated in the Diagnostic Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, American Psychiatric Association [APA], 1994) for both clinical and general population studies. The DSM-IV includes four criteria for alcohol abuse and seven criteria for alcohol dependence, which are summarized in Table 1-1.

According to the DSM-IV, a person receives a diagnosis of *alcohol abuse* if he or she experiences at least one of the abuse criteria and does not meet the definition for dependence. A person receives a diagnosis of *alcohol dependence* if he or she meets at least three of the seven dependence criteria.

The NHSDA, which is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), has included questions to estimate alcohol *dependence* in the United States population age 12 and older since 1991. From 1991 to 1993, DSM-III-R dependence criteria (APA, 1987) were used, and DSM-IV dependence criteria (APA, 1994) have been used in subsequent years. An additional criterion of dependence for the NHSDA is that a person must have used alcohol on six or more days in the past year. In 2000, a number of changes were made to alcohol dependence questions to improve their reliability and validity (SAMHSA, 2002a). The revised dependence questions were generally more restrictive and less global than the ones used prior to 2000, and resulted in somewhat lower prevalence estimates of alcohol dependence in the U.S. population. Also in 2000, DSM-IV questions regarding alcohol *abuse* were included in the NHSDA for the first time. As with dependence, an additional criterion applied in the NHSDA is that a person must have used alcohol on six or

TABLE 1-1 Criteria for Alcohol Abuse and Dependence as Defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)

Alcohol Use Disorder	Brief Identifier of Symptom	DSM-IV Definition
Alcohol abuse	Role impairment	Frequent intoxication leading to failure to fulfill major role obligations (e.g., at school, work, or home)
	Hazardous use	Recurrent use when it is physically hazardous (e.g., driving while intoxicated)
	Legal problems	Recurrent alcohol-related legal problems
	Social problems	Continued drinking despite knowledge of persistent or recurrent social or interpersonal problems caused by or exacerbated by alcohol use
Alcohol dependence	Tolerance	Need to increase consumption by 50 percent or more to achieve the same effects; markedly reduced effects when drinking the same amount
	Withdrawal	Signs of alcohol withdrawal; drinking to avoid or relieve withdrawal
	Using more or longer than intended	Recurrent drinking of larger amounts or for a longer period of time than intended
	Quit/cut down	Unsuccessful attempts or a persistent desire to quit or cut down on drinking
	Much time spent using alcohol	Much time spent using, obtaining, or recovering from the effects of alcohol
	Reduced activities	Important social or recreational activities given up or reduced in favor of alcohol use
	Psychological/ physical problems	Continued drinking despite knowledge of a recurrent or persistent psychological or physical problem caused or exacerbated by alcohol use

SOURCE: Martin and Winters (1998).

more days in the past year. Prevalence estimates for alcohol dependence and abuse in the underage drinking population (based on the 2000 NHSDA) are provided in a later section of this chapter.

Some concerns have been raised about the validity of survey-based self-report measures for assessing conditions such as alcohol abuse and dependence, especially among adolescents. For example, very low prevalence rates of certain alcohol abuse and dependence symptoms (e.g., legal problems, withdrawal symptoms) have been observed in both clinical and general population samples of adolescents and young adults (Martin and Winters,

1998; SAMHSA, 2002a), raising questions about (1) the appropriateness of using DSM-IV alcohol abuse and dependence criteria for underage youth, and (2) the most appropriate methodology for assessing alcohol use disorders in the underage population. In addition, drinking behaviors tend to be sporadic during the developmental period of adolescence and early adulthood, and most alcohol use disorders take years to develop. Moreover, some indicators of abuse such as driving after drinking may not be relevant for adolescents under the age of 16. Thus, DSM-IV criteria may be less reliable and valid indicators of abuse and dependence for youthful drinkers than adult drinkers.

Based on these considerations, it is suggested that the data provided in this chapter regarding alcohol abuse and dependence, which are derived from the 2000 NHSDA, be interpreted with caution, as they may not reflect the prevalence rates that would be obtained through clinical diagnoses. Even so, the survey questions have strong face validity as being indicative of problems stemming from alcohol use and symptoms of dependence. Studies to assess the reliability and validity of adolescent self-report measures of abuse and/or dependence generally have found such measures to be consistent with information obtained from parents, peers, and archival records (Martin and Winters, 1998).

One particular type of abusive drinking behavior is so directly and specifically linked with immediate negative consequences that it is often assessed and reported separately from other alcohol-related problems and conditions. This behavior is driving a motorized vehicle while under the influence of alcohol (DUI), and is captured through a single specific item in the NHSDA separate from the criterion items used to assess alcohol abuse. Although data on the consequences of this behavior, which can be measured in terms of DUI arrests and alcohol-related crashes and fatalities, are provided in Chapter 2, epidemiologic data on self-reported DUI are reported in this chapter along with the other measures of underage alcohol use already described.

Data Sources

A number of ongoing or recently conducted national surveys provide information on drinking behaviors of underage persons in the United States. Nationally representative surveys that are conducted on an annual or biannual basis, and that include persons under age 18 in their samples, include:

- National Household Survey on Drug Abuse (NHSDA)
- Monitoring the Future (MTF)
- Youth Risk Behavioral Survey (YRBS)

The NHSDA target population includes all persons in the United States aged 12 and older except the homeless, active military, and those living in institutionalized group quarters such as jails or hospitals. Interviews are conducted in person and at the respondents' place of residence. Since 1999, the mode of administration has been the computer-assisted interview (CAI), which includes the use of audio computer-assisted self-interview (ACASI) for all sections of the interview in which respondents are asked to provide information regarding sensitive behaviors.

MTF and YRBS are school-based surveys in which students comprise the target population (grades 8, 10, and 12 for MTF and grades 9 through 12 for YRBS). Information is provided by respondents through self-completion of optically scannable forms, usually in the classroom.

Estimates of the prevalence of alcohol use by adolescents based on the NHSDA have consistently been lower than those based on the MTF and YRBS. For example, the estimated prevalence of any alcohol use in the past month for twelfth-grade students as provided by the 2001 MTF is 50 percent, whereas the NHSDA-based estimate for twelfth-grade students is 40 percent. Somewhat larger proportional differences were obtained for eighth- and tenth-grade students (SAMHSA, 2002b, Table E.10). Although some degree of underreporting with the NHSDA is suspected due to the fact that the interviews are conducted in respondents' homes, it is also possible that exaggeration of risky behaviors occurs in the classroom settings used for the school-based surveys. Even though there are differences in the absolute rates of alcohol use provided by household-based and school-based surveys, the demographic patterns of use and the trends across time in alcohol use measures have been remarkably consistent across the different surveys (Harrison, 2001).

The summary data provided in this chapter are based primarily on the NHSDA. This source was used because it covers the entire age range of "underage" persons (i.e., ages 12 to 20), thus allowing all analyses, including comparisons across age subgroups, to be based on the same survey. In addition, the NHSDA includes school-aged respondents who are not in school (or are home schooled). Findings from the MTF and YRBS, however, are used to augment those based on the NHSDA. Voluminous summary data for all three surveys, in both graphical and tabular form and including many more ways of breaking down the data than could be included in this chapter, are available from the sponsoring agencies for each of these surveys.

A number of other data sources that are national in scope also provide information on drinking behaviors of underage persons (or various subsets thereof), but do not meet the specific criteria used in identifying the three survey data sources just described. For example, a large school-based sur-

vey of students in grades 6 through 12 is conducted annually by the Parents' Resource Institute for Drug Education (PRIDE). Although the PRIDE survey does not employ a stratified national sampling design, its size and extensive coverage in many states produce overall estimates that are typically close to the national estimates based on the MTF.

The National Alcohol Survey and the National Longitudinal Alcohol Epidemiologic Survey both provide detailed information on drinking behaviors and patterns among adults aged 18 and older, and thus cover at least a portion of the "underage" population. In addition, three different national surveys are (or have recently been) conducted with college students: the College Alcohol Study conducted by the Harvard School of Public Health, the Core Institute Survey conducted by Southern Illinois University, and the National College Health Risk Behavior Survey conducted by the Centers for Disease Control and Prevention. Although data from these surveys are not incorporated into the findings presented in this chapter, they are sources for detailed information on drinking behavior of specific segments of the underage population.

Prevalence of Underage Drinking Behaviors and Patterns in the United States[2]

Age, Race/Ethnicity, and Gender Differences in Past-Month Alcohol Use

Even before they reach the age of 21, the majority of persons in the United States have consumed an alcoholic beverage at least once in their lifetime. In fact, the majority of 20-year-olds report consuming alcohol in the past month, and thus may be categorized as "current" users. As would be expected, the estimated prevalence of current use based on the 2000 NHSDA increases steadily with age, from ages 12 to 20 (see Figure 1-1). Although not shown in the figure, the highest prevalence of past-month drinking for any age occurs at age 21 (65.2 percent in 2000), the age at which alcohol use becomes legal.

Also shown in Figure 1-1 are estimated prevalence rates based on the 2000 NHSDA, by single year of age, for heavy drinking, and for frequent

[2]As discussed in the previous section, most of the data presented here are derived from the National Household Survey on Drug Abuse (NHSDA) 2000 (the most recent year for which publicly accessible data files are available). Analysis of the preliminary Public Use File (PUF) for 2000, rather than reliance on published summary data, was necessary to construct the specific subgroupings based on age and other demographic variables that seemed most relevant to the purpose of this chapter. Because the PUF contains only a large random subset of the entire sample, the estimates presented here may vary slightly from published estimates based on the full sample.

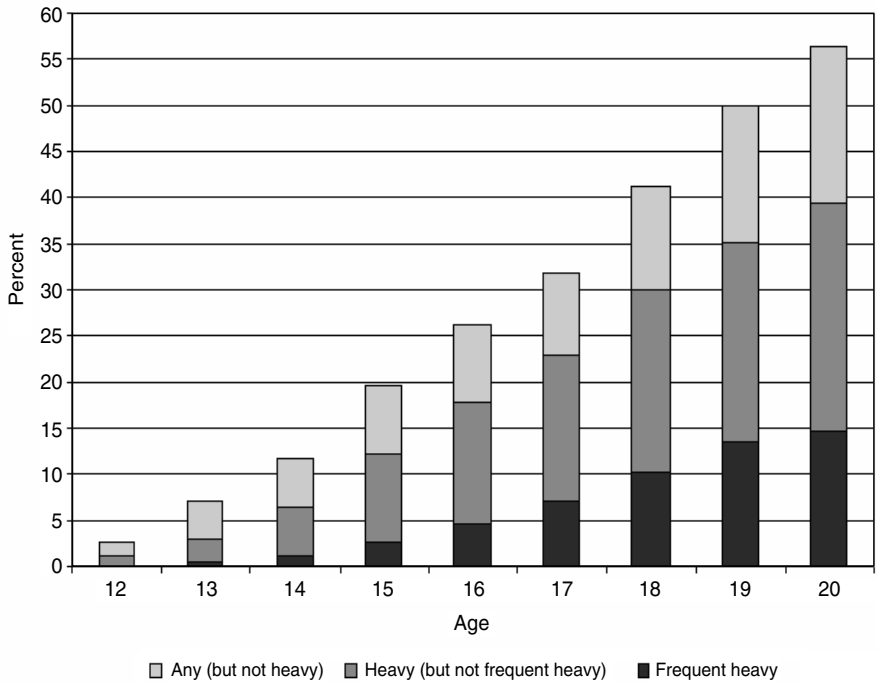

FIGURE 1-1 Prevalence of any use, heavy use, and frequent heavy use of alcohol in the past 30 days, by single years of age, 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

heavy drinking. Heavy drinking is defined here as reporting having five or more drinks on the same occasion in the past 30 days, and frequent heavy drinking as having five or more drinks (on the same occasion) on each of five or more days in the past 30 days.[3] The prevalence rates depicted in the figure are provided in tabular form in Table 1-2. This table also includes the prevalence rates for frequent drinking in the past month, defined as having used any amount of alcohol on six or more days within the past thirty days.

[3]These terms are different from those used by SAMHSA in NHSDA reports and public use data files, but are consistent with guidelines published by the *Journal of Studies on Alcohol*. For example, SAMHSA refers to having five or more drinks on one occasion within the past thirty days as "binge" drinking, and drinking this amount on five or more days in the past thirty days as "heavy" drinking.

TABLE 1-2 Prevalence of Any Use, Heavy Use, Frequent Use, and Frequent Heavy Use of Alcohol in the Past 30 Days, by Single Years of Age, 2000

	Percentage Reporting Alcohol Use in Past 30 Days			
Age	Any	Heavy	Frequent	Frequent Heavy
12	2.5	1.1	0.2	0.1
13	7.1	3.0	0.9	0.3
14	11.5	6.3	2.0	1.2
15	19.7	12.1	3.6	2.6
16	26.3	17.7	6.7	4.7
17	31.9	22.9	10.5	7.1
18	41.2	30.1	14.3	10.2
19	50.0	35.1	20.3	13.5
20	56.6	39.4	22.3	14.6

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

Immediately apparent in the data provided in Figure 1-1 and Table 1-2 is the steady increase in the prevalence of all four drinking behaviors with age. Relatively few (2.5 percent) 12-year-olds reported any alcohol use in the past month. That rate is nearly three times higher (7.1 percent) for 13-year-olds and continues to increase dramatically with each successive year. The same general pattern is evident for the other three drinking measures as well.

What is also very striking, and troubling, about Figure 1-1 is the high proportion of drinkers who are also heavy drinkers. By age 14, more than half of those who reported using any alcohol in the past month also reported that they had five or more drinks on a single occasion in the same 30-day period. The proportion of drinkers who drink heavily continues to increase with age, so that by ages 19 and 20, more than 70 percent of all drinkers are also classified as heavy drinkers. This is one of the most distinguishing patterns of underage drinking when compared to drinking patterns of adults. By age 22 (not shown in figure), the ratio of heavy drinkers to all drinkers is already starting to decrease with age, and in general, adults who drink alcohol are much less likely to be heavy drinkers than are drinkers in middle to late adolescence.

Another striking pattern evident in Table 1-2 is the relatively low prevalence of frequent drinking (i.e., drinking alcohol on six or more of the past 30 days) in comparison to the prevalence of heavy drinking. As a rule, underage drinkers are not frequent drinkers, but when they do drink, they tend to drink large amounts. Of those who are frequent drinkers, most tend to also be frequent heavy drinkers.

Significant differences in the prevalence of underage drinking across racial/ethnic groups have been observed for decades and continue to persist. Prevalence rates based on the 2000 NHSDA for any use in the past month by persons ages 12 to 20, along with rates for heavy, frequent, and frequent heavy use, broken down by major categories of race/ethnicity, are shown in Table 1-3. For all for behaviors, the prevalence rates are highest among non-Hispanic whites, followed closely by Native Americans (including Alaskan Natives). The prevalence rates for African-Americans and Asians are substantially lower than those for whites and Native Americans, while rates for Hispanics and persons reporting multiple racial/ethnic backgrounds fall about halfway between the lowest and highest values. Although the sample size for Pacific Islanders is small, it is still noteworthy that although their rates of any use and heavy use are also relatively moderate, their rates of frequent use and frequent heavy use are much closer to the relatively high values observed for whites.

Due to sample size limitations, finer breakdowns by age groups and gender within the underage population are only possible for the three major racial/ethnic groups: non-Hispanic whites, non-Hispanic African-Americans, and Hispanics. Prevalence rates for any alcohol use in the past month, by these three race/ethnicity categories, are displayed for subgroupings based on age and gender in Figure 1-2. Similar data for heavy use of alcohol are displayed in Figure 1-3. These data are repeated in tabular form, along with prevalence rates for frequent drinking and frequent heavy drinking, in Table 1-4.

The figures and table clearly show that the overall age effects described previously remain strong and consistent even when broken out by racial/ethnic group and gender. They also indicate that the relative prevalence

TABLE 1-3 Prevalence of Any Use, Heavy Use, Frequent Use, and Frequent Heavy Use of Alcohol in the Past 30 Days, Persons Ages 12 to 20, by Race/Ethnicity, 2000

	Percentage Reporting Alcohol Use in Past 30 Days			
Race/Ethnicity	Any	Heavy	Frequent	Frequent Heavy
White	30.8	21.5	10.8	7.5
African-American	18.2	10.2	4.9	2.1
Native American	28.9	20.5	10.5	5.6
Pacific Islander	23.3	15.5	8.6	7.0
Asian	14.0	8.1	2.4	1.6
Multiple races	25.1	16.8	6.6	4.6
Hispanic	24.6	16.9	6.5	4.5

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

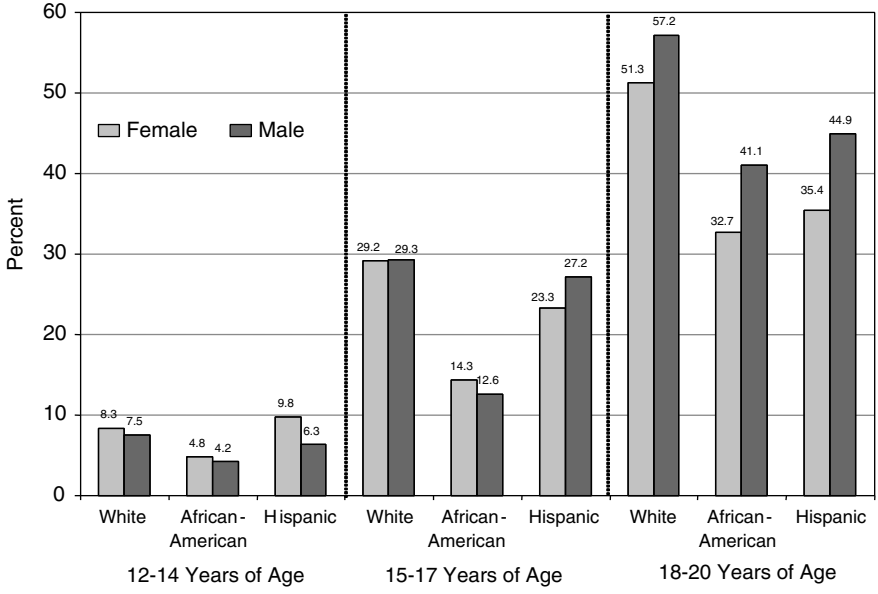

FIGURE 1-2 Prevalence of any use of alcohol in the past 30 days, persons aged 12 to 20, by gender, race/ethnicity, and age group, 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

levels across racial/ethnic subgroups observed in the aggregate generally persist when broken down by age group and gender. That is, even within most age group and gender combinations, whites consistently have the highest rates of use and African-Americans the lowest. One exception is for females in the youngest age group, where Hispanic girls have as high or higher rates than white girls on all of the drinking measures. Conversely, Hispanic females ages 18 to 20 have the lowest rates of frequent alcohol use, even lower than the rate for African-American females in this age range.

For comparison purposes, Table 1-4 also shows the prevalence rates of each drinking behavior for young adults who are of legal age, that is, ages 21 through 25. The data for this age group indicate that the prevalence of any past-month use continues to increase with age into young adulthood. This is true for all three racial/ethnic groups, for both females and males. For heavy and frequent drinking, however, meaningfully higher rates in the 21- to 25-year age group, as compared to persons ages 18 to 20, are observed only among males. For frequent heavy drinking, this pattern of higher prevalence rates in young adulthood is seen only for African-Ameri-

can males. Also, although whites continue to have the highest prevalence rates for all measures in this age group, the rates of use among African-Americans are as high as or higher than those for Hispanics. Although not shown in these analyses, it is noteworthy that the racial/ethnic differences in heavy use among underaged persons and young adults reported here do not generalize to older age groups. Among persons aged 35 and older, data from the 2000 NHSDA show that Hispanics have the highest prevalence rates of heavy use (20 percent), followed by African-Americans (17 percent) and whites (16 percent).

Other Characteristics of Underage Drinking Behavior

The information provided in the preceding section pertains to the consumption of alcoholic beverages of any type. The NHSDA does not ask about specific types of alcoholic beverages, but this information is collected annually from a subsample of seniors in the MTF study. Prevalence rates based on the 2000 MTF (Bachman, Johnston, and O'Malley, 2001) for any use of beer, wine coolers, wine, and hard liquor in the past 30 days by high

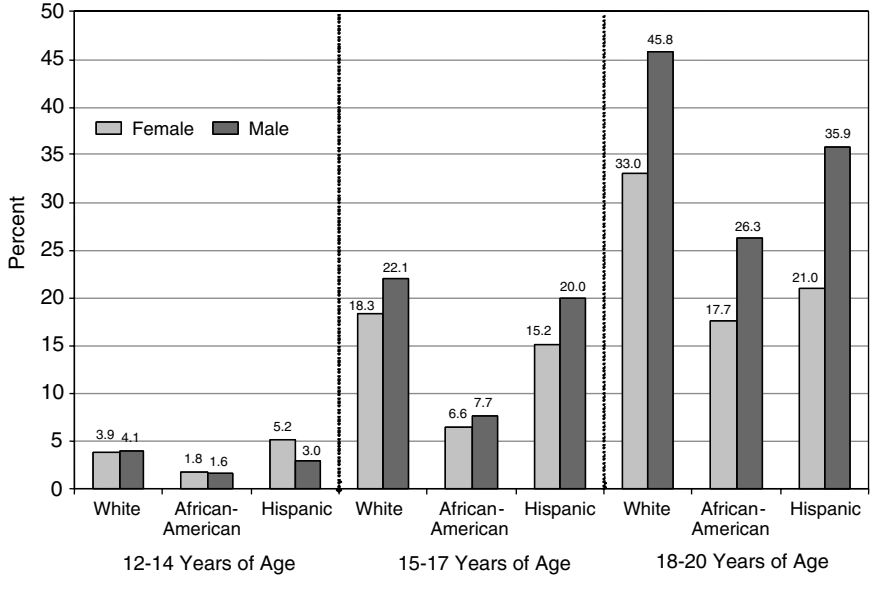

FIGURE 1-3 Prevalence of heavy use of alcohol in the past 30 days, persons aged 12 to 20, by gender, race/ethnicity, and age group, 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

TABLE 1-4 Prevalence of Any Use, Heavy Use, Frequent Use, and Frequent Heavy Use of Alcohol in the Past 30 Days, Persons Ages 12 to 25, by Gender, Race/Ethnicity, and Age Group, 2000

	Percentage Reporting Alcohol Use in Past 30 Days							
	Any Use		Heavy		Frequent		Frequent Heavy	
Age, Race/Ethnicity	Female	Male	Female	Male	Female	Male	Female	Male
Ages 12-14								
White	8.3	7.5	3.9	4.1	1.2	1.4	0.5	0.6
African-American	4.8	4.2	1.8	1.6	0.5	0.4	0.1	0.5
Hispanic	9.8	6.3	5.2	3.0	1.2	0.9	0.8	0.7
Ages 15-17								
White	29.2	29.3	18.3	22.1	7.3	8.5	4.6	6.8
African-American	14.3	12.6	6.6	7.7	2.6	3.4	0.7	2.2
Hispanic	23.3	27.2	15.2	20.0	5.1	8.2	3.5	5.7
Ages 18-20								
White	51.3	57.2	33.0	45.8	18.1	26.9	10.3	21.1
African-American	32.7	41.1	17.7	26.3	8.9	14.1	2.6	6.6
Hispanic	35.4	44.9	21.0	35.9	6.9	15.9	4.6	11.4
Ages 21-25								
White	64.8	75.7	34.6	57.3	20.7	40.2	9.0	23.5
African-American	40.3	57.6	17.5	35.5	10.7	24.0	3.4	9.8
Hispanic	38.0	55.9	22.0	44.9	7.3	19.7	3.6	10.8

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

school seniors, broken out by gender, are provided in Figure 1-4. For both females and males, beer and hard liquor are consumed by substantially higher percentages of seniors than are wine coolers and wine. For females, in fact, the use of hard liquor is nearly as prevalent as the use of beer. Although males have higher rates of past-month beer and hard liquor use, rates for use of wine coolers and wine are approximately the same for females and males.

A fairly similar pattern is seen when heavy drinking within the past two weeks is examined for each of these four beverage types (Figure 1-5). Especially noteworthy are differences across the beverage types in the relative proportions of drinkers who are also heavy drinkers (as indicated by comparing the prevalence rates shown in Figure 1-5 with those in Figure 1-4). Most beer drinkers and hard liquor drinkers also tend to be heavy drinkers of those beverages, especially among males. This tendency to drink heavily if at all is not as strong in the case of wine and wine coolers.

The annual PRIDE survey also asks about specific types of alcoholic

FIGURE 1-4 Prevalence of any use of beer, wine coolers, wine, and hard liquor in the past 30 days, high school seniors, by gender.
SOURCE: Bachman et al. (2001).

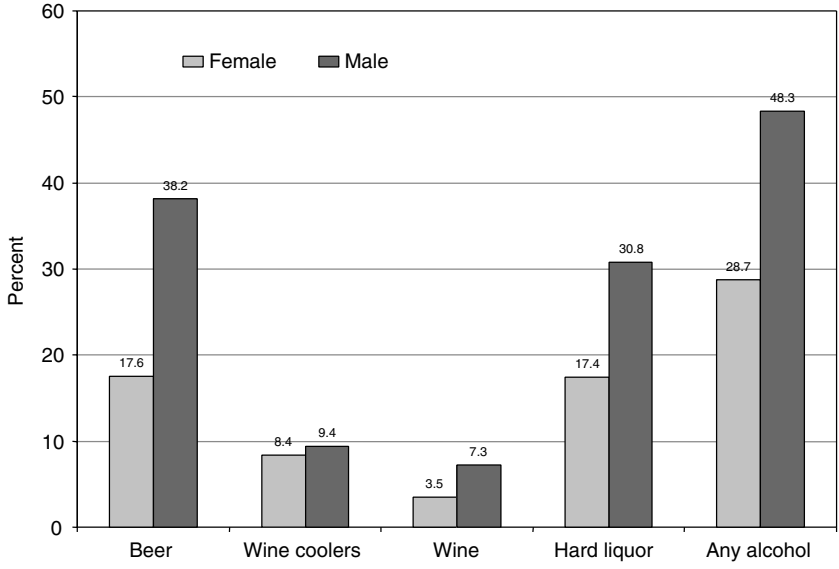

FIGURE 1-5 Prevalence of having five or more drinks of beer, wine coolers, wine, and hard liquor in a row during the past two weeks, high school seniors, by gender.
SOURCE: Bachman et al. (2001).

beverages consumed (i.e., beer, wine coolers, and hard liquor), and collects these data from students in grades six through twelve. As might be expected, the 2001-2002 PRIDE data (PRIDE, 2002) show that consumption of hard liquor in the past year by students in the lower grades (seven through nine) is much less prevalent than the consumption of beer and wine coolers. By the upper grades, however, prevalence rates for hard liquor consumption are similar to those for beer and wine coolers. The data also show a strong association between grade level and perceived ease of obtaining alcoholic beverages. By the twelfth grade, a substantial majority of students report that it would be very easy or fairly easy to obtain beer (79 percent) and hard liquor (75 percent).

The MTF also collects information about the setting and the reasons for alcohol use among high school seniors that is useful in further describing and understanding underage drinking. By far the most common setting for alcohol consumption by high school seniors is at parties—based on the 2000 survey, 57 percent of seniors reported that when they consumed alcohol in the past year, most or all of these times were at parties. The next most common settings were with one or two other people (18.4 percent reporting most or all of the times) and with a date or spouse (15.8 percent reporting most or all of the times). Drinking rarely occurred at school, as just over 90 percent of seniors who used alcohol in the past year also said they never did so at school. Drinking alone was also relatively uncommon, with 76 percent of past-year drinkers reporting that they never drank alone.

Important reasons for drinking as reported by high school seniors likewise convey the strong social aspects and functions of this behavior. The important reason most often given by seniors was "to have a good time with my friends" (74 percent). Other reasons given by a substantial percentage of seniors (between 40 and 50 percent) dealt with a desire to experiment, to relax, and to feel good. A little further down the list of reasons was because alcoholic beverages taste good (38 percent). Only 1.6 percent of seniors (2.5 percent of males and 0.4 percent of females) mentioned that an important reason for their drinking was because they were "hooked" and felt that they had to drink.

Finally, it is instructive to examine the percentage of seniors who indicated that they usually get moderately high or very high when they consume alcohol. Just over half of the seniors responded in this manner (56 percent of males and 46 percent of females). These figures are consistent with the relatively high rates of heavy drinking seen among underage persons who drink alcohol. They also suggest that even though underage alcohol consumption is primarily a social activity intended to facilitate having a good time, many seniors believe that heavy consumption, or getting drunk, is necessary or desirable for this purpose.

Prevalence of Alcohol Abuse, Dependence, and DUI Among Underage Persons in the United States

As was the case with measures of alcohol consumption, rates of underage alcohol abuse and dependence are also very age dependent. As shown in Figure 1-6, both abuse and dependence are extremely rare among 12-year-olds, but the prevalence rates increase rapidly with age. According to the DSM-IV-based criterion used in the 2000 NHSDA, roughly 5 percent of persons in their late adolescence (i.e., 19 or 20 years old) were categorized as being alcohol dependent, and twice that many (i.e., another 10 percent) reported abusive patterns of alcohol use. This ratio generally holds for all ages in the 12- to 20-year age range. As discussed earlier in this chapter, these prevalence rates may not reflect the prevalence of clinically detectable cases of alcohol abuse and dependence.

Looking across all ages, including ages 21 and older, the highest rate for alcohol abuse occurs among persons who are 19 years old. The peak age for alcohol dependence is somewhat later, at age 22. The relatively low ages for peak alcohol abuse may be due in part to the greater likelihood of alcohol-related legal problems for underage drinkers because of the illegality of their behavior.

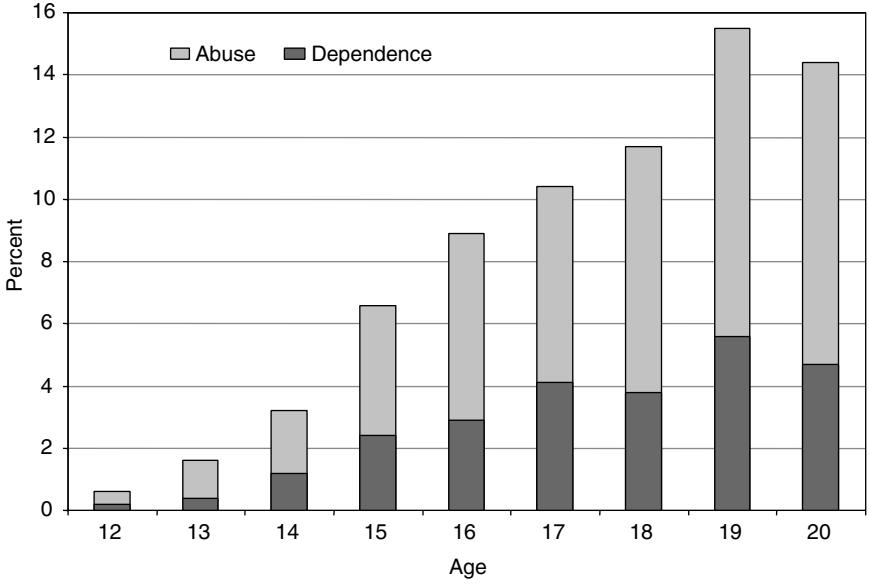

FIGURE 1-6 Prevalence of abuse and dependence, by single years of age, 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

For nearly all ages, the rate of abuse or dependence lies somewhere between the rate for heavy drinking and frequent heavy drinking. As age increases, however, the abuse/dependence rate shifts toward the frequent heavy drinking rate, so that by age 20 these two rates are virtually the same.

With a couple of notable exceptions, the patterns in prevalence rates for alcohol abuse and dependence across racial/ethnic groups (Table 1-5) mirror those observed for heavy and frequent heavy drinking as summarized in Table 1-3. In the case of abuse and dependence, however, the rates for Native Americans are the highest of any group. The rates for persons of multiple races are also relatively higher than they were for measures of use, and very comparable to those observed for whites. Also of interest are the low rates of abuse and dependence observed for Pacific Islanders, which are comparable to those for African-Americans and Asians, even though their rates of heavy and frequent heavy use are relatively high.

Age- and gender-related patterns of alcohol abuse or dependence across the three major racial/ethnic groups are depicted in Figure 1-7. The data reveal that for all three racial/ethnic groups, alcohol abuse or dependence becomes progressively more prevalent among males than females as age increases. In fact, females in the 12- to 14-year age group have even slightly higher rates than males, although the rates in general for this young age group are extremely low. The data also show that for the oldest age category, in particular, the relative difference in the prevalence rates for abuse or dependence between African-Americans and whites are considerably smaller than for heavy and frequent heavy drinking. Additional data from persons older than 20 show that this pattern of convergence continues, resulting in similar rates of alcohol abuse and dependence for whites and African-Americans aged 26 and older.

According to the 2000 NHSDA, approximately 15 percent of persons 16 to 20 years old drove a vehicle in the past year while under the influence

TABLE 1-5 Prevalence of Alcohol Abuse and Dependence, Persons Ages 12 to 20, by Race/Ethnicity, 2000

Race/Ethnicity	Abuse	Dependence	Abuse or Dependence
White	6.0	3.2	9.1
African-American	3.3	1.7	5.0
Native American	7.5	4.1	11.6
Pacific Islander	4.2	1.6	5.8
Asian	2.4	2.2	4.6
Multiple races	6.3	2.9	9.2
Hispanic	4.6	2.5	7.0

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

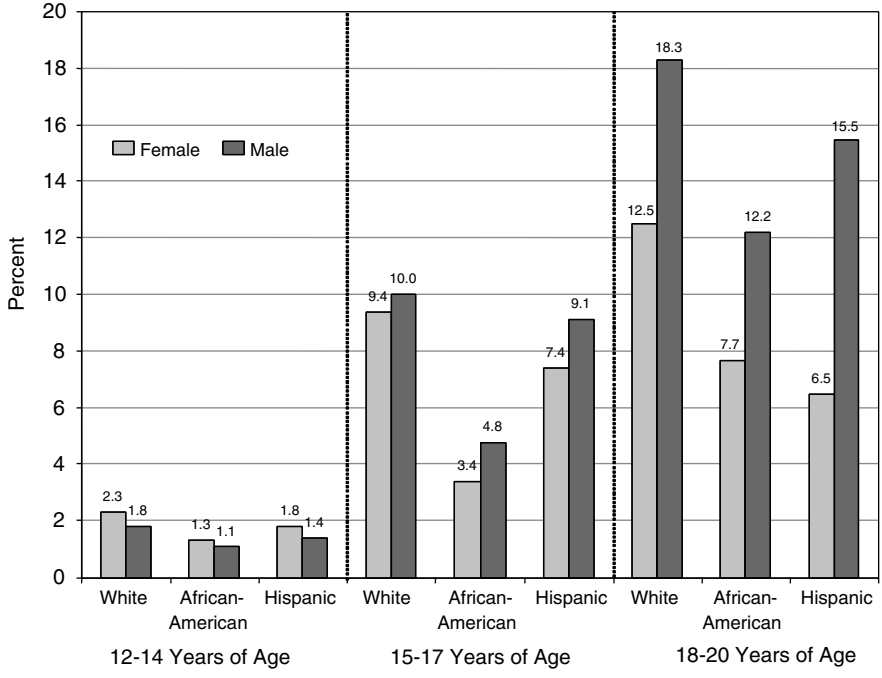

FIGURE 1-7 Prevalence of alcohol abuse or dependence, persons aged 12 to 20, by gender, race/ethnicity, and age group, 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

of alcohol. Patterns for this behavior, differentiated by major racial/ethnic groupings, age group, and gender, are shown in Figure 1-8. The patterns are similar to those observed for measures of alcohol abuse or dependence. Most prominent are the strong association of DUI with age; the relative rates of DUI (from highest to lowest) among whites, Hispanics, and African-Americans; and the more pronounced gender differences (higher rates for males) observed for Hispanics and African-Americans than for whites.

Sociodemographic Characteristics Associated with Alcohol Use, Abuse, and Dependence

In addition to age, gender, and race/ethnicity, a number of other sociodemographic characteristics may be useful for helping to identify subgroups of the underage population at greatest risk for alcohol misuse. Even these additional characteristics, however, only begin to scratch the surface with

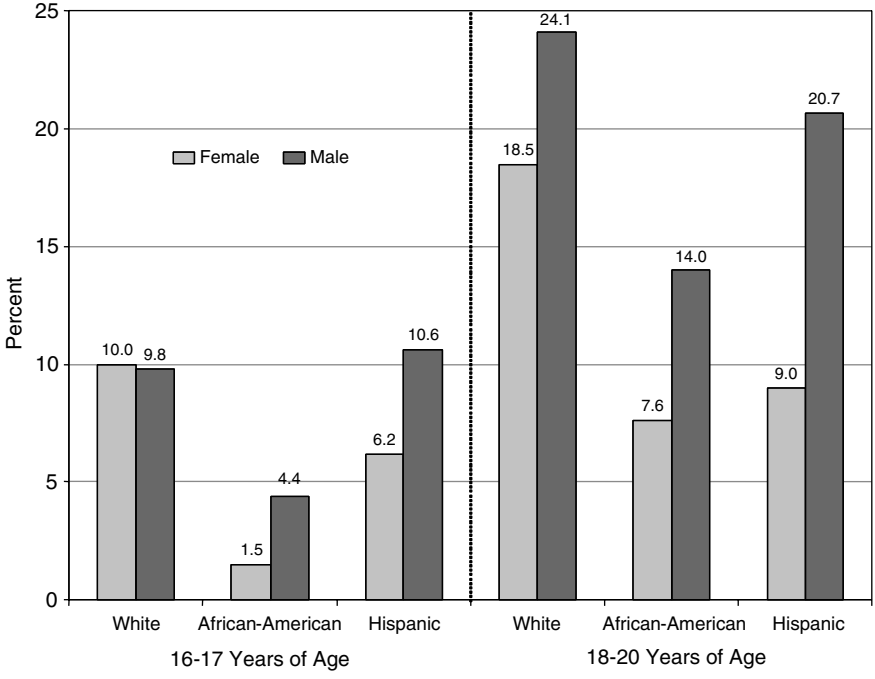

FIGURE 1-8 Prevalence of driving while under the influence of alcohol in the past year, persons aged 16 to 20, by gender, race/ethnicity, and age group, 2000. SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

respect to identifying variables that are associated with underage drinking, and they may be less strongly associated than others based on psychosocial attributes such as attitudes, social relationships, and both learned and innate behavioral tendencies. Nevertheless, basic demographic variables can be useful in identifying relatively intact segments of the population that can be prioritized and targeted for tailored interventions, and can also help to suggest some of the underlying mechanisms that might contribute to greater levels of alcohol misuse in selected subpopulations.

Slightly different sets of sociodemographic characteristics are pertinent to (and available in the NHSDA for) youth ages 12 to 17 and young adults ages 18 to 20. For this reason, separate tables are used to display prevalence rates, by each characteristic, for these two age groups. Table 1-6 presents prevalence rates for any alcohol use, heavy use, and abuse or dependence, by each of six sociodemographic variables, for persons ages 12 to 17.

Very generally, the data presented in the table suggest that each of the following attributes is related to higher levels of alcohol use, heavy use, and abuse/dependence among persons under age 18:

- Higher levels of family income
- Not living in a two-parent household
- Moving during the past year
- Living in smaller areas or areas not in a Metropolitan Statistical Area (MSA)
- Dropping out of school
- Working more than 11 hours per week

TABLE 1-6 Prevalence of Any and Heavy Alcohol Use in the Past 30 Days, and Alcohol Abuse or Dependence, Among Persons Ages 12 to 17, by Selected Demographic Variables

	Any Use	Heavy Use	Abuse or Dependence
Family income			
Low	13.7	8.9	4.6
Medium	16.3	10.5	5.4
High	18.5	11.5	5.1
Family structure			
Two parents in home	15.2	9.4	4.4
Other	19.2	12.9	7.1
Number of moves in past year			
None	15.8	9.9	4.8
One	17.3	11.2	5.7
Two or more	20.7	14.8	8.1
Metropolitan status			
Large Metropolitan Statistical Area (MSA)	15.9	9.9	4.5
Small MSA	16.7	10.5	5.4
Not in MSA	16.8	11.4	6.1
School drop-out status (ages 16 and 17 only)			
In school	28.4	19.5	9.5
Dropped out	36.7	31.4	14.6
Hours worked per week (ages 16 and 17 only)			
None	26.7	18.2	8.4
1 to 10	27.5	19.5	9.9
11 to 20	33.4	23.4	11.2
More than 20	33.4	25.0	12.3

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

Although the overall patterns of relationship were fairly consistent across the different measures of use, some of these attributes tended to be more highly associated with any use (e.g., family income), while others showed relatively stronger associations with abuse/dependence (e.g., metropolitan status). Although some relationships were stronger than others, none of the characteristics examined exhibited exceptionally strong associations with drinking behavior. In other words, there is considerable variation in alcohol use behaviors that cannot be explained by these sociodemographic characteristics. Rather, underage drinking is pervasive across sociodemographically defined subgroups, even though some variation exists. In contrast, there is some research evidence showing that the rates of adolescent use of alcohol and other substances do vary widely according to other sociodemographic variables, such as school catchment area (Ennett, Flewelling, Lindrooth, and Norton, 1997).

One characteristic not included in Table 1-6 is region of the country (this variable was not available in the NHSDA Public Use File). Published findings from the 2000 NHSDA, however, do include alcohol use prevalence rates by region. Summary data for persons ages 12 to 17 show that both any use and heavy use of alcohol are more prevalent in the Northeast and Midwest regions of the country compared to the South and West. The same was true for persons ages 18 to 25. This pattern is consistent with recent findings from Monitoring the Future, and reflects regional differences in alcohol use patterns that have been evident for the past two decades.

When comparing and interpreting patterns of use across sociodemographic subgroups, it is important to keep in mind that other related but unmeasured factors could be largely responsible for subgroup differences observed. The data on the number of hours worked per week provide an example. Studies conducted with national samples of adolescents suggest that the relationship between level of employment (or work intensity) and heavy drinking in adolescence is largely attributable to demographic characteristics (e.g., age, race/ethnicity), level of disposable income, and prior alcohol use (Paschall and Flewelling, 2002; Paschall, Ringwalt, and Flewelling, 2002). Although the narrowly constrained age range used for the summary data displayed in Table 1-6 is expected to remove much of the influence due to age, the associations depicted in that table do not control for the effects of other factors such as race/ethnicity, personal income, and prior levels of alcohol use.

Prevalence rates for alcohol use measures among persons 18 to 20 years old, by selected sociodemographic variables, are displayed in Table 1-7. Among this set of attributes, those that were generally related to higher levels of use, heavy use, and abuse/dependence were

TABLE 1-7 Prevalence of Any and Heavy Alcohol Use in the Past 30 Days, and Alcohol Abuse or Dependence, Among Persons Ages 18 to 20, by Selected Demographic Variables

	Any Use	Heavy Use	Abuse or Dependency
Marital status			
Married	36.8	21.7	5.1
Not married	49.7	35.4	14.3
Pregnancy status (women only)			
Pregnant	8.6	6.8	8.1
Not pregnant	47.7	29.5	10.8
Number of moves in past year			
None	45.4	31.4	11.9
One	51.5	37.4	14.5
Two or more	57.9	42.3	19.5
Metropolitan status			
Large Metropolitan Statistical Area (MSA)	48.0	31.7	12.3
Small MSA	50.9	38.1	14.5
Not in MSA	47.6	34.6	15.3
College student status (excluding persons still in high school)			
Full time college student	56.5	39.4	15.0
Part time student or not in college	47.4	34.3	14.5
Employment status			
Full-time	51.9	36.2	14.6
Part-time	50.3	35.1	13.7
Unemployed	51.1	41.3	22.9
Not working and not in labor force	42.5	30.5	10.6

SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (2000).

- being single,
- not being pregnant (assessed only for women),
- moving during the past year, and
- being a full-time college student.

In addition, persons residing in small metropolitan areas had the highest rates of heavy use, while persons from non-MSA areas had the highest rates of abuse or dependence. These differences, however, were relatively small. Unemployed persons were more likely to report heavy use of alcohol or symptoms of abuse/dependence, but their rates of any use were similar to those who are employed.

The strength of association for marital status varied substantially according to the alcohol use measure. Although unmarried persons were somewhat more likely to use any alcohol than married persons (50 percent compared to 37 percent), the proportionate differences were much greater for heavy use (35 percent versus 22 percent) and especially for abuse/dependence (14 percent versus 5 percent). Conversely, greater rates of any and heavy use were observed among full-time college students compared to others, but the rates for abuse or dependence were similar between these two groups. Although other studies have also documented a higher prevalence of young adult heavy drinking among college students (e.g., Bachman et al., 2002), it has been noted that this relationship is quite strong for white young adults, but does not hold at all for African-Americans (Paschall and Flewelling, 2002).

Understandably, the greatest difference across all the sociodemographic measures was for pregnancy status. Nearly 48 percent of nonpregnant women ages 18 to 20 reported using alcohol in the past month, compared to only 9 percent of pregnant women. This encouraging finding is tempered by the finding that the majority of pregnant women who did use alcohol tended to also report heavy use. The relatively high rate of abuse/dependence among pregnant women is also troubling, although it could be due to in part to a greater tendency by these respondents to report their alcohol use as problematic (and thus meet the criteria for abuse) precisely because they are pregnant.

Recent Trends in Underage Drinking

Examination of recent trends in underage drinking prevalence rates may be useful for helping to anticipate where these rates are headed in upcoming years. Just as important, trend data are valuable for retrospectively reviewing the relative levels of this behavior over time and thus providing a foundation for identifying and/or exploring hypotheses about societal influences on levels of underage drinking. The potential utility of such efforts can be further enhanced if significant differences in trends are observed for identifiable subgroups of the population.

Published estimates of the prevalence of any use and heavy use of alcohol in the past month since 1985 are available from the NHSDA for the age groups 12 to 17 and 18 to 25. Figure 1-9 displays these trends for any alcohol use. The dashed lines between 1985 and 1988, and again between 1988 and 1990, reflect interpolated values for intervening years in which no surveys were conducted. The break in the trend lines between 1998 and 1999 reflect changes in survey methodology that make the estimates for years starting with 1999 not strictly comparable with estimates for the previous years. In 1999, the NHSDA switched to a computer-assisted inter-

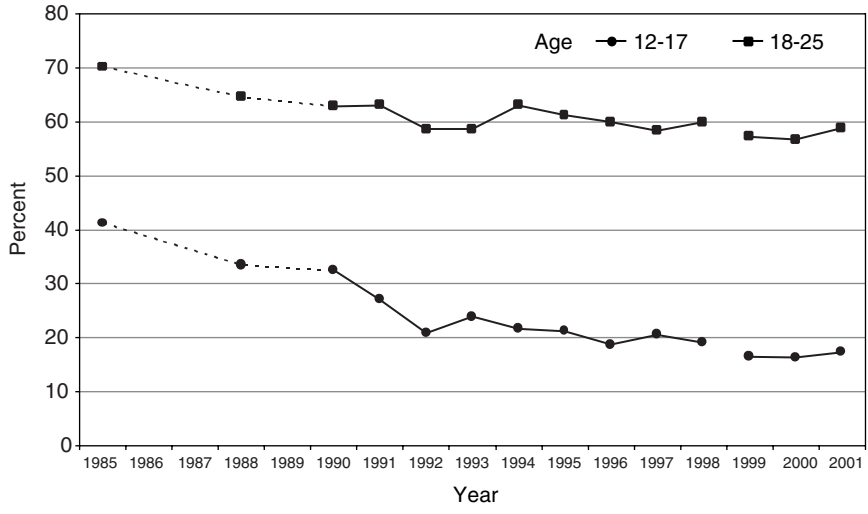

FIGURE 1-9 Trends in the prevalence of any alcohol use in the past 30 days, by age group, 1985 to 2001.
SOURCE: National Household Survey on Drug Abuse (2001) and prior years (published data).

view format that involved changes in the questionnaire structure and imputation procedures, in addition to affording respondents greater privacy. Studies conducted by SAMHSA to compare prevalence levels in heavy drinking (and other key measures of substance use) found no difference in the prevalence rates for any use or heavy use between 1998 and 1999 for any age group when controlling for differences in methodological features, including interviewer experience of the survey administration (SAMHSA, 2000).

Prevalence rates of underage drinking as determined by the NHSDA have not changed appreciably over the past ten years, even though a slight but statistically significant increase in any use for both age groups was observed between 2000 and 2001 (SAMHSA, 2002b, Chapter 3). Relatively stable trends in any use of alcohol in the past month among students over the past eight years were also seen in the MTF (grades eight, ten, and twelve) and YRBS (grades nine through twelve) surveys, although there were slight variations across individual grade levels. Figure 1-9 also depicts the more substantial declines in past-month use of alcohol, especially for persons ages 12 to 17, that occurred between 1985 and 1992. This decline continued a trend that began in the late 1970s, when the use of alcohol and many other substances reached their peaks. The MTF observed similar

dramatic declines for high school seniors. Although the declines in adolescent and young adult rates of alcohol use during this time period began prior to the National Minimum Drinking Age Act in 1984 that led to all states adopting age 21 as the minimum legal drinking age, the largest drops were observed in the years following passage of this legislation.

Trends for heavy use of alcohol in the past month, again based on published data from the NHSDA, are provided in Figure 1-10. The patterns are similar to what was found for any use in the past month, although the decline in heavy use for those ages 18 to 25 was less pronounced. As with Figure 1-9, the rates before and after 1999 are not strictly comparable, with the large apparent increase between 1998 and 1999 being due primarily to methodological changes in the survey administration and imputation procedures rather than to any actual increases in prevalence. Assuming that these changes have enhanced the accuracy of the survey estimates, it appears that the NHSDA-derived prevalence rates of heavy drinking prior to 1999 may have been slightly underestimated.

By analyzing NHSDA Public Use Files from recent years, it was also

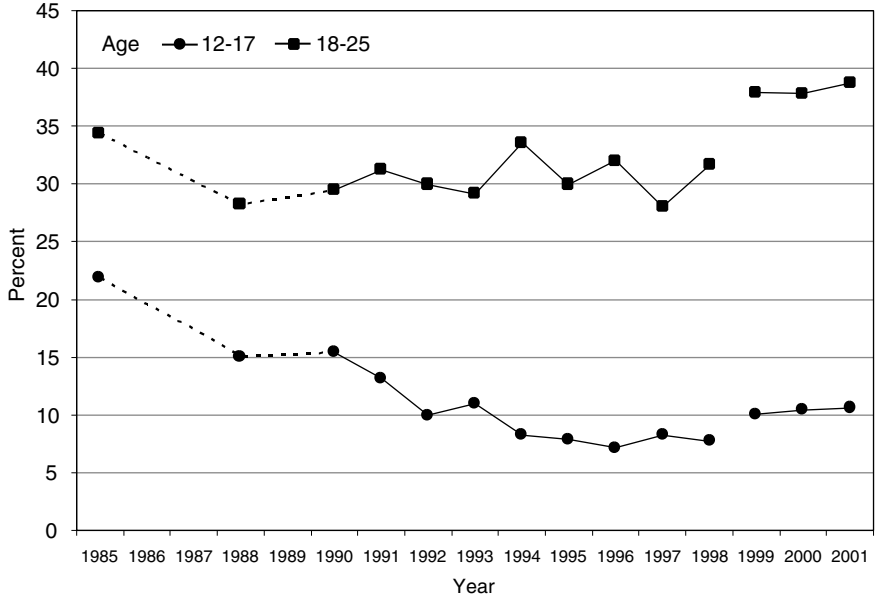

FIGURE 1-10 Trends in the prevalence of heavy alcohol use in the past 30 days, by age group, 1985 to 2001.
SOURCE: National Household Survey on Drug Abuse (2001) and prior years (published data).

possible to generate separate trend estimates from 1994 to 2000 for the 18- to 20-year age group and the 21- to 25-year group. Trends for any past-month use of alcohol are shown in Figure 1-11, and trends for heavy drinking prevalence are provided in Figure 1-12. The figures indicate that the recent trends for these two age groups are roughly parallel and reflect the same overall and relatively flat trends in any use and heavy use of alcohol that already have been noted. Figure 1-12 also visually portrays the very similar rates of heavy alcohol use among underage young adults (ages 18 to 20) with those of legal-aged young adults (ages 21 to 25).

The lack of any definitive trend in these measures of underage drinking in recent years is not particularly encouraging for those looking for progress in this area, and presents a formidable challenge for achieving national goals to reduce underage drinking as outlined in the Centers for Disease Control and Prevention's Healthy People 2010 (U.S. Department of Health and Human Services, 2000). Trend data for underage DUI presented by O'Malley and Johnston (1999) present a similarly disturbing scenario, especially when viewed in contrast to the dramatic reductions in DUI rates seen in the 1980s and early 1990s. Furthermore, data from the 1995 and 2000 National Alcohol Surveys suggest that among individuals ages 18 to

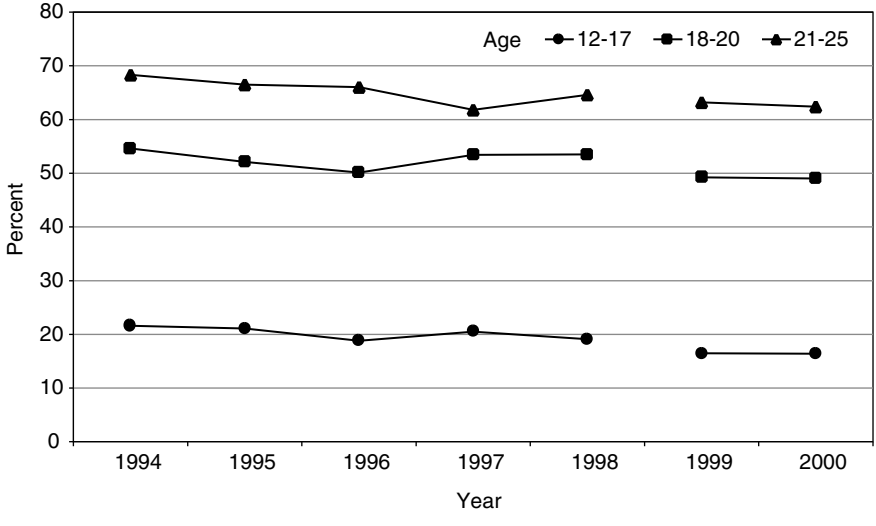

FIGURE 1-11 Trends in the prevalence of any alcohol use in the past 30 days, by finer age groups, 1994 to 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (1994 to 2000).

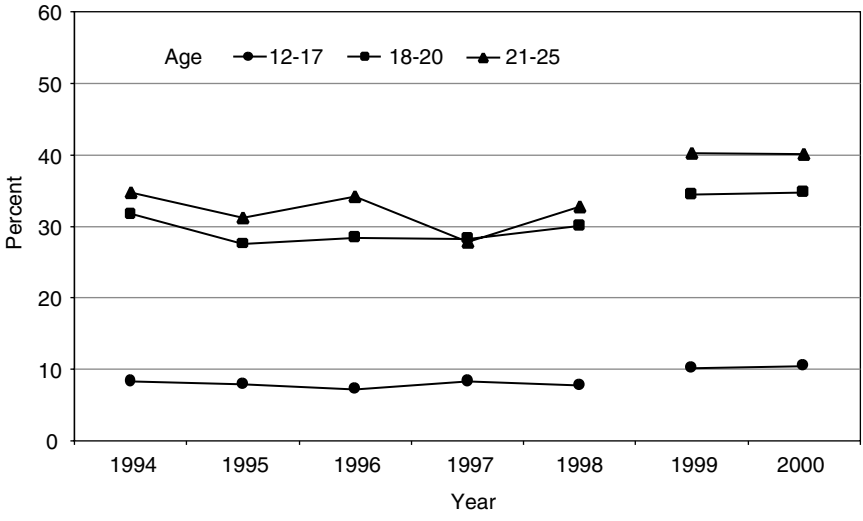

FIGURE 1-12 Trends in the prevalence of heavy alcohol use in the past 30 days, by finer age groups, 1994 to 2000.
SOURCE: National Household Survey on Drug Abuse (Analysis of Public Use File Data) (1994 to 2000).

20 who are frequent heavy drinkers, the number of days per year in which they drink heavily has increased substantially (T.K. Greenfield, personal communication, Alcohol Research Group, Berkeley, California, September 30, 2002).

Historical trend data for underage drinking measures among sociodemographic subgroups are not readily available for the NHSDA. Summary data for high school students based on the MTF, however, are available for this purpose (Johnston, O'Malley, and Bachman, 2002a, 2002b), and include breakdowns according to gender, race/ethnicity, college plans, metropolitan status, region, and family socioeconomic status (SES). Following are some of the key observations made by these researchers regarding trend differences for subgroups based on these sociodemographic characteristics:

- Trends in rates of any use and heavy use of alcohol have been similar for females and males in recent years through 1999. However, there were notable gender differences in trends among high school seniors during the period when these rates declined substantially (i.e., during the 1980s and early 1990s). These differences were characterized by greater declines among males, which served to reduce the magnitude of the large gender differences that had existed in the 1970s.

- Among eighth- and tenth-grade students, rates of heavy use among noncollege-bound students during the 1990s noticeably increased relative to the more stable rates among college-bound students.
- Recent trends in drinking measures generally have been similar across racial/ethnic groups. One exception is the greater decrease in heavy drinking among Hispanic eighth-grade students in recent years, resulting in similar current rates for white and Hispanic eighth graders.
- Although differences exist in underage drinking across groups defined by region, metropolitan status, and parents' SES, these differences have been relatively stable over time—that is, there have been no dramatic differences in subgroup trends.

Limited analyses of NHSDA data since 1994, with respect to gender and racial/ethnic group differences, largely support these observations. One interesting recent development, however, is the apparent resumption of a trend toward gender equality in rates of heavy drinking among underage persons. Between 1999 and 2000, the prevalence rate of heavy drinking decreased slightly among males, and increased slightly among females. This was true for both the 12- to 17-year age group and the 18- to 25-year age group. A trend of diminishing relative differences between males and females in rates of heavy drinking from 1999 to 2000 was also observed among senior high school students in the Monitoring the Future data, and has continued through 2001 (Johnston et al., 2002b).

SUMMARY AND CONCLUSIONS

As has been the case for the past several decades, alcohol continues to be the most widely used psychoactive substance by adolescents and young adults in the nation. Before reaching the age of 21, the great majority of our country's young people have consumed an alcoholic beverage at least once in their lifetime, and more than 57 percent are current drinkers (i.e., they have drunk alcohol within the past 30 days). These levels of current use of alcohol correspond with 42 percent of 20-year-olds who have smoked a cigarette in the past month and 16 percent who have used marijuana in the past month. Perhaps even more significant, the majority of underage persons who drink alcohol also drink large amounts on at least a monthly basis, and 15 percent of persons ages 16 to 20 report driving a vehicle under the influence of alcohol within the past month.

Underage drinking increases steadily with age throughout the range from 12 to 20. Persons in the upper values of this range are likely to drink as much as or more than most adults, and are much more likely to drink heavily. Underage drinking occurs among both males and females, although the rates are higher for males except at the lowest ages (e.g., 12 to 14). It

also occurs across all racial/ethnic groups, but with noticeably higher rates among non-Hispanic whites and Native Americans, and generally lower rates among African-Americans.

Differences are also observed across other sociodemographic subgroups, such as region, metropolitan status, and SES, although these differences are generally not very large. For the most part, demographic correlates of underage drinking are quite stable and have been well documented in prior reviews (e.g., O'Malley, Johnston, and Bachman, 1998; Johnston et al., 2002b). Numerous studies have identified a wide variety of other personal and environmental variables associated with adolescent substance use behaviors (including alcohol use), many of which will be reviewed in Chapters 4 and 5.

Despite very strong and encouraging progress in reducing the prevalence of underage drinking in the 1980s and very early 1990s, prevalence rates have been relatively stable over the past ten years. The same is true for underage DUI. The lack of progress in reducing underage drinking in recent years, including heavy drinking and DUI, warrants heightened attention to this issue and a reexamination of current prevention priorities and approaches. Perhaps there are lessons yet to be learned from the significant reductions in underage drinking achieved during the 1980s, and the dramatic reductions that have occurred more recently in rates of adolescent smoking. As referenced earlier, there is strong evidence that increases in minimum drinking age during the 1980s did lead to the significant reductions in underage drinking and DUI rates, thus supporting the potential efficacy of other types of environmentally focused regulatory approaches as described in Chapters 7, 8, and 9 of this volume.

Regarding adolescent smoking trends, and in contrast to underage drinking, there has been remarkable success in recent years in reducing cigarette use among adolescents. Between 1997 and 2001, past-month use of cigarettes among high school seniors has dropped from 36.5 percent to 29.5 percent, with even larger proportional declines among eighth- and tenth-grade students (Johnston, O'Malley, and Bachman, 2002b). Developing a better understanding of the forces behind this encouraging news, and adapting successful prevention and intervention strategies where possible to underage drinking, holds promise for renewing progress in reducing underage drinking rates and related problems. One of the great challenges in this effort will be to stimulate a genuine and sustainable shift in societal norms and attitudes that will be more conducive to reducing underage drinking, as well as alcohol misuse in general, and more supportive of the specific steps needed to help achieve this goal.

REFERENCES

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders, third edition.* Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, fourth edition.* Washington, DC: Author.

Bachman, J.G., Johnston, L.D., and O'Malley, P.M. (2001). *Monitoring the Future: Questionnaire responses from the nation's high school seniors, 2000.* Ann Arbor, MI: Institute for Social Research.

Bachman, J.G., O'Malley, P.M., Schulenberg, J.E., Johnston, L.D., Bryant, A.L., and Merline, A.C. (2002). *The decline of substance use in young adulthood: Changes in social activities, roles, and beliefs.* Mahwah, NJ: Lawrence Erlbaum Associates.

Dufour, M. (1999). What is moderate drinking? *Alcohol Research and Health*, *23*, 5-14.

Ennett, S.T., Flewelling, R.L., Lindrooth, R.C., and Norton, E.C. (1997). School and neighborhood characteristics associated with school rates of alcohol, cigarette, and marijuana use. *Journal of Health and Social Behavior*, *38*, 55-71.

Grant, B.F., and Dawson, D.A. (1997). Age of onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse*, *9*, 103-110.

Greenfield, T.K. (2000). Ways of measuring drinking patterns and the difference they make: Experience with graduated frequencies. *Journal of Substance Abuse*, *12*, 33-49.

Harrison, L.D. (2001). Understanding the differences in youth drug prevalence rates produced by the MTF, NHSDA, and YRBS studies. *Journal of Drug Issues*, *31*, 665-694.

Hingson, R., Heeren, T., Levenson, A.J., and Voas, R. (2002). Age of drinking onset, driving after drinking, and involvement in alcohol-related motor vehicle crashes. *Accident Analysis and Prevention*, *34*, 85-92.

Johnston, L.D. (1991). Contributions of drug epidemiology to the field of drug abuse prevention. In W. Bukoski (Ed.), *Drug abuse prevention research: Methodological issues* (pp. 57-80), NIDA Research Monograph No. 107. Rockville, MD: National Institute on Drug Abuse.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2002a). *Demographic subgroup trends for various licit and illicit drugs, 1975-2001.* Monitoring the Future Occasional Paper No. 57. Ann Arbor, MI: Institute for Social Research.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2002b). *Monitoring the Future national survey results on drug use, 1975-2001. Vol. I: Secondary school students.* NIH Publication No. 02-5106. Bethesda, MD: National Institute on Drug Abuse.

Martin, C.S., and Winters, K.C. (1998). Diagnosis and assessment of alcohol use disorders among adolescents. *Alcohol Health and Research World*, *22*, 95-105.

O'Malley, P.M., and Johnston, L.D. (1999). Drinking and driving among U.S. high school seniors, 1984-1997. *American Journal of Public Health*, *89*, 678-684.

O'Malley, P.M., Johnston, L.D., and Bachman, J.G. (1998). Alcohol use among adolescents. *Alcohol Health & Research World*, *22*, 85-93.

Parents' Resource Institute for Drug Education (PRIDE). (2002). *PRIDE questionnaire report: 2001-2002 national summary, grades 6 through 12.* Bowling Green, KY: Pride Surveys.

Paschall, M.J., and Flewelling, R.L. (2002). Post-secondary education and heavy drinking by young adults: The moderating effect of race. *Journal of Studies on Alcohol*, *63*, 447-455.

Paschall, M.J., Ringwalt, C.L., and Flewelling, R.L. (2002). Explaining higher levels of alcohol use among working adolescents: An analysis of potential explanatory variables. *Journal of Studies on Alcohol*, *63*, 169-178.

Substance Abuse and Mental Health Services Administration. (2000). *Summary of findings from the 1999 National Household Survey on Drug Abuse*. DHHS Publication No. SMA 00-3466. Rockville, MD: SAMHSA Office of Applied Studies.

Substance Abuse and Mental Health Services Administration. (2002a). *Substance dependence, abuse, and treatment: Findings from the 2000 National Household Survey on Drug Abuse, Appendix C: Measurement of dependence, abuse, treatment, and treatment need*. NHSDA Series A-16, DHHS Publication No. SMA 02-3642. Rockville, MD: SAMHSA Office of Applied Studies.

Substance Abuse and Mental Health Services Administration. (2002b). *2001 National household survey on drug abuse: Summary of findings*. Available: http://www.samhsa.gov/oas/NHSDA/2k1NHSDA/vol12/appendixe.htm [September 16, 2002].

U.S. Department of Health and Human Services. (2000). *Tracking healthy people 2010*. Washington, DC: U.S. Government Printing Office.

2

Social, Health, and Economic Consequences of Underage Drinking*

Ralph Hingson and Donald Kenkel

Since 1988, it has been illegal for someone under the age of 21 to drink alcohol in all 50 states. This was a reversal of an earlier policy trend: In the wake of the 1972 constitutional amendment that extended the right to vote to 18-year-olds, 29 states had also lowered their legal drinking ages. Higher traffic fatalities and other problems experienced in those states were part of the impetus for the national drinking age of 21. This national drinking age has been a clear policy success (U.S. General Accounting Office, 1987; Jones, Pieper, and Robertson, 1992; Shultz et al., 2001; Wagenaar and Toomey, 2002). However, as we will discuss, many underage youth continue to consume alcohol and to experience alcohol related problems.

In the remaining sections of this chapter, we review evidence on the health and social consequences of underage drinking. Research from different perspectives—in terms of disciplines, data, and methods—helps to document these consequences. High-quality data document some of the immediate consequences of underage drinking, such as the number of traffic fatalities that involve underage drinkers. Self-reported data further suggest that a variety of health risks are associated with underage drinking. An intriguing line of emerging research suggests that age of drinking initiation may be a risk factor for adult drinking problems. These patterns should be

*This article is dedicated to Terry Sterling, age 19, who died as the result of an alcohol overdose December 1, 2000, during a fraternity hazing ritual.

viewed with some caution, however, both because of the shortcomings of self-reported data and because of the difficulty of determining the extent to which underage drinking causes other health risks rather than simply being associated with these risks. We then explore research on the economic consequences of underage drinking, including both immediate health care expenditures and earnings losses experienced by underage drinkers over their entire life-course. Finally, we present a brief discussion and conclusion about the program and policy implications of the social and economic consequences of underage drinking.

UNDERAGE ALCOHOL CONSUMPTION

Despite the legal drinking age of 21 in all states, according to the 2001 National Household Survey on Drug Abuse (NHSDA) (N = 68,929 age 12 and over, 32,002 ages 12 to 20, response rate 67 percent), 28.5 percent of persons ages 12 to 20 reported using alcohol in 2001 at some point in the 30 days prior to the survey (Substance Abuse and Mental Health Services Administration [SAMHSA] 2002). Projected onto the U.S. population that age, 10.1 million persons ages 12 to 20 drank in the past 30 days. Nearly 6.8 million, or 19 percent, were binge drinkers (consumed 5 or more drinks on an occasion at least once in the past 30 days). More than 2 million, or 6 percent, drank 5 or more drinks on at least 5 occasions in the past 30 days. Since 1980, the average age people began drinking has dropped from 17.4 to 15.9 years old (SAMHSA, 2002).

Males ages 12 to 20 were more likely to report binge drinking in the past month than their female peers (22 percent versus 16 percent). Binge drinking was reported by 21.7 percent of underage whites and 18.5 percent of underage American Indians or Alaska Natives, but only by 10.7 percent of underage Asians and 10.5 percent of underage blacks.

Among persons under age 21, those ages 18 to 20 were the most likely to drink. Just over half drank in the past month, 30 percent reported binge drinking at least once in the past 30 days, and 13 percent reported consuming 5 or more drinks on at least 5 occasions in the past 30 days.

The Centers for Disease Control and Prevention's (CDC's) National Youth Risk Behavior Survey examined a national random sample of high school students (Grunbaum et al., 2002), nearly all of whom are ages 14 to 18. Completed for CDC in 2001, the survey used a three-stage probability sample to obtain 13,601 completed questionnaires from a representative sample of high school students in public and private schools in the United States, with a response rate of 65 percent. Large numbers in that age group also drink and drink heavily. That survey showed 47 percent of high school students drank alcohol in the past month. Projected to the U.S. high school student population, 7,018,364 drank alcohol in the past month. Thirty-

four percent, or more than 5 million, drank 5 or more drinks within a two-hour period on at least one occasion in the previous month. Seventy-eight percent, or more than 11.6 million, had consumed alcohol at some point in their lives and 29 percent, or 4.3 million, reported starting to drink before age 13. Thirteen percent, or 1.9 million, drove after drinking in the past 30 days and 31 percent, or 4.6 million, rode with a drinking driver. Five percent, or more than 700,000, drank at school in the past 30 days.

For some, heavy drinking begins even before high school. In 2001, according to the NHSDA, 2 percent of 12-year-olds and 3 percent of 13-year-olds consumed 5 or more drinks on at least one occasion in the past 30 days.

HEALTH RISKS ASSOCIATED WITH UNDERAGE DRINKING

Not only is drinking by persons underage an illegal activity, but persons that age who drink are more likely than those who do not to engage in behaviors that pose a risk to their health and the health of others.

Deaths Associated with Underage Drinking

Traffic Crash Deaths

The greatest single mortality risk posed by underage drinking is traffic crashes. Traffic crashes are the leading cause of death in the United States for persons ages 4 to 34 (National Highway Traffic Safety Administration [NHTSA] 2002). According to the Fatality Analysis Reporting System of the NHTSA, in 2001, 39 percent of traffic deaths by those ages 16 to 20 involved a driver, passenger, or pedestrian who had been drinking (2,365/6,051) (NHTSA, 2001). Of course it is possible that some of the drinking drivers in those fatal crashes were 21 or older. In 2001, 1,884 drivers under age 21 in fatal motor vehicle crashes had positive blood alcohol levels, including 45 of whom were under age 16. Of those drivers, 1,109 died in those crashes. Many persons other than the drinking driver were also killed in those crashes. In 2001, 1,099 persons other than drinking drivers under age 21 died in fatal crashes when those drivers under age 21 were involved. Six hundred thirty were under age 21, and most of them (587) were passengers either in the vehicle driven by or struck by the drinking driver under age 21.

Epidemiologic research comparing drivers in single-vehicle fatal crashes with drivers operating motor vehicles at similar times on the same roadways who were not involved in fatal crashes has revealed that each 0.02 percent increase in blood alcohol level nearly doubles the risk of single-vehicle fatal crash involvement and that the risk of death increases with each drink

more for younger drivers than it does for drivers above the age of 21 (Zador, 1991). A more recent national analysis found that in all age and gender groups, there was at least an 11-fold increased risk of single-vehicle fatal crash involvement at a blood alcohol level of 0.08 percent (the legal limit for intoxication for adults in most states). However, for male drivers ages 16 to 20, there was a 52-fold increased single-vehicle fatal crash risk (Zador, Krawchek, and Voas, 2000).

The National Survey of Drinking and Driving conducted for NHTSA in 1999 (National Highway Traffic Safety Administration, 2000) reported that 2 percent of 16- to 20-year-old drivers drove within two hours of drinking in the past month. Though this percentage is substantially lower than the 12 percent reported by all drivers ages 16 and older, drivers ages 16 to 20 drove 12 million times in the preceding year within two hours of drinking (95 percent CI 4, 119). Those drinking driving trips averaged 11 miles in length compared to 14 for all drinking driving trips among drivers ages 16 and older. Particularly disturbing, however, was that when NHTSA calculated the average blood alcohol concentration (BAC) of drivers during their most recent drinking driving trip—based on weight, hours of drinking, gender, volume of consumption, length of drinking episode—and time since last drink, the average calculated BAC for 16- to 20-year-old drivers was 0.10 percent, more than 3 times the level for drivers of all ages and at or above the legal limit for adult drivers in every state. A 170-pound man would have to consume 5 drinks in an hour on an empty stomach to reach a blood alcohol level of 0.10 percent. Furthermore, 40 percent of those 16- to 20-year-olds were driving with another passenger in the vehicle during their most recent drinking driving trip, thereby risking not only their own life but the lives of others. Four percent were driving with children under the age of 15.

Of note, 44 percent of the 16- to 20-year-old drinking drivers believed they were driving at levels that exceeded the legal limit. In other words, nearly half reported engaging in behavior they knew was illegal. Of parallel concern, it is illegal for all persons under age 21 to drive after any drinking, and 56 percent, a majority, who did so did not recognize that they were engaging in illegal behavior. Studies of states that adopted laws making it illegal for persons under 21 to drive after drinking relative to other states have achieved 18 percent declines in driving after any drinking, 23 percent declines in driving after 5+ drinks (Wagenaar, 2001), and 21 percent decline in the type of fatal crash most likely to involve alcohol (single vehicle at night) among drivers under 21 (Hingson, Heeren, and Winter, 1994). In studies where teen awareness of the law has been heightened, significantly greater declines in alcohol-related crashes among drivers under 21 have been recorded (Blomberg, 1992).

Other Unintentional Injury Deaths

Of course, traffic fatalities are not the only type of injury death that has been linked to alcohol. In 2000 there were 15,733 unintentional injury deaths among persons under 21. Of those, 8,797 were traffic deaths and 6,936 were from other causes (e.g., drowning, burns, falls) (National Center for Health Statistics, 2002). A review of more than 300 medical examiner studies in the United States over a 20-year period (Smith, Branas, and Miller, 1999) revealed that the percentage of nontraffic unintentional injury deaths that test positive for alcohol closely corresponds to the percentage of motor vehicle deaths that are alcohol related: 38 percent versus 40 percent. Among persons under age 21, 34 percent of unintentional traffic deaths (2,956/8,797) are alcohol related. If 34 percent of unintentional injury deaths other than motor vehicle deaths among persons under 21 were alcohol related, then 2,358 unintentional injury nontraffic deaths among persons under 21 were alcohol related.

Intentional Injury Deaths

Among adults alcohol was also found to be present in 47 percent of homicides and 29 percent of suicide deaths (Smith et al., 1999). In 2000 there were 4,314 homicides and 2,905 suicides among those under the age of 21. It has been reported that among persons under 21, 36 percent of homicide deaths, 12 percent of male suicide deaths, and 8 percent of female suicide deaths were alcohol related (Levy, Miller, and Lox, 1999). If correct, more than 1,500 homicides and 300 suicides in 2000 among persons under 21 were alcohol related.

Self-Reports of Health Risks Associated with Underage Drinking

Drinking, especially frequent heavy drinking, has been associated with a variety of health risks behaviors among adolescents. An association, of course, does not mean alcohol use causes the other risky behaviors, but it can certainly increase risks to health. For example, if frequent heavy drinkers drive after drinking more often, their risk of traffic crash involvement is higher. If they are also less likely to wear safety belts, then their risk of being injured or killed in those crashes is also higher.

When asked about their drinking in the past 30 days, 28 percent of high school students responding to the National Youth Risk Behavior Survey (Grunbaum et al., 2002) reported at least one occasion when they drank 5 or more drinks. Nine percent reported one such occasion. Six percent reported two occasions, another 6 percent reported 3 to 5 and 7 percent drank 5+ drinks on at least 6 occasions. Nine percent of the

sample drank in the past 30 days, but never as many as five drinks at one sitting. Drinkers were more likely than nondrinkers to engage in a variety of behaviors that pose a risk to health, and the more frequently respondents reported heavy drinking (5 or more on an occasion), the greater their likelihood of engaging in behaviors that pose a risk to health.

Risks in Traffic

As Tables 2-1a and 2-1b show, a greater percentage of those who drank compared to those who never drank engaged in behaviors in traffic that increased their risk of being in a motor vehicle crash and being injured if in a crash. Moreover, the more frequently respondents drank 5 or more drinks, the greater the percentage who engaged in risky behaviors in traffic. Only 3 percent of respondents who never drank said they never wore safety belts compared to 15 percent of those who drank 5+ at least 6 times in the past month (frequent heavy drinkers). Only 14 percent of those who never drank rode with a driver who had been drinking, compared to 80 percent of frequent heavy drinkers. Of course, none who never drank drove after drinking, while 41 percent of frequent heavy drinkers did so. Twenty-two percent of respondents said they rode on a motorcycle and 63 percent on a

TABLE 2-1a Traffic Risks According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Of Motorcyclists Never Wear a Helmet	27%	29%	33%	36%	42%	45%
Of Bicyclists Never Wear a Helmet	73%	81%	86%	88%	89%	92%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-1b Traffic Risks According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Never Wear Seat Belt	3%	3%	5%	7%	10%	15%
Ride with Drinking Driver	14%	31%	50%	60%	69%	80%
Drive after Drinking	0%	11%	13%	32%	43%	41%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

bicycle in the past 30 days. Of those who never drank, 27 percent said they never wore helmets on motorcycles and 73 percent said they never wear bicycle helmets. In contrast, among frequent heavy drinkers, 45 percent never wear motorcycle helmets and 92 percent never wear bicycle helmets.

Weapons and Violence

Compared to nondrinkers, a greater percentage of drinkers and especially frequent heavy drinkers carried weapons, engaged in physical violence (Tables 2-2a and 2-2b), felt sad or hopeless, attempted suicide (Table 2-3), engaged in other psychoactive drug use (Tables 2-4a, 2-4b, and 2-4c), had sex at an earlier age, had more partners, and were more likely to have unprotected sex and to have been or gotten someone pregnant (Tables 2-5a, 2-5b, and 2-5c). Among nondrinkers, 10 percent carried a weapon and 3 percent a gun in the past 30 days. Forty-four percent of frequent heavy drinkers carried a weapon and 22 percent a gun in the past 30 days. Not only were the frequent heavy drinkers more likely to carry weapons and

TABLE 2-2a Weapons and Violence According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Carry Weapon	10%	18%	22%	26%	28%	44%
Carry Gun	3%	4%	8%	8%	11%	22%
Weapon at School	3%	6%	9%	10%	13%	20%
In a Fight Past Year	23%	35%	43%	46%	52%	62%
Injured in a Fight Past Year	2%	4%	7%	6%	7%	13%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-2b Weapons and Violence According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Fight at School Past Year	9%	13%	17%	17%	19%	74%
Threatened at School	6%	8%	11%	12%	12%	19%
Boy/Girlfriend Hit/Slapped Past Year	6%	10%	11%	15%	17%	23%
Forced to Have Sex	5%	8%	9%	12%	13%	18%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-3 Depressed Mood and Suicidal Behavior According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Felt Sad or Hopeless	24%	34%	36%	40%	36%	40%
Ever Attempted Suicide	4%	9%	10%	15%	14%	18%
Injured in a Suicide Attempt	1%	2%	3%	5%	5%	9%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-4a Substance Use According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Used Marijuana at School Past 30 Days	1%	5%	8%	12%	17%	27%
Ever Used Cocaine	3%	7%	14%	20%	28%	43%
Cocaine Use Past 30 Days	0%	2%	6%	8%	14%	26%
Ever Sniff Glue	6%	14%	17%	21%	24%	32%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-4b Substance Use According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Ever Used Heroin	<1%	1%	3%	6%	7%	15%
Ever Used Methamphetamine	2%	6%	13%	29%	27%	37%
Ever Used Steroids	1%	3%	5%	9%	11%	18%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-4c Substance Use According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Ever Inject Drugs	<1%	1%	2%	4%	5%	13%
Past Year Offered Drugs at School	19%	32%	37%	42%	48%	57%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-5a Sexual Risk Behaviors According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Past 30 Days Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Ever Had Sex	34%	56%	62%	71%	74%	87%
Sex Before Age 13	5%	8%	9%	10%	11%	18%
Sex with 6+ Partners	4%	9%	9%	13%	17%	31%

SOURCE: Youth Risk Behavior Survey (YRBS) (2001).

TABLE 2-5b Sexual Risk Behaviors According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Past 30 Days Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
3+ Sex Partners Past 3 Months	2%	4%	5%	8%	10%	20%
Alcohol or Drugs Before Last Sexual Intercourse	3%	9%	16%	23%	36%	52%

SOURCE: Youth Risk Behavior Survey (YRBS) 2001.

TABLE 2-5c Sexual Risk Behaviors According to Frequency of Drinking 5+ Drinks on an Occasion in the Past 30 Days

	Past 30 Days Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Birth Control Last Sex	83%	85%	88%	86%	83%	82%
Been/Gotten Someone Pregnant	5%	7%	7%	11%	11%	19%
Used Condom Last Sex	63%	61%	64%	62%	57%	54%

SOURCE: Youth Risk Behavior Survey (YRBS) 2001.

guns, they were more likely to be in fights in the past year than nondrinkers (62 percent versus 23 percent) and in fights at school (7 percent versus 9 percent). Not surprisingly, they were more likely to have been injured in a fight in the past year (13 percent versus 2 percent) and to feel unsafe or threatened at school (1 percent or 19 percent, respectively, versus 6 percent of nondrinkers).

Twenty-three percent of frequent heavy drinkers reported being hit/slapped by a boyfriend or girlfriend in the past year, compared to 6 percent of nondrinkers. Eighteen percent of the frequent heavy drinkers said they

were forced to have sex in the past year, compared to 5 percent of nondrinkers.

Suicidal Behaviors

Frequent heavy drinkers were more likely to report feeling helpless or sad than nondrinkers (40 percent versus 18 percent), to report suicide attempts in the past year (18 percent versus 4 percent), and to have been injured in a suicide attempt (9 percent versus 1 percent).

Tobacco and Illicit Drugs

Compared to nondrinkers, frequent heavy drinkers were more likely to have used tobacco products: cigarettes (94 percent versus 46 percent), snuff (32 percent versus 2 percent), and cigars (51 percent versus 4 percent). They were dramatically more likely in the past 30 days than nondrinkers to have used marijuana (73 percent versus 7 percent), to have used cocaine (26 percent versus 0 percent), to have sniffed glue (32 percent versus 2 percent), and to have used heroin (15 percent versus <1 percent), methamphetamines (37 percent versus 2 percent), steroids (18 percent versus 2 percent), and illegal injected drugs (13 percent versus <1 percent). First exposure to drugs began at a younger age among frequent heavy drinkers, with 37 percent using marijuana before age 13, compared to only 4 percent of nondrinkers.

A recent analysis of the National Longitudinal Study of Adolescent Health (AdHealth, N = 4,831) revealed that the proportion of persons who use alcohol and tobacco both steadily increase during each consecutive year of adolescence and young adulthood (Jackson, Sher, Cooper, and Wood, 2002). Prior alcohol use more strongly predicted tobacco use than the reverse. In other words, initiation of smoking was a function of prior drinking more so than drinking was a function of prior smoking. The disinhibitory effects of alcohol may reduce resistance to smoking and lead to initiation of use (Sheffiman and Balabanis, 1995).

Although the exact mechanism by which drinking increases the likelihood of smoking has yet to be determined, the findings suggest that the negative consequences of early drinking include heavier smoking and the attendant health consequences of that heavier smoking.

Kandel, Yamaguchi, and Chen (1992) and Kandel and Yamaguchi (1993) analyzed drug use behavior among a random sample of New York high school students and identified a clear sequential pattern of drug involvement with the earliest stages involving use of either alcohol or cigarettes. In this sequence of use, alcohol was generally the drug of first use among males, whereas cigarette and tobacco use most often preceded use of marijuana and other drugs among females. Subsequent stages involved use

of marijuana and then other illicit and/or prescribed drugs. For example, use of marijuana typically preceded use of crack.

Morral, McCaffrey, and Paddock (2002) have published an analysis of the U.S. Household Survey of Drug Use to test a theory of marijuana use as a "gateway" to the use of other drugs. Their analyses did not disprove a gateway effect, but instead demonstrated another plausible alternative. A general drug use propensity may contribute to both marijuana use and the use of other drugs. Whether such an alternative explanation also could explain the association between alcohol and later marijuana and other illicit drug use has yet to be tested.

Sexual Behaviors

According to the National Youth Risk Behavior Survey (Grunbaum et al., 2002), frequent heavy drinkers relative to nondrinkers were also more likely to have had sexual intercourse (87 percent versus 34 percent), sex before age 13 (18 percent versus 5 percent), and sex with at least 6 different partners (31 percent versus 4 percent), and sex with at least 3 partners in the past month (20 percent versus 2 percent). Given their heavier drinking and drug use, frequent heavy drinkers not surprisingly were more likely than nondrinkers to have used alcohol or drugs prior to their last intercourse (52 percent versus 3 percent). Despite their far greater frequency of sexual activity with multiple partners, frequent heavy drinkers were no more likely to use birth control during their last sex (82 percent versus 83 percent) and were less likely to have used a condom (54 percent versus 63 percent). Frequent heavy drinkers were more likely to report having been pregnant or causing someone else to become pregnant (19 percent versus 5 percent) (Grunbaum et al., 2002).

Adolescents in other surveys report they were more likely to have unplanned sexual intercourse when they or a potential partner had been drinking (Strunin and Hingson, 1992). Moreover, young persons who are sexually active are more likely to have unprotected sex when they have intercourse after drinking than when they have intercourse when they have not been drinking (Strunin and Hingson, 1992; Hingson, Strunin, Berlin, and Heeren, 1990; Leigh and Stall, 1993; Stall, McResnick, Wiley, Coates, and Ostrow, 1996).

These findings are important because annually more than 900,000 adolescents become pregnant and most teen pregnancies are unplanned (Henshaw, 1998). Furthermore, adolescents are overrepresented in the nearly 1 million cases of sexually transmitted infection, including chlamydia, gonorrhea, and syphilis (CDC, 1999), which in turn heighten risk of HIV infection. To date in the United States, 138,153 AIDS cases among 13- to 29-year-olds have been reported (U.S. Department of Health and Human

Services, 2000), with most infected during their adolescent years (CDC, 2001).

Academic Performance

Finally, the National Youth Risk Behavior Survey (Grunbaum et al., 2002) reveals that persons who never drank were more likely to report receiving mostly A grades—29 percent compared to 21 percent who drank but never 5 or more drinks at a time, compared to only 12 percent of those who drank 5+ drinks on at least 6 occasions in the past month (Table 2-6). Persons who never drank were also less likely to report receiving mostly Ds and Fs—5 percent compared to 7 percent who drank but not 5 or more at a time, and 15 percent of those who drank 5 or more drinks on at least 6 occasions in the past 30 days. As we will discuss later in this chapter, if alcohol use contributes to poorer academic performance in adolescence, the economic consequences may extend into adult life.

Age of Drinking Onset and Alcohol-Related Health Risks

Not only are adolescents who drink heavily more likely to engage in behaviors that pose a risk to their health, but the younger adolescents are when they begin drinking alcohol, the more likely they are to experience alcohol related problems both during adolescence and in adulthood, including a higher frequency of drinking (Samson, Maxwell, and Doyle, 1989; Gruber, DiClemente, Anderson, and Lodico, 1996), heavier drinking (Barnes, Welte, and Dintcheff, 1992; Hingson, Heeren, Jamanka, and Howland, 2000), alcohol abuse (DeWit, Adlaf, Offord, and Ogborne, 2000), alcohol dependence (DeWit et al., 2000; Grant and Dawson, 1997; Chou and Pickering, 1992), alcohol misuse (Hawkins et al., 1997), alcohol related unintentional injuries (Gruber et al., 1996; Hingson et al., 2000;

TABLE 2-6 Academic Performance According to Frequency of 5 or More Drinks on an Occasion in the Past 30 Days

	Never Drank	Drank Not 5+	1	2	3-5	6+
N =	7,228	2,187	1,248	840	845	891
Grades Mostly						
A's	29%	21%	17%	15%	16%	12%
B's	40%	40%	40%	39%	36%	34%
C's	22%	27%	31%	33%	32%	34%
D's	4%	6%	6%	7%	9%	10%
F's	1%	1%	1%	2%	3%	5%

SOURCE: Youth Risk Behavior Survey (YRBS) 2001.

Hingson, Heeren, Levenson, Jamanka, and Voas, 2002), and getting into fights after drinking (Hingson, Heeren, and Zakocs, 2001). These associations consistently have been found in nationally representative samples of adults in the United States (Hingson et al., 2000; Grant and Dawson, 1997; Chou and Pickering, 1992; Hingson et al., 2002; Hingson et al., 2001), Ontario (DeWit et al., 2000), and New York (Barnes et al., 1992), as well as in national and convenience samples of college undergraduates (Samson et al., 1989) and public high school students (Gruber et al., 1996; Hawkins et al., 1997). Although most studies used cross-sectional designs, Hawkins and colleagues (1997) conducted a longitudinal study following a class of fifth graders for seven years and found similar associations, as did Chassin, Pitts, and Prost (2002), who followed a cohort for eight years whose average age at baseline had been thirteen.

Analyses of the National Longitudinal Alcohol Epidemiology Survey (NLAES) have revealed that those with a younger age of drinking onset are more likely to experience alcohol dependence as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM IV*) criteria (American Psychiatric Association, 1994). In 1992 a random sample of more than 42,000 adults nationwide were surveyed in person by the U.S. Census Bureau, with a response rate of 90 percent. Among both males and females, persons with and without a family history of alcoholism, and persons who began drinking prior to age 14, were at least 3 times more likely than those who waited until age 21 to begin drinking to experience alcohol dependence (Grant, 1998). More than 40 percent of those who began drinking prior to age 14 experienced dependence at some point in their lives.

Subsequent analyses of the NLAES reveal that even after controlling for history of alcohol dependence, those who began drinking at younger ages are more likely to drink heavily (5 or more drinks on an occasion) with greater frequency (Hingson et al., 2000) (Table 2-7).

Furthermore, compared to persons who waited until they were 21 years or older, those who started at age 14 or younger were 12 times more likely to be unintentionally injured while under the influence of alcohol (Hingson et al., 2000), 7 times more likely to be in a motor vehicle crash after drinking (Hingson et al., 2002), and at least 10 times more likely to be in a physical fight after drinking (Hingson et al., 2001) (Figures 2-1 and 2-2). The significant relations between starting to drink at a younger age and these alcohol related injury and trauma outcomes persisted even after controlling for history of alcohol dependency, frequency of heavy drinking, years of drinking, age, gender, race/ethnicity, history of cigarette smoking, and illicit drug use.

These relationships were found ever in the respondent's lifetime and for the year prior to the survey. Because the average NLAES respondent was

TABLE 2-7 Adjusted Odds Ratios Frequency of Heavy Drinking Occasions According to Age Started Drinking

	Past Year Drank Heavily at Least Once Per Week					
Age of Onset	Drink 5+ on an Occasion		Drank to Intoxication		Lifetime Period of Heaviest Drinking Drank 5+ Daily	
	OR	95% CI	OR	95% CI	OR	95% CI
<14	1.44	1.1, 1.88	2.79	1.75, 4.45	2.76	2.13, 3.58
14	1.70	1.2, 2.42	2.80	1.84, 4.77	2.37	1.65, 3.40
15	1.56	1.19, 2.03	3.34	2.11, 5.29	2.12	1.61, 2.79
16	1.34	1.07, 1.69	2.78	1.83, 4.23	1.52	1.21, 1.91
17	1.25	0.99, 1.58	1.77	1.13, 2.78	1.29	1.00, 1.67
18	1.26	1.02, 1.55	1.97	1.29, 3.03	1.27	1.03, 1.57
19	1.33	1.02, 1.72	1.35	0.72, 2.55	1.21	0.91, 1.62
20	0.96	0.7, 1.31	1.82	1.05, 3.16	1.07	0.79, 1.45
21+	1.00	_ _	1.00	_ _	1.00	_ _

Regressions control for Age, Gender, Race/Ethnicity (White Non-Hispanic, Black Non-Hispanic, Hispanic, Other), Education, Drug Use (Current, Former, Never), Smoking (Current, Former, Never), Marital Status (Never Married, Married, Other), Family History of Alcoholism, Alcohol Dependence (Current, Former, Never).
SOURCE: Youth Risk Behavior Survey (YRBS) 2001.

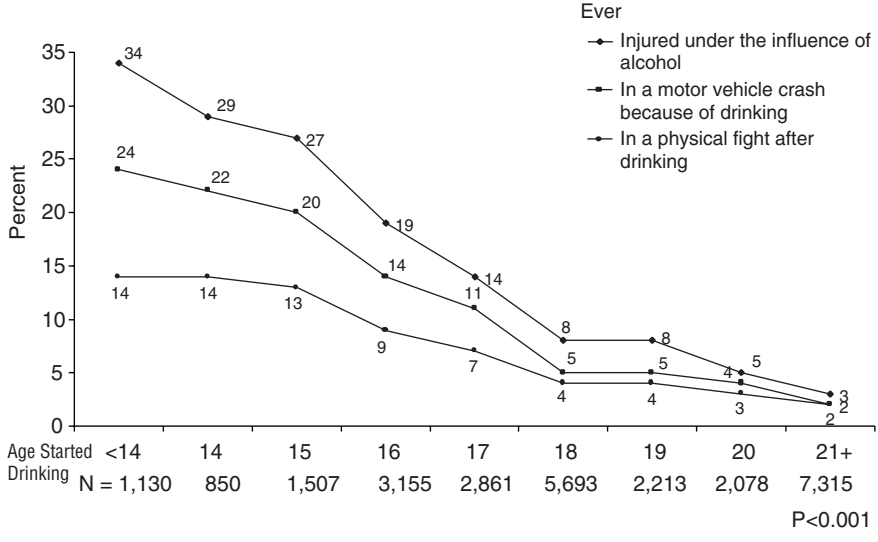

FIGURE 2-1 Ever experienced alcohol related problems according to age started drinking.
SOURCE: Hingson et al. (2000); Hingson et al. (2001); Hingson et al. (2002).

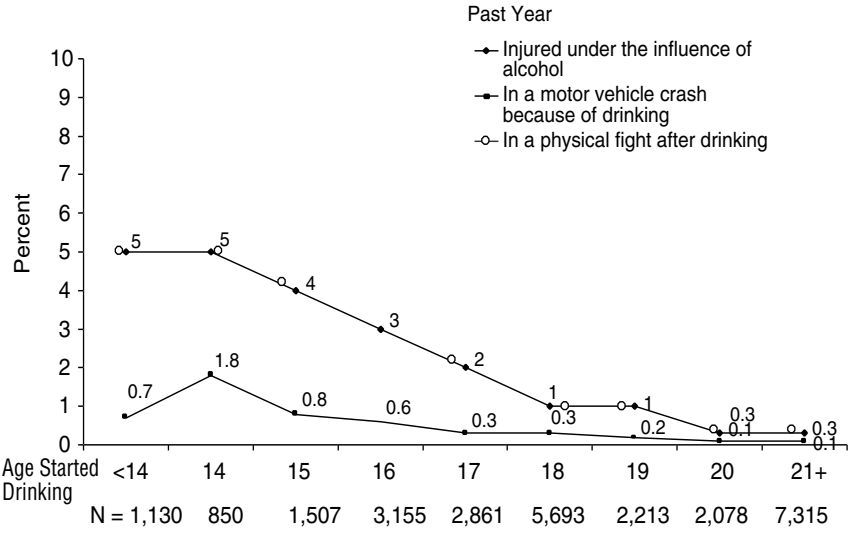

FIGURE 2-2 Past year experiences alcohol related problem according to age started drinking.
SOURCE: Hingson et al. (2000); Hingson et al. (2001); Hingson et al. (2002).

age 44, these findings indicate that risks of injury associated with underage drinking are increased during adolescence, but also persist into adult life (Hingson et al., 2000, 2001, 2002).

More recent analyses (Hingson et al., 2003a, 2003b) of the 1999 Harvard School of Public Health National College Alcohol Survey of over 14,000 students attending full-time at a representative sample of 4-year colleges (response rate 60 percent), found that the earlier the age at which persons ages 19 and older (N = 9,698) first drank to intoxication, the more likely they were to experience alcohol dependence (Figure 2-3) and frequent binge or heavy drinking—5 or more drinks for a man and 4 or more for a woman on a single occasion (Figure 2-3). The latter relation was seen even after further controlling for alcohol dependence. These relationships were found even after controlling analytically for age, gender, race/ethnicity, marital status, parental drinking history, and age of first smoking cigarettes and marijuana (Figures 2-4 and 2-5). Furthermore, the younger respondents were when first drunk, the more likely they were to report driving after drinking and drinking heavily (5+), riding with a drinking driver, unintentional injuries because of drinking, and unplanned and unprotected sex because of drinking. Moreover, these relations also persisted after con-

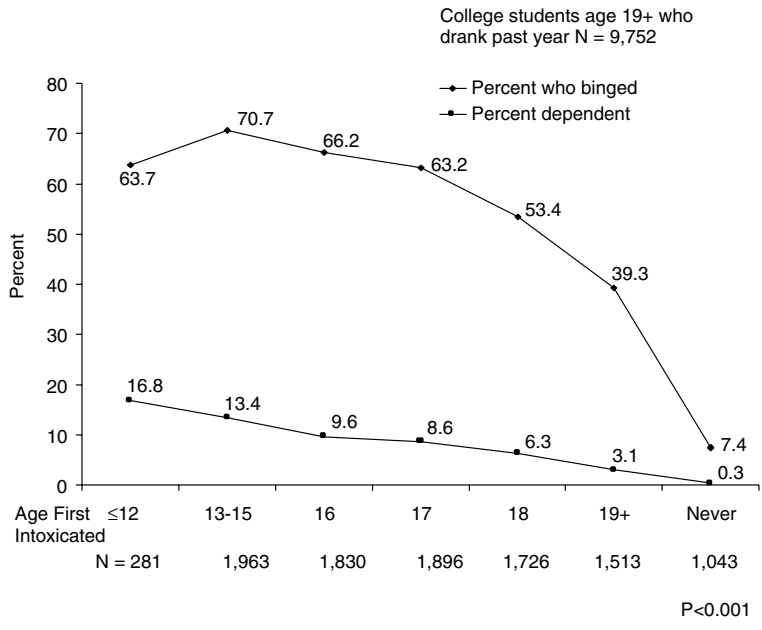

FIGURE 2-3 College alcohol study 1999 binge drinking and alcohol dependence among college students who drink according to age first intoxicated.
SOURCE: Hingson et al. (2003a,b).

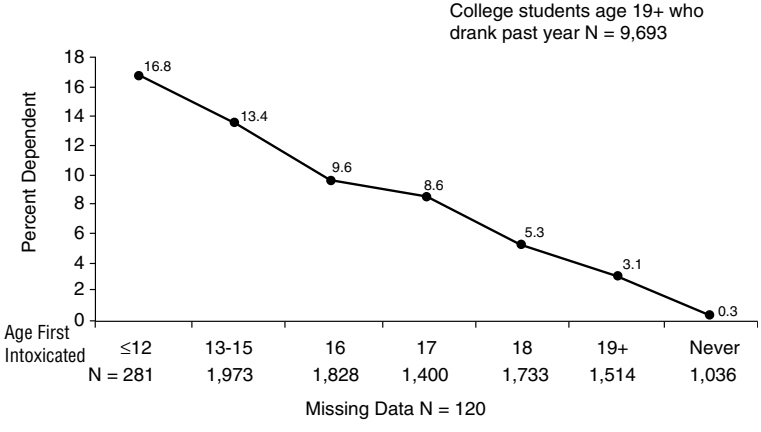

FIGURE 2-4 Alcohol dependence according to age first drunk: 1999 college alcohol survey.
SOURCE: Hingson et al. (2003a,b).

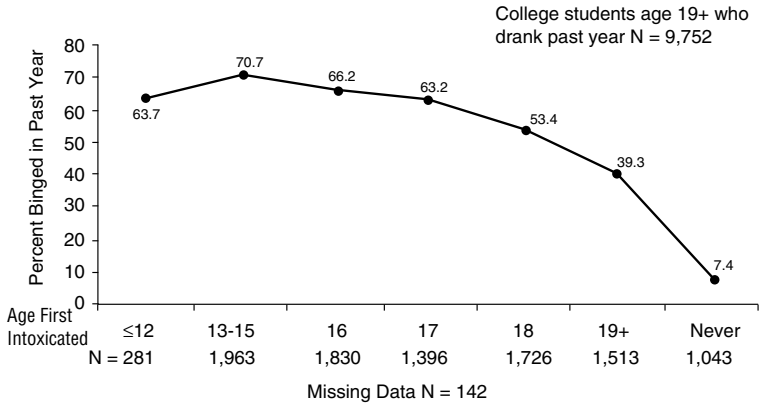

FIGURE 2-5 Binged past year according to age first drunk: 1999 college alcohol survey.
SOURCE: Hingson et al. (2003a,b).

trolling for age, gender, race/ethnicity, age of first use of cigarettes and marijuana, marital status, and whether a respondent's parents had an alcohol problem. The increased rates of driving after drinking, driving after 5+ drinks, injuries, and unplanned and unprotected sex after drinking among college students persisted after further controlling for alcohol dependence and frequency of consuming 5 or more drinks on an occasion in the past 30 days (Figures 2-6 and 2-7).

We should caution that most results on age of drinking onset and alcohol-related risks later in life were based on self-report in cross-sectional surveys and, hence, may be subject to limitations associated with self-report. On the one hand, social desirability biases may foster underreporting of alcohol use and injury involvement after drinking. On the other hand, persons willing to report heavy drinking may be less hesitant than others to report injury involvement after drinking. Although the samples studied were nationally representative and large, and in one in particular the response rate was excellent at 90 percent (Grant et al., 1997), it would be useful to replicate these results in a longitudinal study with chemical markers in addition to self-report. Also, it is possible that people who engage in a variety of deviant or illegal behaviors at an early age are more likely to continue them later in life. For example, childhood conduct disorder has been associated with substance abuse later in life (Robins, 1993).

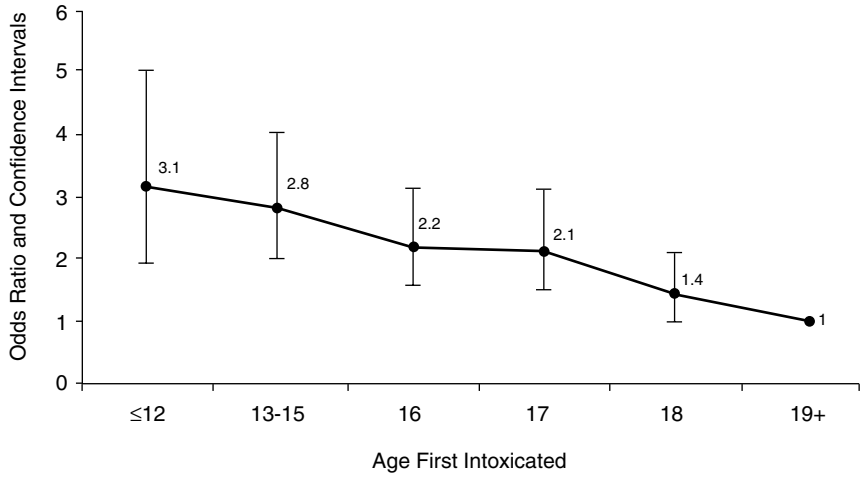

FIGURE 2-6 Alcohol dependence according to age first intoxicated: 1999 college alcohol survey.
SOURCE: Hingson et al. (2003a,b).

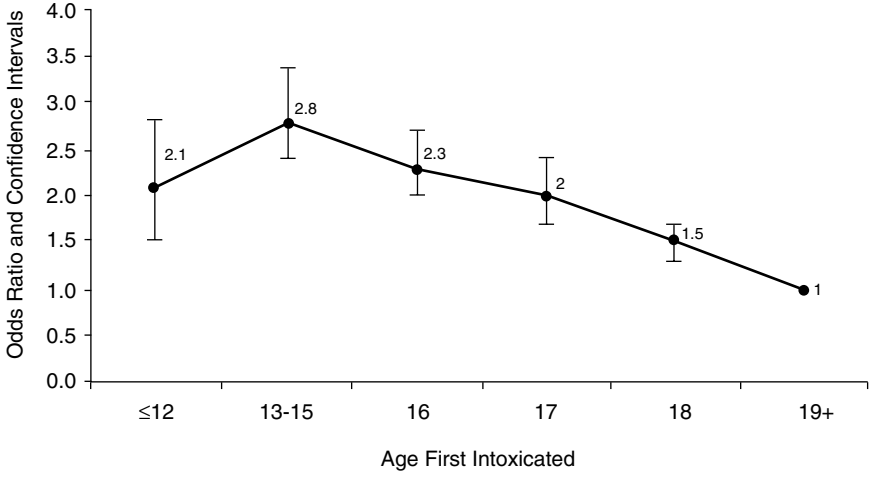

FIGURE 2-7 Past 30 days binged according to age first intoxicated: 1999 college alcohol survey.
SOURCE: Hingson et al. (2003a,b).

These findings indicate a need for additional research in two areas. First, research is needed to explain why starting to drink at an early age relates to alcohol dependence and to heavier drinking later in life, even among persons who are not dependent. Genetics may play a role by predisposing certain individuals to exhibit tolerance to the physiologic effects of alcohol early in their drinking careers, thereby contributing to the establishment of heavier drinking patterns that persist later in life (Schuckit, 1999). Familial influences, both genetic and environmental, may account for the early onset/later dependence relationship (Prescott and Kendler, 1999). Persons who drink earlier may have physiologic changes that contribute to greater tolerance and the need to drink more to achieve the same pleasurable sensations after drinking. They may have learned to drink in less controlled situations with peers whose drinking norms are to drink to intoxication rather than with family and parents who might drink more moderately. They may also have parents who are heavier drinkers. A central construct of Social Learning Theory (Akers, 1977), Social Cognitive Theory (Bandura, 1986), and Problem Behavior Theory (Jessor and Jessor, 1975; Jessor, van Den Bos, Vanderryn, and Costa, 1995) is that adolescents learn and engage in behaviors by observing others. Adolescents whose parents drink alcohol are more likely to drink (Hawkins et al., 1997; Jessor et al., 1995), and adolescents with heavy or problem-drinking parents may be more likely to develop similar patterns.

The Multistage Social Learning Model (Simons, Conger, and Whitbeck, 1988) and Family Interaction Theory (Brook, Brook, Gordon, Whiteman, and Cohen, 1990) suggest that parenting styles may also influence the drinking patterns of their children. Generally, parents with authoritarian parenting styles (i.e., demanding), as opposed to authoritative styles (i.e., demanding but also involved and supportive) are more likely to have offspring who develop alcohol problems (Hawkins et al., 1997; Chassin et al., 2002). Parenting styles that lack warmth, support, supervision, and discipline also predict greater adolescent drinking behavior (Reifman, Barnes, Dintcheff, Farrell, and Uhteg, 1998; McGue, Sharma, and Benson, 1996; Gerrard, Gibbons, Zhao et al., 1999; Simons-Morton, Haynie, Crump, Eitel, and Saylor, 2001; Duncan, Tildesley et al., 1995; Cohen, Richardson, and LaBree, 1994; Simons-Morton, Haynie et al., 1999; Simantov, Schoen, and Klein, 2000; Zhang, Welte, and Wieczorek, 1999).

Parental rules about alcohol use by their children, and supervision and enforcement of those rules, may influence how and when youth begin to drink, and how much they drink both as adolescents and adults. In a longitudinal study (Chassin et al., 2002), parents with a history of alcohol dependence and antisocial personality were found to have children who begin binge drinking at younger ages and who binge at least once per week at ages 19 to 20.

Also, persons who develop alcoholism later in life may have had more adverse experiences in childhood such as psychological, physical, and sexual abuse; domestic violence; and substance abuse by parents (DeWit et al., 2000). A recent national household probability survey of 4,023 adolescents ages 12 to 17 (Kilpatrick et al., 2000) reported that adolescents who had been physically assaulted or sexually assaulted, who had witnessed violence, or who had family members with alcohol and drug use problems had at least a twofold increased risk for alcohol and marijuana abuse and dependence. Sexual assault, physical assault, or witnessed violence were also associated with an earlier age of drinking onset (14.4 years compared to 15.1 among those not victimized). The relations between age of onset and subsequent dependence were not specifically examined. Early age drinking and heavy drinking that leads to dependence may be stimulated by efforts to cope or deal with negative family experiences.

Lastly, lax law enforcement of community and state regulations regarding underage drinking may contribute both to starting to drink at a younger age and to the development of heavier drinking patterns that result in dependence.

The second need for additional research is to examine why, even when diagnosis of alcohol dependence and measures of frequency of lifetime and past-year heavy drinking are controlled, persons who began drinking at an earlier age are more likely after drinking to place themselves in situations that pose risk of injury. Several explanations are possible. Those who begin drinking at an early age may be less fearful of injury and situations that pose risk of injury. Some may derive pleasure or a sense of self-esteem by taking risks associated with injury. It is well known that persons who drive after drinking, for example, are more likely to speed and less likely to wear seat belts (Hingson, Howland, Schiavone, and Damiata, 1990). Alternatively, persons who start drinking at earlier ages may not be as aware of or appreciate how alcohol increases injury risk. Studies have shown that people who drive after heavy drinking are more likely to believe they can drive safely after higher amounts of alcohol consumption (Hingson et al., 2003a,b). For example, they may believe the risks of traffic crashes and other injuries increase only for people who are visibly intoxicated. Also, their heavier consumption of alcohol may further impair the judgment of those who start drinking at a younger age. After drinking, they may be less likely than when sober to recognize situations that pose risk of injury or to fully appreciate the risks posed by those situations.

ECONOMIC CONSEQUENCES OF UNDERAGE DRINKING

In addition to social and health consequences, there are also economic consequences for underage drinkers and for the rest of society. In this

section, we provide a partial accounting of the immediate and life-course economic consequences of underage drinking. The immediate economic consequences stem from the fact that efforts to prevent and treat underage drinking problems and the consequences of underage drinking divert scarce societal resources from alternative uses. The life-course consequences occur if underage drinkers invest in less human capital, which reduces the standard of living they enjoy over their entire life-course. There are additional life-course consequences to the extent underage drinkers are more likely to suffer drinking problems later in life. A central challenge in this line of research is whether the future labor market and drinking problems would have occurred without the underage drinking. There is a need to isolate the extent to which underage drinking causes these problems and is not merely associated with them.

We want to stress that our partial accounting of the economic consequences of underage drinking does not constitute a complete economic evaluation (cost/benefit analysis or cost-effectiveness analysis). A recent cost of illness study estimates that in 1996, the total cost of underage drinking was $52.8 billion (U.S. Department of Justice, 1999; Levy et al., 1999a). Because reductions in costs are a benefit to society, it is tempting to conclude from this estimate that by eliminating underage drinking, society could reap $52.8 billion of benefits. However, from a practical standpoint, it is not really useful to compare the current situation to a highly unlikely alternative scenario where no one under the age of 21 drinks.

In addition, the cost of illness approach is not consistent with the standard methods of economic evaluation (Cook and Ludwig, 2000; Kenkel, 1994). The cost of illness approach is "implicitly based upon the maximization of society's present and future production" (Landefeld and Seskin, 1982). In contrast, economic evaluations of underage drinking are based on the value of the increased well-being of members of society, including their enhanced safety and quality of life. Economic evaluations focus on specific interventions and use comprehensive approaches to measure the benefits of a reduction in underage drinking, such as societal willingness to pay in a cost/benefit analysis (Kenkel, 1998) or the number of quality-adjusted life years saved in a cost-effectiveness analysis (Gold, Siegel, Russell, and Weinstein, 1996).

Although not a cost/benefit analysis, the estimates below provide a quantitative perspective on the importance of underage drinking as a public policy problem (Weimer and Vining, 1989). As Mooney and Wiseman (2000) observe about a similar approach to health priority setting, our approach "measures problems and not the value of solutions." But by providing a more complete understanding of the problem, our estimates are helpful to begin to design appropriate policy solutions.

Immediate Economic Consequences of Underage Drinking: Health Care Expenditures

The immediate consequences of underage drinking are estimated to include at least $8.4 billion of health care expenditures. These expenditures due to underage drinking represent a societal loss because societal resources have been diverted away from other valuable uses. Health care expenditures related to underage drinking include expenditures for alcohol abuse services and expenditures for the medical consequences of alcohol abuse.

We estimate that $7.3 billion are spent annually in the United States for alcohol abuse services for underage drinkers. This estimate is based in part on data from the National Survey of Substance Abuse Treatment Services. These data indicate that in 1998, 138,000 youths ages 12 to 17 were admitted to substance abuse treatment (Substance Abuse and Mental Health Services Administration, 2002). Of these, 9 percent of youth admissions involved alcohol abuse only, and half involved both alcohol and marijuana. Assuming that half of the treatment expenditures for admissions that involved both alcohol and marijuana were for the treatment of the alcohol abuse, we estimate that an equivalent of 47,000 youth were treated for alcohol abuse. The NLAES provides information on youth over 17, but still underage. These data show that 3 percent of young adults ages 18 to 20 sought treatment for alcohol problems. Based on the current population in that age group, this suggests an additional 356,520 young adults were treated. At an average estimated treatment cost of $18,000 (Goodman, Nishiura, and Humphreys, 1997), this means the United States spent $7.3 billion for alcohol abuse services for slightly over 400,000 underage drinkers in treatment. To develop this estimate, we also assumed but do not know for certain that the average treatment costs for youths and adults are the same. The estimate may be high or low depending on whether average treatment costs for youth are higher or lower than costs for adults.

Expenditures for medical consequences related to alcohol abuse by underage drinkers are estimated based on medical expenditures related to traffic crashes that involved an underage drinking driver. Levy et al., (1999a) estimated that these medical care costs total about $1.1 billion. This estimate omits costs related to medical consequences of underage drinking other than traffic crashes.

Life-Course Consequences

Many underage drinkers are in high school or college; in economic terms they are investing in their human capital. If underage drinkers invest in less human capital than their nondrinking peers, later in life they may be less productive workers who earn less and suffer a lower standard of living.

Although these losses are mainly borne by the underage drinkers themselves, the rest of society shares some of the losses to the extent that over their lifetimes, less productive workers receive more antipoverty transfer payments, pay less in taxes, and generate less economic surplus.

Econometric studies provide fairly consistent evidence that underage drinking problems result in less investment in schooling and other aspects of human capital. Mullahy and Sindelar (1989) analyzed Wave I (1980-1981) of the Epidemiologic Catchment Area (ECA) data set. The rich ECA data allowed Mullahy and Sindelar to control statistically for a variety of factors related to educational attainment, including family background measures such as father's education and occupation, and whether the youth suffered from other mental disorders as a teenager. After controlling for these factors, Mullahy and Sindelar estimated that males who experience symptoms of alcoholism before the age of 18 attain on average 1.5 fewer years of schooling. Early symptoms of alcoholism were also associated with a lower probability of later employment in a white-collar professional occupation. Yamada, Kendix, and Yamada (1996) analyzed data from the National Longitudinal Survey of Youth-1979 (NLSY79). This study was also able to control statistically for a range of other determinants of educational attainment, including family background and the student's academic aptitude test score. Yamada and colleagues (1996) estimated that youth who were frequent drinkers have a high school graduation rate that is 4.3 percentage points below that of their peers.

Several studies have extended this line of research to estimate the causal impact of drinking on college attainment. Cook and Moore (1993) used the NLSY79 data to investigate the relationship between heavy drinking in high school and the number of years of college eventually completed. A major concern of this study is that observed patterns of drinking and schooling reflect intertwined decisions, making it difficult to know the extent to which drinking causes the reduced educational attainment. To address this concern, Cook and Moore (1993) relied on the natural or quasi-experiments created by differences in states' alcohol control policies. They estimated that controlling for other factors, students who spend their high school years in states with relatively high beer taxes and minimum legal drinking ages are more likely to graduate college. Using data from the 1993 College Alcohol Study, Wolaver (2002) estimated that high school drinking has small residual effects on college study hours, grade point average (GPA), and declaration of college major; she estimated that drinking while in college has much stronger effects on college outcomes. By combining the results of her study with estimates from labor economics on the returns to college GPA and major, Wolaver estimated that high school and college drinking will eventually translate into substantial earnings losses later in life. For example, she estimated that because of the effects of college drink-

ing on choice of major, college-educated males' future annual earnings are reduced by 1.6 percent to 3.7 percent, while college-educated females' future annual earnings are reduced by 2 percent to 9.8 percent.

The econometric estimates we have reviewed suggest that even those underage drinkers who do not experience alcohol problems as adults may experience reduced earnings and a lower standard of living over their life-course because of their high school and college drinking. Other evidence suggests that the earnings losses may be even larger for those underage drinkers who continue to abuse alcohol as adults. A long line of economics research examines the extent to which current alcohol problems reduce the earnings of working adults (for example, Rice et al., 1990; Mullahy and Sindelar, 1989; 1993, 1994; Kenkel and Ribar, 1994; and National Institute on Drug Abuse and National Institute on Alcohol Abuse and Alcoholism [NIDA/NIAAA], 1998). Although the evidence is somewhat inconsistent, prime-age males with drinking problems appear to earn less, but so do abstainers, compared to their moderate drinking peers (Cook and Moore, 2000). The positive association between moderate drinking and earnings could reflect a causal impact, where moderate drinking improves health and worker productivity. However, ongoing research is also exploring other possible explanations for the association. The studies that find a positive impact of moderate drinking have not examined underage drinking, and it seems highly unlikely that underage drinking that persists as problematic adult drinking will have beneficial productivity effects.

Most of the studies of adult problem drinking and earnings control for other differences between problem and nonproblem drinkers to focus on the direct impact of alcohol problems on earnings. As Mullahy and Sindelar emphasize, this approach underestimates the total impact of alcohol problems if the alcohol problems are the root causes of some of the other differences. Accounting for the indirect effects of problem drinking through lower schooling attainment and occupational choices substantially increases estimates of the earnings losses associated with problem drinking (Mullahy and Sindelar, 1989, 1993, 1994; Kenkel and Ribar, 1994).

In addition, early drinking together with an adult drinking problem may have an interactive or synergistic effect on earnings. NIDA/NIAAA (1998) reported the results of the econometric analysis of the NLAES data used to estimate the productivity effects of alcohol abuse. The results indicated that early initiation of drinking plays an important role in determining worker productivity later in life. Males who met criteria for alcohol dependence and who also initiated drinking before the age of 15 on average earned 13.1 percent less than their nondependent counterparts. Males who met criteria for alcohol dependence, but who were not early initiators on average, earned only 4.4 percent less. If alcohol-dependent males who initiated drinking while underage experienced the same earn-

ings losses as alcohol-dependent males who initiated drinking later in life, the NIDA/NIAAA productivity costs of alcohol abuse would fall from $84 billion to $51 billion. The difference of $33 billion is an estimate of the portion of the productivity costs currently suffered by alcohol-dependent males that is associated with their previous underage drinking. Of course, association does not prove causation: It is a challenging research question to determine the extent to which the future productivity losses are indeed due to the earlier underage drinking.

Yet another channel for underage drinking to have adverse economic consequences over the life-course is if early drinking is a contributory causal factor in adult drinking problems. As described earlier, in the NLAES data earlier age of drinking is associated with higher rates of subsequent problem drinking and alcohol related unintentional injuries. Cook and Moore (2001) reported new econometric evidence that suggests early drinking is causally related to later drinking. They again relied on the natural or quasi-experiments created by state alcohol control policies to study the persistence of youthful drinking. They found that respondents to the NLSY79 who at age 14 lived in a state where the legal drinking age was 18 instead of 21 were more likely to binge drink years later as adults. This evidence that underage drinking increased the risks of adult drinking problems means that some of the earnings losses experienced by adult problem drinkers actually can be traced back to their underage drinking.

DISCUSSION

No matter how careful the assumptions used in this chapter were to estimate the magnitude of injury mortality associated with underage drinking, it would be preferable if all persons who die from unintentional and intentional injury deaths were tested for alcohol. That would provide a more accurate assessment of the magnitude of alcohol related injury deaths among youth and would, if continued over time, permit more informative analyses of the impact of program and policy changes to reduce underage drinking-related deaths. Part of the reason progress has been made in reducing alcohol related traffic deaths in the past two decades is that most drivers who die in traffic crashes are tested for alcohol. This allows comparison of states before and after new drunk driving and other alcohol regulations with states that do not make those changes to assess whether the regulations produce reductions in fatal crashes involving alcohol. Testing is needed not only for traffic deaths, but for deaths from other unintentional injuries (e.g., falls, drownings, burns, overdoses) as well as intentional injuries such as homicide and suicide.

Also, while research needs to be done to determine whether delaying the onset of drinking will prevent alcohol related problems and economic

consequences later in life, we believe findings outlined in this volume provide important information for physicians and other health care providers to share with their adolescent patients about risks associated with early age of drinking onset. They should explore the age their patients started to drink and advise their patients that people who start drinking at early ages not only have an increased risk of developing alcohol dependence, but they also have an increased risk of experiencing motor vehicle and other unintentional injuries and alcohol related violence, which are the major causes of death among adolescents and young adults. They should point out that decisions about underage drinking and schooling may have lifetime economic consequences as well as sometimes literally being a matter of life and death.

Treatment interventions to reduce drinking have been found to reduce alcohol related traffic injuries, violence, and other harms associated with alcohol abuse. A systematic review of randomized control trials to reduce alcohol dependence and abuse (Dinh-Zarr, Diguiseppi, Heitman, and Roberts, 1986) reported reductions in alcohol related traffic crashes, aggressive behavior (Potamainos, North, Meade, Townsend, and Peters, 1986), assaults (Sitharthan, Kavanaugh, and Sayer, 1996) and domestic violence (Barber and Crisp, 1995), and criminal and domestic violence (Toteva and Mi'anov, 1996) associated with posttreatment reductions in drinking. A more recent randomized trial evaluated a brief motivational intervention to reduce drinking among injured problem drinkers (Gentilello, Rivara, Donovan et al., 1999). One year later, the intervention group averaged 3 drinks less per day and experienced a 47 percent reduction in emergency department, trauma center, and hospital injury admissions. The greatest declines involved intentional injuries and were among mild to moderate drinkers. Similar benefits have been observed in a separate experimental evaluation of adolescents positive for being treated in an emergency department (Monti et al., 1999). A brief motivational intervention for older adolescents (mean age 18) produced a significantly lower incidence at 6-month follow-up of alcohol related injuries and alcohol related problems with dates, friends, police, and parents and at school and a lower incidence of driving while intoxicated than experienced by those who received standard care. Both intervention and comparison groups experienced significant posttreatment declines in drinking.

Furthermore, results on age or drinking onset reinforce the need for policies that reduce adolescent drinking, such as the minimum legal drinking age of 21. That law has been found to reduce drinking, alcohol related traffic deaths, and deaths from unintentional injuries under the age of 21 (U.S. General Accounting Office, 1987; Jones et al., 1992; Shultz et al., 2001; Wagenaar and Toomey, 2002). Some studies (Davis and Reynolds, 1990; Parker, 1995), but not all (Hughes and Dodder, 1992; Engs and

Hanson, 1986), have also found that raising the minimum legal drinking age is associated with declines in fighting among the age groups targeted by the law, and one study reported that increases in the legal drinking age was associated with reductions in sexually transmitted diseases among adolescents (Harrison and Kasslet, 2000). One multistate study found that person who were raised in states with a drinking age of 21 relative to younger ages were not only less likely to drink when they were under age 21, but they were less likely to drink when ages 21 to 25 (O'Malley and Wagenaar, 1991). Community-based programs that use compliance check surveys to assess the extent of sales of alcohol to minors and that increase enforcement to prevent sales to underage persons can reduce underage drinking (Wagenaar, Murray, Gehan et al., 2000) and alcohol related traffic crashes and assault injuries (Holder, Gruenwald, Ponick et al., 2000). Whether these community-based programs to heighten enforcement of laws to prevent underage drinking also reduce other health, social, and economic consequences associated with underage drinking during both adolescence and adult years warrants immediate investigation.

REFERENCES

Akers, R.L. (1977). *Deviant behavior: A social learning approach* (2nd ed.). Belmont, CA: Wadsworth.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, Fourth Edition*. Washington, DC: Author.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. NJ: Prentice-Hall.

Barber, J.G., and Crisp, B.R. (1995). The pressure to change approach to working with the partners of heavy drinkers. *Addiction*, *90*, 269-276.

Barnes, G.M., Welte, J.W., and Dintcheff, B. (1992). Alcohol misuse among college students and other young adults: Findings from a general population study in New York State. *International Journal of the Addictions*, *27*, 917-934.

Blomberg, R. (1992). *Lower BAC limits for youth: Evaluation of the Maryland .02 laws*. DOT HS 807 859 Technical Summary. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Brook, J.S., Brook, D.W., Gordon, A.S., Whiteman, M., and Cohen, P. (1990). The psychosocial etiology of adolescent drug use: A family interactional approach. *Genetic, Social, and General Psychology Monographs*, *116*, 111-267.

Centers for Disease Control and Prevention. (1999). *STD surveillance 1998*. Atlanta: Georgia Department of Health and Human Services, Division of STD Prevention.

Centers for Disease Control and Prevention. (2001). *Division of HIV/AIDS prevention surveillance report*. Atlanta: National Center for HIV, STD and TB Prevention

Chassin, L., Pitts, S., and Prost, J. (2002). Binge drinking trajectories from adolescence to emerging adulthood in a high risk sample: Predictors and substance abuse outcomes. *Journal of Consulting and Clinical Psychology*, *70*(1), 67-78.

Chou, S.P., and Pickering, R.P. (1992). Early onset of drinking as a risk factor for lifetime related problems. *British Journal of Addictions*, *87*, 1199-1204.

Cohen, D.A., Richardson, J., and LaBree, L. (1994). Parenting behaviors and the onset of smoking and alcohol use: A longitudinal study. *Pediatrics*, *94*, 368-375.

Cook, P.J., and Ludwig, J. (2000). *Gun violence: The real costs.* New York: Oxford University Press.

Cook, P.J., and Moore, M.J. (1993). Drinking and schooling. *Journal of Health Economics*, *12*(4), 411-430.

Cook, P.J., and Moore, M.J. (2000). Alcohol. In A.J. Culyer and J.P. Newhouse (Eds.), *Handbook of health economics* (pp. 1629-1674). New York: Elsevier Science.

Cook, P.J., and Moore, M.J. (2001). Environment and persistence in youthful drinking patterns. In J. Gruber (Ed.), *Risky behavior among youths* (pp. 378-438). Chicago: University of Chicago Press.

Davis, J.E., and Reynolds, N.C. (1990). Alcohol use among college students: responses to raising the purchase age. *Journal of American College Health*, *38*, 263-269.

DeWit, D.J., Adlaf, E.M., Offord, D.R., and Ogborne, A.C. (2000). Age of first alcohol use: A risk factor for the development of alcohol disorders. *American Journal of Psychiatry*, *157*, 745-750.

Dinh-Zarr, T., Diguiseppi, C., Heitman, E., and Roberts, I. (1986). Preventing injuries through interventions for problem drinking: A systematic review of randomized controlled trials. *Alcohol and Alcoholism*, *34*, 797-799.

Duncan, T. E., Tildesley, E., Duncan, S. C., and Hops, H. (1995). The consistency of family and peer influences on the development of substance use in adolescence. *Addiction*, *90*, 1647-1660.

Engs, R.C., and Hanson, D.J. (1986). Age specific alcohol prohibition and college students' drinking problems: Examining the effects of raising the purchase age. *Psychological Reports*, *59*, 979-984.

Gentilello L.M., Rivara, F.P., Donovan, D.M., Jurkovich, J.G., Daranciang, E., Dunn, C. et al. (1999). Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annuals of Surgery*, *230*, 473-484.

Gerrard, M., Gibbons, F.X., Zhao, L., Russell, D.W., and Reis-Bergan M. (1999). The effect of peers' alcohol consumption on parental influence: A cognitive mediational model. *Journal of Studies on Alcohol (Supplement 13)*, 32-44.

Gold, M.R., Siegel, J.E., Russel, L.B., and Weinstein, M.C. (Eds.). (1996). *Cost-effectiveness in health and medicine: Report of the panel on cost-effectiveness in health and medicine.* New York: Oxford University Press

Grant, B. (1998). The impact of family history of alcoholism on the relationship between the age of onset of alcohol use and DSM-IV alcohol dependence. *Alcohol Health and Research World*, *22*, 144-147.

Grant, B.F., and Dawson, D.F. (1997). Age of onset of alcohol use and its association with DSM IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse*, *9*, 103-110.

Gruber, E., DiClemente, R.J., Anderson, M.M., and Lodico, M. (1996). Early drinking onset and its association with alcohol use and problem behavior in late adolescence. *Preventive Medicine*, *25*, 293-300.

Grunbaum, J., Kann, L., Kindun, S., Williams, B., Ross, J. Lowry, R., and Koelbe, L. (2002). Youth risk behavior surveillance: United States 2001. *Morbidity, Mortality Weekly Report*, *51*(5504), 1-64.

Harrison, P., and Kasslet, W.J. (2000). Alcohol policy and sexually transmitted disease rates. United States, 1981-1995. *Morbidity, Mortality Weekly Report*, *49*, 346-349.

Hawkins, J.D., Graham, J.W., Maguin, E., Abbott, R., Hill, K.G., and Catalano, R.F. (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol*, *58*, 280-290.

Henshaw, S.K. (1998). Unintended pregnancy in the United States, 1982-1993. *Family Planning Perspectives*, *30*, 24-29.

Hingson, R., Howland, J., Schiavone, T., and Damiata, M. (1990a). The Massachusetts Saving Lives Program: Six cities shift the focus from drunk driving to speeding, reckless driving and failure to wear safety belts. *Journal of Traffic Medicine*, *3*, 123-132.

Hingson, R., Strunin, L., Berlin, B.M., and Heeren, T. (1990b). Beliefs about AIDS, use of alcohol and drugs and unprotected sex among Massachusetts adolescents. *American Journal of Public Health*, *80*, 295-299.

Hingson, R., Heeren, T., and Winter, M. (1994). Lower legal blood alcohol limits for young drivers. *Public Health Reports*, *109*, 738-744.

Hingson, R., Heeren, T., Jamanka, A., and Howland, J. (2000). Age of drinking onset and unintentional injury involvement after drinking. *Journal of the American Medical Association*, *284*, 1527-1531.

Hingson, R., Heeren, T., and Zakocs, R. (2001). Age of drinking onset and involvement in physical fights. *Pediatrics*, *108*(4), 872-877.

Hingson, R., Heeren, T., Levenson, S., Jamanka, A., and Voas, R. (2002). Age of drinking onset, driving after drinking and involvement in alcohol related motor vehicle crashes. *Accident Analysis and Prevention*, *34*, 85-92.

Hingson, R., Heeren, T., Zakocs, R., Winter, M., and Wechsler, H. (2003a). Age of first intoxication, heavy drinking, driving after drinking and risk of unintentional injury among U.S. college students. *Journal of Studies on Alcohol*, *64*(1), 23-31.

Hingson, R., Heeren, T., Winter, M., and Wechsler, H. (2003b). Early age of first drunkenness as a factor in college students' unplanned and unprotected sex attributable to drinking. *Pediatrics*, *111*(1), 34-41.

Holder, H.D., Gruenewald, P.J., Ponicki, W.R., Treno, A.J., Grube, J.W., Saltz, R.F., Voas, R.B., Reynolds, R., Davis, J., Sanchez, L., Gaumont, G., and Roeper, P. (2000). Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *Journal of the American Medical Association*, *284*(18), 2341–2347.

Hughes, S.P., and Dodder, R.A. (1992). Changing the legal minimum drinking age: Results of a longitudinal study. *Journal of Studies on Alcohol*, *53*, 568-575.

Jackson, K., Sher, K., Cooper, L., and Wood P. (2002). Adolescent alcohol and tobacco use: Onset persistence and trajectories of use across two samples. *Addiction*, *97*, 517-531.

Jessor, R., and Jessor, S.L. (1975). Adolescent development and the onset of drinking. A longitudinal study. *Journal of Studies on Alcohol*, *36*, 27-51.

Jessor, R., van Den Bos, J., Vanderryn, J., and Costa, F. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychology*, *31*, 923-933.

Jones, N., Pieper, C., and Robertson, L. (1992). The effect of the legal drinking age on fatal injuries of adolescents and young adults. *American Journal of Public Health*, *82*, 112-114.

Kandel, D., and Yamaguchi, K. (1993). From beer to crack: Developmental patterns in drug involvement. *American Journal of Public Health*, *83*, 851-855.

Kandel, D., Yamaguchi, K., and Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol*, *153*, 447-457.

Kenkel, D.S. (1994). The cost of illness approach. In G.S. Tolley, D. S. Kenkel, and R. Fabian (Eds.), *Valuing health for policy: An economic approach* (pp. 42-71). Chicago: University of Chicago Press.

Kenkel, D.S. (1998). A guide to cost-benefit analysis of drunk-driving policies. *Journal of Drug Issues*, *28*(3), 795-812.

Kenkel, D.S., and Ribar, D.C., (1994). Alcohol consumption and young adults' socioeconomic status, *Brookings Papers on Economic Activity-Micro*, 119-161.

Kenkel, D.S., and Wang, P. (1999). Are alcoholics in bad jobs? In F.J. Chaloupka, M. Grossman, W.K. Bickel, and H. Saffer (Eds.), *The economic analysis of substance use and abuse: An integration of economic and behavioral economic research* (pp. 251-278). Prepared for the National Bureau of Economic Research. Chicago: University of Chicago Press.

Kilpatrick, D., Acrerino, R., Saunders, B., Renick, H., Best, C., and Schnury, P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology*, *68*(1), 19-30.

Landefeld, J.S., and Seskin, E.P. (1982). The economic value of life: Linking theory to practice. *American Journal of Public Health*, *76*(6), *555*-566.

Leigh, B.C., and Stall, R. (1993). Substance use and risky sexual behavior for exposure to HIV: Issues in methodology, interpretation, and prevention. *American Psychologist*, *48*, 1035-1045.

Levy, D., Miller, T., and Lox, K. (1999a). *Costs of underage drinking*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Levy, D., Miller, T., Spicer, R., and Cox, K. (1999b, July). *Underage drinking: Immediate consequences and their costs*. Working Paper, July 1999. Pacific Institute for Research and Evaluation. Bethesda, Maryland.

McGue, M., Sharma, A., and Benson, P. (1996). Parent and sibling influences on adolescent alcohol use and misuse: Evidence from a U.S. adoption cohort. *Journal of Studies on Alcohol*, *57*, 8-18.

Monti, P.M., Spirit, A., Myers, M., Colby, S.M., Barnett, N.P., Rohsenow, D.J., Woolard, R., and Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*, *67*, 989-994.

Mooney, G., and Wiseman, V. (2000). Burden of disease and priority setting. *Journal of Health Economics*, *9*(5), 369-372.

Morral, A., McCaffrey, D., and Paddock, S. (2002). Reassessing the marijuana gateway effect. *Addiction*, *97*, 1493-1504.

Mullahy, J., and Sindelar, J., (1989). Life-cycle effects of alcoholism on education, earnings, and occupation. *Economic Inquiry*, *26*(2), 272-282.

Mullahy, J., and Sindelar, J. (1993). Alcoholism, work, and income. *Journal of Labor Economics*, *11*(3), 494-520.

Mullahy, J., and Sindelar, J. (1994). Alcoholism and income: The role of indirect effects. *Milbank Quarterly*, *72*(2), 359-375.

National Highway Traffic Safety Administration. (2000). *National Survey of Drinking and Driving Attitudes and Behavior 1999*. DOT HS 809190. Washington, DC: U.S. Department of Transportation.

National Highway Traffic Safety Administration. (2001). *Fatality analysis reporting system*. Washington, DC: U.S. Department of Transportation.

National Highway Traffic Safety Administration. (2002). *Traffic Safety Facts 2001 Overview*. DOT HS 809476. Washington, DC: U.S. Department of Transportation.

National Institute of Drug Abuse and National Institute on Alcohol Abuse and Alcoholism. (1998). *The economic costs of alcohol and drug abuse in the United States—1992*. Bethesda, MD: Author.

O'Malley, P., and Wagenaar, A. (1991). Effects of minimum drinking age laws on alcohol use, related behavior and traffic crash involvement among American youth. *Journal of Studies on Alcohol*, *52*, 478-491.

Parker, R.N. (1995). *Alcohol and homicide—A deadly combination of two American traditions*. Albany: State University of New York Press.

Potamainos, G., North, W.R.S., Meade, T.W., Townsend, J., and Peters, T.J. (1986). Randomized trial of community-based center versus conventional hospital management in treatment of alcoholism. *Lancet*, *2*, 797-799.

Prescott, C.A., and Kendler, K.S. (1999). Age at first drink and risk for alcoholism: A noncausal association. *Alcoholism, Clinical and Experimental Research*, *23*(1), 101-107.

Reifman, A., Barnes, G.M., Dintcheff, B.A., Farrell, M.P., and Uhteg, L. (1998). Parental and peer influences on the onset of heavier drinking among adolescents. *Journal of Studies on Alcohol*, *59*, 311-317.

Rice, D.P., Kelman, S., Miller, S.L., and Dummeyer, S. (1990). *The economic costs of alcohol and drug abuse and mental illness*. Washington, DC: Alcohol Drug Abuse and Mental Health Administration.

Robins, L.N. (1993). Childhood conduct problems, adult psychopathology and crime. In S. Hodgins (Ed.), *Mental disorder and crime* (pp. 173-193). Newbury Park, CA: Sage.

Samson, H.H., Maxwell, C.D., and Doyle, T.F. (1989). The relation of initial alcohol experience to current alcohol consumption in a college population. *Journal of Studies on Alcohol*, *50*, 254-260.

Schuckit, M. (1999). New finding in the genetics of alcoholism. *Journal of the American Medical Association*, *281*, 1875-1876.

Sheffiman, S., and Balabanis, M. (1995). *Associations between alcohol and tobacco. Alcohol from basic science to clinical practice*. NIAAA Research Monograph 30. J.B. Fertiz and J.P. Allison (Eds.). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Shultz, R., Elder, R., Sleet, D., Nichols, J., Alas, M., Carrande-Kuls, V., Zaza, S., Sosin, D., Thompson, R., and Task Force on Community Preventive Services. (2001). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine*, *21*(4), 66-88.

Simantov, E., Schoen, C., and Klein, J.D. (2000). Health-compromising behaviors: Why do adolescents smoke or drink?: Identifying underlying risk and protective factors. *Archives of Pediatrics and Adolescent Medicine*, *154*, 1025-1033.

Simons, R., Conger, R., and Whitbeck, L. (1988). A multistage social learning model of the influences of family and peers upon adolescent substance abuse. *Journal of Drug Issues*, *18*, 293-315.

Simons-Morton, B., Haynie, D.L., and Kai, Y. (1999). Expectancies and other psychosocial factors associated with alcohol use among early adolescent boys and girls. *Addictive Behavior*, *24*, 229-238.

Simons-Morton, B., Haynie, D.L., Crump, A.D., Eitel, S.P., and Saylor, K.E. (2001). Peer and parent influences on smoking and drinking among early adolescents. *Health Education and Behavior*, *28*, 95-107.

Sitharthan, T., Kavanaugh, D.J., and Sayer, G. (1996). Moderating drinking by correspondence: An evaluation of a new method of intervention. *Addiction*, *19*, 345-355.

Smith, G., Branas, C., and Miller, T. (1999). Fatal non-traffic injuries involving alcohol: A meta analysis. *Annals of Emergency Medicine*, *33*(6), 699-702.

Stall, R., McResnick, L., Wiley, J., Coates, T.J., and Ostrow, D.G. (1996). Alcohol and drug use during sexual activity and compliance with safe sex guidelines for AIDS. *Health Education Quarterley*, *13*, 359-371.

Strunin, L., and Hingson, R. (1992). Alcohol, drugs, and adolescent sexual behaviors. *International Journal of Addictions*, *27*, 129-146.

Substance Abuse and Mental Health Services Administration. (2002). *Results from the 2001 National Household Survey on Drug Abuse: Volume 1: Summary of National Findings*. (NHSDA Series H-17, DHHS Pub. No. SMA 02-3 758.) Rockville, MD:Office of Applied Statistics.

Toteva, S., and Mi'anov, I. (1996). The use of body acupuncture for treatment of alcohol dependence withdrawal syndrome: A controlled study. *American Journal of Acupuncture*, *24*, 19-25.

U.S. Department of Health and Human Services. (2000). *Health United States with adolescent chart*. (DHHS Pub No. 00123172.) Hyattsville, Maryland: Author.

U.S. Department of Justice. (1999). *Costs of underage drinking*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention. Author.

U.S. General Accounting Office. (1987). *Drinking age laws: An evaluation synthesis of their impact on highway safety*. (GAO PEMD 87-100.) Washington, DC: Author.

Wagenaar, A. (2001). Lowered legal blood alcohol limits for young drivers: Effects on drinking, driving and driving after drinking behaviors in 30 states. *American Journal of Public Health*, *91*, 801-804.

Wagenaar, A.C., and Toomey, T.L. (2002). Effects of minimum drinking age laws: Review and analysis of the literature from 1960-2000. *Journal of Studies on Alcohol* (Suppl. 14), 206-225.

Wagenaar, A.C., Murray, D.M., Gehan, J.P., Wolfson, M., Forster, J.L., Toomey, T.L., Perry, C.L., and Jones-Webb, R. (2000). Communities mobilizing for change on alcohol: Outcomes from a randomized community trial. *Journal of Studies on Alcohol*, *61*(1), 85-94.

Weimer, D.L., and Vining, A.R. (1989). *Policy analysis: Concepts and practice*. Englewood Cliffs, NJ: Prentice Hall.

Wolaver, A.M. (2002). Effects of heavy drinking in college on study effort, grade point average, and major choice. *Contemporary Economic Policy*, *20*(4), 415-428.

Yamada, T., Kendix, M., and Yamada, T. (1996). The impact of alcohol consumption and marijuana use on high school graduation. *Health Economics*, *5*(1), 77-92.

Youth Risk Behavior Survey (2001). *Youth risk behavior surveillance United States 2001*. Atlanta, GA: National Center for Chronic Disease Prevention and Health Promotion. Adolescent and School Health.

Zador, P.L. (1991). Alcohol related relative risk of fatal driver injuries in relation to driver age and sex. *Journal of Studies on Alcohol*, *52*, 302-310.

Zador, P.L., Krawchek, S., and Voas, R. (2000). Alcohol related involvement in fatal crashes according to age and gender. *Journal of Studies on Alcohol*, *61*, 387-395.

Zhang, L., Welte, J.W., and Wieczorek, W.F., (1999). The influence of parental drinking and closeness on adolescent drinking. *Journal of Studies on Alcohol*, *60*, 245-251.

3

Health Consequences of Adolescent Alcohol Involvement

Sandra A. Brown and Susan F. Tapert

As underage drinking rates have increased and research technology has improved in recent decades, we have become more aware of the problems caused by alcohol use during the rapid transitions and growth of adolescence. Some adverse effects occur acutely while young people are under the influence of alcohol, whereas other negative effects may become apparent after months or years of heavy use. In this chapter, we discuss how alcohol affects adolescent physical health, brain development, and mental health, as well as the common behavioral consequences of underage drinking.

ACUTE EFFECTS

Accidents

The acute effects of alcohol consumption for adolescents depend on the blood alcohol concentration (BAC) attained. BAC is determined by the amount of alcohol consumed, time elapsed, body weight, and gender. Even at low BACs, impairments in motor control and judgment become apparent. Because rational thinking is increasingly weakened as BACs rise, intoxicated youth are susceptible to riding with drunk drivers (Monti et al., 1999). The leading cause of death for teenagers is unintentional injury, primarily related to motor vehicle accidents (National Center for Health Statistics, 1999), and 20 percent of all traffic crashes of 16- to 20-year-olds involve alcohol (Yi, Williams, and Dufour, 2001). Alcohol intoxication is

associated with even greater risks of traffic accidents for youth as compared to adults, and adolescent drivers are more likely than adults to get into accidents at lower BACs (Yi et al., 2001), likely because they have fewer years of driving experience (Hingson, Heeren, and Winter, 1994; Yi et al., 2001).

Other Mortality Factors

Alcohol is far from the "safe drug" parents often think. As BACs rise, alcohol overdose can occur, resulting in respiration failure, suffocation, coma, and, in some cases, death. Alcohol intoxication produces diminished inhibition, increased violent behavior, and poor judgment that can result in being in the wrong place at the wrong time, and these factors all contribute to young deaths and injuries due to alcohol-related aggressive behavior. Homicide is the second leading cause of death for those ages 10 to 20 (National Center for Health Statistics, 1999). Suicide is the third leading cause of death for youth (National Center for Health Statistics, 1999), and approximately 28 percent of suicides of those 9 to 15 years old can be directly attributed to or are related to alcohol use (Preuss et al., 2002; Reifman and Windle, 1995).

Other Drug Use

Young people under the influence of alcohol are at an increased likelihood of deciding to use other drugs (Brown, Tapert, Tate, and Abrantes, 2000b). Alcohol is often considered a gateway to the use of illegal substances. Youth who drink are significantly more likely to use other illicit drugs, compared to young nondrinkers (Kandel and Davies, 1996). A young person may decide to use an illicit substance after drinking because judgment is impaired, exposure to other substances is more likely, and susceptibility to peer influences is amplified. Once alcohol use has been initiated, the use of other intoxicants may no longer appear as risky to the teen.

Withdrawal and Hangover

Subacute effects of drinking may be experienced in the day or two following an episode of heavy drinking. For adolescents, these effects can include feeling dizzy when first standing up, nausea or vomiting, feeling depressed or irritable, tremor or shakes, racing heart, sweating, rapid breathing, insomnia, headaches, and muscle aches or weaknesses (Stewart and Brown, 1995; Tapert and Brown, 1999). Although relatively rare, youth who have developed a physical addiction to alcohol can experience withdrawal seizures in the first few days of abstinence.

Overall, the acute effects of alcohol use in adolescents are similar to those experienced by adults, except that youth experience less of the sedating effects (Silveri and Spear, 2002) and more memory impairment effects than adults (White, Ghia, Levin, and Swartzwelder, 2000), as revealed by animal studies. Thus, adolescents appear to be at even greater risk for continuing risky behaviors (such as driving drunk, riding with drunk drivers, engaging in sexual behavior, or participating in other physical activities that result in physical injury) during an episode of drinking (Bonomo et al., 2001) and incurring a blackout and forgetting the events of an alcohol-filled evening (Arria, Dohey, Mezzich, Bukstein, and Van Thiel, 1995).

CHRONIC EFFECTS

Some chronic health problems that are commonly observed in adults with alcohol dependence are seldom seen in adolescents, including gastritis, pancreatitis, hepatitis, liver cirrhosis, hypertension, anemia, and malnutrition (Aarons et al., 1999; Clark, Lynch, Donovan, and Block, 2001). However, adolescents who drink heavily are at risk for identifiable health problems, with young females at a somewhat greater risk of incurring more severe physical consequences (Aarons et al., 1999). In one of the few studies of youth using both physical exams and biological measures, Clark and colleagues (2001) found adolescents with alcohol use disorders (AUD) had more problems identified on their physical exams. Oral and sleep problems in particular were linked to alcohol involvement. AUD also reported more health problems and negative affect. Furthermore, extent of alcohol use in adolescence has been linked to dysphasia and poorer physical health during adolescence and young adulthood (Hansell, White, and Vali, 1999; Aarons et al., 1999). Whether youth drink beer, wine, or distilled spirits, poorer health outcomes are expected. As early as adolescence, chronic heavy alcohol use has been shown to affect bones and the liver, and, as we detail in the following section, the brain.

Bone Density and Growth

Animal studies show that chronic alcohol consumption near the time of puberty in male rats leads to decreased bone volume in the limbs and the skull because of its effects on bone-forming cells, and normal bone metabolism does not generally resume after cessation of alcohol use (Wezeman et al., 1999). Late adolescent male rats given alcohol and physical exercise showed reduced bone formation rates, suggesting an increased chance of exercise-related bone injuries in young drinkers (Reed, McCarty, Evans, Turner, and Westerlind, 2002). In female adolescent rats, bone density was reduced during a period of alcohol consumption, and after cessation, bone

growth resumed, but did not compensate for growth that had been lost during the alcohol ingestion period (Sampson and Spears, 1999). Large quantities of alcohol consumed by young rats resulted in weaker bones (Sampson, Perks, Champney, and DeFee, 1996). These findings from animal models are supported by studies in humans showing that alcohol drinkers tend to have less bone mineral density, especially adolescent males (Neville et al., 2002).

High doses of alcohol have also been found to delay puberty in female rodents and primates (Dees, Dissen, Hiney, Lara, and Ojeda, 2000; Dees and Skelley, 1990; Dees, Srivastava, and Hiney, 2001) and male rats (Cicero et al., 1990). However, detailed studies in humans will be needed to understand how alcohol affects pubertal development in young people.

Liver Function

Although liver functioning is commonly compromised in adults who drink heavily, community studies show a negligible incidence of cirrhosis or alcoholic liver disease among adolescents (Bellentani et al., 1997). However, alcohol use-disordered teens show elevated liver enzyme assays and a greater likelihood of abnormalities detected by a physical exam (Clark et al., 2001). The liver absorbs most of the alcohol from the small intestine, and when the liver can no longer process fats, alcohol becomes the preferred fuel. This can set the stage for the development of alcoholic hepatitis or even permanent scarring of the liver, a condition known as cirrhosis, which develops in approximately 15 percent of alcohol-dependent adults. Other problems related to the digestive system include inflammation of the pancreas, gastric irritation, and an increased risk for ulcers (Schuckit, 2000), which can occur in youth but are rare.

Future Problems

Persistent adolescent drinking is associated with an increased risk of multiple future problems. Youth who begin drinking before age 15 are four times more likely to develop alcohol dependence than those who begin drinking at or after age 21 (Grant and Dawson, 1997). Among adults who developed alcoholism, the average age of first drink was 13, first intoxication was 15, and first alcohol-related problem was 20 (Schuckit, Anthenelli, Bucholz, Hesselbrock, and Tipp, 1995). Rodents given alcohol as adolescents show greater intake rates of alcohol as adults, suggesting alterations in sensitivity or tolerance as a result of drinking during adolescence (Yoshimoto et al., 2002). Furthermore, youth who use alcohol are at an increased risk for other drug involvement, failure to develop emotionally and cognitively, and criminal involvement (Newcomb and Bentler, 1988), as detailed

further in this chapter. Youth who increase heavy drinking from ages 18 to 24 and consistently drink heavily at least weekly during this period may have problems successfully managing the transition from adolescence to young adulthood, and may fail to complete goals regarding marriage, education, employment, and financial independence (Schulenberg, O'Malley, Bachman, Wadsworth, and Johnston, 1996).

EFFECTS OF ALCOHOL USE AND ABUSE ON ADOLESCENT BRAIN DEVELOPMENT

Importantly, chronic drinking during adolescence has been associated with brain functioning (Brown, Tapert, Granholm, and Delis, 2000a; Tapert et al., 2001a; Tapert and Brown, 1999; Tapert, Granholm, Leedy, and Brown, 2002). To understand how alcohol use affects adolescent brain development, it is helpful to briefly review the maturational processes that occur during these years.

Healthy Adolescent Brain Development

Myelination

Well before adolescence, the brain achieves its full size and grossly contains the number of brain cells it will have in adulthood. The developments of the brain during adolescence primarily involve refinement into a more efficient organ that requires less fuel (oxygen, blood, and sugar) to operate. Starting before birth and until approximately age 30, the axons of brain cells are insulated with a fatty substance, called myelin, that helps speed the transfer of electric impulses across the cell to facilitate communication with neighboring brain cells (Benes, Turtle, Khan, and Farol, 1994; Sowell, Thompson, Tessner, and Toga, 2001). In adolescence, this process of myelination occurs predominantly in the front half of the brain (frontal and prefrontal lobes), which is responsible for important functions such as planning, organization, and halting an impulse. Thus, by age 30, a person can relay information throughout the frontal lobes and to other regions of the brain and perform planning and organizational tasks much more efficiently than was possible at age 12.

Synaptic Refinement

At birth, each brain cell has connections to up to 10,000 other neurons. These connections, or synapses, are small gaps between brain cells across which specific brain chemicals travel. However, not all these connections are necessary and, in fact, unneeded connections slow brain activity.

Throughout childhood and into mid-adolescence until roughly age 16, these unneeded connections are eliminated, leaving the brain a more refined system (Huttenlocher, 1979) with which to interpret sensory information, conduct thinking, and coordinate motor responses. A related developmental process that continues into adolescence is the functioning of brain chemicals or neurotransmitters (Silveri and Spear, 2002). Adolescent brain developments are prominent in the prefrontal cortex, an area critical for considering the consequences of actions, and other frontal areas that are important for stress responses and managing drives (Spear, 2002). Some scientists speculate that adolescent brain developments carry an evolutionary advantage by encouraging independence and new experiences that reduce the chances of inbreeding (Spear, 2002).

How Alcohol Affects Adolescent Brain Development

Animal Studies

We are just beginning to understand how alcohol use affects brain functioning during this critical period of brain development, both during adolescence and in the long term. Animal studies have suggested that alcohol affects adolescent brain development processes in several ways. A recent study gave adolescent and adult rats multiple episodes of large quantities of alcohol, mimicking the pattern characteristic of many U.S. teens. Once all rats became adults, those who had been given alcohol during adolescence showed more impairments on a memory task than those who had been given alcohol only as adults (White et al., 2000). Furthermore, studies of adolescent and adult rats reveal that chronic alcohol use during adolescence alters sensitivity to alcohol-induced motor dyscoordination (White et al., 2002). Another study examined the effects of a 4-day alcohol binge on adolescent and adult rats. While significant brain damage was found in both groups during the autopsy, several frontal brain regions were damaged only in the adolescent rats, suggesting that different brain regions vary in vulnerability to alcohol effects across development (Crews, Braun, Hoplight, Switzer, and Knapp, 2000). In summary, adolescents appear to be more sensitive than adults to the learning and memory impairments of alcohol, but less sensitive to the sedation and temperature regulation effects (Spear, 2002).

Brain Imaging Studies

A growing number of studies on human adolescents have supported the findings from animal studies: Drinking alcohol during adolescence appears to affect brain functioning and development. Brain size was compared

between youth with adolescent-onset alcohol use disorders and healthy matched comparison youth using magnetic resonance imaging (MRI). Youth with alcohol use disorders had significantly smaller left and right hippocampi, central brain regions critical for the formation of new memories. These results suggested that, during adolescence, the hippocampus may be particularly vulnerable to the adverse effects of alcohol (De Bellis et al., 2000). The implications of these brain structure studies have been highlighted by functional MRI (fMRI) studies. This technique essentially takes a movie instead of just one picture of the brain as the subject performs a task. Using this approach, alcohol-dependent youth were compared to healthy matched comparison youth as they performed a memory task. Participants with alcohol dependence showed significantly less brain response than controls as they performed the challenging memory task, especially in frontal and parietal (upper back of brain) areas (Tapert et al., 2001a).

Neuropsychological Studies

The importance of the animal studies and human brain imaging studies is apparent in the reports of thinking and memory tests with heavy-drinking adolescents. Although some studies have found that teens with alcohol use disorders perform reasonably well on tests of language, intellect, and reasoning (Moss, Kirisci, Gordon, and Tarter, 1994), other studies have found that young heavy drinkers perform more poorly on tests of planning and executive functioning (Giancola and Mezzich, 2000), memory (Brown et al., 2000a), spatial operations (Tapert and Brown, 1999; Tapert et al., 2002), and attention (Tapert et al., 2001a; Tapert and Brown, 1999) tasks. In one study, alcohol-use disordered adolescents who were detoxified in a long-term treatment program demonstrated a 10 percent deficit in their ability to recall both verbal and nonverbal information that had been previously presented to them (Brown et al., 2000a). Having had withdrawal or hangover experiences in the days following a bout of heavy drinking was a particular risk factor for performing more poorly on most cognitive tests (Tapert and Brown, 1999; Tapert et al., 2002), especially those involving spatial functioning (e.g., copying a complex picture or solving a puzzle).

Understandably, the problems in the brain affect thinking and memory abilities, which in turn influence how well young drinkers do in school. A large college survey reported that youth with grade point averages at the D or F level drink three times as much as those who earn A grades (Presley, Meilman, and Lyerla, 1994). For youth being treated for alcohol problems, those who continue to drink and those who experience any alcohol withdrawal appear most likely to exhibit continued deterioration in cognitive functioning (Tapert and Brown, 1999; Tapert et al., 2002).

Mental Health Problems

Unfortunately, adolescent alcohol involvement is associated with a wide variety of mental health concerns, ranging from low self-esteem and deviant behaviors to depression and suicide. Mental health problems and disorders occur significantly more frequently among youth with alcohol use disorders than in the general population and substantially more often than can be accounted for by the base rates of these individual disorders (Lilienfeld, Waldman, and Isreal, 1994). Such comorbidity can occur simultaneously or sequentially, and the timing of the onset of each disorder has important implications for the etiology of the problems, severity of symptoms, typical course of disorders, and outcomes from treatment (Costello, Erkanli, Federman, and Angold, 1999).

Early Alcohol Use

The earlier alcohol use is initiated during childhood or adolescence, the greater the risk for a variety of adverse consequences. It is now well known that when youth begin drinking alcohol before age 14, they have a 41 percent chance of developing alcohol dependence during their lifetime compared to individuals who wait to the legal drinking age of 21 when the risk is reduced to 10 percent (Grant and Dawson, 1997). Not only is age of initial use universally associated with lifetime risk for alcohol dependence, but early use also elevates risk for a multitude of mental health and social problems (McGee, Williams, Poulton, and Moffitt, 2000). Rates of conduct disorder, antisocial personality disorder, nicotine dependence, and illicit drug abuse and dependence are significantly higher among youth who drink early (McGue, Iacona, Legrand, Malone, and Elkins, 2001). Cross-culturally, studies indicate that heavy adolescent alcohol use is associated with psychological distress, anxiety, and depression (Mazaira Castro, Dominguez Santos, and Rodriguez Lopez, 1993) at a time when social anxiety normally increases dramatically.

Youth with early problems such as school difficulties, personal difficulties (e.g., hyperactivity, impulsivity, and inattentiveness), or family problems are at risk of beginning to drink early (McGue et al., 2001). The psychophysiological marker of alcoholism risk P3 amplitude is also apparent by mid-adolescence. Although alcohol use is a prevalent problem among adolescents, those most disadvantaged, such as the homeless, abused or neglected, show high rates of AUDs as well as behavioral and psychological symptoms (McCaskill, Toro, and Wolfe, 1998).

Youth with certain mental health disorders evident in early adolescence are more likely to use alcohol early and accelerate their use throughout adolescence (White, Xie, Thompson, Loeber, and Stouthamer-Loeber,

2001). Disruptive disorders with conduct problems and aggressive or oppositional behaviors have been associated with the early onset of use and abuse (Rose, 1998; Costello et al., 1999). In girls early anxiety disorders may also accelerate alcohol involvement (Rose, 1998). Although drinking patterns fluctuate throughout adolescence, the pattern of youth alcohol consumption is also predictive of later heavy drinking problems. For example, 15- to 19-year-old males who drink or smoke cigarettes to relieve stress are more likely to be heavy or problematic drinkers 5 years later (Poikolainen, Tuulio-Henrikkson, Aalto-Setaelae, Marttunen, and Loennqvist, 2001).

The mental health of minority populations is also significantly disadvantaged by adolescent drinking. For example, heavy drinking in Mexican-American adolescents is associated with alcohol and drug abuse as well as depression in adulthood. Suicide attempts in adulthood are predicted by heavy youth drinking in cross-cultural studies (Hintikka et al., 2000), and suicide is twice as likely for Mexican Americans when alcohol is used heavily during adolescence (Vega, Alderete, Kolody, and Aguilar-Gaxiola, 2000). When alcohol involvement reaches the level of a disorder (abuse or dependence), the likelihood of the disorder resolving by the mid-20s is low, and young adult health and mental health consequences continue to mount (Rohde, Lewinsohn, Kahler, Seeley, and Brown, 2001; Aarons et al., 1999).

Gender differences are evident in several mental health problems associated with adolescent drinking. For example, problematic drinking is associated with posttraumatic stress symptoms for girls, but not boys (Lipschitz, Grilo, Fehon, McGlashan, and Southwick, 2000). Conduct disorder is more prevalent among heavy-drinking boys than girls (Brown, Gleghorn, Schuckit, Myers, and Mott, 1996). The prevalence rate of sexual abuse is also significantly higher for girls than boys with alcohol or other substance use disorder.

Unfortunately, adolescent drinking is associated with a variety of other risky behaviors (e.g., Donovan and Jessor, 1985; Flisher, et al., 2000), which also influence the health, mental health, and social functioning of teens. Youth drinking is associated with nicotine and marijuana use, fighting, early intercourse, school dropout, and suicidal ideation/attempts. Suicide is the third leading cause of death for youth (National Center for Health Statistics, 1999) and is consistently related to alcohol use across studies (e.g., Preuss et al., 2002).

Adolescent Alcohol Use Disorders

It is becoming increasingly evident that the comorbidity of AUD and other mental health disorders is one of the most prevalent and important challenges facing professionals treating youth with alcohol problems to-

day. Consequently, study of these disorders has recently expanded. According to a recent review, in the 1990s more than 125 studies were published focusing on alcohol and drug use disorders and comorbid mental health problems.

Specifically, comorbidity refers to the co-occurrence of two or more disorders (Perrin and Last, 1995), which can be present simultaneously or sequentially. The disorder occurring first (Schuckit, Irwin, and Brown, 1990) or the disorder with the most dominant symptoms (Klerman, 1990) is referred to as the primary disorder. The order of symptoms and disorder onset has important clinical implications for understanding both the causal pathways to the difficulties these youth face (e.g., Mueser, Drake, and Wallach, 1998) as well as the likely clinical course following treatment. AUDs and mental health disorders of youth may reflect common risk (e.g., genetic predisposition, environmental adversity), or be precipitated or exacerbated by each other (e.g., alcohol-induced mood disorder, conduct disorder-provoked alcohol use disorder). The prevalence of these etiological pathways varies across types of mental health disorders and specific drugs of addictions.

Across a variety of service sectors (i.e., alcohol and drug, mental health, juvenile justice, child welfare), youth with alcohol abuse and dependence are most likely to present with other drug disorders, disruptive disorders, and anxiety disorders. In adolescent substance abuse treatment programs, approximately two-thirds of youth evidence a major mental health disorder as measured by DSM Axis I psychopathology in addition to their alcohol problem. According to a recent review of research in this area, 54 to 95 percent of youth in treatment for alcohol problems have conduct or oppositional defiant disorder. Mood disorders are evident in approximately half of treated AUD teens and 15 percent to 42 percent exhibit anxiety disorders (e.g., post-traumatic stress disorder, social phobia). In juvenile justice settings, conduct disorders are the most common comorbid disorder for these teens, whereas in inpatient mental health settings, depressive disorders are as prevalent as disruptive disorders.

Recent studies of youth with an alcohol use disorder indicate poorer outcomes for those with comorbid mental health disorders. In particular, disruptive disorders, anxiety disorders, and severity of psychiatric symptoms have been associated with higher relapse rates and greater severity of posttreatment drug involvement (Brown, 1999). It is unclear whether the poorer outcomes reflect poorer retention in treatment, worse compliance with interventions, or more limited personal resources (e.g., poorer coping skills, fewer family and social supports). Clearly these comorbid youth are exposed to more risks in their home and community environments (e.g., stressors). Because we know so little about optimal behavioral or pharma-

cological treatment for these youth, their adverse outcomes may also reflect poorer client-treatment match. Although intervention research on AUD adolescents with comorbid mental health problems lags behind such research on adults, integrated treatment of the co-occurring problems appears critical (Dembo, 1996). For example, integrated interventions with youth with comorbid conduct disorder and alcohol and drug problems have been shown to increase engagement and retention in treatment (Henggellar et al., 1996). Engagement and retention in treatment has been identified as critical to treatment success with youth (Hser et al., 2001). Similarly, integrated interventions involving family members facilitate engagement as well as retention of such youth (e.g., Liddle and Dakof, 1995) and have demonstrated improved outcomes. At present, the efficacies of specific medications and forms of intervention have not been well explicated for AUD youth with comorbid mental health disorders although joint treatment of the disorders appears advisable.

BEHAVIORAL AND SOCIAL CONSEQUENCES

Among the many concerns related to adolescent alcohol involvement is the risk for serious problems in areas critical to development. For youth to mature into successful adults, clearly they need not only to be physically and emotionally healthy, but also to become successful in domains essential for their roles as adults. To the extent that alcohol use during adolescence disrupts functioning in school or work, or produces interpersonal or psychological impairment, it alters the trajectory of development and reduces potential adult functioning.

Unfortunately, substantial evidence shows that not only is alcohol abuse and dependence associated with problems in these domains, but even modest involvement during high school may create significant problems. For example, of twelfth graders in a well-designed national survey, Monitoring the Future, or MTF (O'Malley, Johnston, and Bachman, 1998), 53 percent had consumed alcohol on at least 10 occasions and two-thirds of these youth indicated they had one or more problems because of their drinking. In fact, one-third of the high school seniors with drinking experience (i.e., 10 or more occasions) reported 3 or more alcohol-related problems. Thus, approximately 15 percent of high school seniors reported multiple problems from alcohol. Similarly, the National Household Survey on Drug Abuse conducted by the Substance Abuse and Mental Health Services Administration (1998) reports that 38 percent of youth ages 12 to 17 who drank alcohol in the prior year experienced at least one problem related to alcohol.

The most commonly reported alcohol-related problems for high school

seniors in the MTF Study included behavior they later regretted (52 percent) and interference with the ability to think clearly (30 percent). One in five students reported damage to their relationship with their significant other (i.e., boyfriend, girlfriend, fiancé) and/or driving unsafely. One of every six students indicated they became involved with people who were a bad influence on them and damage to their relationship with their parents. Approximately 10 percent of high school seniors with alcohol experience said alcohol damaged friendships, hurt them emotionally, got them in trouble with police, and hurt their performance in school.

Sexual Behavior

The impaired judgment resulting from alcohol intoxication can result in risky, early, and unwanted sexual behaviors in youth, which may lead to unintended teen pregnancies and sexually transmitted diseases. For example, youth who drink heavily are three times less likely to use condoms than nondrinkers or infrequent drinkers (Tapert, Aarons, Sedlar, and Brown, 2001b), and heavy drinking is associated with unprotected intercourse and sexual activity before age 16 (Fergusson and Lynskey, 1996). Forty-four percent of sexually active teenagers report they are more likely to have intercourse if they have been drinking (Strunin and Hingson, 1992). Some of this sexual activity is unwelcome. Alcohol use is involved in one- to two-thirds of sexual assault and date rape cases among teens and college students (Office of Inspector General, 1992), and a survey of high schoolers reported that 39 percent of males and 18 percent of females perceive that it is acceptable for a boy to force sex on a girl if she is drunk or high (Office of Inspector General, 1992). A national survey of eighth and tenth graders linked alcohol use with risky behavior as well as sexual victimization, particularly for younger males (Windle, 1994). As a result of these risky behaviors, youth with alcohol use disorders are twice as likely to have a sexually transmitted disease (Tapert et al., 2001b), and girls with alcohol problems are three times more likely to have a pregnancy before age 18 (Tapert et al., 2001b).

School Functioning

As noted previously, school functioning is impacted by student drinking. Alcohol reduces students' ability to think clearly (O'Malley et al., 1998), and use of alcohol on 100 occasions or more is associated with poorer recall of verbal information (Brown et al., 2000a), such as in English or social studies classes, as well as visual spatial information like that presented in math, science, or computer classes (Tapert and Brown, 2000).

Additionally, alcohol use is associated with poor attendance, truancy, and school drop-out (O'Malley et al., 1998). Consequently, youth miss opportunities to learn because of their drinking and are less able to retain learned information when they try. In concert, such a pattern leads to increasing failure in the school setting.

Family Functioning

Family conflict is a common complaint for all families with adolescents experiencing problems. However, youth with heavy alcohol involvement also experience less expressiveness and cohesion in their families. Alcohol-abusing youth less often identify parents as important supports and develop support networks with more drinking peers (Tapert, Tate, and Brown, 1999). In fact, alcohol abuse is associated with elevated rates of running away from home overnight and homelessness. When adolescent alcohol problems are compounded by parental alcoholism, family communication patterns are marked by more negative affect and poorer problem-solving skills.

As noted earlier, a variety of other problem and deviant behaviors co-occur with adolescent drinking (e.g., reckless driving, high-risk sexual behaviors). However, early alcohol involvement is also associated with socialization into deviant peer groups who decrease participation in healthy school, family, and community activity. Association with more deviant peers is linked to increases in illegal behavior, including other drug involvement, theft, and property damage.

These results clearly indicate that even modest alcohol involvement by adolescents has adverse consequences on important domains of functioning despite the prevalence of such behavior. However, youth who meet criteria for alcohol abuse or dependence evidence even more severe social and behavioral consequences and obvious disadvantages (e.g., suspension, expulsion, or dropping out from school) which can have pronounced short term and long term impacts. Table 3-1 depicts common problems of youth with identified alcohol abuse or dependence as they enter treatment. These youth exhibit an average of more than five such major problems (Brown, 1993). Clearly, these problems span all domains of functioning identified as important in both adolescent and young adult functioning. AUDs developing during adolescence are not benign conditions, do not typically resolve over time, and are associated with a multitude of adverse health, psychological, and social consequences, which we are only now starting to understand.

TABLE 3-1 Common Behavioral Correlates of Adolescent Alcohol Abuse

Domain of Functioning	Behavioral Correlates
School	Attendance: truancy, suspension, expulsion, dropout
	Academic performance: decreased studying or grades, decreased comprehension
	Behavioral problems: conflict with authorities and peers
Family	Withdrawal: decreased contact and expressiveness
	Conflict: arguments, running away, lying
Social	Behavior: decreased communication, fights
	Peer group: change in friends or peer alcohol drug use
	Sexuality: earlier intercourse, high-risk behaviors, teen pregnancy
Activities	Work: absenteeism, firing, walking off job
	School activities: decreased participation
	Illegal behavior: property damage, theft
	Reckless behavior: speeding while driving, driving under influence
Health	Physical: accidents, injury, withdrawal symptoms
	Emotional: emotional lability, anxiety, depression or anger, suicidal ideation, psychotic thoughts, decreased motivation

REFERENCES

Aarons, G.A., Brown, S.A., Coe, M.T., Myers, M.G., Garland, A.F., Ezzet-Lofstram, R., Hazen, A.L., and Hough, R.L. (1999). Adolescent alcohol and drug abuse and health. *Journal of Adolescent Health*, *6*, 412-421.

Arria, A.M., Dohey, M.A., Mezzich, A.C., Bukstein, O.G., and Van Thiel, D.H. (1995). Self-reported health problems and physical symptomatology in adolescent alcohol abusers. *Journal of Adolescent Health*, *16*(3), 226-231.

Bellentani, S., Saccoccio, G., Costa, G., Tiribelli, C., Manenti, F., Sodde, M., Saveria Croce, L., Sasso, F., Pozzato, G., Cristianini, G., and Brandi, G. (1997). Drinking habits as cofactors of risk for alcohol induced liver damage. The Dionysos Study Group. *Gut*, *41*(6), 845-50.

Benes, F.M., Turtle, M., Khan, Y., and Farol, P. (1994). Myelination of a key relay zone in the hippocampal formation occurs in the human brain during childhood, adolescence, and adulthood. *Archives of General Psychiatry*, *51*(6), 477-484.

Bonomo, Y., Coffey, C., Wolfe, R., Lynskey, M., Bowes, G., and Patton, G. (2001). Adverse outcomes of alcohol use in adolescents. *Addiction*, *96*(10), 1485-96.

Brown, S.A. (1993). Recovery patterns in adolescent substance abuse. In J.S. Baer, G.A. Marlatt, and R.J. McMahon (Eds.), *Addictive behaviors across the lifespan: Prevention, treatment, and policy issues* (pp. 161-183). Beverly Hills, CA: Sage.

Brown, S.A. (1999). Treatment of adolescent alcohol problems: Research review and appraisal. *NIAAA Extramural Scientific Advisory Board: Treatment*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Brown, S.A., Gleghorn, A.A., Schuckit, M.A., Myers, M.G., and Mott, M.A. (1996). Conduct disorder among adolescent alcohol and drug abusers. *Journal of Studies on Alcohol*, *57*(3), 314-324.

Brown, S.A., Tapert, S.F., Granholm, E., and Delis, D.C. (2000a). Neurocognitive functioning of adolescents: Effects of protracted alcohol use. *Alcoholism: Clinical and Experimental Research*, *24*(2), 164-171.

Brown, S.A., Tapert, S.F., Tate, S.R., and Abrantes, A.M. (2000b). The role of alcohol in adolescent relapse and outcome. *Journal of Psychoactive Drugs*, *32*, 107-115.

Cicero, T.J., Adams, M.L., O'Connor, L., Nock, B., Meyer, E.R., and Wozniak, D. (1990). Influence of chronic alcohol administration on representative indices of puberty and sexual maturation in male rats and the development of their progeny. *Journal of Pharmacology and Experimental Therapeutics*, *255*(2), 707-715.

Clark, D.B., Lynch, K.G., Donovan, J.E., and Block, G.D. (2001). Health problems in adolescents with alcohol use disorders: Self-report, liver injury, and physical examination findings and correlates. *Alcoholism: Clinical and Experimental Research*, *25*(9), 1350-1359.

Costello, J.E., Erkanli, A., Federman, E., and Angold, A. (1999). Development of psychiatric comorbidity with substance abuse in adolescents: Effects of timing and sex. *Journal of Clinical Child Psychology*, *28*, 298-311.

Crews, F.T., Braun, C.J., Hoplight, B., Switzer, R.C., III, and Knapp, D.J. (2000). Binge ethanol consumption causes differential brain damage in young adolescent rats compared with adult rats. *Alcoholism: Clinical and Experimental Research*, *24*(11), 1712-1723.

De Bellis, M.D., Clark, D.B., Beers, S.R., Soloff, P.H., Boring, A.M., Hall, J., Kersh, A., and Keshavan, M.S. (2000). Hippocampal volume in adolescent-onset alcohol use disorders. *American Journal of Psychiatry*, *157*(5), 737-744.

Dees, W.L., Dissen, G.A., Hiney, J.K., Lara, F., and Ojeda, S.R. (2000). Alcohol ingestion inhibits the increased secretion of puberty-related hormones in the developing female rhesus monkey. *Endocrinology*, *141*(4), 1325-1331.

Dees, W.L., and Skelley, C.W. (1990). Effects of ethanol during the onset of female puberty. *Neuroendocrinology*, *51*(1), 64-69.

Dees, W.L., Srivastava, V.K., and Hiney, J.K. (2001). Alcohol and female puberty: The role of intraovarian systems. *Alcohol Research and Health*, *25*(4), 271-275.

Dembo, R. (1996). Problems among youth entering the juvenile justice system, their service needs and innovative approaches to address them. *Substance Use and Misuse*, *31*(1), 81-94.

Donovan, J.E., and Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology*, *53*(6), 890-904.

Fergusson, D.M., and Lynskey, M.T. (1996). Alcohol misuse and adolescent sexual behaviors and risk taking. *Pediatrics*, *98*, 91-96.

Flisher, A.J., Kramer, R.A., Hoven, C.W., King, R.A., Bird, H.R., Davies, M., Gould, M.S., Greenwald, S., Lahey, B.B., Regier, D.A., Schwab-Stone, M., and Shaffer, D. (2000). Risk behavior in a community sample of children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *7*, 881-887.

Giancola, P.R., and Mezzich, A.C. (2000). Neuropsychological deficits in female adolescents with a substance use disorder: Better accounted for by conduct disorder? *Journal of Studies on Alcohol*, *61*(6), 809-817.

Grant, B.F., and Dawson, D.A. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse*, *9*, 103-110.

Hansell, S., White, H.R., and Vali, F.M. (1999). Specific alcoholic beverages and physical and mental health among adolescents. *Journal of Studies on Alcohol*, *2*, 209-218.

Henngellar, S.W., Rodick, J.D., Borduin, C.M., Hanson, C.L., Watson, S.M., and Urey, J.R. (1996). Multisystemic treatment of juvenile offenders: Effects on adolescent behavior and family interactions. *Developmental Psychology*, *22*, 132-141.

Hingson, R., Heeren, T., and Winter, M. (1994). Lower legal blood alcohol limit for young drivers. *Public Health Report*, *109*, 738-744.

Hintikka, J., Hintikka, U., Lehtonen, J., Viinamaeki, H., Koskela, K., and Kontula, O. (2000). Common mental disorders, suicidality and use of health care services during late adolescence in Finland. *Journal of Adolescent Health*, *1*, 2-3.

Hser, Y.I., Grella, C.E., Hubbard, R.L., Hsieh, S.C., Fletcher, B.W., Brown, B.S., and Anglin, M.D. (2001). An evolution of drug treatments for adolescents in 4 U.S. cities. *Archives of General Psychiatry*, *58*, 689-695.

Huttenlocher, P.R. (1979). Synaptic density in human frontal cortex—developmental changes and effects of aging. *Brain Research*, *163*(2), 195-205.

Kandel, D.B., and Davies, M. (1996). From adolescence to adulthood. *American Journal of Psychiatry*, *153*, 1654.

Klerman, G.L. (1990). Approaches to phenomena of comorbidity. In J.D. Maser and C.R. Cloninger (Eds.), *Comorbidity of mood and anxiety disorders* (pp. 13-37). Washington, DC: American Psychiatric Press.

Liddle, H.A., and Dakof, G.A. (1995). Family-based treatment for adolescent drug use: State of the science. In E. Rahdert et al. (Ed.), *Adolescent drug abuse: Assessment and treatment*. (Research monograph 156). Rockville, MD: National Institute on Drug Abuse.

Lilienfeld, S.O., Waldman, I.D., and Israel, A.C. (1994). A critical examination of the use of the term and concept of comorbidity in psychopathology research. *Clinical Psychology-Science and Practice*, *1*(1), 71-83

Lipschitz, D.S., Grilo, C.M., Fehon, D., McGlashan, T.M., and Southwick, S.M. (2000). Gender differences in the associations between posttraumatic stress symptoms and problematic substance use in psychiatric inpatient adolescents. *Journal of Nervous and Mental Disease*, *6*, 349-356.

Mazaira Castro, J.A., Dominquez Santos, M.D., and Rodriguez Lopez, A. (1993). Alcohol consumption and its relationship with the presence of minor psychiatric pathology in Galicia's adolescent population. *Psiquitria Infanto-Juvenil*, *1*, 35-41.

McCaskill, P.A., Toro, P.A., and Wolfe, S.M. (1998). Homeless and matched housed adolescents: A comparative study of psychopathology. *Journal of Clinical Child Psychology*, *3*, 306-319.

McGee, R., Williams, S., Poulton, R., and Moffitt, T. (2000). A longitudinal study of cannabis use and mental health from adolescence to early adulthood. *Addiction*, *4*, 491-503.

McGue, M., Iacono, W.G., Legrand, L.N., Malone, S., and Elkins, I. (2001). Origins and consequences of age at first drink: Associations with substance-use disorders, disinhibitory behavior and psychopathology, and P3 amplitude. *Alcoholism: Clinical and Experimental Research*, *8*, 1156-1165.

Monti, P.M., Colby, S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M., Woolard, R., and Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*, *67*, 989-994.

Moss, H.B., Kirisci, L., Gordon, H.W., and Tarter, R.E. (1994). A neuropsychologic profile of adolescent alcoholics. *Alcoholism: Clinical and Experimental Research*, *18*, 159-163.

Mueser, K.T., Drake, R.E., and Wallach, M.A. (1998). Dual diagnosis: A review of etiological theories. *Addictive Behaviors*, *23*(6), 717-734.

National Center for Health Statistics. (1999). *10 leading causes of death, United States*. Atlanta, GA: Author.

Neville, C.E., Robson, P.J., Murray, L.J., Strain, J.J., Twisk, J., Gallagher, A.M., McGuinness, M., Cran, G.W., Ralston, S.H., and Boreham, C.A. (2002). The effect of nutrient intake on bone mineral status in young adults: The Northern Ireland young hearts project. *Calcified Tissue International*, *70*(2), 89-98.

Newcomb, M.D., and Bentler, P.M. (1988). *Consequences of adolescent drug use: Impact on the lives of young adults*. Newbury Park, CA: Sage.

Office of Inspector General. (1992). *Youth and alcohol: Dangerous and deadly consequences*. Washington, DC: Department of Health and Human Services.

O'Malley, P.M., Johnston, L.D., and Bachman, J.G. (1998). Alcohol use among adolescents. *Alcohol Health and Research World*, *22*(2), 85-93.

Perrin, S., and Last, C.G. (1995). Dealing with comorbidity. In A.R. Eisen, C.A. Kearney, and C. Schaffer (Eds.), *Clinical handbook of anxiety disorders in children and adolescents* (pp. 412-435). Northvale, NJ: Jason Aronson.

Poikolainen, K., Tuulio-Henrikkson, A., Aalto-Setaelae, T., Marttunen, M., and Loennqvist, J. (2001). Predictors of alcohol intake and heavy drinking in early adulthood: A 5-year follow-up of 15-19-year-old Finnish adolescents. *Alcohol and Alcoholism*, 1, 85-88.

Presley, C.A., Meilman, P.W., and Lyerla, R. (1994). Development of the Core Alcohol and Drug Survey: Initial findings and future directions. *Journal of American College Health*, *42*(6), 248-255.

Preuss, U.W., Schuckit, M.A., Smith, T.L., Danko, G.P., Buckman, K., Bierut, L., Bucholz, K.K., Hesselbrock, M.N., Hesselbrock, V.M., and Reich, T. (2002). Comparison of 3190 alcohol-dependent individuals with and without suicide attempts. *Alcoholism: Clinical and Experimental Research*, *26*(4), 471-477.

Reed, A.H., McCarty, H.L., Evans, G.L., Turner, R.T., and Westerlind, K.C. (2002). The effects of chronic alcohol consumption and exercise on the skeleton of adult male rats. *Alcoholism: Clinical and Experimental Research*, *26*(8), 1269-1274.

Reifman, A., and Windle, M. (1995). Adolescent suicidal behaviors as a function of depression, hopelessness, alcohol use, and social support: A longitudinal investigation. *American Journal of Community Psychology*, *23*(3), 329-354.

Rohde, P., Lewinsohn, P.M., Kahler, C.W., Seeley, J.R., and Brown, R.A. (2001). Natural course of alcohol use disorders from adolescence to young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, (1), 83-90.

Rose, R.J. (1998). A developmental behavior-genetic perspective on alcoholism risk. *Alcohol Health and Research World*, *22*(2), 131-143.

Sampson, H.W., Perks, N., Champney, T.H., and DeFee, B., II. (1996). Alcohol consumption inhibits bone growth and development in young actively growing rats. *Alcoholism: Clinical and Experimental Research*, *20*(8), 1375-1384.

Sampson, H.W., and Spears, H. (1999). Osteopenia due to chronic alcohol consumption by young actively growing rats is not completely reversible. *Alcoholism: Clinical and Experimental Research*, *23*(2), 324-327.

Schuckit, M.A. (2000). *Drug and alcohol abuse: A clinical guide to diagnosis and treatment* (5th ed.). New York: Plenum.

Schuckit, M.A., Anthenelli, R.M., Bucholz, K.K., Hesselbrock, V.M., and Tipp, J. (1995). The time course of development of alcohol-related problems in men and women. *Journal of Studies on Alcohol*, *56*(2), 218-225.

Schuckit, M.A., Irwin, M., and Brown, S.A. (1990). The history of anxiety symptoms among 171 primary alcoholics. *Journal of Studies on Alcohol*, *51*(1), 34-41.

Schulenberg, J., O'Malley, P.M., Bachman, J.G., Wadsworth, K.N., and Johnston, L.D. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol*, *57*(3), 289-304.

Silveri, M.M., and Spear, L.P. (2002). The effects of NMDA and GABAA pharmacological manipulations on ethanol sensitivity in immature and mature animals. *Alcoholism: Clinical and Experimental Research*, *26*(4), 449-456.

Sowell, E.R., Thompson, P.M., Tessner, K.D., and Toga, A. W. (2001). Mapping continued brain growth and gray matter density reduction in dorsal frontal cortex: Inverse relationships during postadolescent brain maturation. *The Journal of Neuroscience*, *21*(22), 8819-8829.

Spear, L.P. (2002). The adolescent brain and the college drinker: Biological basis of propensity to use and misuse alcohol. *Journal of Studies on Alcohol (Suppl. 14)*, 71-81.

Stewart, D.G., and Brown, S.A. (1995). Withdrawal and dependency symptoms among adolescent alcohol and drug abusers. *Addiction*, *90*, 627-635.

Strunin, L., and Hingson, R. (1992). Alcohol, drugs, and adolescent sexual behavior. Special issue: Key issues in epidemiology and control policies. *International Journal of Addictions*, *27*, 129-146.

Substance Abuse and Mental Health Services Administration. (1998). *Prevalence of substance abuse among racial and ethnic subgroups in the United States*. Rockville, MD: Department of Health and Human Services. (Publication No. SMA, 98-3200).

Tapert, S., Brown, G., Meloy, M., Dager, A., Cheung, E., and Brown, S. (2001a). fMRI measurement of brain function in alcohol use disordered adolescents. *Alcoholism: Clinical and Experimental Research*, *25*, 80A.

Tapert, S.F., Aarons, G.A., Sedlar, G., and Brown, S.A. (2001b). Adolescent substance use and sexual risk taking behavior. *Journal of Adolescent Health*, *28*, 181-189.

Tapert, S.F., and Brown, S.A. (1999). Neuropsychological correlates of adolescent substance abuse: Four-year outcomes. *Journal of the International Neuropsychological Society*, *5*, 481-493.

Tapert, S.F., and Brown, S.A. (2000). Substance dependence, family history of alcohol dependence, and neuropsychological functioning in adolescence. *Addictions*, *95*(7), 1043-1053.

Tapert, S.F., Granholm, E., Leedy, N., and Brown, S.A. (2002). Substance use and withdrawal: Neuropsychological functioning over 8 years in youth. *Journal of the International Neuropsychological Society*, *8*, 873-883.

Tapert, S.F., Tate, S., and Brown, S.A. (1999). Substance abuse: An overview. In P.B. Sutker and H.E. Adams (Eds.), *Comprehensive handbook of psychopathology* (3rd ed.) (555-590). New York: Plenum.

Vega, W.A., Alderete, E., Kolody, B., and Aguilar-Gaxiola, S. (2000). Adulthood sequela of adolescent heavy drinking among Mexican Americans. *Hispanic Journal of Behavioral Sciences*, *2*, 254-266.

Wezeman, F.H., Emanuele, M.A., Emanuele, N.V., Moskal, S.F., II, Woods, M., Suri, M., Steiner, J., and LaPaglia, N. (1999). Chronic alcohol consumption during male rat adolescence impairs skeletal development through effects on osteoblast gene expression, bone mineral density, and bone strength. *Alcoholism: Clinical and Experimental Research*, *23*(9), 1534-1542.

White, A.M., Bae, J.G., Truesdale, M.C., Ahmad, S., Wilson, W.A., and Swartzwelder, H.S. (2002). Chronic-intermittent ethanol exposure during adolescence prevents normal developmental changes in sensitivity to ethanol-induced motor impairments. *Alcoholism: Clinical and Experimental Research*, *26*(7), 960-968.

White, A.M., Ghia, A.J., Levin, E.D., and Swartzwelder, H.S. (2000). Binge pattern ethanol exposure in adolescent and adult rats: Differential impact on subsequent responsiveness to ethanol. *Alcoholism: Clinical and Experimental Research*, *24*(8), 1251-1256.

White, H.R., Xie, M., Thompson, W., Loeber, R., and Stouthamer-Loeber, M. (2001). Psychopathology as a predictor of adolescent drug use trajectories. *Psychology of Addictive Behaviors*, *3*, 210-218.

Windle, M. (1994). Substance use, risky behaviors, and victimization among a US national adolescent sample. *Addiction*, *89*, 175-182.

Yi, H., Williams, G.D., and Dufour, M.C. (2001). *Surveillance report #56: Trends in alcohol-related fatal traffic crashes, United States, 1977-99*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Yoshimoto, K., Hori, M., Sorimachi, Y., Watanabe, T., Tano, T., and Yasuhara, M. (2002). Increase of rat alcohol drinking behavior depends on the age of drinking onset. *Alcoholism: Clinical and Experimental Research*, *26*(8), 63S-65S.

4

Developmental and Environmental Influences on Underage Drinking: A General Overview

Bonnie L. Halpern-Felsher and Michael Biehl

How do we prevent underage drinking in a society in which youth receive positive messages about alcohol coupled with warnings that alcohol is illegal and risky? Alcohol pervades our culture, and youth are well aware of its popularity. Adolescents and young adults witness the casual use of alcohol by parents, other adults, and peers, and alcohol is commonly displayed in advertisements, in movies, on television, on t-shirts, at sports events, and through similar venues. Therefore, it is not surprising that experimental or occasional use of alcohol is reported by the majority of U.S. adolescents (Substance Abuse and Mental Health Services Administration, 2001), making it, by definition, a normative behavior during the second decade of life. This is not to say that underage alcohol consumption is condoned, as any alcohol use can lead to cognitive impairment, risk of injury or death if consumed before vehicle use, or violence. Futhermore, it is illegal for anyone under age 21.

In this chapter, we provide an overview of the developmental and environmental factors that have been implicated in normative underage alcohol use.[1] In doing so, we apply a lifespan developmental systems approach (Baltes, 1987; Baltes, Reese, and Lipsitt, 1980; Lerner et al., 1994), whereby development is viewed as a lifespan process, with past events

[1]We do not discuss factors that influence excessive or atypical alcohol use (e.g., mental or addictive disorders) because the factors generally responsible for these drinking patterns are not necessarily the same as those involved in normative alcohol use.

influencing current ones, which in turn influence future developments. A central tenet of lifespan models is that there is a dynamic, reciprocal interaction between the individual and his or her environment. Therefore, reducing risk behavior and promoting healthy pathways can only be accomplished through a fundamental understanding of the developmental and environmental factors that impinge on youths' lives.

In this chapter, we do not attempt to review all of the literature concerning the multitude of factors involved in adolescent alcohol use. Instead, we focus on developmental and environmental influences, with particular emphasis on factors we consider most amenable to prevention and intervention efforts. We refer readers to other, more extensive and lengthy reviews that have already made significant contributions to the field (e.g., Dielman, Butchart, Shope, and Miller, 1991; Halebsky, 1987; Hawkins, Catalano, and Miller, 1992; Vakalahi, 2001).

DEVELOPMENTAL INFLUENCES ON UNDERAGE ALCOHOL USE

Adolescence marks a period of great and rapid physical, cognitive, psychosocial, and emotional changes. All of these changes increase one's desire for more autonomy and decision making, which can result in risk taking, including alcohol use. Understanding how these individual-level developmental factors relate to alcohol use is critical in order to create developmentally appropriate and effective alcohol prevention and intervention programs. In this section, we review adolescent physical, cognitive, and psychosocial development, with particular emphasis on how such development influences underage alcohol consumption.

Physical Development

Adolescent development is typically marked by rapid and extreme biological changes—namely, the onset of puberty and menarche. During this time, hormones, brain development, and the environment interact to result in increased growth, change in voice characteristics, and the development of secondary sex characteristics.

Puberty often signals changes in one's own as well as others' expectations for the adolescent. For example, taller and more mature-looking adolescents are often expected to be more responsible and take on adult roles and behaviors earlier than less physically mature peers of the same age group. However, depending on the age at which puberty occurs, the adolescents' level of social and emotional maturation may not match their physical development. When this mismatch occurs, expectations for adult-like responsibilities may be met with negative or health-compromising self-perceptions and behaviors. For example, early maturing girls tend to show

increased dissatisfaction with their bodies, have lower self-esteem, have school difficulties, and engage in problem behaviors such as drinking, smoking, and early sexual behavior as compared to late-maturing girls. In contrast, late-maturing boys express more dissatisfaction with their body image, tend to be less popular and less athletic, and perform less well academically than early maturing boys. The psychological and behavioral difficulties resulting from early or late pubertal onset can be ameliorated through parental involvement, communication, and support.

Cognitive and Psychosocial Development

During adolescence, thinking becomes more abstract and less concrete, and adolescents become more future oriented, allowing them to consider multiple aspects of any decision at one time, assess potential consequences of a decision, consider possible outcomes associated with various choices, and plan for the future. These cognitive changes are coupled with psychosocial development, including social perspective taking, susceptibility to peer pressure, and increased need for autonomy (e.g., Steinberg and Cauffman, 1996). Social perspective taking refers to the ability to recognize how the thoughts and actions of one person can influence those of another. Social perspective taking has been shown to gradually increase until about age 16 (Steinberg and Cauffman, 1996). Applied to underage drinking, it is expected that individuals who are more capable of social perspective taking will be more able to understand why underage alcohol use is not condoned and understand that not all people have the same views concerning alcohol use. Although generally an indicator of greater maturity, a downside of this new ability to understand different perspectives is that adolescents become highly concerned with peer conformity, which may make them more susceptible to peer pressure, including pressure to drink alcohol. A more detailed discussion of peer influences and social norms is presented later in this chapter.

These cognitive and psychosocial changes are also accompanied by adolescents' questioning of parental control and rules and their desire to be more autonomous, which often translates into their desire to participate in, and eventually dictate, their own decision making. The desire to be autonomous and make one's own decisions is considered an important hallmark of adolescence. The literature clearly indicates that the need to be more autonomous and be granted more decision making opportunities increases with age. Several other simultaneous changes during adolescence serve to increase adolescents' desire for autonomy. First, as indicated earlier, physical changes of puberty result in the adolescent seeing himself or herself as more deserving of privileges, and others tend to have similar expectations for youth. Second, increased time spent with peers leads to more experi-

ences and comparisons of others' authority, power, and privileges. Finally, cultural and societal beliefs indicate that adolescence is a time to practice adult roles (Hill, 1973; see also Silverberg and Gondoli, 1996, for a review).

Perceptions of Alcohol-Related Risks

Two critical and overlapping areas of theory and research have emerged from our understanding of adolescent cognitive and psychosocial development: 1) adolescents' perceptions of risk, and 2) adolescent decision making. These areas have particular relevance to clinicians, policy makers, and researchers interested in understanding underage alcohol use. In this chapter, we discuss the notion of adolescent egocentrism, perceptions of invulnerability, and alcohol-related expectancies. For a discussion regarding alcohol-related decision making, see Jacobs, Chapter 5.

Both lay and scientific circles often have hypothesized that adolescents are not concerned about their health, that they make poor judgments about risks, and that they believe they are invulnerable to harm, and because of these perceptions, they engage in risk behaviors (see, for example, Social Cognitive Theory [Bandura, 1994], the Health Belief Model [Rosenstock, 1974], the Theory of Reasoned Action [Fishbein and Ajzen, 1975], the Theory of Planned Behavior [Ajzen, 1985], Self-Regulation Theory [Kanfer, 1970], and Subjective Culture and Interpersonal Relations Theory [Triandis, 1977]). The notion that adolescents do not adequately perceive risks largely stems from Elkind (1967, 1978), who argued that egocentric young adolescents hold an exaggerated sense of uniqueness and believe in a "personal fable"—that they are special and in some ways immune to the natural laws that pertain to others. Thus, they view themselves as invulnerable to harm, and therefore are more likely to engage in risk behaviors. Adolescent egocentrism and the associated perceptions of invulnerability are thought to become less evident as the adolescent matures cognitively.

Although Elkind's theory is appealing, it has not held up to empirical scrutiny. Evidence shows that adolescent egocentrism increases from childhood to early adolescence, and then gradually decreases through middle and late adolescence (De Rosenroll, 1987; Urberg and Robbins, 1984). But adolescent egocentrism does not appear to be linked to young adolescents' transition into formal operations (Gray and Hudson, 1984; Jahnke and Blanchard-Fields, 1993; Lapsley, Milstead, Quintana, Flannery, and Buss, 1986), nor has research supported a relationship between egocentrism and perceptions of invulnerability (Dolcini et al., 1989).

The majority of studies assessing the relationship between perceptions of invulnerability to harm and alcohol use have examined whether judgments of risk vary by behavioral engagement. Overall, results show that adolescents who have drunk alcohol perceive alcohol-related risks to be less

likely to occur compared to adolescents without prior alcohol consumption (Goldberg, Halpern-Felsher, and Millstein, 2002; Halpern-Felsher et al., 2001; Hampson, Severson, Burns, Slovic, and Fisher, 2001; Kuther, 2002). Another set of studies has examined whether adolescents and adults differ in their estimates of risk. Contrary to hypotheses, most of this research has revealed that adults and adolescents give similar estimates of risk taking, including those related to alcohol use (e.g., Beyth-Marom, Austin, Fischhoff, Palmgren, and Jacobs-Quadrel, 1993; Quadrel, Fischhoff, and Davis, 1993).

Causal relationships between risk estimates and alcohol use must be made cautiously as most studies have used cross-sectional methodology, poor definitions of alcohol use, and inadequate assessments of risk perceptions (see Halpern-Felsher et al., 2001, for details). Despite lack of evidence, the concept of adolescent "invulnerability" remains pervasive in both scientific and lay circles, is used to explain adolescents' decisions to engage in potentially harmful behavior, and is incorporated into many intervention programs (Weinstein, 1983; Weisenberg, Kegeles, and Lund, 1980). Longitudinal, prospective studies are needed in order to fully understand the extent to which perceptions of low risk actually predict and motivate alcohol use.

Perceptions of Alcohol-Related Benefits

An emphasis on perceived risk alone may be inadequate to predict or change behavior because risk is only part of the behavioral decision making equation. What is missing is knowing the extent to which adolescents perceive benefits of risky behaviors. The decision making literature has argued that individuals should consider both the risks and benefits when making decisions (Baron, 1988; Weinstein and Fineberg, 1980). In addition, alcohol expectancy researchers have found that perceived benefits, in addition to perceived risks, are important predictors of drinking behavior (Christiansen, Goldman, and Inn, 1982; Christiansen, Roehling, Smith, and Goldman, 1989; Chen, Grube, and Madden, 1994; Goldberg et al., 2002; Grube, Chen, Madden, and Morgan, 1995; Jones, Corbin, and Fromme, 2001; Smith, Goldman, Greenbaum, and Christiansen, 1995; Wood, Nagoshi, and Dennis, 1992). More recently, Goldberg and colleagues (2002) found that, regardless of age, participants with more drinking experience perceived benefits to be more likely to occur, and risks less likely.

Indeed, adolescents' reasons for drinking alcohol often include an acknowledgment or identification of alcohol-related benefits, such as alcohol being used in social interactions to help them to reduce inhibitions, feel more relaxed (Jones et al., 2001; Wood et al., 1992), reduce tension, foster courage, and reduce worry (Prendergast, 1994).

Age, Gender, and Experiential Differences in Alcohol-Related Expectancies

Both positive and negative alcohol-related expectancies vary by age. By age 12, individuals with and without drinking experience have a well-formulated sense of alcohol-related expectancies (Christiansen et al., 1982; Jones et al., 2001). Although children's and adults' general alcohol expectancies are similar (Dunn and Goldman, 1996), negative expectancies are more often reported by younger children, with perceptions of alcohol-related benefits increasing with age (Goldberg et al., 2002; Miller, Smith, and Goldman, 1990). Specific expectancies also differ by age. Young adolescents (e.g., 12- to 14-year-olds) rank reduced tension and impaired behavioral functioning among the highest expectancies; 15- to 16-year-olds cite enhanced social and physical pleasure and modified social and emotional behavior; and older adolescents (e.g., 17- to 19-year-olds) list enhanced sexual performance and increased power among their highest expectancies (Christiansen et al., 1982).

There are also gender differences in alcohol expectations. Adolescent males typically perceive more positive and fewer negative consequences of alcohol use than do adolescent females. Furthermore, the frequency of alcohol use has been associated with global positive effects, sexual enhancement, and pleasure for men, but reduced tension for women (Jones et al., 2001). However, there were no differences between males and females in the relationship between amount of alcohol use and perceived outcomes.

Independent of age effects, prior experience with alcohol use also plays a large role in alcohol-related expectancies, alcohol-related decision making, and subsequent alcohol use (Christiansen et al., 1989; Christiansen et al., 1982; Chen et al., 1994; Goldberg et al., 2002; Grube et al., 1995; Jones et al., 2001; Smith et al., 1995; Wood et al., 1992). In particular, enhanced sexual feelings, power, and reduced tension have been reported by those with greater drinking experiences, while youth with little or no alcohol experiences have more global expectancies of increased pleasure (Christiansen et al., 1982).

ENVIRONMENTAL INFLUENCES ON UNDERAGE ALCOHOL USE

At the same time that youth are experiencing rapid physical, cognitive, psychosocial, and emotional changes, they are embedded within changing and multilayered contexts. These contexts and their reciprocal relationship with youth also must be understood in order to reduce underage drinking most effectively. In this section, we discuss the roles that parents, peers, and the larger society play in underage alcohol use.

Parents

Although multiple influences in adolescents' lives will determine their developmental course, parents have the single most important external influence on adolescents' development and behavior, including alcohol use. For more than 50 years, the relationship between parents' child-rearing orientations and child outcomes has been studied. This venture has resulted in a host of literature linking parenting styles to substance use (e.g., Lamborn, Mounts, Steinberg, and Dornbusch, 1991). Typically, researchers have found that children raised in homes in which parents were warm, loving, and involved, supported their children's independence and valued their children's opinions, and also set limits and monitored their children's activities were more likely to exhibit positive developmental outcomes and less likely to exhibit risk behaviors than were children reared in less supportive homes.

With respect to alcohol use, parental monitoring and involvement have emerged as particularly important parenting behaviors. Parental monitoring includes parental or guardian supervision and knowledge about their adolescents' activities and friends. Parental monitoring also entails setting clear expectations and having fair and direct consequences (Connell, Halpern-Felsher, Clifford, Crichlow, and Usinger, 1995; Connell and Halpern-Felsher, 1997; Halpern-Felsher, et al., 1997; Lee and Halpern-Felsher, 2001). Correlated with parental monitoring is parental involvement, which includes the parents having an active interest and participation in their child's activities and development. Parents can prevent or reduce adolescents' alcohol use in part by setting curfews, being aware of and participating in after-school and weekend activities, helping them to improve social skills, and reducing their adolescents' affiliation with peers who are engaging in risk activities (Beck and Lockhart, 1992; Cohen, Richardson, and LaBree, 1994; Steinberg, Fletcher, and Darling, 1994). Research on parental monitoring consistently shows protective effects on alcohol use (Barnes, Reifman, Farrell, and Dintcheff, 2000; Bogenschneider, Wu, Raffaelli, and Tsay, 1998; Reifman, Barnes, Dintcheff, Farrell, and Uhteg, 1998; DiClemente et al., 2001).

Parental norms and attitudes regarding adolescents' alcohol use (Ary, Tildesley, Hops, and Andrews, 1993; Baer, Barr, Bookstein, Sampson, and Streissguth, 1998; McGue, Sharma, and Benson, 1996; Stice, Barrera, and Chassin, 1998; Webb and Baer, 1995; Weinberg, Dielman, Mandell, and Shope, 1994) are also important influences on use (e.g., Sieving, Perry, and Williams, 2000). Studies have also shown that parents' own alcohol use is associated with underage drinking (e.g., Pandina and Johnson, 1989) as well as increased chance of experiencing alcohol-related negative consequences (Pandina and Johnson, 1990). Parents' use of alcohol is related to

less family support, reduced parental monitoring, and less effective coping strategies, which in turn are related to a greater likelihood of alcohol use among adolescents (Barnes et al., 2000; e.g., Johnson and Pandina, 1993; Reifman et al., 1998).

Studies have also demonstrated that sibling alcohol use is a risk factor in a target individual's alcohol use (Ary et al., 1993; McGue et al., 1996). For example, McGue and colleagues (1996) showed that while parental alcohol use only had an effect for the biological children, sibling alcohol use was related to both adoptive and biological children's alcohol consumption. The effect was stronger if the sibling was similar in age, gender, and ethnicity.

Peers

Adolescents and adults spend a greater amount of time with their peers than with their family or other adults. Thus, peers become a major source of support and socialization for youth. Research shows that these peer networks can play a role in underage drinking. Adolescents are more likely to consume alcohol if they affiliate with peers who consume alcohol (Ary et al., 1993; Colder and Chassin, 1999; Fergusson, Horwood, and Lynskey, 1995; Curran, Stice, and Chassin, 1997; Dielman, Shope, Butchart, Campanelli, and Caspar, 1989; Sieving et al., 2000; Stice et al., 1998; Webster, Hunter, and Keats, 1994), have friends who offer them alcohol (Sieving et al., 2000), and are encouraged to use alcohol (Duncan, Duncan, and Hops, 1994; Keefe, 1994).

The potentially negative influence of peers on alcohol use can be ameliorated through positive adolescent-parent relationships, parental monitoring, and parental involvement (Parke and Ladd, 1992). For example, compared to less involved parents, parents who are more involved may oversee and monitor their children's peer relationships. Parents also have a significant amount of influence on their children's actual choice of friends, helping them to gravitate toward peers with fewer risk behaviors.

Several prevention efforts have attempted to alleviate the effects of peer influences on alcohol use. One area of programmatic focus has been to try to change perceptions of alcohol-related social norms. Such efforts have been based on research indicating that youth are aware of the normative nature of alcohol use and want to follow the crowd (Aas and Klepp, 1992; Barnes, Farrell, and Banerjee, 1995; Beck and Treiman, 1996; Olds and Thombs, 2001). Perceived use of alcohol by one's peers and friends independently predicts self-reported alcohol use (e.g., Olds and Thombs, 2001; Reifman et al., 1998), with peers having a greater influence on adolescent drinking than parents (Kuther, 2002). However, such programmatic efforts should proceed cautiously given evidence that two types of norms must be

distinguished and acknowledged (Cialdini, Reno, and Kallgren, 1990; Kallgren, Reno, and Cialdini, 2000). One type, descriptive norms, are one's perceptions of what most others are doing. The second type, injunctive norms, are the perceptions of what other people think one should be doing or not be doing. Cialdini and colleagues argue that focusing on injunctive norms is more effective at changing behavior than targeting only descriptive norms.

Another effort to reduce the influence of peer pressure has been to teach and encourage drinking refusal self-efficacy (e.g., Bell, Ellickson, and Harrison, 1993; Ellickson, Bell, and Harrison, 1993). This concept, borrowed from Bandura's (1986, 1997) general self-efficacy, refers to one's belief in his or her ability to resist urges or social pressures to drink, to drink in particular situations, or to consume large amounts of alcohol at one time. Adolescents with more positive self-efficacy are less likely to drink or drink excessively (Oei, Fergusson, and Lee, 1998; Webb and Baer, 1995), and those with fewer refusal skills are more likely to drink (Hays and Ellickson, 1996). Refusal skills may be a better predictor of problem drinking than alcohol expectancies, especially for heavy or frequent alcohol use (Connor, Young, Williams, and Ricciardelli, 2000; Oei et al., 1998).

Society and Community

We live in a society in which alcohol is ubiquitous, glamorized, and touted as a hallmark of adulthood. Advertisements for alcohol use are abundant, and alcohol is prominently displayed on television, in movies, in music, and at sports events. These societal messages compete with and even overshadow messages against underage drinking. Such mixed messages are particularly confusing to youth who are trying to make sense of their changing body and world, and who are trying to understand and meet societal expectations.

The extent to which alcohol consumption is considered to be the norm and is accepted within a given community contributes to variation in underage alcohol consumption. Underage drinking is less prevalent in communities in which youth are well monitored and where there is greater policing and enforcement of vendors who sell alcohol to youth. An especially vulnerable time in which youth particularly need supervision is after school (3 to 6 p.m.). Youth spend approximately 40 to 50 percent of their hours in discretionary time (Larson and Verma, 1999), with much of it unsupervised for older adolescents. Youth who participate in after-school programs, such as sports, clubs, library-based activities, and youth-serving organizations, are less likely to use alcohol (Eccles and Barber, 1999). Unfortunately, adolescents' participation in these after-school programs has lessened over

the past two decades, largely because of reduced funding and because transportation and accessibility to these programs is often limited.

Colleges and universities are also a prime example of a community in which alcohol use is accepted and rampant. Despite college and university administration policies regarding underage drinking, the college environment continues to be a major time of alcohol use for youth. During college, underage youth can easily obtain alcohol from college mates older than age 21, and at times parents even supply college students with kegs of beer.

SUMMARY

Clearly, a great number of developmental and environmental factors contribute to underage drinking. All of these influences, from the most basic pubertal maturation to the most macrolevel societal policies, interact in complex ways. It must be recognized that behavior does not occur in a vacuum and cannot be understood adequately without considering the interplay between the individual and the many different types of environments in which he or she lives. For example, the confluence of cognitive and psychosocial maturation juxtaposed with societal expectations lead to shifts in youths' focus of affiliation gradually from parents to peers and from group relations to intimate relations with individuals outside of the family. These expanding social relationships broaden adolescents' sense of extrafamilial reality and reinforce their increasing sense of individuality, need for autonomy, and desire to take on adult roles. Their newly acquired ability to think abstractly and to take a third person's perspective are important prerequisites for successful socialization that is tied to new responsibilities and freedom. However, such developments may also lead to risky choices, such as alcohol consumption.

Although we cannot change development, we can understand it, and we can use knowledge about adolescent and young adult development to inform the creation of more effective intervention programs. Knowledge about the development of future perspective taking, for example, is important to the development of alcohol-related prevention and intervention programs. Programs that focus on long-term outcomes will be less applicable and less effective for a young adolescent of about age 12 for whom there is an immature sense of the future and future consequences.

In addition, we can focus efforts on the environmental influences and the confluence between factors that are predictors of alcohol use. For example, enhancing parental monitoring and involvement, whereby parents are more aware of their child's whereabouts, is likely to result in youth who are less likely to use alcohol. Alcohol-related expectations are also related to alcohol use, with alcohol use positively related to perceived benefits and

negatively related to perceived risks. As pointed out by Hawkins, Catalano, and Miller (1992: 87), prevention programs should include a "developmentally adjusted, multiple-component risk-reduction strategy that cuts across traditional health, education, and human service delivery systems."

REFERENCES

Aas, H., and Klepp, K.I. (1992). Adolescents' alcohol use related to perceived norms. *Scandinavian Journal of Psychology*, *33*(4), 315-325.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, and J. Bechmann (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). New York: Springer-Verlag.

Ary, D.V., Tildesley, E., Hops, H., and Andrews, J. (1993). The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International Journal of the Addictions*, *28*(9), 853-880.

Baer, J.S., Barr, H.M., Bookstein, F.L., Sampson, P.D., and Streissguth, A.P. (1998). Prenatal alcohol exposure and family history of alcoholism in the etiology of adolescent alcohol problems. *Journal of Studies on Alcohol*, *59*(5), 533-543.

Baltes, P.B. (1987). Theoretical propositions of lifespan developmental psychology: On the dynamics between growth and decline. *Developmental Psychology*, *23*, 611-626.

Baltes, P.B., Reese, H.W., and Lipsitt, L.P. (1980). Lifespan developmental psychology. *Annual Review of Psychology*, *31*, 65-110.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1994). Social cognitive theory and exercise of control over HIV infection. In R.J. DiClemente and J.L. Peterson (Eds.), *Preventing AIDS: Theories and methods of behavioral interventions* (pp. 24-29). New York: Plenum Press.

Bandura, A. (1997). *Self-efficacy: The exercise of self-control*. New York: W.H. Freeman.

Barnes, G.M., Farrell, M.P., and Banerjee, S. (1995). Family influences on alcohol abuse and other problem behaviors among black and white Americans in a general population sample. In G.M. Boyd, J. Howard, and R.A. Zucker (Eds.), *Alcohol problems among adolescents: Current directions in prevention research* (pp. 13-31). Hillsdale, NJ: Lawrence Erlbaum Associates.

Barnes, G.M., Reifman, A.S., Farrell, M.P., and Dintcheff, B.A. (2000). The effects of parenting on the development of adolescent alcohol misuse: A six-wave latent growth model. *Journal of Marriage and the Family*, *62*(1), 175-186.

Baron, J. (1988). *Thinking and deciding*. New York: Cambridge University Press.

Beck, K.H., and Lockhart, S.J. (1992). A model of parental involvement in adolescent drinking and driving. *Journal of Youth and Adolescence*, *21*, 35-51.

Beck, K.H., and Treiman, K.A. (1996). The relationship of social context of drinking, perceived social norms, and parental influence to various drinking patterns of adolescents. *Addictive Behaviors*, *21*(5), 633-644.

Bell, R.M., Ellickson, P.L., and Harrison, E.R. (1993). Do drug prevention effects persist into high school? How Project ALERT did with ninth graders. *Preventive Medicine*, *22*, 463-483.

Beyth-Marom, R., Austin, L., Fischhoff, B., Palmgren, C., and Jacobs-Quadrel, M. (1993). Perceived consequences of risky behaviors: Adults and adolescents. *Developmental Psychology*, *29*, 549-563.

Bogenschneider, K., Wu, M.Y., Raffaelli, M., and Tsay, J.C. (1998). Parent influences on adolescent peer orientation and substance use: The interface of parenting practices and values. *Child Development*, *69*, 1672-1688.

Chen, M.J., Grube, J.W., and Madden, P.A. (1994). Alcohol expectancies and adolescent drinking: Differential prediction of frequency, quantity, and intoxication. *Addictive Behaviors*, *19*, 521-529.

Christiansen, B.A., Goldman, M.S., and Inn, A. (1982). Development of alcohol-related expectancies in adolescents: Separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology*, *50*, 336-344.

Christiansen, B.A., Roehling, P., Smith, G., and Goldman, M. (1989). Using alcohol expectancies to predict adolescent drinking behavior after one year. *Journal of Consulting and Clinical Psychology*, *57*, 93-99.

Cialdini, R.B., Reno, R.R., and Kallgren, C.A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*, 1015-1026.

Cohen, D.A., Richardson, J., and LaBree, L. (1994). Parenting behaviors and the onset of smoking and alcohol use: A longitudinal study. *Pediatrics*, *94*, 368-375.

Colder, C.R., and Chassin, L. (1999). The psychosocial characteristics of alcohol users versus problem users: Data from a study of adolescents at risk. *Development and Psychopathology*, *11*, 321-348.

Connell, J.P., and Halpern-Felsher, B.L. (1997). How neighborhoods affect educational outcomes in middle childhood and adolescence: Conceptual issues and an empirical example. In J. Brooks-Gunn, G. Duncan, and J.L. Aber (Eds.), *Neighborhood poverty, volume I: Context and consequences for children* (pp. 174-199). New York: Russell Sage Foundation.

Connell, J.P., Halpern-Felsher, B.L., Clifford, E., Crichlow, W., and Usinger, P. (1995). Hanging in there: Behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high school. *Journal of Adolescent Research*, *10*, 41-63.

Connor, J.P., Young, R.M., Williams, R.J., and Ricciardelli, L.A. (2000). Drinking restraint versus alcohol expectancies: Which is the better indicator of alcohol problems? *Journal of Studies on Alcohol*, *61*, 352-359.

Curran, P.J., Stice, E., and Chassin, L. (1997). The relation between adolescent alcohol use and peer alcohol use: A longitudinal random coefficients model. *Journal of Consulting and Clinical Psychology*, *65*, 130-140.

De Rosenroll, D.A. (1987). Early adolescent egocentrism: A review of six articles. *Adolescence*, *22*, 791-802.

DiClemente, R.J., Wingood, G.M., Crosby, R., Sionean, C., Cobb, B.K., Harrington, K., Davies, S., Hook, E.W., III, and Oh, M.K. (2001). Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics*, *107*, 1363-1368.

Dielman, T.E., Butchart, A.T., Shope, J.T., and Miller, M. (1991). Environmental correlates of adolescent substance use and misuse—Implications for prevention programs. *International Journal of the Addictions*, *25*(7A-8A), 855-880.

Dielman, T.E., Shope, J.T., Butchart, A.T., Campanelli, P.C., and Caspar, R.A. (1989). A covariance structure model test of antecedents of adolescent alcohol misuse and a prevention effort. *Journal of Drug Education*, *19*, 337-361.

Dolcini, M.M., Cohn, L.D., Adler, N.E., Millstein, S.G., Irwin, C.E., Kegeles, S.M., and Stone, G.C. (1989). Adolescent egocentrism and feelings of invulnerability: Are they related? *Journal of Early Adolescence*, *9*, 409-418.

Duncan, T.E., Duncan, S.C., and Hops, H. (1994). The effects of family cohesiveness and peer encouragement on the development of adolescent alcohol-use: A cohort-sequential approach to the analysis of longitudinal data. *Journal of Studies on Alcohol*, *55*, 588-599.

Dunn, M.E., and Goldman, M.S. (1996). Empirical modeling of an alcohol expectancy memory network in elementary school children as a function of grade. *Experimental and Clinical Psychopharmacology*, *4*, 209-217.

Eccles, J.S., and Barber, B.L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Youth and Adolescence*, *6*, 281-294.

Elkind, D. (1967). Egocentrism in adolescence. *Child Development*, *38*, 1025-1034.

Elkind, D. (1978). Understanding the young adolescent. *Adolescence*, *13*, 127-134.

Ellickson, P.L., Bell, R.M., and Harrison, E.R. (1993). Changing adolescent propensities to use drugs: Results from Project ALERT. *Health Education Quarterly*, *20*(2), 227-242.

Fergusson, D.M., Horwood, L.J., and Lynskey, M.T. (1995). The prevalence and risk-factors associated with abusive or hazardous alcohol-consumption in 16-year-olds. *Addiction*, *90*, 935-946.

Fishbein, M., and Ajzen, I. (1975). *Beliefs, attitudes, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Goldberg, J.H., Halpern-Felsher, B.L., and Millstein, S.G. (2002). Beyond invulnerability: The importance of benefits in adolescents' decision to drink alcohol. *Health Psychology*, *21*, 477-484.

Gray, W., and Hudson, L. (1984). Formal operations and the imaginary audience. *Developmental Psychology*, *20*, 619-627.

Grube, J.W., Chen, M., Madden, P., and Morgan, M. (1995). Predicting adolescent drinking from alcohol expectancy values: A comparison of additive, interactive, and nonlinear models. *Journal of Applied Social Psychology*, *25*, 839-857.

Halebsky, M.A. (1987). Adolescent alcohol and substance abuse: Parent and peer effects. *Adolescence*, *22*, 961-967.

Halpern-Felsher, B.L., Connell, J.P., Spencer, M.B., Aber, J.L., Duncan, G.P., Clifford, E., Crichlow, W.E., Usinger, P.A., Cole, S.P., Allen, L., and Seidman, E. (1997). Neighborhood and family factors predicting educational risk and attainment in African American and white children and adolescents. In J. Brooks-Gunn, G. Duncan, and J.L. Aber (Eds.), *Neighborhood poverty, volume I: Context and consequences for children* (pp. 146-173). New York: Russell Sage Foundation.

Halpern-Felsher, B.L., Millstein, S.G., Ellen, J., Adler, N., Tschann, J., and Biehl, M. (2001). The role of behavioral experience in judging risks. *Health Psychology*, *20*, 120-126.

Hampson, S.E., Severson, H.H., Burns, W.J., Slovic, P., and Fisher, K.J. (2001). Risk perception, personality factors and alcohol use among adolescents. *Personality and Individual Differences*, *30*, 167-181.

Hawkins, J.D., Catalano, R.F., and Miller, J.Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance-abuse prevention. *Psychological Bulletin*, *112*, 64-105.

Hays, R.D., and Ellickson, P.L. (1996). What is adolescent alcohol misuse in the United States according to the experts? *Alcohol and Alcoholism*, *31*, 297-303.

Hill, J.P. (1973). *Some perspectives on adolescence in American society*. Washington, DC: U.S. Department of Health, Education, and Welfare Office of Child Development.

Jahnke, H.C., and Blanchard-Fields, F. (1993). A test of two models of adolescent egocentrism. *Journal of Youth and Adolescence*, *22*, 313-326.

Johnson, V., and Pandina, R.J. (1993). A longitudinal examination of the relationships among stress, coping strategies, and problems associated with alcohol use. *Alcoholism: Clinical and Experimental Research*, *17*, 696-702.

Jones, B.T., Corbin, W., and Fromme, K. (2001). A review of expectancy theory and alcohol consumption. *Addiction*, *96*, 427-436.

Kallgren, C.A., Reno, R.R., and Cialdini, R.B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*, 1002-1012.

Kanfer, F.H. (1970). *Self-regulation: Research, issues and speculations*. New York: Appleton-Century-Crofts.

Keefe, K. (1994). Perceptions of normative social pressure and attitudes toward alcohol-use: Changes during adolescence. *Journal of Studies on Alcohol*, *55*, 46-54.

Kuther, T.L. (2002). Rational decision perspectives on alcohol consumption by youth—Revising the theory of planned behavior. *Addictive Behaviors*, *27*, 35-47.

Lamborn, S.D., Mounts, N.S., Steinberg, L., and Dornbusch, S.M. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development*, *62*, 1049-1065.

Lapsley, D., Milstead, M., Quintana, S.M., Flannery, D., and Buss, R.R. (1986). Adolescent egocentrism and formal operations: Tests of a theoretical assumption. *Developmental Psychology*, *22*, 800-807.

Larson, R.W., and Verma, S. (1999). How children and adolescents spend time across the world: Work, play, and developmental opportunities. *Psychological Bulletin*, *125*, 701-736.

Lee, C.Y., and Halpern-Felsher, B.L. (2001). Parenting of adolescents. In L. Balter (Ed.), *Parenthood in America: An Encyclopedia* (Vol. 1, pp. 14-17). Santa Barbara, CA: ABC-CLIO.

Lerner, R.M., Miller, J.R., Knott, J.H., et al. (1994). Integrating scholarship and outreach in human development research, policy, and service: A developmental contextual perspective. In D.L. Featherman, R.M. Lerner, and M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 12, pp. 249-273). Hillsdale, NJ: Erlbaum Associates.

McGue, M., Sharma, A., and Benson, P. (1996). Parent and sibling influences on adolescent alcohol use and misuse: Evidence from a U.S. adoption cohort. *Journal of Studies on Alcohol*, *57*, 8-18.

Miller, P.M., Smith, G.T., and Goldman, M.S. (1990). Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol*, *51*, 343-349.

Oei, T.P., Fergusson, S., and Lee, N.K. (1998). The differential role of alcohol expectancies and drinking refusal self-efficacy in problem and nonproblem drinkers. *Journal of Studies on Alcohol*, *59*, 704-711.

Olds, R.S., and Thombs, D.L. (2001). The relationship of adolescent perceptions of peer norms and parent involvement to cigarette and alcohol use. *Journal of School Health*, *71*, 223-228.

Pandina, R.J., and Johnson, V. (1989). Familial drinking history as a predictor of alcohol and drug consumption among adolescent children. *Journal of Studies on Alcohol*, *50*, 245-253.

Pandina, R.J., and Johnson, V. (1990). Serious alcohol and drug problems among adolescents with a family history of alcoholism. *Journal of Studies on Alcohol*, *51*, 278-282.

Parke, R.D., and Ladd, G.W. (Eds.). (1992). *Family-peer relationships: Modes of linkage*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Prendergast, L. (1994). Substance use and abuse among college students: A review of the recent literature. *Journal of American College Health*, *43*, 99-113.

Quadrel, M.J., Fischhoff, B., and Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist*, *48*, 102-116.

Reifman, A., Barnes, G.M., Dintcheff, B.A., Farrell, M.P., and Uhteg, L. (1998). Parental and peer influences on the onset of heavier drinking among adolescents. *Journal of Studies on Alcohol*, *59*, 311-317.

Rosenstock, I.M. (1974). Historical origins of the health belief model. In M.H. Becker (Ed.), *The health belief model and personal health behavior* (pp. 1-8). Thorofare, NJ: Charles B. Sclack.

Sieving, R.E., Perry, C.L., and Williams, C.L. (2000). Do friendships change behaviors, or do behaviors change friendships? Examining paths of influence in young adolescents' alcohol use. *Journal of Adolescent Health*, *26*, 27-35.

Silverberg, S.B., and Gondoli, D.M. (1996). Autonomy in adolescence: A contextualized perspective. In G.R. Adams, R. Montemayor, and T.P. Gullotta (Eds.), *Psychosocial development during adolescence: Progress in developmental contextualism* (pp. 12-61). Thousand Oaks, CA: Sage.

Smith, G., Goldman, M., Greenbaum, P., and Christiansen, B. (1995). Expectancy for social facilitation from drinking: The divergent paths of high-expectancy and low-expectancy adolescents. *Journal of Abnormal Psychology*, *104*, 32-40.

Steinberg, L., and Cauffman, E. (1996). Maturity of judgment in adolescence: Psychosocial factors in adolescent decision making. *Law and Human Behavior*, *20*, 249-272.

Steinberg, L.D., Fletcher, A., and Darling, N. (1994). Parental monitoring and peer influences on adolescent substance use. *Pediatrics*, *93*, 1060-1064.

Stice, E., Barrera, M., and Chassin, L. (1998). Prospective differential prediction of adolescent alcohol use and problem use: Examining the mechanisms of effect. *Journal of Abnormal Psychology*, *107*, 616-628.

Substance Abuse and Mental Health Services Administration. (2001). *National household survey on drug abuse*. Rockville, MD: Author.

Triandis, H.C. (1977). *Interpersonal behavior*. Monterey, CA: Brooks Cole.

Urberg, K., and Robbins, R. (1984). Perceived vulnerability in adolescents to the health consequences of cigarette smoking. *Preventive Medicine*, *13*, 367-376.

Vakalahi, H.F. (2001). Adolescent substance use and family-based risk and protective factors: A literature review. *Journal of Drug Education*, *31*, 29-46.

Webb, J.A., and Baer, P.R. (1995). Influence of family disharmony and parental alcohol-use on adolescent social skills, self-efficacy, and alcohol-use. *Addictive Behaviors*, *20*, 127-135.

Webster, R.A., Hunter, M., and Keats, J.A. (1994). Personality and sociodemographic influences on adolescents' substance use: A path-analysis. *International Journal of the Addictions*, *29*, 941-956.

Weinberg, N.Z., Dielman, T.E., Mandell, W., and Shope, J.T. (1994). Parental drinking and gender factors in the prediction of early adolescent alcohol-use. *International Journal of the Addictions*, *29*, 89-104.

Weinstein, M., and Fineberg, H. (1980). *Clinical decision analysis*. Philadelphia: Saunders.

Weinstein, N.D. (1983). Reducing unrealistic optimism about illness. *Health Psychology*, *2*, 11-20.

Weisenberg, M., Kegeles, S.S., and Lund, A.K. (1980). Children's health beliefs and acceptance of a dental preventive activity. *Journal of Health and Social Behavior*, *21*, 59-74.

Wood, M.D., Nagoshi, C.T., and Dennis, D.A. (1992). Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse*, *18*, 461-476.

5

Perceptions of Risk and Social Judgments: Biases and Motivational Factors

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Adolescents are often characterized as poor decision makers by teachers, parents, and policy makers who point to underage drinking, teen pregnancy, or delinquency as evidence of poor judgment. Indeed, there has been great interest in understanding adolescent risk taking and decision making over the past two decades. More than 10 years ago, Elliott and Feldman (1990) suggested that our understanding of adolescent decision making was critical because of the large number of roles and choices available to teenagers in our culture, combined with "social conventions [that] have granted adolescents greater self-determination at steadily younger ages, even as the diversity of socially acceptable life options has expanded" (p. 4). The same authors noted that "adolescents are left with the task of, but not necessarily the requisite intellectual and emotional tools for, reconciling [such decision making tasks]" (p. 5).

Despite widespread interest in how children and youth make decisions and numerous programs to improve their decision-making skills, few of the educational programs have been based on our current knowledge about the development of biases in reasoning and motivational processes that may contribute to judgments related to risk taking. In this chapter, after briefly reviewing previous research on adolescent cognition related to decision making, I discuss a number of reasoning, motivational, and developmental issues that are critical to our understanding of adolescent risk taking.

EARLIER RESEARCH ON ADOLESCENT REASONING RELATED TO DECISION MAKING

Much of the research related to adolescent risk taking has relied on the assumption that decision making is based on reasoning and information-processing abilities, and it typically has been rooted in traditional developmental models. The result of the exclusive emphasis on reasoning competence as the basis for decision making is reflected in research from the 1980s and early 1990s that compared adolescents' and adults' decision making on unfamiliar, hypothetical scenarios. These studies indicated that by early adolescence (typically about age 12), teens are able to use basic adult concepts and reasoning (Dunkle, 1992; Moshman and Franks, 1986; Overton, 1990). Thus, many studies suggested that by early to middle adolescence, reasoning abilities were similar to those of adults (for reviews, see Byrnes and Beilin, 1991; Kuhn, 1989; Overton, 1990). Moshman (1993) concluded that "there is no evidence of any important component of rationality that is lacking in adolescents and found in most adults" (p. 37). In addition to general reasoning abilities, a few studies investigating specific decision making skills were conducted during the same period. A number of these supported the findings of the reasoning literature, indicating few differences between the decision making of adolescents and adults. For example, studies looking at information use in everyday decision making found that by age 12, adolescents systematically searched for relevant information (Klayman, 1985), and that early adolescents used almost the same sources of information as did their parents when making everyday decisions about certain topics, such as which bike to buy or which camp to attend (Jacobs, Bennett, and Flanagan, 1993).

Other research, however, did not support the adolescent-as-adult perspective. These studies reported age-related differences between early and later adolescence in decisions that involved making inferences, perceiving risk (Lewis, 1981; Shtarkshail, 1987), considering consequences (Beyth-Marom, Austin, Fischhoff, Palmgren, and Jacobs-Quadrel, 1993; Gouze, Strauss, and Keating, 1986; Lewis, 1981), planning (Rowe, 1984; Urberg and Rosen; 1987), and rates of perceived invulnerability (Quadrel, Fischhoff, and Davis, 1993). A big difference between this second set of studies and the first was that they focused on real-world issues, social situations, and judgments based on prior experiences, whereas the other studies were concerned with cognitive performance under ideal conditions. Thus, the earlier studies indicate that decision making is not a single cognitive competence and that there are many complexities inherent in any particular decision related to risk taking behavior. Fischhoff and Quadrel (1991) made a similar point, suggesting that formal decision analysis be used to understand the many variants that affect each adolescent decision regarding alco-

hol because it allows the estimation of the many options, consequences, and uncertainties that an adolescent might face when making such a decision.

It is clear from the previous research that decision making about underage drinking (or any other risky behavior) is a product of interactions among a number of different competencies, situations, and emotional states. Thus, studies that focus exclusively on discerning age differences in cognitive competence may tell us only what adolescents can do under ideal conditions, rather than what they will do under more realistic conditions when personal goals, beliefs, prior experience, values, and emotions are added to the decision-making equation (Jacobs and Klaczynski, 2002). Although important, this narrow definition of competence may miss the part of decision making that is most closely related to the risk taking behaviors that are of interest to policy makers and parents and that may distinguish adolescents from adults. Several components of decision making have not typically been captured when the focus has been on cognitive competence, including biased social judgments, motivation, and self-perceptions. The remainder of this chapter reviews our current knowledge about those three topics, then concludes by making some observations about the potential implications of this research for our understanding of adolescent risk taking behaviors.

BIASES IN SOCIAL JUDGMENTS

The overriding theme in the adult judgment and decision-making literature has been that adults commonly fall prey to judgment biases, ignore important information, rely on seemingly inappropriate decision making shortcuts, and make nonoptimal decisions across a wide array of situations when they are making social judgments (for reviews see Dawes, 1988; Nisbett, 1993; Plous, 1993). Thus, research on adult judgment and decision making has focused on when and how decision making deviates from normative models. If adults, who have more experience and knowledge about the world, can fall prey to judgment biases under certain conditions, it is not surprising that adolescents might be at even greater risk of succumbing to such biases when making social judgments.

Nonoptimal Decisions Due to the Task

The task of making sound decisions about social situations, including those that involve opportunities for drinking alcohol, may be inherently more difficult than making decisions about nonsocial topics. We know from previous research with adult populations that the use of nonnormative decision strategies is directly related to the social context and content surrounding the decision situation. Adults are more likely to use nonnormative

decision strategies in particular situations, including unfamiliar tasks, choices with uncertain outcomes, group presentation of information, and ambiguous situations (Fischhoff, Slovic, and Lichtenstein, 1979; Bernbaum and Mellars, 1983; Manis, Dovalina, Avis, and Cardoze, 1980; Christensen-Szalanski and Beach, 1982).

Adolescents may be routinely making decisions under exactly the same conditions in which most adults turn to faulty decision rules. They must consider new options that have never been available to them before, and their valuing of those options begins to depend on their weighing of family versus peer versus their own values. They must attempt to consider the potential consequences for their decisions from an often inconsistent pattern of restrictions and privileges (e.g., childlike restrictions about bedtime that don't match the adult privilege of driving the family car). Furthermore, while they must determine the likelihood of various consequences, their estimates must be based on limited knowledge of a more diverse group of people than they have encountered before.

We have found evidence for greater biases in social judgments when the topics are social rather than nonsocial (Jacobs and Potenza, 1991); when the outcomes of a risk taking decision are probabilistic (Finken, Jacobs, and Laguna, 1998); when adolescents are reasoning about populations with greater variability (Jacobs and Narloch, 2001); and when they are reasoning about unfamiliar others (Jacobs, Greenwald, and Osgood, 1995). These findings suggest that, when faced with decision tasks that have these characteristics, adolescents (and adults) may be more likely to exhibit less-than-optimal reasoning. Underage drinking and other forms of risk taking are likely to occur in social situations and when adolescents find themselves with large groups of unfamiliar peers. In these situations, they are left to estimate how others typically behave and what they think. This may lead to overestimations of others' drinking and acceptance of such behavior.

Nonoptimal Decisions Due to Judgment Biases

In social psychology, the terms "intuitive statisticians," "intuitive psychometricians," and "intuitive social scientists" (Nisbett and Ross, 1980) have been used to label adults' use of statistical rules to make everyday social judgments. A large body of literature on this topic in social psychology suggests that adults are reasonably good psychometricians in many everyday social judgments, but that they sometimes over- or under-apply particular rules or use shortcut "heuristics" instead of relying on the normative rules. Although some researchers have suggested that the decision biases that adults exhibit are overgeneralizations of rules that are usually beneficial (e.g., Arkes and Ayton, 1999; Baron, 1990; Gigerenzer, Hoffrage, and Kleinboelting, 1991), much of the research on adult judgment and

decision making has focused on deviations from normative models, demonstrating judgment biases and reliance on heuristic shortcuts (for reviews see Dawes, 1988; Nisbett, 1993; Plous, 1993). This research is important for our understanding of adolescents' risk taking judgments related to alcohol use because biased judgment rules may influence their decision making as they encounter opportunities for underage drinking.

To examine the developmental antecedents of judgment shortcuts and biases reported for adults, procedures from adult decision making research have been adapted for research with children and adolescents (e.g., Baron, Granato, Spranca, and Teubal, 1993; Davidson, 1995; Jacobs and Potenza, 1991; Jacobs et al., 1995; Reyna and Ellis, 1994). These studies have revealed three trends. First, we know that even very young children use many of the same "rules of thumb" or heuristics that adults use in their decisions and appear susceptible to the same judgment biases observed in adults. Second, reliance on heuristic and judgment biases, at least under some task conditions, increases with age. Third, research illustrating age-related increases in heuristics and biases has typically found that these developments are accompanied by developments in the reasoning competencies that enable children and adults to make normatively prescribed judgments and decisions. Two areas of research on judgment biases that are directly relevant for our understanding of underage drinking are reviewed.

Judgments Based on Social Knowledge

The topic of overreliance on information that is representative of a social category (e.g., age, gender, or what "popular" kids do) versus the real base rates of behaviors or attitudes is one area that has been studied by several developmental researchers. In one of the first studies on the development of judgment heuristics (Jacobs and Potenza, 1991), we found that, although even first graders ignored base rate information to make social judgments, this bias increased across the elementary school years and the use of social categories as an explanation for social judgments increased between sixth grade and college. Paradoxically, over this same age range, on parallel problems that did not involve social content, the use of the actual base rate information increased.

Despite increased competence to use base rate information with age, several studies (Agnoli, 1991; Barrouillet, Markovits, and Quinn, 2002; Davidson, 1995; Jacobs and Potenza, 1991) have shown that in situations in which social concepts are activated (e.g., stereotypes), competence is *less frequently* displayed with age and, in turn, reliance on biased heuristics is more prominent as children make the transition into adolescence. Similar unexpected developmental trajectories have been found for other biases when judgments involve personal beliefs or social content (Klaczynski,

2001; Klaczynski and Narasimham, 1998; Markovits and Dumas, 1999). In these cases, the majority of older adolescents and young adults exhibited biased reasoning, based their judgments on outcomes rather than a priori probabilities, and relied on small samples of vivid evidence rather than large samples of relatively pallid evidence.

These findings have serious implications for many real-world situations when the base rates are not clear (e.g., social gatherings, parties). In such situations, adolescents are likely to make judgments based on their beliefs about how others behave. For example, at a party when 20 teens are drinking and 15 are not, the individual is likely to make a decision about whether or not to drink based on his or her prior social stereotype that "people who attend such parties all drink," rather than on the actual numbers. A number of studies have shown that adolescents believe that underage alcohol use is normative (Aas and Klepp, 1992; Barnes, Farrell, and Banerjee, 1995; Beck and Treiman, 1996; Olds and Thombs, 2001) and that their estimates of the norms for drinking and for drinking and driving are high (Basch, DeCicco, and Malfetti, 1989; Jaccard and Turrisi, 1987). One teen summed it up by saying, "*Everybody*'s going to drink and get behind the wheel some time" (Basch et al., 1989:392).

Estimation and Perceptions of Risk

A different kind of problem that may arise when individuals are making social judgments occurs when errors are made in the course of estimating risk. This happens because the actual base rates of most behaviors and risks are not available when we make everyday decisions. In order to judge whether three or six drinks of alcohol are "reasonable," the adolescent needs to have some kind of "data" about how often others engage in behaviors and how often particular consequences of behaviors occur. Such base rate information in the real world seldom is presented to us as we make judgments, however, leaving us to "collect the data" for ourselves. Previous research indicates that even adults have a tendency to overestimate small and underestimate large base rates (Lichtenstein, Slovic, Fischhoff, Layman, and Combs, 1978) and to assume that others' attitudes and behaviors would resemble their own (Nisbett and Kunda, 1985). This general dilemma is compounded by the fact that adolescents must make judgments based on a limited amount of previous experience (Jacobs et al., 1995). Thus, if adolescents hear stories of others drinking a lot or happen to attend parties at which alcohol is served, they are likely to conclude from their limited sample that the norms for underage drinking are much higher than they really are.

We have conducted a series of studies to determine the developmental patterns of estimation about day-to-day behaviors, as well as estimates of

some low-probability, but high-risk, behaviors. In one study, we measured the accuracy of children's base rate judgments with "accuracy" defined as the correspondence between their estimates of classmate's behaviors and the criterion of children's self-reports of the same behaviors. We found that children at all grade levels were generally overestimating the base rates of behaviors, while slightly underestimating attitudinal base rates; however, even first-graders' estimates only deviated from the criterion by an average of 1.11 points on an 11-point scale. The most important finding was that accuracy increased for both behavioral and attitudinal estimates throughout the elementary school years (Jacobs et al., 1995). We know, however, that children and adolescents are not well calibrated to the size of the sample when they are collecting social data (Jacobs and Narloch, 2001). They are as likely to make similar generalizations from small and from large samples, although they are sensitive to the expected variability of the particular behaviors (e.g., the number of alcoholic drinks consumed is expected to be more variable than the number of burgers eaten).

Others have examined the accuracy of adolescents' perceptions of risk regarding alcohol and they have found that adolescents rate the risks of drinking alcohol as greater for others than for themselves (Hansen, Raynor, and Wolkenstein, 1991). Interestingly, normative beliefs and beliefs about consequences are among a small set of factors that have the strongest relationships to later alcohol and substance abuse for adolescents (Hansen and Rose, 1997). In addition, McNeal and Hansen (1999) have shown that the deterioration of normative beliefs mediates the transition from nonuse to use of alcohol during middle adolescence. Finally, adolescents who are involved in heavy drinking typically perceive greater benefits relative to risks and fewer long-term consequences, as well as a higher rate of participation by others (Benthin, Slovic, and Severson, 1993; Hansen et al., 1991). Similarly, in a recent study with adolescents between the ages of 13 and 15 (Johnston and Jacobs, 2003), we examined the accuracy of estimates of classmates' involvement in problem behaviors (ranging from drinking alcohol to shoplifting). We found that although all adolescents in the study overestimated the rates of peer behaviors, great variation was seen in the size of the estimation bias, enabling us to distinguish three groups. Participation in deviant activities was related to size of estimation bias. Extreme overestimators were engaged in significantly more mild and severe deviant behaviors than either the moderate or on-target group, and they reported poorer self-esteem and lower grade point averages (GPAs).

This pattern of results supports previous studies (e.g., Nisbett and Kunda, 1985) indicating that adults and adolescents have a tendency to overestimate the population base rates for activities in which they, themselves, are engaged (risky or not). Indeed, adolescents, as well as adults, who participate in high-risk activities generally believe that the rate of

participation by others is higher than do nonparticipants (Benthin et al., 1993); thus, beliefs about normative practices may be related to older adolescents' decisions to engage in risky behaviors (Basch et al., 1989). In addition, people are only moderately successful at assessing how much they know, resulting in overconfidence about their judgments (Quadrel, Fischhoff, Fischhoff, and Halpern, 1992). We know that even college students tend to have a number of misperceptions about the effects of use (e.g., Jaccard and Turrisi, 1987). Feelings of overconfidence about one's knowledge combined with misperceptions about the facts may lead to greater risk taking among adolescents. This may be particularly pronounced among some teens; Quadrel et al. (1992) found that at-risk adolescents exhibited greater overconfidence about their knowledge than other adolescents or adults.

One of the most intriguing findings from the studies just reviewed is that there are individual differences in judgment biases—we have a group of teens out there who perceive fewer long-term consequences of alcohol use, who are "extreme overestimators" of others' behaviors, and who exhibit greater overconfidence and perceptions of immunity. The same group of adolescents is also reporting more alcohol use, engaging in more deviant behaviors in general, doing more poorly in school, and exhibiting lower self-esteem. This is the group that we would expect to make the worst decisions. It is difficult to determine whether these judgment biases are precursors to decisions to begin using alcohol (e.g., everyone else is doing it, so I want to try) or if they are the result of engaging in particular behaviors, so that it is used as a post-hoc justification for behavior (e.g., if I'm doing it, everyone else must be doing it more).

SELF-MOTIVATION AND RISK TAKING

What do adolescents do when faced with decisions that matter to them personally? Constructs that are intimately tied to the sense of self, such as personal goals, attitudes, values, emotional states, and self-beliefs, quite likely affect adolescents' choices. Recent research has explored motivational influences on children's and adolescents' reasoning and judgments. A few of these topics will be discussed.

Self-Beliefs

Cochran (1991) describes some decisions as self-invested, as compared to self-divested, choices. Self-divested decisions are those that are devoid of self-considerations, and based exclusively on objective data. In adolescence, it is probable that most (if not all) decisions have a self-invested quality, even if on the surface they appear to be self-divested (selecting clothes, for

example). This is supported by the findings from the adolescent risk taking literature that suggest that judgments about hypothetical scenarios do not predict actual behaviors that are self-invested for risk-taking behaviors, such as marijuana smoking (Bauman, 1980), cigarette smoking (Bauman, Fisher, Bryan, and Chenoweth, 1984), sexual activity (Gilbert, Bauman, and Udry, 1986), or contraceptive use (Paikoff, 1990). More support is found in studies indicating that, during middle and late adolescence, teens believe that choices regarding alcohol and drug use are personal decisions rather than ones related to social convention or morality (Nucci, Guerra, and Lee, 1991). These authors also report that high-drug-use teens view themselves as the sole authority on such decisions rather than their parents or the law.

As with many motivational factors, beliefs about oneself may play a dual role in decision making as both outcome and predictor. Self-beliefs will play a role in individuals' choices by guiding the selection and use of information used to evaluate oneself, and at the same time, decision outcomes contribute to the beliefs about the self. Self-evaluation is one area that has been well studied. The adult social psychology literature has frequently contrasted the concept of "self-serving biases" that drive self-evaluation (e.g., Greenwald, 1980; Kruglanski and Ajzen, 1983) with the view that people are really trying to evaluate themselves accurately (e.g., Darley and Goethals, 1980), but fail to get sufficient information or use faulty judgment rules (e.g., Ajzen and Fishbein, 1975; Nisbett and Ross, 1980). Trope (1986) describes the first view as "self-enhancement" because it suggests that people select and use the information that will enhance their self-evaluation; he describes the second view as "self-assessment" because it assumes that people are choosing information and strategies that they believe will yield the most accurate self-evaluation.

Self-assessment goals may be particularly strong during adolescence because identity formation is critically important during this period (Erikson, 1968; Marcia, 1980). If adolescents are "trying on" various identities or attempting to construct coherent self-beliefs, self-evaluation may play a large role in decision making, and the particular role may vary depending on the adolescent's point in development. For example, while constructing identity, the adolescent's motivation may be for new experiences that will allow him or her to evaluate what fits and what does not. At this point, adolescents may knowingly make choices that they know they may later regret "just for kicks" or "just to see what it is like."

Self-enhancement or even self-preservation goals may also play a large role during this period. Due to increased concerns about fitting in and conforming to the peer group, adolescents may want to select information that will enhance their self-perceptions. Of course, the information that adolescents find to be self-enhancing may differ dramatically from that

used by adults. For example, Harter, Waters, and Whitesell (1998) and others have reported increased focus on physical appearance during adolescence that declines with age. Therefore, adolescents may be motivated to make decisions that will enhance their self-evaluations of their appearance, whereas adults may be more motivated to select information that will enhance their evaluations of their parenting skills or stature in careers. For some adolescents, self-enhancing information may involve risk taking so that they build their identities around selected memories of risky behaviors. In addition to the immediate goal of self-enhancement, each small choice will influence the adolescent's self-beliefs. For example, a negative self-evaluation of ability is met with the decision options of cheating, setting lower standards, lowering the perceived value of success, or giving up (so that ability can be discounted if no effort was expended). Once one of these self-protecting decisions is made, self-evaluation is more positive and other decisions will be motivated by the same need to maintain positive beliefs about the self.

Some support for adolescents' self-enhancement or self-protection bias can be found in a series of studies done by Klaczynski and his colleagues to examine the use of biased judgments that are personally relevant. By presenting "evidence" that is either consistent with or threatening to their goals and beliefs, they found that adolescents exhibit more biased reasoning and less statistical reasoning on scenario problems that threaten their personal goals (Klaczynski and Fauth, 1997; Klaczynksi and Gordon, 1996) and those that are discrepant with their personal beliefs (Klaczynski, 1997; 2000; Klaczynski and Aneja, 2002). These investigations have illustrated that the motivation to protect favored beliefs directly affects adolescents' use of reasoning. Additional evidence of self-protection related to alcohol use by adolescents may be found in the studies reviewed earlier indicating that at-risk adolescents perceive the consequences of alcohol use and other risk taking as lower than other teens. In addition, adolescents who are heavy drinkers are more likely to believe that they are "immune" from the negative consequences of alcohol than those who drink moderately or not at all (Hansen et al., 1991).

Constrained Options

One's history of previous choices (based on values and goals) may constrain one's options over time. This may occur because the value of some options decreases if they are infrequently selected, until their value is so low that they are no longer considered. The result is a more constrained set of options due to the cumulative restrictions of previous social and economic choices. For most people, options become more limited in scope because of the funneling effect that occurs as life choices are made. For

example, a 16-year-old and a 26-year-old are each faced with deciding whether to stay at a party and continue to drink heavily. Each has to go to work the next morning. The most negative consequence for either of them would be missing work due to a hangover, and ultimately being fired. This outcome is valued differently by the two people because the 16-year-old knows that even if he loses this job, that other similar part-time jobs are available, and his parents will continue to support him (although he may have less spending money). The 26-year-old is more concerned about the negative outcome of losing the job because of previous choices concerning college major, geographic location, and financial obligations for a car and home that have preceded this job. The older man is likely to have lower values for the same positive outcomes (e.g., impressing friends) due to the constraints imposed by his previous choices.

Gardner and Herman (1991) have discussed a similar concept with regard to adolescents' AIDS risk taking behavior. They suggest that one reason adolescents are more likely than adults to behave as if opportunities for gains are more valuable than protection from losses is that adolescents have less to lose. They may discount the value of protection from risk because they believe that what they might gain is worth more than what they have to lose. Gardner and Herman (1991) suggest that this is a rational response to uncertainty, and adolescents have greater uncertainty concerning their ultimate social and economic niches in life. Whether it is rational or not, social and experiential constraints clearly limit decision making, and these may occur with greater frequency as adolescents get older and the expectations for them change.

In addition, options may be constrained by objective changes in the child's life (Fischhoff, 1992). Clearly, decision opportunities, as well as the circumstances under which they are made, vary considerably from toddlerhood to adulthood. Toddlers have little autonomy and make choices primarily by refusing to do certain things; as children mature they are allowed to make more choices and are more often stuck with the consequences. Our theories tend to focus on change within the individual rather than change in the environment and in how it responds to the individual; thus, the ways in which changes in decision-making skills are responses to changes in the environment rather than cognitive changes is not clear.

The Role of Context

It is important to remember that decisions are not content or context free. They are always focused on a topic and made within a particular context. The adult literature clearly indicates that information selected for decision making is specifically guided by goals, and that the structuring of information depends on its intended use (e.g., Kahneman and Tversky,

1984; Zukier and Pepitone, 1984; Zukier, 1986). Most recent developmental research acknowledges the importance of context; thus, we should expect task dependence and unevenness in the development of judgment and decision-making skills. There is ample evidence of domain specificity during development from areas such as problem solving (Bransford, Sherwood, Vye, and Rieser, 1986; Sternberg and Martin, 1988) and decision consultation during adolescence (Finken and Jacobs, 1996). As Kuhn (1989) suggests, it appears that both domain-specific and domain-general processes need to be considered because there is likely to be some degree of generality within any particular area.

Another important part of domain specificity is the social context. Adolescents' decisions and decision processes may vary, depending on whether they are made in the context of school, extracurricular activities, home, or the mall; they may have different goals when making decisions with the family and with friends; their motivations may even vary depending on which group of friends they are with at a given time. One study found that older adolescent females consult different individuals, depending on the type of decision they are making (Finken and Jacobs, 1996). In addition to the influence of social context on the process and outcomes of decisions, social interactions are the arenas in which adolescents are most likely to learn to make decisions. Although no one really believes that decisions are made in a vacuum, the important roles of family and friends as decision making models and teachers have often been ignored. Families provide an arena in which fledgling decision makers try their new skills, and where more experienced decision makers model appropriate behavior or even provide instruction on how to make decisions (Jacobs and Ganzel, 1993).

The Role of Consequences

The feedback an adolescent receives in the form of consequences may play a large role in future decisions. Developmental models have been particularly poor at including the role of feedback or practice; however, practice may allow adolescents to gradually replace decision strategies that don't work with new ones (Kuhn, 1989). Experience is especially important for actions such as identifying alternatives or estimating consequences (Fischhoff, 1992), but may mislead the developing decision maker if outcome alone is used as the hallmark of a good decision or one that should be repeated. This is because the outcomes of many decisions have an element of probability (e.g., not getting caught when speeding), so that poor decisions can sometimes result in good outcomes.

The problem is compounded when misattributions occur for the probabilistic outcomes because an adolescent could experience a negative out-

come even if good decision making skills are used, while the same adolescent could experience a positive outcome even if using poor decision making skills. This is important because if one learns to attribute outcomes to ability as a decision maker when such an attribution is unwarranted, future decisions could be affected. Because outcomes are probabilistic, adolescents may interpret the fact that they previously drank too much and drove home without an accident as evidence that they can drink and drive safely (Jacobs and Ganzel, 1993). For example, if an adolescent decides to drive after having six drinks of alcohol, and gets to her destination without mishap, she may attribute the outcome to good judgment ability (e.g., "I know when I've had too much to drink") rather than to good luck. Because the actual probability of an accident is quite low, this event may happen several times and the self-evaluation will be reinforced, leading to more risk taking in the future. Basch et al. (1989) report comments from focus groups with adolescents that support this point; one participant in their study said, "I do not think I've ever had so much to drink that I (couldn't) drive. I'm always driving and I've never had an accident" (p. 393). Another said, "Even if I'm way over the alcohol limit, I just pay extra close attention . . . do a lot of driving . . . driving is second nature to me . . . and even drunk driving, I do that a lot. One should just know how to do it" (p. 393).

The effect of such misattributions may be particularly profound during adolescence, when individuals are just beginning to make decisions with consequences, and have little experience to guide their attributions. We have found some support for this idea in two studies related to older adolescents' risk taking behaviors. In one study of adolescent women who were sexually active, those who had taken risks (not used birth control), but experienced no consequences (pregnancy), gave the lowest estimates for the probability of getting pregnant in the future (Jacobs and Potenza, 1992). In a second study, we found that older adolescent drinkers who had not encountered negative consequences believed their risks of being in an accident when drinking and driving were lower than those who did not drink or had less experience drinking and driving (Finken et al., 1998). These findings highlight the importance of perceptions of consequences (e.g., McNeal and Hansen, 1999) and make it clear that experience with underage drinking without negative consequences may lead to misattributions and a heightened sense of invulnerability.

A related issue is the serial nature of everyday decision making. Most current models that have been used to study adolescents or adults assume that one major decision is made, on the basis of lots of information, and without feedback. In reality, few if any decisions are made this way. An adolescent decides to "say no" to alcohol and does so at the first opportunity. However, after getting feedback from peers, indicating that the choice was not popular, the adolescent may change that decision or put off imple-

menting it. In addition, a decision to drink heavily at a party may be followed by decisions to abstain or to drink responsibly. When pregnant adolescents are asked about their decision not to use contraception, they are not typically asked about the many times they did use it (and how or when their decision changed). Instead of a reasoned, one-time decision, arrived at after considering the value of various options and their related consequences, we may need serial models of decision making (see Beyth-Marom et al., 1993, for evidence related to one-time versus regular decisions). According to this conceptualization, a "decision" to become involved in underage drinking would be reached by making a series of choices over time that appear to be made quite independently rather than by considering options and outcomes at the same time. Each particular choice then contributes to the next choice.

CONCLUSIONS AND IMPLICATIONS

The work from the 1980s suggested that, although some cognitive skills that are relevant for judgments about risk are in place by early adolescence (e.g., deductive and logical reasoning, information search, conceptual understanding of risk/benefit information), other skills, such as drawing relevant inferences, perceiving risk, considering potential consequences, generating more alternatives, and developing contingency plans, appear to develop during the adolescent period. This chapter focused on more recent work that suggests some of the ways in which adolescent decision making about risk taking may be impacted by motivational and reasoning biases in an attempt to point out the many ways in which decision making in adolescence may be a product of more than just cognitive capabilities.

The chapter presents an image of the development of judgment and decision making skills that runs contrary to that painted by traditional developmental theories because the evidence suggests that judgment heuristics and other biases appear to be linked to increases in knowledge and to the construction of personal theories about the social world. As different social concepts are acquired, and as these become increasingly consolidated, adolescents are likely to base their judgments on social category information, *increasing* rather than reducing the potential for biased judgments. In addition, the number of situations in which shortcut reasoning strategies are likely to be applied increases with age. Interestingly, the ability to reason logically increases during the same time period, so that by middle adolescence, individuals possess the ability to think rationally and logically, but they may not invoke those skills in everyday judgment situations. At these times, they may rely instead on what has been termed "experiential processing" that may result in biased decision making.

Adding to the potential for biased social judgment processes are the many motivational factors that play a role during adolescence, including the development of self-concept and identity, values and goals, contextual factors, and overreliance on the consequences of events as a guide to future decision making. An important message from the research is that motivations have a substantial impact on whether heuristics or more analytic reasoning abilities are used to make judgments and decisions.

What are the implications for understanding underage drinking and making an impact on adolescents? Several generalizations can be made from the research reviewed:

- In a variety of situations, adolescents, like adults, fall prey to judgment biases and decision heuristics that are likely to impact their perceptions of risk. Adolescents use judgment shortcuts and heuristics instead of the available base rates, particularly in social situations in which it is cognitively "easier" to use prior beliefs, social stereotypes, and highly visible information. These heuristics are based on their understanding of the social world, which may in itself be biased.
- Adolescents overestimate the base rates of peers' risk taking behaviors, especially when they are engaged in similar risk taking. Whether their perceptions are motivated by self-protection or faulty estimation strategies, these inaccurate estimates are likely to form the basis for their views of their own behavior as normative.
- Self-preservation plays a large role in adolescents' selection of information to use for social comparison and for estimating risk. This is especially likely to be important during the period of identity formation.
- Decisions are content and context specific—choosing to drink alcohol at a party of close friends may be very different than choosing to drink at a large tailgate event with hundreds of people in attendance.
- There is evidence that people can be trained to overcome biased judgment strategies by getting them to focus on the relevant information; some of this work has been done with adolescents.

As the developmental and adult studies reviewed here illustrate, logical deductive reasoning strategies are not frequently used when social judgments are being made about events with uncertain outcomes. Therefore, teaching rational decision making skills alone is not likely to make an impact on everyday, seat-of-the-pants choices about underage drinking. Factors related to judgment biases, self-perceptions, and motivation need to be included in our thinking about adolescent alcohol use. In addition, differences in the effectiveness of various approaches may depend on the developmental level, context, and prior experiences of the adolescents them-

selves; a one-size-fits-all approach is unlikely to work. Finally, adolescents' "readiness" to drink, despite the fact that they are underage in our country, is related to a confluence of cognitive, social, emotional, and community factors. The positive trends in development that lead to greater autonomy and a focus on the self and peers are the same trends that lead to great opportunities for risk taking. The key to program development related to underage drinking is to understand and acknowledge adolescents' judgment and decision making abilities, while being aware of the limitations and biases inherent in the same processes.

REFERENCES

Aas, H., and Klepp, K.I. (1992). Adolescents' alcohol use related to perceived norms. *Scandinavian Journal of Psychology*, *33*(4), 315-325.

Agnoli, F. (1991). Development of judgmental heuristics and logical reasoning: Training counteracts the representativeness heuristic. *Cognitive Development*, *6*, 195-217.

Ajzen, I., and Fishbein, M. (1975). A Bayesian analysis of attribution processes. *Psychological Bulletin*, *82*, 261-272.

Arkes, H.R., and Ayton, P. (1999). The sunk cost and Concorde effects: Are humans less rational than lower animals? *Psychological Bulletin*, *125*(5), 591-600.

Barnes, G.M., Farrell, M.P., and Banerjee, S. (1995). Family influences on alcohol abuse and other problem behaviors among Black and white adolescents in a general population sample. In G.M. Boyd, J. Howard, and R.A. Zucker (Eds.), *Alcohol problems among adolescents: Current directions in prevention research* (pp. 13-31). Hillsdale, NJ: Lawrence Erlbaum Associates.

Baron, J. (1990). Harmful heuristics and the improvement of thinking. In D. Kuhn (Ed.), *Developmental perspectives on teaching and learning skills* (pp. 28-47). Basel: Karger.

Baron, J., Granato, L., Spranca, M., and Teubal, E. (1993). Decision making biases in children and early adolescents: Exploratory studies. *Merrill-Palmer Quarterly*, *39*, 22-46.

Barrouillet, P., Markovits, H., and Quinn, S. (2002). Developmental and content effects in reasoning with causal conditionals. *Journal of Experimental Child Psychology*, *81*(3), 235-248.

Basch, C.E., DeCicco, I.M., and Malfetti, J.L. (1989). A focus group study on decision processes of young drivers: Reasons that may support a decision to drink and drive. *Health Education Quarterly*, *16*, 389-396.

Bauman, K.E. (1980). *Predicting adolescent drug use: Utility, structure, and marijuana*. New York: Praeger.

Bauman, K.E., Fisher, L.A., Bryan, E.S., and Chenoweth, R.L. (1984). Antecedents, subjective expected utility, and behavior: A panel study of adolescent cigarette smoking. *Addictive Behaviors*, *9*, 121-136.

Beck, K.H., and Treiman, K.A. (1996). The relationship of social context of drinking, perceived social norms, and parental influence to various drinking patterns of adolescents. *Addictive Behaviors*, *21*(5), 633-644.

Benthin, A., Slovic, P., and Severson, H. (1993). A psychometric study of adolescent risk perception. *Journal of Adolescence*, *16*, 153-168.

Bernbaum, M.H., and Mellars, B.A. (1983). Bayesian inference: Combining base rates with opinions of sources who vary in credibility. *Journal of Personality and Social Psychology*, *45*, 792-804.

Beyth-Marom, R., Austin, L., Fischhoff, B., Palmgren, C., and Jacobs-Quadrel, M. (1993). Perceived consequences of risky behaviors: Adults and adolescents. *Developmental Psychology*, *29*, 549-563.

Bransford, J., Sherwood, R., Vye, N., and Rieser, J. (1986). Teaching thinking and problem solving: Research foundations. *American Psychologist*, *41*(10), 1078-1089.

Byrnes, J.P., and Beilin, H. (1991). The cognitive basis of uncertainty. *Human Development*, *34*, 189-203.

Christensen-Szalanski, J.J., and Beach, L.R. (1982). Experience and the base rate effect. *Organizational Behavior and Human Performance*, *29*, 270-278.

Cochran, L. (1991). *Life-shaping decisions*. New York: Peter Lang.

Darley, J.M., and Goethals, G.R. (1980). People's analyses of the causes of ability-linked performances. In L. Berkowitz (Ed.), *Advances in experimental and social psychology* (Vol. 13, pp. 2-39). New York: Academic Press.

Davidson, D. (1995). The representativeness heuristic and conjunction fallacy effect in children's decision making. *Merrill-Palmer Quarterly*, *41*, 328-346.

Dawes, R.M. (1988). *Rational choice in an uncertain world*. San Diego: Harcourt Brace Jovanovich.

Dunkle, M. (1992). Equal access and the development of students' understanding of a limited open forum. Unpublished manuscript, University of Nebraska.

Elliott, G.R., and Feldman, S.S. (1990). Capturing the adolescent experience. In S.S. Feldman and G.R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 1-14). Cambridge, MA: Harvard University Press.

Erikson, E. (1968). *Identity, youth, and crisis*. New York: Norton.

Finken, L.L., and Jacobs, J.E. (1996). Consultant choice: A comparison between abortion and other decisions. *Journal of Adolescent Research*, *11*, 235-260.

Finken, L.L., Jacobs, J.E., and Laguna, K. (1998). The role of age, experience, and situational factors in the drinking and driving decisions of college students. *Journal of Youth and Adolescence*, *27*, 493-511.

Fischhoff, B. (1992). Decisions about alcohol: Prevention, intervention, and policy. *Alcohol Health and Research World*, *16*, 257-266.

Fischhoff, B., and Quadrel, M.J. (1991). Adolescent alcohol decisions. *Alcohol Health and Research World*, *15*(1), 43-51.

Fischhoff, P., Slovic, B., and Lichtenstein, S. (1979). Subjective sensitivity analysis. *Organizational Behavior and Human Performance*, *23*, 339-359.

Gardner, W., and Herman, J. (1991). Adolescent AIDS risk taking: A rational choice perspective. In W. Gardner, S. Millstein, and B. Wilcox (Eds.), *Adolescents in the AIDS epidemic* (pp. 17-34). San Francisco: Jossey-Bass.

Gigerenzer, G., Hoffrage, U., and Kleinboelting, H. (1991). Probabilistic mental models: A Brunswickian theory of confidence. *Psychological Review*, *98*(4), 506-528.

Gilbert, M.A., Bauman, K.E., and Udry, J.R. (1986). A panel study of subjective expected utility for adolescent sexual behavior. *Journal of Applied Social Psychology*, *16*, 745-756.

Gouze, K.R., Strauss, D., and Keating, D.P. (1986, March). *Adolescents' conceptions of stress and coping*. Paper presented at the biennial meeting of the Society for Research in Adolescence, Madison, WI.

Greenwald, A.G. (1980). The totalitarian ego. *American Psychologist*, *35*, 603-618.

Hansen, W.B., Raynor, A.E., and Wolkenstein, B.H. (1991). Perceived personal immunity to the consequences of drinking alcohol: The relationship between behavior and perception. *Journal of Behavioral Medicine*, *14*, 205-224.

Hansen, W.B., and Rose, L. (1997). *Issues in classification in metaanalysis in substance abuse prevention research*. NIDA Research Monograph #170. Washington, DC: National Institute of Drug Abuse.

Harter, S., Waters, P., and Whitesell, N. R. (1998). Relational self-worth: Differences in perceived worth as a person across interpersonal contexts among adolescents. *Child Development*, *69*, 756-766.

Jaccard, J., and Turrisi, R. (1987). Cognitive processes and individual differences in judgments relevant to drunk driving. *Journal of Personality and Social Psychology*, *53*, 135-145.

Jacobs, J.E., Bennett, M.A., and Flanagan, C. (1993). Decision making in one-parent and two-parent families: Influence and information selection. *Journal of Early Adolescence*, *13*, 245-266.

Jacobs, J.E., and Ganzel, A.K. (1993). Decision making in adolescence: Are we asking the wrong question? In M.L. Maehr and P.R. Pintrich (Eds.), *Advances in achievement and motivation* (Vol. 8, pp. 1-31). Greenwich, CT: JAI Press.

Jacobs, J.E., Greenwald, J.P., and Osgood, D.W. (1995). Developmental differences in base rate estimates of social behaviors and attitudes. *Social Development*, *4*, 165-181.

Jacobs, J.E., and Klaczynski, P.A. (2002). The development of judgment and decision making during childhood and adolescence. *Current Directions in Psychological Science*, *11*, 145-149.

Jacobs, J.E., and Narloch, R.H. (2001). Children's use of sample size and variability to make social inferences. *Journal of Applied Developmental Psychology*, *22*, 1-21.

Jacobs, J.E., and Potenza, M.T. (1991). The use of judgment heuristics to make social and object decisions: A developmental perspective. *Child Development*, *62*, 166-178.

Jacobs, J.E., and Potenza, M.T. (1992). The effects of risk on adolescent contraceptive behavior. Paper presented at the annual meeting of the Society for Judgment and Decision Making, St. Louis, MO, November.

Johnston, K., and Jacobs, J.E. (2003). Children's illusory correlations: The role of attentional bias in group impression formation. *Journal of Cognition and Development*, *4*(2), 129-160.

Kahneman, D., and Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, *39*, 341-350.

Klaczynski, P.A. (1997). Bias in adolescents' everyday reasoning and its relationship with intellectual ability, personal theories, and self-serving motivation. *Developmental Psychology*, *3*, 273-283.

Klaczynski, P.A. (2000). Motivated scientific reasoning biases, epistemological beliefs, and theory polarization: A two-process approach to adolescent cognition. *Child Development*, *71*, 1347-1366.

Klaczynski, P.A. (2001). Framing effects on adolescent task representations, analytic and heuristic processing, and decision making: Implications for the normative-descriptive gap. *Journal of Applied Developmental Psychology*, *22*, 289-309.

Klaczynski, P.A., and Aneja, A. (2002). Development of quantitative reasoning and gender biases. *Developmental Psychology*, *38*(2), 208-222.

Klaczynski, P.A., and Fauth, J. (1997). Developmental differences in memory-based intrusions and self-serving statistical reasoning biases. *Merrill-Palmer Quarterly*, *43*, 539-566.

Klaczynski, P.A., and Gordon, D.H. (1996). Everyday statistical reasoning during adolescence and young adulthood: Motivational, general ability, and developmental influences. *Child Development*, *67*(6), 2873-2892.

Klaczynski, P.A., and Narasimham, G. (1998). Development of scientific reasoning biases: Cognitive versus ego-protective explanations. *Developmental Psychology*, *34*, 175-187.

Klayman, J. (1985). Children's decision strategies and their adaptation to task characteristics. *Organizational Behavior and Human Decision Processes*, *35*, 179-201.

Kruglanski, A.W., and Ajzen, I. (1983). Bias and error in human judgment. *European Journal of Social Psychology*, *13*, 1-44.

Kuhn, D. (1989). Children and adults as intuitive scientists. *Psychological Review*, *96*, 674-689.

Lewis, C.C. (1981). How adolescents approach decisions: Changes over grades seven to twelve and policy implications. *Child Development*, *52*, 538-544.

Lichtenstein, S., Slovic, P., Fischhoff, B., Layman, M., and Combs, B. (1978). Judged frequency of lethal events. *Journal of Experimental Psychology: Human Learning and Memory*, *4*, 551-578.

Manis, M., Dovalina, I., Avis, N.E., and Cardoze, S. (1980). Base rates can affect individual predictions. *Journal of Personality and Social Psychology*, *38*, 231-248.

Marcia, J.E. (1980). Identity in adolescence. In J. Adelson (Ed.), *Handbook of adolescent psychology* (pp. 159-177). New York: Wiley.

Markovits, H., and Dumas, C. (1999). Developmental patterns in the understanding of social and physical transivity. *Journal of Experimental Child Psychology*, *73*(2), 95-114.

McNeal, R.B., and Hansen, W.B. (1999). Developmental patterns associated with the onset of drug use: Changes in postulated mediators during adolescence. *Journal of Drug Issues*, *29*, 381-400.

Moshman, D. (1993). Adolescent reasoning and adolescent rights. *Human Development*, *36*(1), 27-40.

Moshman, D., and Franks, B.A. (1986). Development of the concept of inferential validity. *Child Development*, *57*, 153-165.

Nisbett, R.E. (1993). Rules, reasoning, and choice behavior. In G. Harman (Ed.), *Conceptions of the human mind: Essays in honor of George A. Miller* (pp. 99-110). Hillsdale, NJ: Lawrence Erlbaum Associates.

Nisbett, R.E., and Kunda, Z. (1985). Perception of social distributions. *Journal of Personality and Social Psychology*, *48*, 297-311.

Nisbett, R., and Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgments*. Englewood Cliffs, NJ: Prentice-Hall.

Nucci, L., Guerra, N., and Lee, J. (1991). Adolescent judgments of the personal, prudential, and normative aspects of drug usage. *Developmental Psychology*, *27*, 841-848.

Olds, R.S., and Thombs, D.L. (2001). The relationship of adolescent perceptions of peer norms and parent involvement to cigarette and alcohol use. *Journal of School Health*, *71*(6), 223-228.

Overton, W.F. (1990). Competence and procedures: Constraints on the development of logical reasoning. In W.F. Overton (Ed.), *Reasoning, necessity, and logic: Developmental perspectives* (pp. 1-32). Hillsdale, NJ: Lawrence Erlbaum Associates.

Paikoff, R.L. (1990). Attitudes toward consequences of pregnancy in young women attending a family planning clinic. *Journal of Adolescent Research*, *5*, 467-484.

Plous, S. (1993). *The psychology of judgment and decision making*. New York: McGraw-Hill.

Quadrel, M., Fischhoff, B., Fischhoff, M., and Halpern, S. (1992). Calibration of adolescents' and adults' confidence judgments. Unpublished manuscript, Carnegie Mellon University, Pittsburgh, PA.

Quadrel, M. J., Fischhoff, B., and Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist*, *48*(2), 102-116.

Reyna, V.F., and Ellis, S.C. (1994). Fuzzy-trace theory and framing effects in children's risky decision making. *Psychological Science*, *5*, 275-279.

Rowe, K.L. (1984, July). *Adolescent contraceptive use: The role of cognitive factors*. Paper presented at the annual meeting of the American Psychological Association, Toronto, Canada.

Shtarkshail, R.A. (1987). An examination of the concept of "risk taking" and its application to the contraceptive behavior of youth. *International Journal of Adolescent Medicine and Health*, *3*(2), 121-144.

Sternberg, R., and Martin, M. (1988). When teaching thinking does not work, what goes wrong? *Teachers College Record*, *89*(4), 555-578

Trope, Y. (1986). Self-enhancement and self-assessment in achievement behavior. In R.M. Sorrentino and E.T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 350-378). New York: Guilford.

Urberg, K.A., and Rosen, R.A. (1987). Age differences in adolescent decision making. *Journal of Adolescent Research*, *2*, 447-454.

Zukier, H. (1986). The paradigmatic and narrative modes in goal-guided inference. In R.M. Sorrentino and E.T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 465-502). New York: Guilford.

Zukier, H., and Pepitone, A. (1984). Social roles and strategies in prediction: Some determinants of the use of base rate information. *Journal of Personality and Social Psychology*, *47*, 349-360.

6

Alcohol Use and Misuse: Prevention Strategies with Minors

William Hansen and Linda Dusenbury

Research since 1980 demonstrates the potential for a variety of education and community interventions that target individuals or groups of individuals to reduce the onset of alcohol use and misuse among minors. This chapter reviews approaches that involve schools, families, and communities and recommends strategies for achieving a broad-based effort for reducing alcohol use among youth.

SCHOOL-BASED APPROACHES

Extensive research has been completed during the past two decades on school-based approaches to alcohol prevention. To a large extent, these approaches have taken advantage of several facts. Programmatically, students in schools are relatively easy to reach; it is the setting in which most youth can easily be found, there is a place in the curriculum of most schools for alcohol to be addressed, and addressing alcohol use and misuse is consistent with the broader goals of education.

In many instances, research projects have not limited the focus of intervention to alcohol. Many projects—even those specifically designed to prevent alcohol use and misuse—have included other substances as well. In part, this approach reflects researchers' understanding of the relationships among substances; alcohol is often used early in the cycle of substance use. Those who drink heavily are more likely to go on to use other substances. Those who use other substances are also more likely to begin drinking heavily and develop problematic patterns of use.

Three prevention projects that have had an alcohol-specific focus have been completed. These include: (1) the Alcohol Misuse Prevention Trial (AMPS) (Dielman, Shope, Leech, and Butchart, 1989); (2) the Adolescent Alcohol Prevention Trial (AAPT) (Hansen and Graham, 1991); and (3) Project Northland (Perry et al., 1996 [main outcome paper Phase I]; Perry et al., 2002 [main outcome paper Phase II]).

AMPS

The AMPS program was designed to prevent the misuse of alcohol among students enrolled in their last year of elementary school (Dielman, Shope, Butchart, and Campanelli, 1986; Dielman et al., 1989). The original goal of AMPS was to reduce the prevalence of alcohol use among middle school students through an intervention that focused on resistance skills training. Students were taught skills believed to be necessary to avoid alcohol misuse, including saying "no" to peer pressure. Fifth- and sixth-grade classes of students were randomly assigned either to receive the program or to serve as no-treatment controls. Fifth-grade classes were also randomly assigned to receive or not to receive a booster program. Half of all students in each group were tested prior to the beginning of the program. All students were tested 2, 14, and 26 months after program delivery.

There was no reduction in alcohol misuse among fifth graders who received the AMPS program compared with those in the control group. This was true for those enrolled in the core AMPS program as well as those who received the booster program.

For sixth graders, there were some reductions in alcohol misuse. There was a lower rate of onset of drinking among all students that was, statistically speaking, marginally significant. Effects were stronger when only students with some prior experience with alcohol were considered. Notably, increases in drinking by sixth-grade students who had some prior experience with drinking were significantly lower among those who received the program compared to those who did not. There were no differences between groups if students hadn't used alcohol prior to the start of the study.

Because this evaluation of AMPS found that effects were not maintained over time, an enhanced AMPS curriculum was developed, which included more sessions, role playing, and norm-setting activities within the program. The goals of the enhanced AMPS program were to teach students about alcohol use and misuse in their social contexts and to develop students' skills for identifying and resisting social pressures to use alcohol. The purpose of this research was to describe the development, implementation, and evaluation of this enhanced AMPS curriculum. Specifically, students' exposure to AMPS and their prior drinking experiences were studied in

relation to their curriculum knowledge and rates of alcohol use and misuse over time.

A total of 1,725 students from 35 elementary and middle schools in southeastern Michigan participated in the study. Schools were randomly assigned to treatment and control conditions. The treatment condition received the AMPS curriculum and the controls did not. The AMPS curriculum was administered to the treatment students in sixth, seventh, and eighth grades. Questionnaires were administered to both treatment and control students at the beginning of the study in the sixth-grade fall semester and again during the spring semesters of sixth, seventh, and eighth grades. The students were surveyed about their alcohol use and misuse, curriculum knowledge (alcohol facts, knowledge of pressures to use alcohol, norms regarding use, decision-making skills, and resistance skills), and prior drinking history. Based on students' prior alcohol use, they were assigned to one of three groups: (1) abstainer; (2) supervised drinker, and (3) unsupervised drinker.

Treatment group students had significantly higher levels of curriculum knowledge compared to control students. Across all three posttests from grades six through eight, the treatment group's mean knowledge scores increased significantly from pretest. Control students' mean knowledge scores did not increase significantly over time from pretest to grades seven and eight posttests.

Increases in the rates of alcohol use were similar for treatment and control group abstainers and supervised drinkers. Unsupervised drinkers in the control group increased their alcohol use more than did similar students in the treatment group. However, this difference was not statistically significant.

The rate of alcohol misuse over time for prior abstainers and supervised drinkers appeared to be about the same for both treatment and control conditions. For abstainers, both the treatment and control groups significantly increased their alcohol misuse from pretest to all posttests. Control supervised drinkers significantly increased their alcohol misuse from pretest to posttests at grades seven and eight. Treatment group supervised drinkers significantly increased their alcohol misuse from pretest to grade eight posttest. However, the rates of misuse over time for prior unsupervised drinkers were different compared to the supervised drinkers and abstainers. The control unsupervised subgroup significantly increased their misuse rates from pretest to grade eight posttest; the treatment unsupervised group did not significantly increase their misuse rates over the same time period.

The results of this evaluation imply that programs like AMPS may be most effective among students with prior histories of unsupervised drinking. Students who had a history of unsupervised drinking and received the

intervention increased their rate of alcohol use and misuse less over time compared to unsupervised drinkers in the control condition. The authors (Dielman, Shope, Butchart, and Campanelli, 1986; Dielman, Shope, Leech, and Butchart, 1989) suggested that the success among students with a prior unsupervised drinking history may be because they had more reason to find the program material relevant. Programs that utilize the social influence approach, such as AMPS, may benefit form identifying students based on their prior drinking histories. This could help tailor programs for students from different drinking backgrounds. Although students who have histories of unsupervised drinking clearly have the most to gain from a prevention program, students with less experience or no experience with drinking should be targeted as well. Taking into account students' drinking histories may enhance the effectiveness of alcohol use prevention programs.

A recently completed analysis of data from AMPS examined the role of resistance skills and normative beliefs (Wynn, Schulenberg, Maggs, and Zucker, 2000). Results indicate that normative beliefs mediated the effect of the intervention on alcohol overindulgence from 7th through 8th grade and from 8th through 10th grade. In contrast, although the prevention program increased refusal skills, the ability to resist peer pressure did not mediate the effect of the program.

AAPT

The goal of AAPT (Donaldson, Graham, and Hansen, 1994; Hansen and Graham, 1991) was to test the importance of normative education versus building skills for resisting peer pressure as program components for preventing alcohol, tobacco, and marijuana use. AAPT was an efficacy trial with a high degree of control over the delivery of program content by trained specialists who were employees of the University of Southern California.

Two intervention strategies were developed. The first approach was titled Normative Education. The goal of this program was to establish beliefs in conventional norms among students. This program taught students that the prevalence of substance use among their peers was lower than they might otherwise expect. It also taught students that substance use was generally not approved of by their peer group. The norm-setting activities currently included in All Stars (Hansen, 1996) had their origins in this research project and, except for improvements that have been incorporated over the years, are essentially the same sets of lessons that were developed for AAPT.

The second approach was titled Resistance Skills Training. The goal of this program was to help students to build skills to resist peer and other forms of social pressure. Students were taught a variety of techniques for identifying and resisting social pressure. They were taught skills for being

assertive in peer interactions and they practiced these skills through role-played scenarios. Individual approaches were compared, as was a program that included both elements and a program that included neither element. The latter included only information about consequences of using alcohol, tobacco, and marijuana.

The Normative Education program produced lower rates of increase for all three substances measured. The Resistance Skills Training program, in contrast, did not produce lower use rates for any of the substances. Between pretest and posttest, classes that were exposed to either the Information Only program or the Resistance Skills Training Only program demonstrated increases in the percentage of students reporting "ever being drunk" (11 percent). The increase for students in classes exposed to Normative Education was 4 percent. Only 1.4 percent of students reported having problems that could be associated with alcohol use in the seventh grade. By eighth grade, problems associated with alcohol among students who were not enrolled in a Normative Education class increased 2.4 percent. Problem alcohol use among students in Normative Education classes increased 0.3 percent.

Initial use of alcohol among students in Normative Education classes increased 11 percent. Among students in classes that did not receive Normative Education, the increase was 14 percent. At pretest, 5 percent of students overall reported drinking during the past week. This increased by 5 percent among those with no Normative Education classes, but increased less than 3 percent among students exposed to Normative Education. Furthermore, the onset of marijuana use was lower among students exposed to the Normative Education program. Reports of ever having used marijuana increased 2.2 percent among students exposed to Normative Education; the rate increased 6.2 percent among students who did not receive Normative Education. Normative Education students reported lower smoking in the past 30 days (4.8 percent) than students not enrolled in Normative Education (6.5 percent).

The outcomes of the AAPT interventions (see Figure 6-1) were examined by looking at the role specific mediators played in changing substance use onset (Donaldson et al., 1994). Findings indicated that both programs changed their primary targeted mediating variables. The Resistance Skills Training program significantly improved the skills of students who received instruction. Similarly, students exposed to Normative Education had improved significantly, meaning more conventional perceptions of alcohol, tobacco, and marijuana use norms within the peer group. Of significant interest was the finding that the presence of offers to use drugs was actually reduced among those who participated in the Normative Education program.

The analysis of these data revealed no relationship between improving

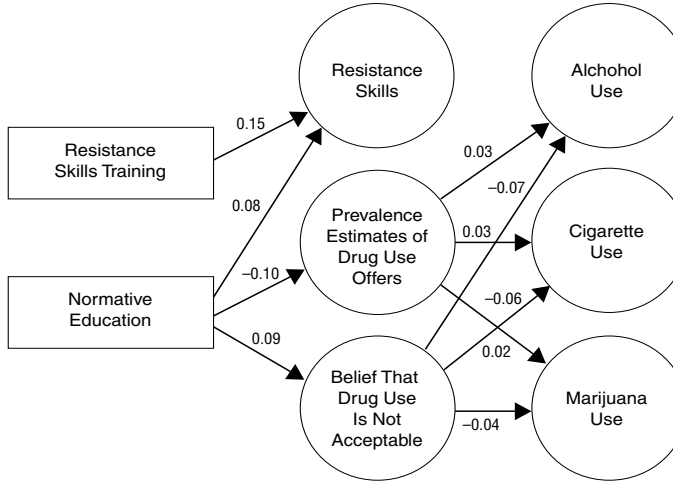

FIGURE 6-1 Statistically significant paths: AAPT examination of mediating variables.
SOURCE: Donaldson et al. (1994).

resistance skills and reducing drug use. In contrast, improved normative beliefs and reduced offers for drug use were significantly predictive of a reduction in the onset of drug use. A recent study (Taylor, Graham, Cumsille, and Hansen, 2001) in which growth curve modeling was applied to AAPT data over a 5-year period (through grade 11) demonstrated that the Normative Education program had two enduring effects. The first effect was to suppress the overall level of alcohol and tobacco use throughout the period. The second effect was to suppress the rate of increase of these substances. Both results speak strongly to the efficacy of the applied norm-setting approach to achieving prevention goals.

AAPT intervention approaches have been integrated into All Stars, a program that targets alcohol, tobacco, marijuana, and inhalant use as well as fighting. Short-term results show a similar pattern with significant reductions in alcohol and tobacco use. An analysis of the program's effects on mediators reveals that the program was effective only when targeted mediators were successfully manipulated by instructors.

Project Northland

Project Northland is a communitywide alcohol use prevention program for young adolescents that builds on research of the past two decades in

primary prevention of alcohol, tobacco, and other drug use with young adolescents. Project Northland extends its approach to prevention by systematically linking and studying curricula in schools, parental involvement programs, extracurricular peer leadership, and communitywide task forces for young adolescents in grades 6 to 8 and in grades 11 and 12 (Perry et al., 2002). This is the only project targeting high school students. Project Northland involved 24 school districts and 28 adjoining communities in northeastern Minnesota. Although Project Northland is thus more than a classroom curriculum, it includes a school-based intervention.

Project Northland included three school interventions—Slick Tracy, delivered during sixth grade; Amazing Alternatives!, delivered during seventh grade; and PowerLines, delivered during eighth grade. The objectives of the program were to: (1) create a nondrinking norm for teens; (2) provide peer and parent role models; (3) structure alcohol-free opportunities and decrease opportunities for teens to get alcohol; (4) provide knowledge of social influences and increase self-efficacy to resist influences; and (5) reinforce the value of nondrinking.

The Slick Tracy Home Team Program was implemented with sixth-grade students and their parents, and involved a "home team" approach, consisting of four sessions of activity story books (with characters Slick Tracy and Breathtest Mahoney as role models). Students completed activity books with their parents as homework during four consecutive weeks. In addition, Northland Notes for Parents were included in each Slick Tracy activity book and contained information for parents on young adolescent alcohol use. The intervention also involved small group discussions around the themes of the books during school and the Slick Tracy Family Fun Night, an evening fair where students' posters and projects from the program were displayed. The major themes of the Slick Tracy Home Team Program included facts and myths about alcohol use, advertising influences, peer influences, and parent-child communication (Williams, Perry, Dudovitz, and Veblen-Mortenson, 1995).

The Amazing Alternatives! Program consisted of a peer-led classroom curriculum. The overall theme was to introduce seventh-grade students and their parents to ways to resist and counteract influences on teens to use alcohol, and to introduce alternatives to drinking. The classroom program included eight sessions of peer- and teacher-led activities over 8 weeks (Hingson, Howland, Schiavone, and Damiata, 1990; Perry, et al., 1989). The program used audiotape vignettes, group discussions, class games, problem solving, and role plays related to themes of why young people use alcohol and alternatives to use, the influences to drink, strategies for resisting those influences, normative expectations that most people their age do not drink, and intentions not to drink. Peer leaders for the classroom program were selected with an open election in which students chose individu-

als they "liked and respected," without any admonishments from teachers to restrict the leaders to nonusers of alcohol.

PowerLines was implemented in 1993-94 and consisted of an eight-session classroom curriculum. The goals of the eighth-grade interventions were to introduce students to the "power" groups (individuals and organizations) within their communities that influence adolescent alcohol use and availability and to teach community action/citizen participation skills. Students interviewed parents, local government, law enforcement, school teachers and administrators, and retail alcohol merchants about their beliefs and activities concerning adolescent alcohol use. Students conducted a "town meeting" in which small groups of students represented various community groups and made recommendations for community action for alcohol use prevention.

Alcohol use outcomes were measured by the Alcohol Tendency Scale and its separate items for spring 1994 (see Table 6-1). Among all students, those in the intervention districts had statistically significantly lower scores on the Tendency Scale by the end of eighth grade, indicative of less likelihood of drinking, than did students in the reference districts. The Tendency Scale score was also significantly lower among baseline nonusers (those who had not yet used alcohol at the beginning of sixth grade) in the intervention districts.

For all students, the percent of students who reported alcohol use in the past month and past week was significantly lower in the intervention group at the end of eighth grade. For nonusers of alcohol at the pretest, the percentages of students reporting alcohol use, cigarette use and marijuana use were significantly lower in the intervention districts at the end of the eighth grade. Differences between conditions in multiple-drug use among all students were examined by calculating the prevalence of combinations of alcohol and cigarette use. Among all students, 14.3 percent of those in the intervention districts reported both using alcohol in the past month and smoking cigarettes on more than one or two occasions. This compares with 19.6 percent of those in the reference districts, a difference that was statistically significant and indicates a 27 percent reduction in "gateway" drug

TABLE 6-1 Project Northland: Eighth-Grade Outcomes for All Students (N = 1,901)

Outcome	Intervention Communities	Reference Communities
Alcohol Tendency Scale (8-48)	16.0	17.5
Past month alcohol use	23.6%	29.2%
Past week alcohol use	10.5%	14.8%

use, or drug use that progresses from nonillicit substances to more dangerous and illicit substances. These outcomes were further analyzed using mediation analysis, which found the changes in peer norms and peer role models targeted in the intervention were the most predictive of change in alcohol use (Komro et al., 2001). By 10th grade, effects had decayed and no differences between groups were observed. However, Project Northland resumed with students in the eleventh and twelfth-grades, and rates of increase in alcohol use were significantly reduced in the intervention districts compared with the reference districts from tenth to twelfth grades (Perry et al., 2002).

The school components of Project Northland were integrated with family and community interventions. This research implies that interventions that focus on norm setting, that are delivered in an interactive manner, and that are integrated with broad-based approaches have significant potential to reduce the onset of alcohol use and misuse among minors.

Lessons Learned from Other School-Based Prevention Projects

A number of researched programs that target multiple substances, primarily including tobacco and marijuana, have also demonstrated reductions in alcohol use. Indeed, many of these projects target multiple substances because of the evidence that demonstrates strong linkages among them.

The Life Skills Training program, a broader personal and social skills training program for middle school students, is designed to prevent tobacco, alcohol, and drug use, and has been evaluated in 10 separate published evaluation studies (Botvin, Baker, Dusenbury, Botvin, and Diaz, 1995; Botvin, Baker, Dusenbury, Tartu, and Botvin, 1990; Botvin et al., 1989a; Botvin, Dusenbury, Baker, James-Ortiz, and Kerner, 1989b; Botvin et al., 1992; Botvin and Eng, 1982; Botvin, Renick, and Baker, 1983; Botvin, Baker, Botvin, Filazzola, and Millman, 1984; Botvin, Schinke, Epstein, and Diaz, 1994). These studies have shown relative reductions of up to 50 to 75 percent in tobacco, alcohol, or marijuana use at seventh-grade posttest. A recent 6-year follow-up of 4,466 seventh-grade students showed that results erode only slightly by the end of high school, with 66 percent reductions in the use of all three: tobacco, alcohol, and marijuana. Minority students comprised at least 75 percent of the sample in 6 out of 10 separate studies; in each of these 6 studies, there was a combination of Blacks (11 to 87 percent) and Hispanics (10 to 74 percent).

There has been one published, 6-year evaluation of Project Alert (Bell, Ellickson, and Harrison, 1993; Ellickson and Bell, 1990; Ellickson, Bell, and Harrison, 1993), a social resistance skills training program for students in grades six and seven, or seven and eight. Project Alert consists of 11

sessions in the first year, and 3 in the second. Results showed immediate posttest relative reductions in drinking of up to 50 percent. In the second year of the study (in the eighth grade), there were declines in marijuana use of 33 to 60 percent, and smoking reductions of 17 to 55 percent. All positive effects disappeared after 15 months. In addition, there were some negative effects for high-risk youth. Minority students comprised 30 percent of the sample (10 percent Asian, 9 percent Hispanic, 8 percent Black, 3 percent other ethnic groups). Perhaps in response to some of the questions about Project Alert's lasting impact, the project has been expanded to include an intervention for high schools that is now being tested in South Dakota (RAND, 2000).

A substance abuse prevention component for grades five through eight that was later integrated into the Michigan Model, a comprehensive health education curriculum, was recently evaluated in a small study (Shope, Copeland, Marcoux, and Kamp, 1996). The program significantly reduced the rate of smoking, drinking, marijuana use, and cocaine use, but not smokeless tobacco use. One concern about the generalizability of these findings to the Michigan Model is whether teachers will implement the 7 lessons related to drug use with fidelity when they are being asked to implement 40 to 60 sessions of the comprehensive health education program each year.

Project STAR (Pentz et al., 1989; Pentz et al., 1990) included an 18-session social resistance skills training approach for students in grades five to eight. Drinking, smoking, and marijuana use dropped 30 percent at 1-year follow-up; results persisted through the 3 years of the study. The intervention involved multiple components (school curriculum, family program, media spots), but only the presentation of the school curriculum was experimentally manipulated.

FAMILY-BASED APPROACHES

Research has identified important family predictors of alcohol use. Parents are a powerful source of influence on their children. That influence can be negative or positive. Parental alcohol abuse, for example, has been shown to increase the likelihood that children will drink. Compared with children of social drinkers, adult children of alcoholics are more likely to report that they have drunk more all their lives and more frequently during high school (Ross and Hill, 2001). In terms of positive influence, Catalano (1993) calls parents "a formidable key in preventing teen substance use," for parents have the power to affect their children's decisions whether or not to use alcohol (as well as other drugs) in two important ways: they can inhibit their children's use directly, and they can reinforce their children's involvement in positive alternatives (such as religious or athletic programs)

that are inconsistent with alcohol and other drug use (Bry and Slechta, 2000).

Parental monitoring also is a key factor in reducing the likelihood that young people will drink (Dusenbury, 2000; Jackson, Henrickson, and Dickinson, 1999). Easy access to alcohol also has been associated with higher rates of drinking among young people (Jackson et al., 1999). Other factors that increase risk include family norms that support drinking by children at home, and the absence of clear family rules and policies prohibiting the use of alcohol (Jackson et al., 1999).

A number of family-based prevention programs have been developed. Most of these are concerned with substance abuse broadly defined (alcohol and other drug use). Some of these programs are universal programs targeting all youth; other selective approaches respond to the needs of youth at high risk for alcohol or other drug abuse because their parents abuse these substances.

Five family-based prevention projects that have had an alcohol-specific focus have been completed. These include: (1) Prenatal and Infancy Home Visitation by Nurses (Olds, 1997); (2) The Michigan State University Multiple Risk Outreach Program (Nye, Zucker, and Fitzgerald, 1995; Maguin, Zucker, and Fitzgerald, 1994); (3) Family Matters (Bauman, Ennett, Foshee, Pemberton, King, and Koch, 2002); (4) Project Northland (Williams, Perry, Farbakhsh, and Veblen-Mortenson, 1999); and (5) Preparing for the Drug-Free Years (Kosterman, Hawkins, Spoth, Haggerty, and Zhu, 1997).

Prenatal and Infancy Home Visitation by Nurses was a program serving low-income women during pregnancy and continuing into early childhood (Olds, 1997). Nurses were used to educate mothers and support them during the important transition to becoming a parent. Nurses addressed maternal health issues, provided education about child development and parenting, encouraged support by family and friends, and provided linkages to needed services. The program focused on three general risk factors: the mother's use of drugs, alcohol, and cigarettes during pregnancy; maladaptive care of the child; and issues relative to the mother's adjustment, including family size, work, and welfare dependence.

Results revealed that the program improved diet and reduced smoking during pregnancy, reduced subsequent child neglect and abuse, improved children's IQ scores, and reduced risk for later substance use by children and parents. A 15-year follow-up revealed 79 percent fewer incidents (verified reports) of child abuse or neglect, 69 percent fewer arrests of the mother, and a 44 percent reduction in behavioral problems due to alcohol and drug abuse.

The Michigan State University Multiple Risk Outreach Program was designed to interrupt important family mediators of later alcoholism. The project recruited fathers from a group of men convicted of driving while

impaired. The program provided parents with training in consistent monitoring and reinforcement for prosocial behavior. Families were assigned to one of three conditions: (1) both parents participate (n = 22); (2) only mothers participate (n = 20); and (3) no-treatment control group (n = 23).

The 10-month intervention focused on child management training and included a component on marital problem solving. The program consisted of weekly sessions and two telephone contacts per week until parents mastered the training objectives (usually 4 months), followed by biweekly sessions and weekly telephone contacts to support and maintain mastery.

The program resulted in significant improvements in child behavior (measured on the Child Behavior Rating Scale-Preschool Version) when families completed the program and when mothers had a high level of participation and investment in the program. Only increases in positive behaviors were sustained at follow-up. The effects were strongest when both parents participated (Maguin et al., 1994; Nye et al., 1995).

Family Matters is a universal, family-based prevention program that targets alcohol and tobacco. The intervention mails parents four booklets, each of which is followed up by a telephone call from a health educator. An evaluation with 1,014 families with 12- to 14-year-old children revealed reductions in tobacco and alcohol use by children in the 12 months following the program. The program also increased rule setting about tobacco and alcohol use in families (Ennett et al., 2001; Bauman, Foshee, Ennett, Pemberton, Hicks, King, and Koch, 2001).

As noted earlier, Project Northland is a multicomponent alcohol prevention program for students in middle school. Specifically, the program includes family-based components in sixth and seventh grades, a school-based component in seventh grade, and a community-based component in eighth grade. During eight sessions per year for 3 years, the school-based program emphasizes Normative Education and Social Resistance Skills Training. During the sixth and seventh grades, highly appealing informational packets and homework activities were completed by parents and children together and were brought by students or mailed to the families. They included suggestions for setting up family policies, holding family meetings, and communicating with teens.

Toomey and colleagues (1996) found in evaluating the seventh-grade mailed program that a third of parents completed activities that had been mailed to them. Mailing materials home to parents provides greater flexibility than having students take materials home from school. As a result of the parent program intervention, students were more likely to be aware of their family's rules concerning alcohol, and had more discussions about alcohol with their parents. The program also had a positive impact on parent-child communication and other important family protective factors.

Outcome studies over 3 years with 1,901 sixth graders showed that the multicomponent program reduced use of alcohol as well as tobacco and marijuana. The program also reduced students' misperceptions about the prevalence of drinking. In terms of effects specific to the family-based component, by the end of sixth grade more intervention than reference students reported that their parents had spoken to them about drinking. By the end of eighth grade more students reported that their families had rules about drinking.

Preparing for the Drug-Free Years (PDFY) is a universal, five-session program for parents of children ages 8 to 14. This program, designed primarily for parents, empowers parents with the skills needed to enhance protective factors (e.g., bonding to child by increasing opportunities for involvement with the child as well as interaction; how to effectively resist negative influences and reinforce good behavior through effective management techniques) and reduce risk factors (e.g., family conflict). The program trains parents in communication skills so they can effectively communicate norms that do not support substance use. Parents also learn skills and techniques for effectively managing their families. Finally, the program helps parents teach their children the skills they will need to effectively resist influences to use alcohol.

The program is based on the social development model. In order to make the intervention sensitive to the culture of the target community, community members who have received training deliver the program. The use of videos in each session helps to standardize content.

Kosterman, Hawkins, Spoth, Haggerty, and Zhu (1997) report that PDFY increased communication between parents and children and improved the quality of parent-child relationships in two rural, economically depressed communities in the Midwest. Other studies suggest the program can be adapted to other cultural groups. Park and colleagues (2000) report that the program significantly improved parents' norms concerning alcohol use, and reduced the growth of alcohol use in their children. Spoth, Guyll, and Day (2002) report a savings of $5.85 in alcohol-use disorder costs for every dollar spent on the program.

COMMUNITY-BASED APPROACHES

Communities play an important role in supporting norms for alcohol use, as well as restricting alcohol availability. Social interaction and social influences are critically important in drinking. To prevent underage drinking, community factors and norms clearly must be addressed (Wagenaar and Perry, 1994).

A variety of prevention efforts have included multiple components involving schools, families, communities, and media (for example, Pentz et al.,

1989; Perry et al., 1996; Hawkins, Catalano, and Miller, 1992). Gorman and Speer (1996) identified eight published evaluation studies of community-based approaches. Many of these were multicomponent interventions. Although experts agree that comprehensive approaches that target multiple domains are much more likely to be effective, evaluations of multicomponent approaches have not yet determined how much each component contributes to a program's overall effectiveness. Four community-based prevention approaches are described: (1) Project Northland; (2) Day One Community Partnerships; (3) Communities Mobilizing for Change; and (4) Community Trials Intervention to Reduce High Risk Drinking.

In Project Northland, communitywide task forces were mobilized to reduce the availability of alcohol and to improve community attitudes about and against teen drinking (Perry et al., 1996; Williams and Perry, 1998) during the first year of the project. Task forces included members from a cross-section of the community: government, law enforcement, school representatives, business representatives, health professionals, youth workers, parents, concerned citizens, clergy, and adolescents. During the first year, task forces focused primarily on promoting awareness of alcohol issues among teens and the organization and implementation of alcohol-free recreational activities for adolescents (Veblen-Mortenson et al., 1999).

During the second year of the program, the intervention included a peer participation program named T.E.E.N.S. (The Exciting and Entertaining Northland Students). This intervention was designed to provide peer leadership experience outside the classroom through participants' involvement in planning alcohol-free activities for seventh-grade students. Adult volunteers were recruited from the middle and junior high schools and surrounding communities to facilitate the T.E.E.N.S. groups. One-day leadership training sessions were held for student representatives. The leadership training included learning methods to find out seventh graders' favorite activities, to plan a budget for an activity, and to publicize an activity. Planning booklets were given to students. Sixteen percent of the students in the program participated in planning at least one activity for their peers and nearly 50 percent attended at least one activity. These student planners significantly reduced their levels of alcohol use by the end of seventh grade (Komro, Perry, Veblen-Mortenson, and Williams, 1994; Komro et al., 1996).

During the second year of the project, communitywide task force activities involved the passage of five alcohol-related ordinances and three resolutions, including enactment of local ordinances requiring responsible beverage service training to prevent illegal alcohol sales to underage youth and intoxicated patrons in three of the communities. Other activities included the initiation of a Gold Card program to link community businesses

and schools. Gold Cards issued to students by participating businesses provided discounts to students who pledged to be alcohol and drug free.

During the third year of the project, T.E.E.N.S. activities continued. The communitywide task forces increased their collaboration with existing organizations to make as many linkages as possible with local groups that directly influence underage drinking. Activities included: (1) discussions with local alcohol merchants about their alcohol-related policies concerning young people; (2) distribution of materials that support policies concerning the sale of alcohol to minors, including ID checks and legal consequences for selling alcohol to minors; (3) ongoing meetings to initiate new Gold Card Programs to link community businesses and schools; and (4) continued sponsorship of alcohol-free activities for young teens, including the establishment of a teen center in one community.

Day One Community Partnerships involved a community coalition in a diverse urban community in southern California. Comprehensive alcohol prevention activities were used. The most promising was the adoption of comprehensive policies by the city government to reduce the availability of alcohol to minors. A 3-year survey indicated a trend in reducing monthly use of alcohol for middle and high school students. Furthermore, there was a significant reduction in weekly alcohol use for 12th graders (Rohrbach, Johnson, Mansergh, Fishkin, and Neumann, 1997).

Communities Mobilizing for Change is a Center for Substance Abuse Prevention model program. The program is designed to organize and mobilize communities to reduce access to alcohol for 13- to 20-year-olds. It is a universal prevention intervention that provides resource materials to help communities organize, including materials for civic groups, faith organizations, schools, law enforcement, and liquor licensing boards. Materials include alcohol compliance check procedure manuals, model ordinances, model public policies, institutional policies, and research material. The intervention reduced drinking among 18- to 20-year-olds. It improved practices in places that serve alcohol, it increased the number of alcohol merchants checking age, and reduced the number of older teens providing alcohol to other teens.

Community Trials Intervention to Reduce High Risk Drinking is a multicomponent, community-based intervention that targets environmental factors supporting alcohol use (Holder et al., 1997). The intervention is designed to increase community awareness, reduce access to alcohol for young people, and encourage responsible beverage service and enforcement. Six intervention and control communities in southern California and South Carolina participated in an evaluation. These communities had populations of approximately 100,000. The intervention decreased sales to minors, increased driving under the influence enforcement, and increased coverage of alcohol issues in the media. Results indicated that driving under the

influence was cut in half. Following the intervention, half as many people reported that they drank too much. There was a 10 percent reduction in nighttime crashes, and a 6 percent reduction in crashes where the driver was under the influence of alcohol. Forty-three percent fewer assault injuries were treated in emergency rooms.

KEY ELEMENTS OF EFFECTIVE ALCOHOL PREVENTION APPROACHES FOR MINORS

From these studies, we conclude that there are several important lessons to be learned about what key elements are important for preventing the use and misuse of alcohol among minors.

Strategies That Work

Interventions should be multicomponent and integrated. Schools provide a captive population for the delivery of prevention programs. School-based programs have shown evidence of effectiveness. Similarly, family- and community-based interventions have produced short-term reductions in the prevalence and intensity of alcohol use. Prevention benefits when all of these venues are used in concert in a coordinated and mutually supporting manner. A meta-analysis by Tobler and colleagues (2000) revealed that systemwide change interventions were most effective. These interventions utilized a community component involving family and other community leaders (e.g., teachers, counselors) or tried to change the school environment. Communities and schools are encouraged to use interactive substance use prevention programs, especially those that combine community involvement or work to change school environment. Communities should adopt prevention interventions that include school, family, and community components.

Interventions should be sufficient in dose and follow-up. Passing through adolescence takes a decade. During this period, significant developmental changes occur. For interventions to be effective, they must be delivered throughout this period to have lasting effects. Educational and family programs focus most heavily on the first part of adolescence and then become increasingly rare. The increased use of boosters and multiyear programs should be encouraged. Community interventions may similarly come and go during the period of a decade. However, a combined and consistently implemented approach to prevention will yield results.

Programs need to establish nonuse norms. Extensive research demonstrates that establishing positive norms is a key to preventing alcohol use and misuse. During adolescence, it is common for youth at risk for engaging in inappropriate alcohol behaviors to grossly overestimate the prevalence and acceptability of alcohol use among peers. One method of chang-

ing norms is to change these prevalence estimates by providing the real data, or to employ peer leaders who model nonuse in their classrooms and communities.

Parental monitoring should be stressed. Research on prevention with families consistently demonstrates that parental monitoring, including monitoring free time and time with friends, is highly effective as a strategy for preventing the onset of alcohol use and misuse. Programs that provide parents with skills for active monitoring should be encouraged. Increasing parent-child communication concerning alcohol use promotes positive norms at home and helps parents to explain reasons for monitoring their children.

Educational programs need to be interactive in their approach. The effective educational programs reviewed earlier were all highly interactive in their nature. That is, they did not rely on didactically presented messages, but used teaching techniques that encouraged participants to be actively engaged in the process of forming social norms. The Tobler et al. (2000) meta-analysis revealed that interactive programs that delivered more hours of programming were more effective than interactive programs that delivered fewer hours. This trend was not evident among noninteractive programs. This was true for all studies together and for the high-quality studies.

Interventions should be implemented with fidelity. There is strong evidence that the quality of program delivery is highly related to successful outcome (Dusenbury, Brannigan, Falco, and Hansen, 2003). Training for providers is crucial. Providers also must have sufficient time to become fluent in delivering the program. On the initial attempt, program providers typically focus on understanding the mechanics of a program. Only after they have mastered the mechanics of program delivery are they able to focus on underlying psychological and sociological constructs that define quality implementation.

Interventions should limit access to alcohol. Family and community interventions that were successful included a focus on limiting youth access to alcohol. Such approaches need to include not only the adoption of laws and ordinances, but their enforcement and the development of a strong social norm that supports the intent of such policies.

Interventions should be institutionalized. Institutionalization is crucial for prevention to realize its full potential. Institutionalized programs can have long-lasting effects.

Strategies That Do Not Work

Noting which strategies do not work is important because these should be avoided. Many programs have not yet been demonstrated to be effective.

However, lack of evidence of effectiveness is different than evidence about contraindicated approaches. Those that researchers have broadly concluded either not to work or to be counterproductive include: (1) scare tactics; (2) congregating high-risk students; (3) exclusive focus on information; and (4) a failure to specifically focus on alcohol and tie information, norms, and skills development to alcohol use.

REFERENCES

Bauman, K.E., Ennett, S.T., Foshee, V.A., Pemberton, M., King, T.S., and Koch, G.G. (2002). Family matters: A family-directed program designed to prevent adolescent tobacco and alcohol use. *Health Promotion Practice*, *2*(1), 81-96.

Bauman, K.E., Foshee, V.A., Ennett, S.T., Pemberton, M., Hicks, K.A., King, T.S., and Koch, G.G. (2001). Influence of a family program on adolescent tobacco and alcohol use. *American Journal of Public Health*, *91*(4), 604-610.

Bell, R., Ellickson, P., and Harrison, E. (1993). Do drug prevention effects persist into high school? How project ALERT did with ninth-graders. *Preventive Medicine*, *22*, 463-483.

Botvin, G.J., Baker, E., Botvin, E.M., Filazzola, A.D., and Millman, R.B. (1984). Prevention of alcohol misuse through the development of personal and social competence: A pilot study. *Journal of Studies on Alcohol*, *45*, 550-552.

Botvin, G.J., Baker, E., Dusenbury, L., Botvin, E.M., and Diaz, T. (1995). Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association*, *273*(14), 1106-1112.

Botvin, G.J., Baker, E., Dusenbury, L., Tortu, S., and Botvin, E.M. (1990). Preventing adolescent drug abuse through a multimodal cognitive-behavioral approach: Results of a three-year study. *Journal of Consulting and Clinical Psychology*, *58*, 437-446.

Botvin, G.J., Batson, H., Witts-Vitale, S., Bess, V., Baker, E., and Dusenbury, L. (1989a). A psychosocial approach to smoking prevention for urban black youth. *Public Health Reports*, *104*, 573-582.

Botvin, G.J., Dusenbury, L., Baker, E., James-Ortiz, S., and Kerner, J. (1989b). A skills training approach to smoking prevention among Hispanic youth. *Journal of Behavioral Medicine*, *12*, 279-296.

Botvin, G.J., Dusenbury, L., Baker, E., James-Ortiz, S., Botvin, E.M., and Kerner, J. (1992). Smoking prevention among urban minority youth: Assessing effects on outcome and mediating variables. *Health Psychology*, *11*(5), 290-299.

Botvin, G.J., and Eng, A. (1982). The efficacy of a multicomponent approach to the prevention of cigarette smoking. *Preventive Medicine*, *11*, 199-211.

Botvin, G.J., Renick, N.L., and Baker, E. (1983). The effects of scheduling format and booster sessions on a broad-spectrum psychosocial smoking prevention program. *Journal of Behavioral Medicine*, *6*, 359-379.

Botvin, G.J., Schinke, S.P., Epstein, J.A., and Diaz, T. (1994). Effectiveness of culturally-focused and generic skills training approaches to alcohol and drug abuse prevention among minority youths. *Psychology of Addictive Behaviors*, *8*, 116-127.

Bry, B.H., and Slechta, C.A. (2000). Research evidence for home-based, school, and community interventions. In N. Boyd-Franklin and B.H. Bry, *Reaching out in family therapy: Home-based, school, and community interventions* (pp. 181-201). New York: Guilford Press.

Catalano, R.F. (1993). Prevention column: Parents: A formidable key in preventing teen substance use. *Adolescent Magazine*, *6*(4), 16-17.

Dielman, T.E., Shope, J.T., Butchart, A.T., and Campanelli, P.C. (1986). Prevention of adolescent alcohol misuse: An elementary school program. *Journal of Pediatric Psychology*, *11*(2), 259-284.

Dielman, T.E., Shope, J.T., Leech, S.L., and Butchart, A.T. (1989). Differential effectiveness of an elementary school-based alcohol misuse prevention program by type of prior drinking experience. *Journal of School Health*, *59*, 255-263.

Donaldson, S.I., Graham, J.W., and Hansen, W.B. (1994). Testing the generalizability of intervening mechanism theories: Understanding the effects of adolescent drug use prevention interventions. *Journal of Behavioral Medicine*, *17*(2), 195-216.

Dusenbury, L. (2000). Family-based drug abuse prevention programs: A review. *Journal of Primary Prevention*, *20*, 337-352.

Dusenbury, L., Brannigan, R., Falco, M., and Hansen, W.B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, *18*, 237-256.

Ellickson, P.L., and Bell, R.M. (1990). Drug prevention in junior high: A multi-site longitudinal test. Science, 247, 1299-1305.

Ellickson, P.L., Bell, R.M., and Harrison, E.R. (1993). Changing adolescent propensities to use drugs: Results from Project ALERT. *Health Education Quarterly*, *20*, 227-242.

Ennett, S.T., Bauman, K.E., Pemberton, M., Foshee, V.A., Chuang, Y., King, T.S., and Koch, G.G. (2001). Mediation in a family-directed program for prevention of adolescent tobacco and alcohol use. *Preventive Medicine*, *33*, 333-346.

Gorman, D.M., and Speer, P.W. (1996). Preventing alcohol abuse and alcohol related problems through community intervention: A review of evaluation studies. *Psychology and Health*, *11*, 95-131.

Hansen, W.B. (1996). Pilot test results comparing the All Stars program with seventh-grade D.A.R.E.: Program integrity and mediating variable analysis. *Substance Use and Misuse*, *31*(10), 1359-1377.

Hansen, W.B., and Graham, J.W. (1991). Preventing alcohol, marijuana, and cigarette use among adolescents: Peer pressure resistance training vs. establishing conservative norms. *Preventive Medicine*, *20*, 414-430.

Hawkins, D.J., Catalano, R.F., and Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *American Psychological Association Psychological Bulletin*, *112*, 64-105.

Hingson, R.H., Howland, J., Schiavone, T., and Damiata, M. (1990). The Massachusetts saving lives program: Six cities widening the focus from drunk driving to speeding, reckless driving, and failure to wear seat belts. *Journal of Traffic Medicine*, *18*, 123-132.

Holder, H.D., Saltz, R.F., Grube, J.W., Treno, A.J., Reynolds, R.I., Voas, R.B., and Gruenewald, P.J. (1997). Overall results and observations: Summing up: Lessons from a comprehensive community prevention trial. *Addiction*, *92*, S293-S301.

Jackson, C., Henriksen, L., and Dickinson, D. (1999). Alcohol-specific socialization, parenting behaviors and alcohol use by children. *Journal of Studies on Alcohol*, *60*, 362-367.

Komro, K.A., Perry, C.L., Murray, D.M., Veblen-Mortenson, S., Williams, C.L. and Anstine, P.S. (1996). Peer planned social activities for the prevention of alcohol use among young adolescents. *Journal of School Health*, *66*(9), 328-333.

Komro, K.A., Perry, C.L., Veblen-Mortenson, S., and Williams, C.L. (1994). Peer participation in Project Northland: A communitywide alcohol use prevention project. *Journal of School Health*, *64*, 318-322.

Komro, K.A., Perry, C.L., Williams, C.L., Stigler, M.H., Farbakhsh, K., and Veblen-Mortenson, S. (2001). How did Project Northland reduce alcohol use among young adolescents? Analysis of mediating variables. *Health Education Research: Theory and Practice*, *16*(1), 59-70.

Kosterman, R., Hawkins, J.D., Spoth, R., Haggerty, K.P., and Zhu, K. (1997). Effects of a preventive parent-training intervention on observed family interactions: Proximal outcomes from preparing for the drug free years. *Journal of Community Psychology*, *25*(4), 277-292.

Maguin, E., Zucker, R.A., and Fitzgerald, H.E. (1994). The path to alcohol problems through conduct problems: A family based approach to very early intervention with risk. *Journal of Research on Adolescence*, *4*, 249-269.

Nye, C., Zucker, R., and Fitzgerald, H. (1995). Early intervention in the path to alcohol problems through conduct problems: Treatment involvement and child behavior change. *Journal of Consulting and Clinical Psychology*, *63*, 831-840.

Olds, D. (1997). The prenatal/early infancy project: Fifteen years later. In G.W. Albee and T.P. Gullotta (Eds.), *Primary prevention works* (pp. 41-67). Thousand Oaks, CA: Sage.

Park, J., Kosterman, R., Hawkins, J.D., Haggerty, K.P., Duncan, T.E., Duncan, S.C., and Spoth, R. (2000). Effects of the preparing for the drug free years curriculum on growth in alcohol use and risk for alcohol use in early adolescence. *Prevention Science*, *1*(3), 125-138.

Pentz, M.A., Dwyer, J.H., MacKinnon, D.P., Flay, B.R., Hansen, W.B., Wang, E.Y.I., and Johnson, C.A. (1989). A multi-community trial for primary prevention of adolescent drug abuse: Effects on drug use prevalence. *Journal of the American Medical Association*, *261*(22), 3259-3266.

Pentz, M.A., Trebow, E.A., Hansen, W.B., MacKinnon, D.P., Dwyer, J.H., and Johnson, C.A. (1990). Effects of program implementation on adolescent drug use behavior. *Evaluation Review*, *14*(3), 264-289.

Perry, C.L., Grant, M., Ernberg, G., Florenzano, R.U., Langdon, M.D., Blaze-Temple, D., Cross, D., Jacobs, D.R., Myeni, A.D., Waahlberg, R.B., Berg, S., Andersson, D., Fisher, K.J., Saunders, B., and Schmid, T. (1989). W.H.O. collaborative study on alcohol education and young people: Outcomes of a four-country pilot study. *International Journal of Addictions*, *24*(12), 1145-1171.

Perry, C.L., Williams, C.L., Komro, K.A., Veblen-Mortenson, S., Stigler, M.H., Munson, K.A., Farbakhsh, K., Jones, R.M., and Forster, J.L. (2002). Project Northland: Long-term outcomes of community action to reduce adolescent alcohol use. *Health Education Research*, *16*(5), 101-116.

Perry, C.L., Williams, C.L., Veblen-Mortenson, S., Toomey, T., Komro, K.A., Anstine, P.S., McGovern, P.G., Finnegan, J.R., Forster, J.L., Wagenaar, A.C., and Wolfson, M. (1996). Project Northland: Outcomes of a communitywide alcohol use prevention program during early adolescence. *American Journal of Public Health*, *86*(7), 956-965.

Rohrbach, L.A., Johnson, C.A., Mansergh, G., Fishkin, S.A., and Neumann, F.B. (1997). Alcohol-related outcomes of the day one community partnership. *Evaluation and Program Planning*, *20*(3), 315-322.

Ross, L.T., and Hill, E.M. (2001). Drinking and parental unpredictability among adult children of alcoholics: A pilot study. *Substance Use and Misuse*, *36*, 609-638.

Shope, J.T., Copeland, L.A., Marcoux, B.C., and Kamp, M.E. (1996). Effectiveness of a school-based substance abuse prevention program. *Journal of Drug Education*, *26*(4), 323-337.

Spoth, R., Guyll, M., and Day, S.X. (2002). Universal family-focused interventions in alcohol-use disorder prevention: Cost-effectiveness and cost-benefit analyses of two interventions. *Journal of Studies on Alcohol*, *63*, 219-228.

Taylor, B., Graham, J.W., Cumsille, P., and Hansen, W.B. (2001). Modeling prevention program effects on growth in substance use: Analysis of five years of data from the adolescent alcohol prevention trial. *Prevention Science*, *1*(4), 183-197.

Tobler, N.S., Roona, M.R., Ochshorn, P., Marshall, D.G., Streke, A.V., and Stackpole, K.M. (2000). School-based adolescent drug prevention programs: 1998 meta-analysis. *The Journal of Primary Prevention*, *20*, 275-336.

Toomey, T.L., Williams, C.L., Perry, C.L., Murray, D.M., Dudovitz, B., and Veblen-Mortenson, S. (1996). An alcohol primary prevention program for parents of seventh-graders: The amazing alternatives! Home Program. *Journal of Child and Adolescent Substance Abuse*, *5*, 35-53.

Veblen-Mortenson., S., Rissel, C.E., Perry, C.L., Forster, J., Wolfson, M., and Finnegan, J.R. (1999). Lessons learned from Project Northland: Community organization in rural communities (pp. 105-117). In Neil Bracht (Ed.), *Health promotion at the community level* (2nd ed.). Thousand Oaks, CA: Sage.

Wagenaar, A.C., and Perry, C.L. (1994). Community strategies for the reduction of youth drinking: Theory and application. *Journal of Research on Adolescence*, *4*, 319-345.

Williams, C.L., and Perry, C.L. (1998). Lessons from Project Northland: Preventing alcohol problems during adolescence. *Alcohol Health and Research World*, *22*(2), 107-116.

Williams, C.L., Perry, C.L., Dudovitz, B., and Veblen-Mortenson, S. (1995). A home-based prevention program for sixth-grade alcohol use: Results from Project Northland. *Journal of Primary Prevention*, *16*, 125-147.

Williams, C.L., Perry, C.L., Farbakhsh, K., and Veblen-Mortenson, S. (1999). Project Northland: Comprehensive alcohol use prevention for young adolescents, their parents, schools, peers and communities. *Journal of Studies on Alcohol*, *13*, 112-124.

Wynn, S., Schulenberg, J., Maggs, J.L., and Zucker, R.A. (2000). Preventing alcohol misuse: The impact of refusal skills and norms. *Psychology of Addictive Behaviors*, *14*, 36-47.

7

Supply Side Approaches to Reducing Underage Drinking: An Assessment of the Scientific Evidence

Harold D. Holder

The consumption of alcoholic beverages by youth is an issue of importance to public health and safety in most countries, especially in the United States. The extent to which the supply of alcoholic beverages, including its production, distribution, and retail sale, influence consumption and cause harm is especially relevant to public policy concerning preventing underage drinking, especially heavy drinking.

At the simplest level, supply responds to demand. Whenever there is a public desire for alcohol, a supply will be created (even if it is illicit). Yet the supply and demand relationship is hardly one-directional. This is especially true if the supply of alcohol is legal and public, for there is also a clear potential for supply to influence demand, especially among youth who can view drinking as an "adult" activity. Therefore, the supply of alcohol and retail sales are especially relevant to policy concerns about youth drinking. Youth are attracted to lower cost and illegal supply of alcohol because purchase of alcohol in legal retail outlets is forbidden. As a result, this chapter is directed to research concerning the supply side of alcohol and its interaction with alcohol consumption and eventually with alcohol problems.

ALCOHOL SUPPLY AND ACCESS BY YOUTH

Even with the highest minimum alcohol purchase age in the world, American youth enjoy many opportunities to obtain alcohol. There is clear evidence that youth perceive alcohol to be available to them, whether

through retail or social outlets. Youth continue to experience ready access to alcohol, and 94 percent of twelfth graders reported in 2001 that it is "fairly" or "very" easy to get (University of Michigan, 2001). In a national study of adolescents in grades seven through twelve, Swahn, Hammig, and Ikeda (2002) found that youth report relatively easy access to both alcohol and guns in their home. In fact, gun versus alcohol availability was relatively similar (29 percent versus 24 percent). Purchase surveys reveal that anywhere from 30 percent to 70 percent of outlets may sell to underage buyers, depending on their geographical location (e.g., Forster et al., 1994; Forster, Murray, Wolfson, and Wagenaar, 1995; Preusser and Williams, 1992; Grube, 1997). Even at the lowest end of this range (30 percent), seven tries at different outlets will yield a 92 percent successful purchase rate. Given the likelihood that social networks of youth will share information about outlets at which alcohol has been purchased successfully, the estimated maximum of six unsuccessful tries prior to almost certain purchase is conservative. Focus groups have also indicated that underage youth typically procure alcohol from commercial sources and adults or at parties where parents and other adults are not present (Jones-Webb et al., 1997; Wagenaar et al., 1993). Wagenaar et al. (1996) have reported that 46 percent of ninth graders, 60 percent of twelve graders, and 68 percent of youth aged 18 to 20 obtained alcohol from an adult on their most recent drinking occasion. Commercial outlets were the second most prevalent alcohol source for youth aged 18 to 20. The source of alcohol varies by age group, as shown in Table 7-1 (Wagenaar et al., 1996). Students in ninth grade rely on home sources of alcohol much more than the older students. The reliance on home supply declines significantly by the end of high school. Of particular note is that social sources, that is, other persons either underage themselves or persons of legal age, were the predominate sources of alcohol for all age groups.

A similar finding from other studies suggests that younger adolescents' primary sources of alcohol are older siblings, friends and acquaintances, and adults (through third-party transactions) as well as parties (Harrison,

TABLE 7-1 Source of Alcohol by Age Group (all numbers in percentages for current drinkers over the past 30 days)

Source of Alcohol	9th Grade Students	12th Grade Students	Youth Ages 18-20
Commercial alcohol outlet	3	9	14
Home	27	6	11
Another person under age 21	29	29	10
Another person age 21 or older	46	60	68

SOURCE: Wagenaar et al. (1996).

Fulkerson, and Park, 2000; Jones-Webb et al., 1997; Schwartz, Farrow, Banks, and Giesel, 1998; Wagenaar et al., 1993). In addition, the national surveys of college student drinking find that a large percentage of college youth report they do not have to pay anything for alcohol, presumably because they are at a party where someone else is supplying the alcohol (Wechsler, Kuo, Lee, and Dowdall, 2000).

The importance of alcohol supply to youth has been studied by examining the effects of alcohol advertising on youth decisions about drinking (Atkin, Eadie, Leather, McNeill, and Scott, 1988; Austin and Nach-Ferguson, 1995; Grube and Wallack, 1994). There is evidence of the effects of alcohol promotion on youth. In addition, such issues as legal age for purchase of alcohol and the enforcement of underage sales of alcohol have been shown to affect youth access to retail supply (Grube, 1997; Wagenaar and Toomey, 2002). In addition, alcohol prices have an important effect on youth drinking (see Cook and Moore, 2001).

STANDARDS OF EVIDENCE FOR PREVENTION STRATEGIES

Solid empirical evidence should form the basis for the decisions that communities, agencies, and individuals make about how to reduce availability of alcohol to youth. At a minimum, this evidence should (1) provide substantial indication of effectiveness in reducing access and ideally youth drinking, and (2) should be based on methodologically strong research. In other words, good ideas are not sufficient, regardless of their logical, intuitive, or popular appeal.

First, the evaluation of the prevention strategy must show that it affects reliable and valid measures of youth drinking or risk factors clearly shown to increase risk of drinking. Second, this effect must be demonstrated using designs that allow the research to rule out competing explanations and the utilization of appropriate statistical analyses in comparison to an appropriate comparison or control group or condition. Third, an appropriate research design should be used. Evaluating investigator-designed prevention programs can utilize randomized controlled trials, which can be used to rule out competing hypotheses. With many policy interventions, however, it is impractical, inappropriate, or not possible to undertake random assignment. With interventions such as alcohol taxation and drunk driving laws, the political process, not random assignment, determines whether individuals in a certain jurisdiction on a given date are subject to high or low taxes, tough or lenient drunk driving laws, and so on. Such studies have been called quasi-experimental designs (Cook and Campbell, 1979) to describe designs that do not employ random assignment to experimental or control conditions. Scientists also use the term natural experiments or "experiments without random assignment." Alternative designs should be em-

ployed that provide the strongest evidence for the specific prevention situation. Fourth, the characteristics of the population addressed should be clearly specified, as should the intervention. Fifth, prevention effects should be replicated by independent investigators. For this chapter there was no requirement that policy interventions be evaluated with randomized control designs.

Youth drinking is a primary dependent variable, which could be considered the target for supply side prevention strategies. However, such a variable is often unavailable for evaluating supply side strategies, and other indicators or surrogates are employed. One dependent variable often used is alcohol-involved traffic crashes for underage persons—persons who are under 21 years old, but licensed to drive. This dependent variable has at least two desired features; (1) longitudinal data are available for traffic crashes in all states, so complex outcome analyses can be undertaken, and (2) traffic crashes are frequently an alcohol-involved harm for youth. Other indicators, including self-reported drinking over the past 30 days (a reasonable indicator of frequency of drinking) and heavy drinking events or frequency (often 5 drinks or more per drinking occasion for males and 4 drinks or more for females), are also used when survey data are available. Recently, alcohol-involved injuries and violence involving youth and young adults (either as victims or perpetrators) also have been used.

STRATEGIES TO AFFECT THE SUPPLY OF ALCOHOL TO YOUTH

Most policy measures aimed at young people target the availability of alcohol by increasing personal cost or risk. Other alcohol policies that do not specifically target youth can also have a substantial impact on drinking by young people, and such policies can communicate norms to young people regarding the unacceptability of their drinking and to adults about the unacceptability of providing alcohol to underage persons (see Laixuthai and Chaloupka, 1993). Minimum drinking or purchase age limits, for example, are intended specifically to decrease or prevent drinking by young people without regard to the situation in which the drinking takes place. Policies targeting drinking occasions attempt to prevent drinking in conjunction with risky activities or situations without necessarily reducing overall drinking in the population or among specific groups. Random breath testing, for example, is designed to reduce drinking and driving, but does not target specific groups nor is it intended to reduce overall alcohol consumption in the population. See the summary of research by Grube and Nygaard (2001), of which this chapter makes extensive use, as well as Komro and Toomey (2002).

In general, one can organize into two groups alternative strategies that are designed to directly or indirectly alter the availability of alcohol to

youth: those that affect economic availability and those that affect physical availability. The former includes both the actual retail price of alcohol (or full price) as paid by the consumer and what might be called "acquisition or opportunity costs," that is, the cost of locating alcohol, including finding transportation. This is covered in Chapter 9 of this volume. The latter is a much larger domain of prevention; it includes efforts to reduce retail availability of alcohol, but also social availability.

The Physical Availability of Alcohol

This section summarizes the alternative strategies for reducing the physical availability of alcohol to youth. The subsections are organized under strategies with similar characteristics: restricting retail access, reducing convenience, reducing social and third-party access, and increasing sanctions.

Restricting Retail Access by Youth and Its Enforcement

This subsection discusses strategies that are specifically directed at reducing the retail access of alcohol to youth, including specifying a legal age of purchase, limiting the age of alcohol sellers, responsible beverage service, controls on age of alcohol seller, reducing use of false identification, enforcement against sales of alcohol to youth, and restrictions on alcohol advertising.

Underage drinking and purchase laws. The goal of a higher minimum legal drinking age is to reduce alcohol consumption among those under 21 years of age. In the 1980s, all U.S. states were required to adopt a uniform minimum age of 21 for all beverages. The U.S. General Accounting Office (GAO) (1987) reviewed 32 published research studies both before and after the law changed. GAO concluded that there was solid scientific evidence that increasing the minimum age for purchasing alcohol reduced the number of alcohol-involved traffic crashes for those below the age of 21. These and more recent studies uniformly show that increasing the minimum drinking age significantly decreases self-reported drinking by young people, the number of fatal traffic crashes, and the number of arrests for driving under the influence of alcohol (DUI).

Yu, Varone, and Shacket (1997) found a 70 percent decrease in self-reported alcohol purchase by 19- to 20-year-olds after the implementation of a minimum drinking age of 21 in New York state. O'Malley and Wagenaar (1991) found that the minimum age affected self-reported alcohol use among young people and reduced traffic crashes. The effect on car crashes continued well after young people reached the legal drinking age. Klepp, Schmidt, and Murray (1996) found that implementation of the uniform

minimum legal drinking age of 21 in the United States reduced the overall prevalence of drinking and driving. Saffer and Grossman (1987a, 1987b), Wagenaar (1981, 1986), and Wagenaar and Maybee (1986) indicate that raising the minimum legal drinking age from 18 to 21 decreased single vehicle nighttime crashes involving young drivers from 11 percent to 16 percent at all levels of crash severity. Voas, Tippetts, and Fell (1999), using data from all 50 states and the District of Columbia for 1982 through 1997, concluded that the enactment of the uniform minimum drinking age law was responsible for a 19 percent net decrease in fatal crashes involving young drinking drivers after controlling for driving exposure, beer consumption, enactment of zero-tolerance laws, and other relevant changes in the laws during that time period.

In the most comprehensive review to date, Wagenaar and Toomey (2002) analyzed all identified published studies on the drinking age from 1960 to 1999, a total of 132 documents. They coded eight key variables for each study. The variables included the jurisdiction (i.e., state or province) studied, specific outcome measures analyzed (e.g., self-reported drinking, car crash fatalities), and whether the study was specific to college student populations. In addition, each study was rated on three indicators of methodological quality. In 48 of the studies they reviewed, the effects of changes in the drinking age on alcohol consumption were examined, using a total of 78 alcohol consumption measures (e.g., sales figures, self-reported drinking). Of the 78 measures, 45 percent showed that a higher legal drinking age was associated with reduced alcohol consumption among youth, while 5 percent found that a higher drinking age was associated with greater adolescent consumption.

Wagenaar and Toomey (2002) found 57 published studies that assessed the effects of changes in the legal minimum drinking age on indicators of drunk-driving and traffic crashes. A total of 102 crash outcome measures were analyzed (e.g., fatal crashes, drunk-driving crashes, self-reported driving-after-drinking). Of the 102 analyses, more than 50 percent found that raising the drinking age reduced crashes, and lowering it raised the crash rate. Only 2 found a positive relationship between the legal drinking age and traffic crashes. Of the 95 analyses, including comparison groups, 50 (53 percent) found a statistically significant effect of changing the drinking age on car crashes. Most of these analyses (92 percent) employed probability samples or a complete census of the relevant population.

Wagenaar and Toomey (2002) analyzed 24 published studies that assessed the effects of changes in the legal minimum drinking age on indicators of other health and social problem outcomes, such as suicide, homicide, or vandalism. Sixteen percent of these studies showed lower problem levels among adolescents when the drinking age was higher. When they analyzed the 23 studies of higher methodological quality, they found that

35 percent showed that a higher minimum drinking age was associated with lower rates of other problems.

Their analysis of the evidence led them to conclude that—compared to a wide range of other programs and efforts to reduce drinking among high school students, college students, and other teenagers—increasing the legal age for purchase and consumption of alcohol to 21 appears to have been the most effective strategy. In agreement with that, the National Highway Traffic Safety Administration (NHTSA, 1998) estimated that a drinking age of 21 reduced traffic fatalities by 846 deaths in 1997 and prevented a total of 17,359 deaths since 1975. It is clear, however, that the benefits of a higher drinking age are realized only if the law is enforced. Despite higher minimum drinking age laws, young people can and do purchase alcohol (e.g., Forster et al., 1994; Forster et al., 1995; Preusser and Williams, 1992; Grube, 1997). Such sales result from low and inconsistent levels of enforcement, especially when there is little community support for underage alcohol sales enforcement (Wagenaar and Wolfson, 1994, 1995). Even moderate increases in enforcement can reduce sales of alcohol to minors by as much as 35 percent to 40 percent, especially when combined with media and other community and policy activities (Grube, 1997; Wagenaar et al., 2000a,b).

Responsible beverage serving practices. Efforts to promote responsible beverage service or sales (RBS) involve the creation of clear policies (e.g., requiring clerks or servers to check identification for all customers appearing to be under the age of 30) and training in their implementation (e.g., teaching clerks and servers to recognize altered or false identification). RBS can be implemented at both on-license establishments, which can sell alcohol for consumption on premise (e.g., bars, pubs, and restaurants) (Saltz and Stanghetta, 1997), and off-license establishments, which can only sell alcohol for consumption elsewhere (e.g., liquor stores and grocery stores) (Grube, 1997). Saltz and Hennessy (1990a, 1990b) and Saltz (1988) demonstrated that server training is most effective when coupled with a change in actual serving policy and practices of a bar or restaurant. RBS has been found to reduce the number of intoxicated patrons leaving a bar (e.g., Dresser and Gliksman, 1998; Gliksman et al., 1993; Saltz, 1987, 1989) and the number car crashes (e.g., Holder and Wagenaar, 1994). Whether RBS interventions can reduce minors' use of alcohol is less clear. Establishments with firm and clear policies (e.g., checking ID for all patrons who appear under the age of 30) and a system for monitoring staff compliance are less likely to sell alcohol to minors (Wolfson et al., 1996a; Wolfson et al., 1996b). However, Grube (1997) found that voluntary clerk and manager training at off-license establishments had a negligible effect on sales to minors above and beyond the effects of increased enforcement. Similarly, a

study in Australia found that, even after training, age was rarely checked in bars, although decreases in the number of intoxicated patrons were observed (Lang, Stockwell, Rydon, and Beel, 1996, 1998). In one study, RBS training was associated with an increase in self-reported checking of identification by servers (Buka and Birdthistle, 1999). Overall, establishing definite alcohol serving policies in each licensed establishment has the potential to reduce sales of alcohol to youth and overall problematic consumption of alcohol.

Controls on who is selling alcohol. Alcohol control agencies typically spend a considerable part of their time checking the credentials of those seeking licenses to sell alcoholic beverages. Typically, they attempt to keep those with criminal records or associations out of the trade. The minimum age of alcohol sellers that is set in some countries could affect the extent to which underage sales might occur, with younger persons finding themselves less able to distinguish underage from of-age buyers and being more willing to sell to underage buyers. Treno, Gruenewald, Alaniz, Freisthler, and Remer (2000) report that among a community-based sample of alcohol establishments, off-premise sales were more likely from younger than older salespeople. In places where a minimum legal drinking age exists, there is likely to be some sort of informal market to serve underage drinkers. However, no evaluations have been done of minimum age-of-seller restrictions.

Use of false ID to obtain alcohol. Underage persons can obtain alcohol from retail sources using false age identification cards. For example, a survey was conducted among high school juniors and seniors and college students under age 21 in New York and Pennsylvania. New York has generally weak laws on purchase of alcohol by persons under legal age, while Pennsylvania has generally strong laws and state-controlled liquor stores. In comparison with high school respondents in Pennsylvania, more high school students in New York reported that they drank, drank more often, and obtained alcohol from underage friends. More attempts to purchase alcohol at bars, liquor stores, and other outlets were reported by New York high school and college students. Preusser, Ferguson, Williams, and Farmer (1995) found that nearly 60 percent of New York college student respondents reported using false, borrowed, altered, or counterfeit identification to purchase alcohol, compared with 37 percent in Pennsylvania. They also found that nearly 30 percent of New York high school students reported the use of false identification, compared with 14 percent in Pennsylvania. Schwartz et al. (1998) found that 15 percent of high school students, 14 percent of college freshmen, and 24 percent of youth reporting also using illegal drugs said they were able to purchase beer by the case with borrowed, altered, or fake ID. Suggestions to reduce the effective use of

illegal identification include universal ID checking of all alcohol customers, use of two-view or hologram photos on a driver's license, and requiring two or more different ID cards at the point of purchase. Increased enforcement against stores that fail to identify underage customers is another strategy to reduce sales to youth.

Administrative regulations concerning alcohol sales to youth. The enforcement of laws against sales of alcohol to youth varies considerably across states. States that take youth drinking less seriously have much lower arrest rates for violations of sales to youth laws, while states that apparently take sales of alcohol to youth seriously have much higher arrest rates for law violations (Wagenaar and Wolfson, 1994). Wagenaar and Wolfson (1994) found that states that had more arrests for minor crimes tended to have fewer arrests for underage drinking. They concluded that where penalties were lenient, the threats were inadequate to deter providers of alcohol from selling or providing alcohol to underage persons. As a result, they concluded that the enforcement and penalties against providing alcohol to youth were inadequate to serve as an effective deterrent. Because few commercial establishments were cited for serving/selling alcohol to youth, there was no real practical level of deterrence for retail establishments (Wagenaar and Wolfson, 1994).

Compliance checks are efforts to test if underage persons can purchase alcohol from licensed alcohol outlets. While police sting operations often utilize an actual underage person and cite or arrest a clerk or store manager when the underage person is successful in purchasing, most research-based compliance checks utilize underage persons whom a committee of local citizens have judged to look underage and therefore should naturally have their identification checked when attempting to purchase alcohol (Grube, 1997; Holder et al., 2000). Because retailer awareness of enforcement activities is important to the success of compliance check programs, media advocacy efforts are important and should be used to inform the public and retailers about the ongoing intervention. The effects of compliance checks within a community context are described later in this chapter.

A recent study in Louisiana (Scribner and Cohen, 2001) used a repeated intervention design of a random sample of off-sale alcohol outlets in New Orleans. The intervention was a compliance check carried out by the Louisiana Department of Beverage Control (ABC) and involved the use of "underage-looking youth" who ranged from ages 17 to 22 to attempt to purchase alcohol in licensed outlets. If an alcohol sale was made without requiring age identification, then the outlet was considered noncompliant. This enforcement strategy was linked with increased local news coverage to increase both public and off-premise outlet owner/manager awareness of the compliance checks. At baseline before intervention, 11.2 percent of

outlets were compliant. Two months after the intervention, the level of compliance had increased to 39.9 percent. Eight months after the intervention, there was a residual level of compliance even without any further media coverage.

Restrictions on alcohol advertising to youth. Policies that restrict advertising to young people are strategies designed to limit the supply side of alcohol to youth. Such restrictions could conceivably affect consumption (see Grube and Nygaard, 2001). Survey studies consistently find small, but significant, relationships between awareness of and liking of alcohol advertising and adolescents' drinking beliefs and behaviors (e.g., Casswell and Zhang, 1998; Connolly, Casswell, Zhang, and Silva, 1994; Grube, Madden, and Friese, 1996; Grube and Wallack, 1994; Wyllie, Zhang, and Casswell, 1998). Although a few econometric studies have shown positive relationships between advertising expenditures and overall consumption or alcohol-related mortality (e.g., Saffer, 1997), others are negative or mixed in their findings (Duffy, 1995; Nelson and Moran, 1995). Apparently no studies have investigated the specific effects of advertising restrictions on youth drinking or associated problems.

Reducing the Convenience of Retail Alcohol

Such strategies are not targeted specifically at young or underage drinkers, but they have the potential to limit the overall availability of alcohol to all drinkers, including youth. These strategies typically increase the opportunity cost to the drinker, that is, the cost in time and money to actually obtain alcohol from retail sources.

Density of alcohol outlets. The number and concentration of alcohol retail outlets affect the convenience of youth obtaining alcohol, and the distance between outlets increases the cost to obtain alcohol. Restricting alcohol availability through law has been a key policy in Canada, the United States, and many other parts of the world (Kortteinen, 1989; Room, 1987). Gruenewald, Ponicki, and Holder (1993) conducted a time series cross-sectional analysis of alcohol consumption and density of alcohol outlets over all 50 U.S. states. The results indicated that a 10 percent reduction in the density of alcohol outlets would reduce consumption of spirits from 1 percent to 3 percent and consumption of wine by 4 percent. However, Gruenewald, Millar, Ponicki, and Brinkley (2000) did not find a significant relationship between consumption and the density of outlets in neighborhoods. One recent study has investigated the relationship of density of alcohol outlets with underage drinking and driving behavior as reported on two telephone surveys in California (Treno, Grube, and Martin, in press).

The study found that although outlet density did not directly affect either youth driving after drinking or riding with drinking drivers, density did interact with the driver licensing status of the youth on both behaviors. Thus higher density was positively related to drinking and driving among licensed youth drivers and negatively related to riding with drinking drivers among youth who did not have driver licenses. This is the first solid evidence of a relationship between alcohol outlet densities and drinking-related risky behavior by youth.

Licensing of alcohol outlets can restrict the number or density of outlets in a given area as well as the hours of sale, the types of beverages, and the size of beverage containers. Several U.S. studies have investigated the effects of privatization of wine sales and the elimination of a state monopoly on retail sales of distilled spirits (e.g., Wagenaar and Holder, 1995; Holder and Wagenaar, 1990). These studies found an increase in overall consumption, but did not analyze consumption by young people. Valli (1998) reported that when medium strength beer was made available in grocery stores in a township in Finland, drinking among 13- to 17-year-olds increased. Minors could purchase alcohol more easily than when sales had been restricted to state stores.

Days and hours of sale. Reducing the days and times of alcohol sales restricts the opportunities for alcohol purchasing and can reduce heavy consumption. It is a common strategy for reducing drinking-related problems, although the trend in recent years has been to liberalize such restrictions in many countries (e.g., Drummond, 2000). Smith (1988) found that the introduction of Sunday alcohol sales in Brisbane, Australia, was related to increased traffic crashes. However, these results are not unequivocal, as these effects could be contaminated by other trend effects on Sunday sales and nonequivalent distribution of crashes over days of the week (see Gruenewald, 1991). Reducing the hours of sale is associated with decreases in drinking and drinking problems (e.g., Gray, Saggers, Atkinson, Sputore, and Bourbon, 2000) with reductions in hospital admissions, and with arrests for alcohol-related causes. In one of the few studies focusing on youth, it was found that temporary bans on the sales of alcohol from midnight Friday through 10 a.m. Monday because of federal elections reduced cross-border drinking in Mexico by young Americans (Baker, Johnson, Voas, and Lange, 2000). In particular, the early closing on Friday night was associated with a 35 percent reduction in the number of pedestrians crossing the border and a reduction in the number of these with blood alcohol levels of 0.08 percent or higher. In sum, it appears that changes in licensing provisions that substantially reduce hours of service can have a significant impact on drinking and drinking-related problems overall. The evidence that

such changes affect young people is more limited as most evaluations have focused on the total drinking population.

Lower alcohol content of beverages. The active ingredient in alcohol, ethanol, is what makes alcohol a mind-altering substance that lowers performance and increases risk, especially in youth who are less experienced drinkers (on average) than adult drinkers. Increasing the availability of beverages with lower alcohol content may reduce the amount of alcohol consumed and the associated levels of intoxication (Österberg, 1991). Lower alcohol content beverages have been encouraged in many countries in recent years. These beverages often have fewer taxes added, which produces reduced retail prices in countries such as Sweden, Norway, and Finland, where such low-alcohol beer is sold in grocery stores rather than in state-monopoly retail stores. This lower taxation has been used in many Scandinavian countries, which have encouraged three classes of beer according to their alcohol content and at least two classes of wine. In Finland, the sale of medium-strength beer began in 1969 in all food stores and most cafes. Medium-strength beer had been available for a number of years in the state monopoly stores and restaurants (Österberg, 1991). Mäkelä (1970) concluded that the number of drinking occasions in which the blood alcohol level reached 0.10 percent increased by as much as 25 percent in one year following the change, and there was a substantial increase in the estimated numbers of heavy drinkers. On the other hand, Skog (1988), after analyzing the effect of the introduction of light beer in Norway in March 1985, found a substitution of lower for higher alcohol content beer, but the estimate was not statistically significant. He concluded that the data do not permit unequivocal evidence of substitution or addition. Noval and Nilsson (1984) found that total alcohol consumption in Sweden was substantially higher when medium-strength beer could be purchased in grocery stores between 1965 and 1977, rather than only in state monopoly stores. Overall, the evidence is suggestive but not conclusive that making lower alcohol content beverages available can be an effective strategy. This strategy does, on the face of it, have the potential to reduce the level of absolute alcohol consumed and associated intoxication and impairment. Studies of the specific effects of reduced-alcohol beverages on young people apparently have not been done.

Strategies for Reducing Social and Third-Party Access to Alcohol

As described previously, a substantial portion of alcohol obtained by underage persons is from social sources (e.g., friends, parties, homes) and other persons (both underage and of legal age) who purchase alcohol and

provide it to underage persons. The effort to limit alcohol access from these sources most likely remains the most significant challenge for youth drinking prevention.

Reducing third-party purchases and provision of alcohol. The Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice, has created a guide for reducing alcohol access by youth (OJJDP, 1999). The highest priorities recommended by OJJDP is a compendium of environmental strategies, including "shoulder taps" and compliance checks (described previously). Shoulder taps occur when an underage person asks another person to purchase alcohol on their behalf. This is a common strategy that adolescents use to obtain alcohol (e.g., Jones-Webb et al., 1997; Smart, Adalf, and Walsh, 1996; Wagenaar et al., 1993; Wagenaar et al., 1996), in part because young people believe it is less risky than purchasing alcohol themselves. Underage persons themselves are breaking the law through this purchase, even if they do not consume the alcohol. Adults of legal purchase age are also breaking the law by purposefully purchasing alcohol for a young person. Shoulder tap interventions occur when an underage person or a person who appears to be underage, stands outside a licensed alcohol outlet and asks an older person to purchase alcohol. In such cases, the potential buyer may be offered a small "fee" for making this purchase. If the older person actually makes the alcohol purchase and gives it to the youth, the older person can be arrested or cited by the police. The shoulder tap intervention is a recommended strategy to directly reduce third-party alcohol transactions by enforcing laws prohibiting the provision of alcohol to minors (NHSTA, 1997; Stewart, 1999). The utilization of strategies addressing shoulder taps is a potentially promising strategy to reduce third-party sources of alcohol to minors that has not been tested seriously in replicated controlled studies.

Party patrols. Parties are another major source of alcohol for underage drinkers (e.g., Wagenaar et al., 1993). Underage drinking parties frequently involve large groups and are commonly held in a home, an outdoor area, or another public location such as a hotel room. Party patrols are a recommended strategy to address underage drinking parties (Little and Bishop, 1998; Stewart, 1999). Parties are frequently cited as one of the settings at highest risk for youth alcohol consumption and related problems, and have been linked to impaired driving, sexual assaults, violence, property damage, and the initiation of alcohol use of younger adolescents by older adolescents (Mayer, Forster, Murray, and Wagenaar, 1998; Schwartz and Little, 1997; Wagenaar et al., 1993). Decreased sales to older minors, in turn, are expected to reduce availability of alcohol to younger adolescents. When a party patrol is used, police enter locations where parties are in progress.

They can use noise or nuisance ordinances as a basis for entering a party to observe if underage drinking is taking place. In party patrol strategies, police are enlisted, as a part of their regular patrol duties, to routinely: (1) enter premises where parties that may involve underage drinking are underway, (2) respond to complaints from the public about noisy teenage parties where alcohol use is suspected, and (3) check, as part of regular weekend patrols, open areas and other venues where teen parties are known to occur. When underage drinking is discovered, the drinkers and the person who supplied the alcohol can be cited. Even when it is not possible to cite the person who supplied the alcohol, awareness of increased police activity in this regard can act as a deterrent and can express community norms regarding the unacceptability of providing alcohol to minors. As with other environmental interventions, public awareness and media attention are important to increase the deterrence effect of this strategy. This strategy has not been tested in controlled prevention trials.

Keg registration. Keg registration laws require the purchaser of a keg of beer to complete a form that links the purchaser's name to a number on the keg. If a beer keg is found in a drinking setting where young people are consuming alcohol, then the person who purchased the keg can be identified and held responsible. Keg registration is considered primarily as a tool for prosecuting adults who supply alcohol to young people at parties and even establishments that rent beer kegs to underage persons. Keg registration laws have become increasingly popular at the local level in the United States. Unfortunately, no studies have been done on the effectiveness of these laws in reducing access to alcohol by underage persons.

Restrictions on drinking locations and possession of alcohol. Specifying locations where drinking cannot occur is a policy that has been implemented in conjunction with laws about public drinking and/or public intoxication, as well as those prohibiting drinking in parks or recreational locations or in the workplace. These restrictions have real potential for affecting youth drinking because youth often prefer recreational venues for drinking, such as public parks, beaches, and lakes. Limiting drinking in such locations also holds the potential for reducing social access to alcohol provided by others. Discussions of these types of interventions are contained in Giesbrecht and Douglas (1990) and "Communities Mobilize to Rescue the Parks" (1991). These policies have been employed in a number of forms throughout the world, but have not been systematically evaluated for the specific effects on access to alcohol by underage persons.

The four strategies just described have promising evidence of potential value in reducing youth access to alcohol, but they have not been tested via controlled trials for their effectiveness. Each has the potential to be effective

based on other strategies that have been successful in reducing retail access of alcohol to youth.

Curfews for youth. Curfews establish a time when children and young people below certain ages must be home. Although the use of curfews was not initially considered an alcohol-problem prevention strategy, research has shown positive effects. The goal is to reduce the availability of alcohol to youth through social sources and to reduce the convenience of obtaining alcohol at youth gatherings. In states that have established such curfews, alcohol-involved traffic crashes for young people below the curfew age have declined (Preusser, Williams, Zador, and Blomberg, 1984; Williams, Lund, and Preusser, 1984).

Strategies That Increase Sanctions Against Sale/Service to Youth and Sanctions Against Youth

These are liability and administrative strategies to prevent others from providing alcohol to youth and to deter youth themselves from possessing alcohol illegally.

Legal (Tort) liability concerning alcohol sales and service to youth. Liability and administrative regulations are strategies that have the power of court or legal regulation to hold persons or establishments responsible for sale or service of alcohol to youth and the social provision of alcohol (social hosts) to youth. Tort liability concerning drinking and alcohol sale/service establishes civil penalties, usually some form of a fine or liability for civil suit, to those who are found responsible for specific types of alcohol-involved harm, including providing alcohol to minors (see discussion by Sloan, Stout, Whetten-Goldstein, and Lliang, 2000). Most tort liability provisions and court actions have been directed at licensed establishments for providing alcohol to an underage person. The rationale for establishing third-party liability, rather than first-party offenders (e.g., drunks or minors) includes a recognition that such parties may lack the ability to make appropriate compliance decisions (Kraakman, 1998), there are fewer third parties to regulate, third parties can be efficient monitors of alcohol service practices, and commercial sellers are in a better financial position to render compensation. Most states have a requirement that a customer must be of eligible age to drink alcohol sold. Under these statutes, statutory liability exists only for a third party, not the minor, for legal action. Therefore, even if a licensed establishment's sale/service of alcohol to the minor may be an illegal sale, the minor cannot establish the statutory cause of action (Matthew Bender and Co., *Liquor Law Liability*, Ref. 14-401, Pub. 498).

In a few jurisdictions, tort liability has been extended to social hosts on the basis that social hosts can monitor their guests' drinking before driving and the serving of alcohol to minors. In some states, such as California, there are strict limits on social host liability, but courts are increasingly finding ways around these limits. For example, in 1995 New Hampshire recognized a common-law cause of action for social host liability and a North Carolina court in 1992 recognized a cause of action for a social host who serviced a visibly intoxicated guest. In 1999 in Georgia there was a suit against a 16-year-old boy and his parents. The boy served alcohol in his home to a 15-year-old girl. The parents were not held liable because they were not home at the time and there was no evidence that they had previously provided beer to their son or his friends. However, the boy was held liable, even though he himself was a minor, and it was of no consequence that the girl willingly drank the alcohol because under the Georgia legal code, the cause of action belonged to the plaintiffs.

Dram shop liability is a special form of tort liability that allows individuals who have been harmed by a person impaired by alcohol to sue that person. Retail alcohol outlets have long contended that drinkers who purchase alcohol from legal licensed establishments are responsible for the consequences of their own drinking. State legislatures and the courts under dram shop liability have established that providing alcohol to an obviously intoxicated person or in amounts that obviously lead to impairment can be grounds for a civil suit and possible damages. The use of dram shop liability has been advanced as a potential tool to deter sellers and social hosts from irresponsible selling or provision of alcohol. This is discussed in Mosher (1984) and Holder et al. (1993). Much of the research concerning the effects of tort liability in general, and dram shop liability in particular, has focused on intoxicated persons who subsequently are involved in some type of traffic crash. However, because selling or serving alcohol to persons under the legal drinking age also can be grounds for liability in many states, this also becomes a part of the possible prevention strategies to reduce alcohol service and sales to youth, especially when an intoxicated minor is involved in a traffic crash. In addition, youth are more likely than older people to be driving while impaired by alcohol (Gruenewald et al., 1996).

Tort liability has several features that support its place as an alternative for prevention. The argument for tort liability concerning youth drinking is the threat of monetary damage when a youth is impaired by alcohol. If those who provide alcohol to youth who subsequently injure others are liable for damages, this can deter, so the argument goes, those who would provide alcohol to youth.

Sloan et al. (2000) analyzed traffic fatalities across all states and examined the potential effect of a number of factors on fatalities over time and

across states. They examined in particular the effect of tort liability on commercial servers for selling alcohol to underage drinkers. They found that imposing such tort liability on commercial services resulted in reduced fatality rates for those drivers under 21 (actually 15 to 20) controlling for other dependent variables. This is a single-cross sectional and time-series study that demonstrates the potential of tort liability regarding selling alcohol to persons under 21. Even though it is a single study, the use of data from all 50 states across time increases the strength of the conclusions. The only issue for replication concerns the selection of other intervening and explanatory variables not included by these authors. This study did not include a variable for the existence of social host liability.

Zero-tolerance laws. Zero-tolerance laws set lower blood alcohol level limits for underage drivers and/or create a risk of loss of license when an underage youth has been found to be drinking, even if the youth was not driving. Usually this limit is set at the minimum that can be detected reliably by breath testing equipment (i.e., 0.01-0.02 blood alcohol level). Zero-tolerance laws also commonly invoke other penalties such as automatic license revocation. An analysis of the effect of zero-tolerance laws in the first 12 states enacting them found a 20 percent relative reduction in the proportion of single-vehicle nighttime fatal crashes among drivers under 21, compared with nearby states that did not pass zero-tolerance laws (Hingson, Heeren, and Winter, 1994b, Martin, Grube, Voas, Baker, and Hingson, 1996). Zwerling and Jones (1999) reviewed six studies on the impact of zero tolerance. All studies showed that the policy reduced injuries and crashes attributed to youthful drivers. In three of the studies, however, the reductions were not statistically significant, possibly because of a lack of statistical power. More recent empirical studies have provided additional evidence for the effectiveness of zero-tolerance laws. Thus, a study of all 50 states and the District of Columbia found a net decrease of 24 percent in the number of young drivers with positive blood alcohol levels as a result of the implementation of zero-tolerance laws (Voas et al., 1999). Similarly, a 19 percent reduction in self-reported driving after any drinking and a 24 percent reduction in driving after five or more drinks was found using Monitoring the Future survey data from 30 states (Wagenaar, O'Malley, and LaFond, 2001). Differences in enforcement of zero-tolerance laws have been identified as a key issue in understanding why some programs are less successful than others (Ferguson, Fields, and Voas, 2000), as has lack of awareness on the part of young people (Balmforth, 1999; Hingson, Heeren, and Winter, 1994a). The use of media campaigns to increase young peoples' awareness of reduced blood alcohol level limits and of enforcement efforts can significantly increase the effectiveness of zero-tolerance laws (Blomberg, 1992).

Alcohol policies at schools and universities. School and university policies are formal regulations that provide for sanctions against youth for the possession of alcohol on school or university property. The penalties are usually a part of school policies that ban or provide restrictions for possession or provision of alcohol on school property. Such policies are popular among colleges and universities. Nearly half of U.S. elementary, middle/junior high, and senior high schools have explicit policies prohibiting alcohol use on campus and at school functions and, in some cases, any possession of alcohol by students (Modzeleski, Small, and Kann, 1999). Universities have similar policies prohibiting alcohol in school facilities, prohibiting use by underage students, or restricting alcohol advertising on campus (Wechsler et al., 2000). Grimes and Swisher (1989) found that students report that such policies are barriers to drinking, but there are few controlled evaluations of such policies. Odo, McQuiller, and Stretsky (1999), in a study of newly enacted policies that prohibited alcohol in all university-affiliated living residences (i.e., dorms, fraternities, sororities), found that such policies were associated with reduced prevalence of drinking in the affected residences, but not with the frequency of heavy drinking. A case study of a campus prohibition on underage drinking or possession of alcohol, public consumption, and use of kegs was reported (Cohen and Rogers, 1997) with positive findings, but lacking a control or comparison condition, it is not possible to accept findings unconditionally. These studies provide promising but incomplete evidence of the potential for such administrative policies to reduce underage drinking.

STRATEGIES THAT ALTER THE ENVIRONMENT OF DRINKING

There are a number of strategies that target the drinking context for alcohol and that are relevant to any consideration of supply side prevention strategies for youth. This chapter recognizes that at least one other chapter addresses drinking and driving; in this chapter, we are concerned with how such strategies affect the drinking context and thus social and retail supply of alcohol. Youth who drive often supply alcohol to others in the context of motor vehicles, and regular and highly visible enforcement of drinking and driving can affect social supply, such as the provision of alcohol to youth at parties. In addition, alcohol retail outlets such as bars, restaurants, and pubs can be affected (sometimes threatened) by highly visible enforcement of their sales practices, but especially by extensive drink-drive enforcement such as random breath testing. In addition, the threat of the loss of one's driver's license for possession of alcohol or even for drinking can alter youth motivation to seek alcohol and reduce alternative forms of alcohol supply. These strategies are seen as a complement to strategies directed at alcohol supply to youth.

Drinking and Driving

Random breath testing (RBT) involves extensive and continuous random stops of drivers, who are required to take a breath test to establish their blood alcohol level. Tests of RBT in Australia (Homel, 1986, 1990), Canada (Mercer, 1985) and Great Britain (Ross, 1988a, 1988b) indicate that this strategy reduces car crashes. For example, in Australia, RBT resulted in a 24 percent reduction in nighttime crashes, especially in metropolitan areas (e.g., Cameron, Cavallo, and Sullivan, 1992; Cameron, Diamantopoulou, Mullan, Dyte, and Gantzer, 1997; Drummond, Sullivan, and Cavallo, 1992). Both enforcement and public awareness seem to be needed for the success of these programs. Moore, Barker, Ryan, and McLean (1993) found that males and those under age 30 perceived it was unlikely that they would be apprehended for drinking and driving despite RBT programs. However, the perceived likelihood of apprehension increased with exposure to RBT, notably when that exposure was recent. Ross (1982) pointed out that the threat of enforcement, or public expectation that one may be stopped and arrested, has had more influence than actual enforcement. However, increased public expectations of arrest must be reinforced with actual increased enforcement to have a sustained effect (Hingson, Howland, and Levenson, 1988; Vingilis and Coultes, 1990; Zador, Lund, Fields, and Weinberg, 1989).

Sobriety checkpoints, a limited version of RBT, are often implemented in individual U.S. states under prescribed circumstances often involving pre-notification about when and where they will be implemented. Even under these restricted circumstances there is some evidence that they reduce drinking and driving and related traffic crashes. Evaluation of a Tennessee checkpoint program (Lacey, Jones, and Smith, 1999), for example, showed a 20 percent decrease in alcohol-related fatal crashes and a 6 percent reduction in single vehicle nighttime crashes. These effects were observable 21 months after implementation of the program. Similarly, an evaluation of checkpoint programs in four California communities indicated that they decreased alcohol-involved injury and fatal crashes by 9 percent to 40 percent, depending upon the community (Stuster and Blowers, 1995). No significant changes were observed in non-alcohol involved crashes or in a comparison community. Surprisingly, the degree of success of the programs was the same regardless of low or high staffing levels or whether mobile units or stationary checkpoints were used. Public awareness and publicity, however, were identified as important mediators of effectiveness. No studies have evaluated the effects of these strategies on youth drinking and driving but there is no reason to believe that this age group of drinking drivers would not be affected by such policies.

Per se Laws

Per se laws specify the blood alcohol level or concentration at which a driver is considered legally impaired (i.e., the level at which a driver can be arrested and charged with drinking and driving). The per se level has been declining in Europe, Australia, New Zealand, and North America. Reductions in the allowable levels of driver impairment have been associated with reduced crash levels (Liben, Vingilis, and Blefgen, 1987; Ross, 1982; Zador et al., 1989).

Administrative License Revocation

Laws permitting the withdrawal of driving privileges without court action have been adopted by 38 states to prevent traffic crashes caused by unsafe driving practices, including driving with a blood alcohol level over the legal limit (Hingson et al., 1996). These laws were associated with a 5 percent to 9 percent decline in nighttime fatal crashes in some studies (Hingson, 1993; Zador et al., 1989). License revocation is one type of punishment that has been shown to be effective in reducing repeated incidents of drinking and driving and as a major deterrent to youthful drinkers who drive. The threat of loss of one's driver's license has been shown to have important effects in deterring drinking and driving by persons previously convicted of driving under the influence (Ross, 1991). This strategy, which has not been evaluated specifically for effects on youth drinking and driving, is considered to be especially relevant to youth because the driver's license is a high-status, valuable possession for young people.

Graduated Licenses

Graduated licensing places special limits on new or young drivers. For example, it restricts nighttime driving and/or prohibits driving with other adolescents. A graduated licensing program in Connecticut led to a 14 percent net reduction in crash involvement among the youngest drivers (Ulmer, Ferguson, Williams, and Preusser, 2000). Similarly, in New Zealand, a 23 percent reduction in car crash injuries among novice drivers was found after implementation of a graduated licensing system (Langley, Wagenaar, and Begg, 1996). In Ontario, Canada, a 25 percent reduction in self-reported drinking and driving was found following the introduction of graduated licensing (Mann et al., 1997). A 27 percent reduction in alcohol-related crashes involving new drivers was also found in that province following implementation of the program (Boase and Tasca, 1998). Among the youngest drivers (ages 16 to 19) the reduction in alcohol-related crashes was somewhat smaller (19 percent), but still statistically significant.

Automobile Ignition Interlock Devices

Automobile ignition interlocks are devices that prevent the driver from starting the car if the driver's blood alcohol level is above a preset limit. This device has been discussed as a potential means to reduce all drinking and driving, but has been used in the United States primarily as a means to prevent a drinking and driving offender with multiple offenses from starting his/her auto after drinking (Voas, 1988). As the price of these devices declines, requiring them in cars that adolescents drive could be possible.

COMMUNITY INTERVENTIONS

A recent development in strategies to affect the supply side of alcohol for youth are comprehensive community projects that utilize one or more environmental strategies in concert (as described individually earlier) to affect alcohol access by youth. We will describe two examples of such projects.

Communities Mobilizing for Change on Alcohol

Communities Mobilizing for Change on Alcohol (CMCA) was a community organizing effort designed to reduce the accessibility of alcohol to youth under the legal drinking age of 21. CMCA focused on changing local policies and practices to reduce underage access to alcohol (Wagenaar, Murray, Wolfson, Forster, and Finnegan, 1994). Interventions undertaken by the communities included decoy operations (i.e., "stings") with alcohol outlets, citizen monitoring of outlets selling to youth, keg registration, alcohol-free events for youth, reducing hours of sale for alcohol, responsible beverage service training, and information programs for youth and adults (Wagenaar and Perry, 1994; Wagenaar, Gehan, Jones-Webb, Toomey, and Forster, 1999). The CMCA project recruited 15 communities in Minnesota and western Wisconsin. Communities were matched and randomly assigned to the intervention or control condition, resulting in seven intervention sites and eight comparison sites, ranging in population from 8,000 to 65,000.

The CMCA project employed a part-time local organiser within each community to activate the communities to select and implement interventions designed to reduce underage access to alcohol.

Evaluation data were collected before the intervention and about two-and-a-half years after beginning the intervention. These data included a survey of ninth and twelfth grade students, telephone surveys of 18- to 20-year-olds and beverage alcohol merchants, a study using 21-year-old women who appeared to be younger to see if they would be sold or served alcohol without identification, and monitoring of mass media. Qualitative and

quantitative process data were collected to capture how the intervention moved ahead and the obstacles staff and communities faced in reaching their objectives.

Merchant survey data revealed that they increased checking for age identification, reduced their likelihood of sales to minors, and reported more care in controlling sales to youth (Wagenaar et al., 1996). The study using purchasers who looked young confirmed that alcohol merchants increased age-identification checks and reduced their propensity to sell to minors. The telephone survey of 18- to 20-year-olds indicated that they were less likely to consume alcohol themselves and less likely to provide it to other underage persons (Wagenaar et al., 2000a,b). Finally, the project found a statistically significant net decline (intervention compared to control communities) in drinking and driving arrests among 18- to 20-year olds and disorderly conduct violations among 15- to 17-year-olds (Wagenaar et al., 2000a,b).

The interventions (Wagenaar et al., 2000a,b) reduced both drinking (7 percent reduction in 30-day prevalence and 4 percent decrease in drinking occasions) and drinking-related behaviors among 18- to 20-year-olds, and decreased alcohol sales to minors. However, no overall effect was found for drinking by high school-aged youth. A purchase attempt survey revealed that the interventions led to a 10 percent net increase in checking for age identification, and a 10 percent net reduction in merchants' alcohol sales to minors (Wagenaar et al., 2000a,b).

The Community Trials Project

The Community Trials Project (Holder et al., 1997) tested a five-component community intervention to reduce alcohol-related harm among people of all ages. Three experimental and three matched comparison communities were selected, each with a population of approximately 100,000. Each community was racially diverse, with 40 percent or more minority group members. The Community Trials Project fielded five intervention components: (1) a "Media and Mobilization" component to develop community organization and support for the goals and strategies of the project and to utilize local news to increase public support of environmental strategies; (2) a "Responsible Beverage Service" component to reduce service to intoxicated patrons at bars and restaurants; (3) a "Sales to Youth" component to reduce underage access; (4) a "Drinking and Driving" component to increase local enforcement of driving while intoxicated laws; and (5) an "Access" component to reduce the availability of alcohol. Comparing experimental and control communities, it was found that the intervention produced significant reductions in nighttime injury crashes (10 percent lower in experimental than in comparison communities) and in crashes in

which the driver was found by police to "have been drinking" (6 percent). Assault injuries observed in emergency departments declined by 43 percent in the intervention communities vs. the comparison communities, and all hospitalized assault injuries declined by 2 percent. There was a 49 percent decline in reports of driving after "having had too much to drink" and 51 percent in self-reports of driving when "over the legal limit." Surprisingly, although the drinking population increased slightly in the experimental sites over the course of the study, there was a significant reduction in problematic alcohol use: Average drinks per occasion declined by 6 percent and the variance in drinking patterns (an indirect measure of heavy drinking) declined by 21 percent (Holder et al., 2000). Of particular interest is that the Sales to Youth component produced a significant reduction in alcohol sales to minors. Overall, off-premise outlets in experimental communities were half as likely to sell alcohol to minors as in the comparison sites. This was the joint result of special training of clerks and managers to conduct age identification checks, the development of effective off-premise outlet policies, and, especially, the threat of enforcement of lawsuits against sales to minors (Grube, 1997).

Community Interventions Overall

These two community studies support the positive effects of compliance checks of alcohol merchants as well as the utilization of multiple strategies in concert. Other studies have also demonstrated that such comprehensive strategies can make substantial contributions to declines in alcohol sales to minors in a relatively short period of time. For example, a program in Denver yielded reductions in sales to underage police cadets of more than 50 percent over 10 months (Preusser, Williams, and Weinstein, 1994); similar reductions are reported by Lewis et al. (1996). Levels of enforcement can be enhanced significantly with only modest increases in community support, and even moderate increases in enforcement can reduce outlet sales of alcohol to minors, especially when combined with media and other community and policy activities (Grube, 1997; Lewis et al., 1996; Wagenaar et al., 2000a,b).

Available research has confirmed that no local policy to reduce youth drinking can be fully effective unless it is enforced adequately, and there is public awareness of both the policy and its enforcement efforts on the part of the intended targets. Media advocacy constitutes the purposeful use of local news (i.e., newspapers, radio, and TV) in support of local policy. It has been shown to be a low-cost, yet effective strategy to increase public awareness and public support of alcohol availability strategies (Stewart and Casswell, 1993; Treno and Holder, 1997; Treno et al., 1996; Holder and

Treno, 1997). Media advocacy will be used to increase perception of risk of citation of retail sellers, underage buyers, parents, and other adults for selling and/or providing alcohol to underage persons; increase citizens' awareness and acceptance of enforcement; enhance communities' perceptions of ownership of intervention strategies; and support efforts to increase the perceived risk of providing alcohol to minors at parties. The project coordinator in each intervention community will arrange for newspaper articles that describe the intervention activities and report the number of off-sale outlets that were cited for sales to minors. Television news coverage will include hidden cameras that record decoy operations where alcohol is purchased by underage decoys, as well as more general stories (Grube, 1997). Based on the Community Trials Project (Holder et al., 2000), media advocacy will increase local media news coverage of the problem of underage drinking and the enforcement strategies being undertaken. In practice, local news media monitor each other's news and, as a result, a story in one source often is repeated in another source. This increase in news coverage leads to community awareness (Holder and Treno, 1997). Thus it operates as an essential adjunct of the environmental strategies implemented, although it is not an end in itself.

CONCLUSION

Based on the available scientific evidence from more than one controlled study, the most effective public policies to reduce the retail and social alcohol availability to youth and associated problems appear to be (1) the minimum drinking age and its enforcement, (2) zero tolerance or graduated licensing, and (3) enforcement of sales of alcohol to underage persons, especially using compliance checks of retail sales of alcohol to underage persons. The effects of reducing alcohol outlet density on youth drinking need further study. There is one positive, significant finding of a relationship between outlet density and youth DUI. The potential of tort liability to reduce traffic crashes for persons under 21 is based on one national study.

Random breath testing and sobriety checkpoints appear promising for reducing drinking and driving based on studies with the general population, although there is little available evidence for their effectiveness, specifically with young people and the potential to impact both social and retail supply. Relatively large changes in the conditions of sale, such as increasing the form of alcohol availability or changing the days and hours of alcohol sale, could possibly alter youth access to alcohol. Similarly, the introduction or legalization of specific beverage types appears to change beverage preferences and possibly increase consumption.

What is unknown at this point in time is the effectiveness of strategies to reduce the social availability of alcohol to youth. Approaches such as shoulder taps, party patrols, or keg registration need controlled testing and evaluation, although on the surface such strategies have the potential to be effective. Although strategies with a similar theoretical basis have been shown to be effective, we do not have evidence from controlled trials. The bottom line is that no strategy to affect the supply side of alcohol for youth will be consistently effective unless applied in practice and enforced. This enforcement is largely dependent on the will and desire of states and communities to support such application and enforcement. Without consistent enforcement, little of the potential of these strategies can be achieved in practice.

REFERENCES

Atken, P.P., Eadie, D.R., Leathar, D.S., McNeill, R.E., and Scott, A.C. (1988). Television advertisements for alcoholic drinks do reinforce under-age drinking. *British Journal of Addiction*, *83*, 1399-1419.

Austin, E.W., and Nach-Ferguson, B. (1995). Sources and influences of youth and school-age children's general and brand-specific knowledge about alcohol. *Health Communication*, *9*, 323-349.

Baker, T.K., Johnson, M.B., Voas, R.B., and Lange, J.E. (2000). Reduce youthful binge drinking: Call an election in Mexico. *Journal of Safety Research*, *31*(2), 61-69.

Balmforth, D. (1999). *National survey of drinking and driving, attitudes and behavior: 1997*. (DOT HS No. 808 844). Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Blomberg, R.D. (1992). *Lower BAC limits for youth: Evaluation of the Maryland .02 Law* (DOT HS No. 807 860). Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Boase, P., and Tasca, L. (1998). *Graduated licensing system evaluation: Interim report '98*. Toronto: Ministry of Transportation of Ontario.

Buka, S.L., and Birdthistle, I.J. (1999). Long-term effects of a community-wide alcohol server training intervention. *Journal of Studies on Alcohol*, *60*, 27-36.

Cameron, M., Cavallo, A., and Sullivan, G. (1992). *Evaluation of the random breath testing initiative in Victoria 1989-1991. Multivariate time series approach*. (Report No. 38). Victoria, Australia: Monash University Accident Research Centre.

Cameron, M., Diamantopoulou, K., Mullan, N., Dyte, D., and Gantzer, S. (1997). *Evaluation of the country random breath testing and publicity program in Victoria, 1993-1994*. (Report No. 126). Victoria, Australia: Monash University Accident Research Centre.

Casswell, S., and Zang, J.F. (1998). Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: A longitudinal study. *Addiction*, *93*(8), 1209-1217.

Cohen, F., and Rogers, D. (1997). Effects of alcohol policy change. *Journal of Alcohol and Drug Education*, *42*, 69-82.

Communities Mobilize to Rescue the Parks. (1991, Winter). *Prevention File*, *6*(1), 7-8.

Connolly, G.M., Casswell, S., Zhang, J.F., and Silva, P.A. (1994). Alcohol in the mass media and drinking by adolescents: A longitudinal study. *Addiction*, *89*(10):1255-1263.

Cook, P.J., and Moore, M.J. (2001). The economics of alcohol abuse and alcohol-control policies. *Health Affairs*, *21*, 120-133.

Cook, T.D., and Campbell, D.T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago: Rand McNally.

Dresser, J., and Gliksman, L. (1998). Comparing statewide alcohol server training systems. *Pharmacology, Biochemistry, and Behavior*, *61*,150.

Drummond, A.E, Sullivan, G., and Cavallo, A. (1992). *An evaluation of the random breath testing initiative in Victoria 1989-1990: Quasi-experimental time series approach* (Report No. 37). Victoria, Australia: Monash University Accident Research Centre.

Drummond, D.C. (2000). UK government announces first major relaxation in the alcohol licensing laws for nearly a century: Drinking in the UK goes 24-7. *Addiction*, *95*(7), 997-998.

Duffy, M. (1995). Advertising in demand systems for alcoholic drinks and tobacco: A comparative study. *Journal of Policy Modeling*, *17*, 557-577.

Ferguson, S.A., Fields, M., and Voas, R.B. (2000, May). *Enforcement of zero tolerance laws in the United States*. Paper presented at the 15th International Conference on Alcohol, Drugs, and Traffic Safety, Stockholm, Sweden.

Forster, J.L., McGovern, P.G., Wagenaar, A.C., Wolfson, M., Perry, C.L., and Anstine, P.S. (1994). The ability of young people to purchase alcohol without age identification in northeastern Minnesota, USA. *Addiction*, *89*(6), 699-705.

Forster, J.L., Murray, D.M., Wolfson, M., and Wagenaar, A.C. (1995). Commercial availability of alcohol to young people: Results of alcohol purchase attempts. *Preventive Medicine*, *24*(4), 342-347.

Giesbrecht, N. and Douglas, R.R. (1990, January). *The demonstration project and comprehensive community programming: Dilemmas in preventing alcohol-related problems*. Paper presented at the International Conference on Evaluating Community Prevention Strategies: Alcohol and Other Drugs, San Diego, CA.

Gliksman, L., McKenzie, D., Single, E., Douglas, R., Brunet, S., and Moffatt, K. (1993). Role of alcohol providers in prevention: An evaluation of a server intervention programme. *Addiction*, *88*, 1195-1203.

Gray, D., Saggers, S., Atkinson, D., Sputore, B., and Bourbon, D. (2000). Beating the grog: Evaluation of the Tennant Creek liquor licensing restrictions. *Australian and New Zealand Journal of Public Health*, *24*(1), 39-44.

Grimes, J.D., and Swisher, J.D. (1989). Educational factors influencing adolescent decision-making regarding use of alcohol and drugs. *Journal of Alcohol and Drug Education*, *35*, 1-15.

Grube, J.W. (1997). Preventing sales of alcohol to minors: Results from a community trial. *Addiction*, *92*(Suppl. 2), S251-S260.

Grube, J.W., Madden, P.A., and Friese, B. (1996, June). *Television alcohol advertising increases adolescent drinking*. Poster presented at the annual meeting of the American Psychological Society, San Francisco, CA.

Grube, J.W., and Nygaard, P. (2001). Adolescent drinking and alcohol policy. *Contemporary Drug Problems*, *28*, 87-131.

Grube, J.W., and Wallack, L. (1994). Television beer advertising and drinking knowledge, beliefs, and intentions among school children. *American Journal of Public Health*, *84*, 254-259.

Gruenewald, P.J. (1991, October). *Alcohol problems and the control of availability: Theoretical and empirical issues*. Paper presented at the National Institute on Alcohol Abuse and Alcoholism Conference, Economic and Socioeconomic Issues in the Prevention of Alcohol Related Problems, Bethesda, MD.

Gruenewald, P.J., Millar, A., Ponicki, W.R., and Brinkley, G. (2000). Physical and economic access to alcohol: The application of geostatistical methods to small area analysis in community settings. In R.A. Wilson and M.C. DuFour (Eds.), *The epidemiology of alcohol problems in small geographic areas* (pp. 163-212). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Gruenewald, P.J., Millar, A.B., Treno, A.J., Yang, Z., Ponicki, W.R., and Roeper, P. (1996). The geography of availability and driving after drinking. *Addiction*, *91*(7), 967-983.

Gruenewald, P.J., Ponicki, W.B., and Holder, H.D. (1993). The relationship of outlet densities to alcohol consumption: A time series cross-sectional analysis. *Alcoholism: Clinical and Experimental Research*, *17*(1), 38-47.

Harrison, P.A., Fulkerson, J.A., and Park, E. (2000). Relative importance of social versus commercial sources in youth access to tobacco, alcohol, and other drugs. *Preventive Medicine*, *31*, 39-48.

Hingson, R. (1993). Prevention of alcohol-impaired driving. *Alcohol Health and Research World*, *17*(1), 28-34.

Hingson, R.W., Heeren, T., and Winter, M. (1994a). Effects of lower legal blood alcohol limits for young and adult drivers. *Alcohol, Drugs and Driving*, *10*, 243-252.

Hingson, R., Heeren, T., and Winter, M. (1994b). Lower legal blood alcohol limits for young drivers. *Public Health Reports*, *109*(6), 738-744.

Hingson, R.W., Howland, J., and Levenson, S. (1988). Effects of legislative reform to reduce drunken driving and alcohol-related traffic fatalities. *Public Health Reports*, *103*(6), 659-667.

Hingson, R.W., McGovern, T., Howland, J., Heeren, T., Winter, M., and Zakocs, R. (1996). Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program. *American Journal of Public Health*, *86*(6), 791-797.

Holder, H.D., Gruenewald, P.J., Ponicki, W.R., Grube, J.W., Saltz, R.F., Voas, R.B., Reynolds, R., Davis, J., Sanchez, L., Gaumont, G., Roeper, P., and Treno, A.J. (2000). Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *Journal of the American Medical Association*, *284*(18), 2341-2347.

Holder, H.D., Janes, K., Mosher, J., Saltz, R., Spurr, S., and Wagenaar, A.C. (1993). Alcohol beverage server liability and the reduction of alcohol-involved problems. *Journal of Studies on Alcohol*, *54*(1), 23-36.

Holder, H.D., Saltz, R.F., Grube, J.W., Voas, R.B., Gruenewald, P.J., and Treno, A.J. (1997). A community prevention trial to reduce alcohol-involved accidental injury and death: Overview. *Addiction*, *92*(Suppl. 2), S155-S172.

Holder, H.D., and Treno, A.J. (1997). Media advocacy in community prevention: News as a means to enhance policy change. *Addiction*, *92*(Suppl. 2), S189-S199.

Holder, H.D., and Wagenaar, A.C. (1990). Effects of the elimination of a state monopoly on distilled spirits' retail sales: A time-series analysis of Iowa. *British Journal of Addiction*, *85*(12), 1615-1625.

Holder, H.D., and Wagenaar, A.C. (1994). Mandated server training and reduced alcohol-involved traffic crashes: A time series analysis of the Oregon experience. *Accident Analysis and Prevention*, *26*(1), 89-97.

Homel, R. (1986). *Policing the drinking driver: Random breath testing and the process of deterrence*. Canberra: ACT, Federal Office of Road Safety.

Homel, R. (1990). Random breath testing and random stopping programs in Australia. In R.J. Wilson and R.E. Mann (Eds.), *Drinking and driving: Advances in research and prevention*. New York: Guilford.

Jones-Webb, R., Toomey, T., Miner, K., Wagenaar, A.C., Wolfson, M., and Poon, R. (1997). Why and in what context adolescents obtain alcohol from adults: A pilot study. *Substance Use and Misuse*, *32*(2), 219-228.

Klepp, K.I., Schmid, L.A., and Murray, D.M. (1996). Effects of the increased minimum drinking age law on drinking and driving behavior among adolescents. *Addiction Research*, *4*(3), 237-244.

Komro, K., and Toomey, T. (2002). Strategies to prevent underage drinking. *Alcohol Research and Health*, *26*, 5-14.

Kortteinen, T. (Ed.) (1989). *State monopolies and alcohol prevention. Report and working papers of a collaborative international study*, No. 181. Helsinki: Social Research Institute of Alcohol Studies.

Kraakman, R. (1998). Third-party liability. In P. Newman (Ed.), *The new Palgrave dictionary of economics and the law, vol. 3* (pp. 583-587). London: Macmillan Reference.

Lacey, J.H., Jones, R.K., and Smith, R.G. (1999). *Evaluation of Checkpoint Tennessee: Tennessee's statewide sobriety checkpoint program.* Washington, DC: National Highway Traffic Safety Administration.

Laixuthai, A., and Chaloupka, F.J. (1993). Youth alcohol use and public policy. *Contemporary Policy Issues*, *11*(4), 70-81.

Lang, E., Stockwell, T., Rydon, P., and Beel, A. (1996). Use of pseudo-patrons to assess compliance with laws regarding underage drinking. *Australian and New Zealand Journal of Public Health*, *20*(3), 296-300.

Lang, E., Stockwell, T., Rydon, P., and Beel, A. (1998). Can training bar staff in responsible serving practices reduce alcohol-related harm? *Drug and Alcohol Review*, *17*(1), 39-50.

Langley, J.D., Wagenaar, A.C., and Begg, D.J. (1996). An evaluation of the New Zealand graduated driver licensing system. *Accident Analysis and Prevention*, *28*(2), 139-146.

Lewis, R.K., Paine-Andrews, A., Fawcett, S.B., Francisco, V.T., Richter, K.P., Copple, B., and Copple, J.E. (1996). Evaluating the effects of a community coalition's efforts to reduce illegal sales of alcohol and tobacco products to minors. *Journal of Community Health*, *21*(6), 429-436.

Liben, C.B., Vingilis, E.R., and Blefgen, H. (1987). The Canadian drinking-driving countermeasure experience. *Accident Analysis and Prevention*, *19*(3), 159-181.

Little, B., and Bishop, M. (1998). Minor drinkers/major consequences: Enforcement strategies for underage alcoholic beverage law violators. *FBI Law Enforcement Bulletin*, *67*, 1-4.

Mäkelä, K. (1970). Dryckesgångernas frekvens enligt de konsumerade dryckerna och mängden före och efter lagreformen [Frequency of drinking occasions according to kind and amount of beverages before and after the legislative reform]. *Alkoholpolitik*, *33*, 144-153.

Mann, R.E., Stoduto, G., Anglin, L., Pavic, B., Fallon, F., Lauzon, R., and Amitay, O.A. (1997). Graduated licensing in Ontario: Impact of the 0 BAL provision on adolescents' drinking-driving. In C. Mercier-Guyon (Ed.), *Alcohol, drugs, and traffic safety, vol. 3* (pp. 1055-1060). Annecy, France: Centre d'Etudes et de Recherches en Médecine du Trafic.

Martin, S.E., Grube, J.W., Voas, R.V., Baker, J., and Hingson, R. (1996, November). Zero tolerance laws: Effective public policy? *Alcoholism: Clinical and Experimental Research*, *20*(Suppl. 8), 147A-150A.

Mayer, R.R., Forster, J.L., Murray, D.M., and Wagenaar, A.C. (1998). Social settings and situations of underage drinking. *Journal of Studies on Alcohol*, *59*(2), 207-215.

Mercer, G.W. (1985). The relationships among driving while impaired charges, police drinking-driving roadcheck activity, media coverage and alcohol-related casualty traffic accidents. *Accident Analysis and Prevention*, *17*(6), 467-474.

Modzeleski, W., Small, M.L., and Kann, L. (1999). Alcohol and other drug prevention policies and education in the United States. *Journal of Health Education*, *30*(Suppl. 5), S42-S49.

Moore, V., Barker, J., Ryan, A., and McLean, J. (1993). Effect of random breath testing on perception of likelihood of apprehension and on illegal drink-driving. *Drug and Alcohol Review*, *12*(3), 251-258.

Mosher, J.F. (1984). The impact of legal provisions on bar room behavior. *Alcohol*, *1*, 205-211.

National Highway Traffic Safety Administration. (1997). *Youth DWI and underage enforcement*. Washington, DC: Author.

National Highway Traffic Safety Administration. (1998). *Traffic safety facts 1997: Alcohol*. Washington, DC: U.S. Department of Transportation, National Center for Statistics and Analysis.

Nelson, J.P., and Moran, J.R. (1995). Advertising and U.S. alcoholic beverage demand: System-wide estimates. *Applied Economics*, *27*, 1225-1236.

Noval, S., and Nilsson, T. (1984). Mellanölets effekt på konsumtionsunivån och tillväxten hos den totala alkoholkonsumtionen [The effects of medium-strength beer on consumption levels and the rise in overall alcohol consumption]. In T. Nilsson (Ed.), *När mellenölet försvann [When middle-strength beer disappeared]* (pp. 77-93). Linköping: Samhällsvetenskapliga institutionen, Universitetet i Linköping.

Odo, J., McQuiller, L., and Stretsky, P. (1999). An empirical assessment of the impact of RIT's student alcohol policy on drinking and binge drinking behavior. *Journal of Alcohol and Drug Education*, *44*, 49-67.

Office of Juvenile Justice and Delinquency Prevention (OJJDP). (1999). *Regulatory strategies for prevention of youth access to alcohol: Best practices*. Washington, DC: U.S. Department of Justice (published by the Pacific Institute for Research and Evaluation in support of the OJJDP Enforcing the Underage Drinking Laws Program).

O'Malley, P.M., and Wagenaar, A.C. (1991). Effects of minimum drinking age laws on alcohol use, related behaviors and traffic crash involvement among American youth: 1976-1987. *Journal of Studies on Alcohol*, *52*(5), 478-491.

Österberg, E. (1991). Current approaches to limit alcohol abuse and the negative consequences of use: A comparative overview of available options and an assessment of proven effectiveness. In O. Aasland (Ed.), *The negative social consequences of alcohol use* (pp. 266-269). Oslo: Norwegian Ministry of Health and Social Affairs.

Preusser, D.F., Ferguson, S.A., Williams, A.F., and Farmer, C.M. (1995). *Underage access to alcohol: Sources of alcohol and use of false identification*. Arlington, VA: Insurance Institute for Highway Safety.

Preusser, D.F., and Williams, A.F. (1992). Sales of alcohol to underage purchasers in three New York counties and Washington, DC. *Journal of Public Health Policy*, *13*, 306-317.

Preusser, D.F., Williams, A.F., and Weinstein, H.B. (1994). Policing underage alcohol sales. *Journal of Safety Research*, *25*(3), 127-133.

Preusser, D.F., Williams, A.F., Zador, P.L., and Blomberg, R.D. (1984). The effect of curfew laws on motor vehicle crashes. *Law and Policy*, *6*, 115-128.

Room, R. (1987, January 20-22). *Alcohol monopolies in the U.S.A.: Challenges and opportunities*. Paper presented at a meeting on The Role of Alcohol Monopolies, organized by the Swedish Systembolaget, Vaxholm, Sweden.

Ross, H.L. (1982). *Deterring the drinking driver: Legal policy and social control (2nd ed.)*. Lexington, MA: DC Heath and Company.

Ross, H.L. (1988a). Deterrence-based policies in Britain, Canada and Australia. In M.D. Laurence, J.R. Snortum, and F.E. Zimring (Eds.), *The social control of drinking and driving* (pp. 64-78). Chicago: University of Chicago Press.

Ross, H.L. (1988b). Editorial: British drink-driving policy. *British Journal of Addiction*, *83*, 863-865.

Ross, H.L. (1991, April). *Administrative license revocation for drunk drivers: Options and choices in three states*. Washington, DC: AAA Foundation for Traffic Safety.

Saffer, H. (1997). Alcohol advertising and motor vehicle fatalities. *Review of Economics and Statistics*, *79*(3), 431-442.

Saffer, H., and Grossman, M. (1987a). Beer taxes, the legal drinking age, and youth motor vehicle fatalities. *Journal of Legal Studies*, *16*, 351-374.

Saffer, H., and Grossman, M. (1987b). Drinking age laws and highway mortality rates: Cause and effect. *Economic Inquiry*, *25*, 403-417.

Saltz, R.F. (1987). The roles of bars and restaurants in preventing alcohol-impaired driving: An evaluation of server intervention. *Evaluation and Health Professions*, *10*(1), 5-27.

Saltz, R.F. (1988). Server intervention and responsible beverage service programs. In *Surgeon General's workshop on drunk driving—Background papers* (pp. 169-179). Rockville, MD: Office of the Surgeon General.

Saltz, R.F. (1989). Research needs and opportunities in server intervention programs. *Health Education Quarterly*, *16*(3), 429-438.

Saltz, R.F., and Hennessy, M. (1990a). *The efficacy of "responsible beverage service" programs in reducing intoxication*. Working Paper. Berkeley, CA: Prevention Research Center.

Saltz, R.F., and Hennessy, M. (1990b). *Reducing intoxication in commercial establishments: An evaluation of responsible beverage service practices*. Working Paper. Berkeley, CA: Prevention Research Center.

Saltz, R.F., and Stanghetta, P. (1997). A community-wide responsible beverage service program in three communities: Early findings. *Addiction*, *92*(Suppl. 2), S237-S249.

Schwartz, R.H., Farrow, J.A., Banks, B., and Giesel, A.E. (1998). Use of false ID cards and other deceptive methods to purchase alcoholic beverages during high school. *Journal of Addictive Diseases*, *17*(3), 25-34.

Schwartz, R.H., and Little, D.L. (1997). Let's party tonight: Drinking patterns and breath alcohol values at high school parties. *Family Medicine*, *29*(5), 325-331.

Scribner, R., and Cohen, D. (2001). The effect of enforcement on merchant compliance with the minimum legal drinking age. *Journal of Drug Issues*, *31*, 857-866.

Skog, O.-J. (1988, June 5-11). *The effect of introducing a new light beer in Norway: Substitution or addition*. Unpublished paper presented at Kettil Bruun Society Meeting, Berkeley, CA.

Sloan, F.A., Stout, E.M., Whetten-Goldstein, K., and Liang, L. (2000). *Drinkers, drivers, and bartenders: Balancing private choices and public accountability*. Chicago: University of Chicago Press.

Smart, R.G., Adalf, E.M., and Walsh, G.W. (1996). Procurement of alcohol and underage drinking among adolescents in Ontario. *Journal of Studies on Alcohol*, *57*(4), 419-424.

Smith, D.I. (1988). Effect on traffic accidents of introducing Sunday alcohol sales in Brisbane, Australia. *International Journal of the Addictions*, *23*, 1091-1099.

Stewart, K. (1999). *Strategies to reduce underage alcohol use: Typology and brief overview*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

Stewart, L., and Casswell, S. (1993). Media advocacy for alcohol policy support: Results from the New Zealand Community Action Project. *Health Promotion International*, *8*(3), 167-175.

Stuster, J.W. and Blowers, P.A. (1995). *Experimental evaluation of sobriety checkpoint programs*. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Swahn, M.H., Hammig, G.J., and Ikeda, R.M. (2002). Prevalence of youth access to alcohol or a gun in the home. *Injury Prevention*, *8*(3), 227-230.

Treno, A.J., Grube, J.W., and Martin, S.E. (in press). Alcohol availability as a predictor of youth drinking and driving: A hierarchical analysis of survey and archival data. *Alcoholism: Clinical and Experimental Research*.

Treno, A.J., Breed, L., Holder, H.D., Roeper, P., Thomas, B.A., and Gruenewald, P.J. (1996). Evaluation of media advocacy efforts within a community trial to reduce alcohol-involved injury: Preliminary newspaper results. *Evaluation Review*, *20*(4), 404-423.

Treno, A.J., Gruenewald, P.J., Alaniz, M.L., Freisthler, B., and Remer, L.G. (2000). *The geographic distribution of the service of alcoholic beverages to intoxicated and underage patrons: Implications for policy at the local level*. Poster presented at the annual meeting of the Research Society on Addiction, June 24-29, Denver, CO.

Treno, A.J., and Holder, H.D. (1997). Community mobilization: Evaluation of an environmental approach to local action. *Addiction*, *92*(Suppl. 2), S173-S187.

Ulmer, R.G., Ferguson, S.A., Williams, A.F., and Preusser, D.F. (2000). *Teenage crash reduction associated with delayed licensure in Connecticut*. Arlington, VA: Insurance Institute of Highway Safety.

U.S. General Accounting Office. (1987). *Drinking-age laws: An evaluation synthesis of their impact on highway safety*. (Report to the Chairman, Subcommittee on Investigations and Oversight, Committee on Public Works and Transportation, House of Representatives). Washington, DC: U.S. Superintendent of Documents.

University of Michigan. (2001). Rise in ecstasy use among American teens begins to slow. *News and Information Services*, *12*, December 19.

Valli, R. (1998). Forandringar i ungdomarnas alkoholvanor nar mellanolet slapptes fritt: Fallet Jakobstad [Changes in young people's alcohol consumption with improved availability of medium strength beer: The case of Pietarsaari]. Nordisk Alkohol- and Narkotikatidskrift [*Nordic Alcohol and Drug Studies*], *15*(3), 168-175.

Vingilis, E., and Coultes, B. (1990). Mass communications and drinking-driving: Theories, practices and results. *Alcohol, Drugs and Driving*, *6*(2), 61-81.

Voas, R.B. (1988). Emerging technologies for controlling the drunk driver. In M. Laurence, J. Snortum, and F. Zimming (Eds.), *Social control of the drunk driver* (pp. 321-370). Chicago: University of Chicago Press.

Voas, R.B., Tippetts, A.S., and Fell, J. (1999, September). *United States limits drinking by youth under age twenty-one: Does this reduce fatal crash involvements?* Paper presented at the annual meeting of the Association for the Advancement of Automotive Medicine, Barcelona, Spain.

Wagenaar, A.C. (1981). Effects of an increase in the legal minimum drinking age. *Journal of Health Policy*, *2*, 206-225.

Wagenaar, A.C. (1986). Preventing highway crashes by raising the legal minimum age for drinking: The Michigan experience 6 years later. *Journal of Safety Research*, *17*, 101-109.

Wagenaar, A.C., and Holder, H.D. (1995). Changes in alcohol consumption resulting from the elimination of retail wine monopolies: Results from five U.S. states. *Journal of Studies on Alcohol*, *56*(5), 566-572.

Wagenaar, A.C., and Maybee, R.G. (1986). Legal minimum drinking age in Texas: Effects of an increase from eighteen to nineteen. *Journal of Safety Research*, *17*, 165-178.

Wagenaar, A.C., and Perry, C.L. (1994). Community strategies for the reduction of youth drinking: Theory and application. *Journal of Research on Adolescence*, *4*(2), 319-345.

Wagenaar, A.C., and Toomey, T.L. (2002). Effects of minimum drinking age laws: Review and analyses of the literature from 1960 to 2000. *Journal of Studies on Alcohol* (Suppl. 14), 206-225.

Wagenaar, A.C., and Wolfson, M. (1994). Enforcement of the legal minimum drinking age in the United States. *Journal of Public Health Policy*, *15*, 37-53.

Wagenaar, A.C., and Wolfson, M. (1995). Deterring sales and provision of alcohol to minors: A study of enforcement in 295 counties in four states. *Public Health Reports*, *110*, 419-427.

Wagenaar, A.C., Murray, D.M., and Toomey, T.L. (2000a). Communities mobilizing for change on alcohol (CMCA): Effects of a randomized trial on arrests and traffic crashes. *Addiction*, *95*(2), 209-217.

Wagenaar, A.C., O'Malley, P.M., and LaFond, C. (2001). Very low legal BAC limits for young drivers: Effects on drinking, driving, and driving-after-drinking behaviors in 30 states. *American Journal of Public Health*.

Wagenaar, A.C., Murray, D.M., Wolfson, M., Forster, J.L., and Finnegan, J.R. (1994). Communities mobilizing for change on alcohol: Design of a randomized community trial. *Journal of Community Psychology* (Special Issue), 79-101.

Wagenaar, A.C., Finnegan, J.R., Wolfson, M., Anstine, P.S., Williams, C.L., and Perry, C.L. (1993). Where and how adolescents obtain alcoholic beverages. *Public Health Reports*, *108*(4), 459-464.

Wagenaar, A.C., Gehan, J.P., Jones-Webb, R., Toomey, T.L., and Forster, J. (1999). Communities mobilizing for change on alcohol: Lessons and results from a 15-community randomized trial. *Journal of Community Psychology*, *27*(3), 315-326.

Wagenaar, A.C., Murray, D.M., Gehan, J.P., Wolfson, J., Forster, J.L., Toomey, T.L., Perry, C.L., and Jones-Webb, R. (2000b). Communities mobilizing for change on alcohol: Outcomes from a randomized community trial. *Journal of Studies on Alcohol*, *51*(1), 85-94.

Wagenaar, A.C., Toomey, T.L., Murray, D.M., Short, B.J., Wolfson, M., and Jones-Webb, R. (1996). Sources of alcohol for underage drinkers. *Journal of Studies on Alcohol*, *57*, 325-333.

Wechsler, H., Kuo, M., Lee, H., and Dowdall, G.W. (2000). Environmental correlates of underage alcohol use and related problems of college students. *American Journal of Preventive Medicine*, *19*(1), 24-29.

Williams, A., Lund, A., and Preusser, D. (1984). *Night driving curfews in New York and Louisiana: Results of a questionnaire survey*. Washington, DC: Insurance Institute for Highway Safety.

Wolfson, M., Toomey, T.L., Forster, J.L., Wagenaar, A.C., McGovern, P.G., and Perry, C.L. (1996a). Characteristics, policies and practices of alcohol outlets and sales to underage persons. *Journal of Studies on Alcohol*, *57*(6), 670-674.

Wolfson, M., Toomey, T.L., Murray, D.M., Forster, J.L., Short, B.J., and Wagenaar, A.C. (1996b). Alcohol outlet policies and practices concerning sales to underage people. *Addiction*, *91*(4), 589-602.

Wyllie, A., Zhang, J.F., and Casswell, S. (1998). Positive responses to televised beer advertisements associated with drinking and problems reported by 18- to 29-year-olds. *Addiction*, *93*(5), 749-760.

Yu, J., Varone, R., and Shacket, R.W. (1997). *Fifteen-year review of drinking age laws: Preliminary findings of the 1996 New York State Youth Alcohol Survey*. New York: Office of Alcoholism and Substance Abuse.

Zador, P., Lund, A., Fields, M., and Weinberg, K. (1989). Fatal crash involvement and laws against alcohol-impaired driving. *Journal of Public Health Policy*, *10*, 467-485.

Zwerling, C., and Jones, M.P. (1999). Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine*, *16*(1S), 76-80.

8

Effectiveness of Sanctions and Law Enforcement Practices Targeted at Underage Drinking Not Involving Operation of a Motor Vehicle

Thomas L. Hafemeister and Shelly L. Jackson[1]

Underage drinking is pervasive in the United States (see Flewelling, Paschall, and Ringwalt, 2002). This chapter focuses on the effectiveness of sanctions and law enforcement practices intended to deter youth from purchasing, possessing, or consuming alcohol, or from using misrepresentation to purchase alcohol.[2] The first section of this chapter is divided into three parts: (1) a brief review of relevant federal, state, and local laws, (2) a review of related law enforcement practices, and (3) a review of the sanctions targeted at underage drinking and their effectiveness. The second section of this report briefly reviews (1) federal and state laws pertaining to the responses of elementary and secondary schools to underage drinking, (2) germane elementary through secondary school policies and sanctions, and (3) the effectiveness of these policies and sanctions in curbing underage drinking.

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[1]Opinions and points of view expressed in this document are those of the author and do not necessarily reflect the official position of the U.S. Department of Justice.

[2]This chapter is not intended to address policies designed to prevent driving by youth while under the influence of alcohol or supply side policies intended to deter vendors from selling alcohol to youth.

LAWS AND ORDINANCES PROHIBITING UNDERAGE POSSESSION, CONSUMPTION, AND PURCHASE OF ALCOHOL AND RELATED USE OF FALSE IDENTIFICATION

Federal Law

The National Minimum Drinking Age Act of 1984 (23 USCA §158) requires states to adopt a national minimum drinking age of 21 for "purchase or public possession" of alcohol as a condition for a state's receipt of federal highway funds. The law has had a sizable effect in that, currently, all 50 states and the District of Columbia have a minimum drinking age law (MDAL) that sets the minimum drinking age at 21 (Office of Inspector General [OIG], 1991). Research has found that this change in MDALs resulted in a decrease in the number of deaths of youth associated with drinking and driving (O'Malley and Wagenaar, 1991; U.S. General Accounting Office, 1987; Jones, Piper, and Robertson, 1992); but there is little research on its impact on other aspects of underage drinking (e.g., possession, consumption, purchase, misrepresentation).

State Laws

Basic alcohol control policies are established at the state level. States vary considerably in how they have crafted laws related to underage purchase of alcohol (i.e., purchasing alcohol from retailers), possession (i.e., carrying or handling alcohol), consumption (i.e., the drinking of alcohol), and misrepresentation (i.e., lying about one's age or using false identification to purchase alcohol) (Pacific Institute for Research and Evaluation [PIRE], 2000). For example, according to MADD (2002), 34 states and the District of Columbia have a law prohibiting youth consumption of alcohol, 40 states have a law against the use of false identification to purchase alcohol, and 38 states and the District of Columbia have a law that penalizes an attempt by a youth to purchase alcohol. All 50 states and the District of Columbia have a law that sanctions the actual underage purchase of alcohol (MADD, 2002). Forty-six states and the District of Columbia have statutes prohibiting the possession of alcohol by underage persons. Although not all states prohibit each of these activities, namely, purchase, possession, consumption, and misrepresentation, many do, and the President's Commission on Model State Drug Laws (1993) recommends that states adopt laws that prohibit all of them.[3]

[3]Discussion of motor vehicle-related offenses is beyond the purview of this chapter. However, two related laws may be relevant to this chapter. Open container laws make it an offense to possess an open container of an alcoholic beverage in the passenger compartment

For each particular alcohol violation, states' underage drinking laws either stipulate a specific sanction or establish a range of available sanctions. The nature of these sanctions will be discussed more fully, including whether they should be criminal or noncriminal in nature. It is worth noting, however, that the severity of sanctions varies considerably, from relatively minor fines of $50 to $100 to incarceration (PIRE, 1999). Between these extremes can be found various intermediate sanctions such as required community service, mandated alcohol assessment and treatment, and driver's license suspension or revocation. In addition, states vary in whether they impose a graduated series of sanctions that attempt to increase the severity of sanctions for subsequent offenses.

There are some fairly universal exceptions to the underage drinking laws that some commentators refer to as loopholes (OIG, 1991). For example, a substantial number of states permit youth to possess and consume alcohol on private property, although the presence or consent of their parents is often required (see Table 8-1). Similarly, roughly half permit youth to drink or handle alcohol when the youth's parent is involved, although many of these states confine this activity to private property (see Table 8-1). Other exceptions include allowing youth to enter an establishment that serves alcohol when accompanied by a parent/guardian (e.g., ARIZ. REV. STAT. § 4-244 [2002]) and permitting youth to handle alcohol when it is a requirement of employment (e.g., in grocery stores, restaurants) (e.g., ME. REV. STAT. ANN. tit. 28-A, § 2051 [2002]). Youth also may be exempt when they are purchasing alcohol for their parents (e.g., IDAHO CODE § 23-1334 [2002]). Finally, youth may be exempt from these laws when the possession or consumption of alcohol is related to a religious practice (e.g., MICH. COMP. LAWS § 436.1703 [2002]) or for a medical purpose (e.g., ARK. CODE ANN. § 04.16.051 [2002]). Table 8-1 provides excerpts of the statutory language used to establish the private property and parental involvement exceptions.

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of a motor vehicle. Similarly, anticonsumption laws make it an offense to consume alcoholic beverages in the passenger compartment of a motor vehicle (National Highway Traffic Safety Administration/National Institute on Alcohol Abuse and Alcoholism [NHTSA/NIAAA], 1999). Although these laws are used primarily in conjunction with the operation of a motor vehicle and drunk driving, they can encompass nondriving scenarios such as when youth consume alcohol in a stationary motor vehicle. Because underage drinking often occurs in remote locations, such as parks and beaches (Mayer, Forster, Murray, and Wagenaar, 1998), a stationary motor vehicle may be where youth are found to be drinking and these laws may thus become the means for applying sanctions targeted at underage drinking unrelated to the operation of a motor vehicle.

TABLE 8-1 State Summary of Private Property and Parental Involvement Exceptions to Underage Drinking Offenses

State	Private Property Exceptions	Exceptions When Parents Are Involved
Alabama	No exception provided	No exception provided
Alaska	No exception provided	No exception provided
Arizona	No exception provided	No exception provided
Arkansas	No exception provided	This section does not prohibit the furnishing or delivery of an alcoholic beverage (1) by a parent to the parent's child, . . . if the furnishing or delivery occurs off licensed premises; . . . (Ark. Code Ann. § 04.16.051[b][1])
California	[prohibits] . . . any alcoholic beverage in his or her possession on any street or highway or in any public place or in any place open to the public . . . (Cal. Bus. & Prof. Code § 25662[a]) . . . consumes any alcoholic beverage in any on-sale premises . . . (Cal. Bus. & Prof. Code § 25658[b])	. . . does not apply to possession . . . making a delivery of an alcoholic beverage in pursuance of the order of his or her parent . . . (Cal. Bus. & Prof. Code § 25662[a])
Colorado	It shall be an affirmative defense [to possess or consume] . . . while such person was legally upon private property with the knowledge and consent of the owner or legal possessor of such private property and the ethyl alcohol was possessed or consumed with the consent of his parent . . . who was present during such possession or consumption; . . . (Colo. Rev. Stat. § 18-13-122[3][a])	It shall be an affirmative defense [to possess or consume] . . . while such person was legally upon private property with the knowledge and consent of the owner or legal possessor of such private property and the ethyl alcohol was possessed or consumed with the consent of his parent . . . who was present during such possession or consumption; . . . (Colo. Rev. Stat. § 18-13-122[3][a]) The provisions of this subsection shall not apply to . . . a minor who possesses alcoholic liquor while accompanied by a parent . . . (Colo. Rev. Stat. § 30-89[b][3])

continued

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Connecticut	[cannot] . . . possess any alcoholic liquor on any street or highway or in any public place or place open to the public, including any club which is open to the public, . . . (CONN. GEN. STAT. § 30-89[b])	No exception provided
Delaware	This section shall not apply to the possession or consumption of alcoholic liquor . . . by members of the same family within the private home of any of said members. (DEL. CODE ANN. tit. 4, § 904[f])	This section shall not apply to the possession or consumption of alcoholic liquor . . . by members of the same family within the private home of any of said members. (DEL. CODE ANN. tit. 4, § 904[f])
District of Columbia	No exception provided	No exception provided
Florida	No exception provided	No exception provided
Georgia	The prohibitions . . . shall not apply with respect to the possession of alcoholic beverages for consumption . . . when the parent . . . gives the alcoholic beverage to the person and when possession is in the home of the parent . . . and such parent . . . is present. (GA. CODE ANN. § 3-3-23[c])	The prohibitions . . . shall not apply with respect to the possession of alcoholic beverages for consumption . . . when the parent . . . gives the alcoholic beverage to the person and when possession is in the home of the parent . . . and such parent . . . is present. (GA. CODE ANN. § 3-3-23[c])
Hawaii	. . . no minor shall have liquor in the minor's possession or custody in any motor vehicle on a public highway or in any public place, public gathering, or public amusement or at any public beach or public park; . . . (HAW. REV. STAT. § 281-101.5[b])	No exception provided
Idaho	No exception provided	No exception provided

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Illinois	[prohibits] . . . any alcoholic beverage in his or her possession on any street or highway or in any public place or in any place open to the public . . . (235 ILL. COMP. STAT. 5/6-16[a][ii])	This Section does not apply to possession . . . making a delivery of an alcoholic beverage in pursuance of the order of his or her parent . . . (235 ILL. COMP. STAT. 5/6-16[a][ii]) It is unlawful for any parent . . . to permit his or her residence to be used by an invitee of the parent's child . . . , in a manner that constitutes a violation of this Section. (235 ILL. COMP. STAT. 5/6-16[a-1])
Indiana	No exception provided	It is [prohibited] . . . to knowingly transport [alcoholic beverage] on a public highway when not accompanied by at least one (1) of his parents . . . (IND. CODE ANN. § 7.1-5-7-7[3])
Iowa	. . . except in the case of liquor, wine, or beer given or dispensed to a person under legal age within a private home and with the knowledge, presence, and consent of the parent . . . (IOWA CODE ANN. § 123.47[2])	. . . except in the case of liquor, wine, or beer given or dispensed to a person under legal age within a private home and with the knowledge, presence, and consent of the parent . . . (IOWA CODE ANN. § 123.47[2])
Kansas	No exception provided	This section shall not apply to the possession and consumption . . . when such possession and consumption is permitted and supervised, and such beverage is furnished, by the person's parent . . . (KAN. STAT. ANN. § 41-727[e])
Kentucky	No exception provided	No exception provided
Louisiana	No exception provided	It is unlawful for any person, other than a parent, . . . to purchase on behalf of a person under 21 years of age any alcoholic beverage. (LA. REV. STAT. ANN. § 14:93.13)

continued

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Maine	A minor may not: Consume any liquor . . . , except in a home in the presence of the minor's parent . . . (ME. REV. STAT. ANN. tit. 28-A, § 2051[1][B]) A minor may not: Have in the minor's possession except: In a home in the presence of the minor's parent, . . . (ME. REV. STAT. ANN. tit. 28-A, § 2051[1][E][2])	A minor may not: Consume any liquor . . . , except in a home in the presence of the minor's parent . . . (ME. REV. STAT. ANN. tit. 28-A, § 2051[1][B]) A minor may not: Have . . . in the minor's possession except: In a home in the presence of the minor's parent, . . . (ME. REV. STAT. ANN. tit. 28-A, § 2051[1][E][2])
Maryland	No exception provided	No exception provided
Massachusetts	No exception provided	Whoever, being under 21 years of age and not accompanied by a parent . . . , knowingly possesses, transports or carries on his person, any alcohol or alcoholic beverages, . . . (MASS. GEN. LAWS ANN. ch. 138, § 34C)
Michigan	No exception provided	No exception provided
Minnesota	. . . it is an affirmative defense . . . that the defendant consumed the alcoholic beverage in the household of the defendant's parent . . . and with the consent of the parent . . . (MINN. STAT. § 340A.503[Subd. 1(2)]) It is unlawful . . . to possess any alcoholic beverages with the intent to consume it at a place other than the household of the person's parent . . . (MINN. STAT. § 340A.503[Subd. 3])	. . . it is an affirmative defense . . . that the defendant consumed the alcoholic beverage in the household of the defendant's parent . . . and with the consent of the parent . . . (MINN. STAT. § 340A.503[Subd. 1(2)]) It is unlawful . . . to possess any alcoholic beverages with the intent to consume it at a place other than the household of the person's parent (MINN. STAT. § 340A.503[Subd. 3])
Mississippi	[it is an offense if he or she] has in his or her possession in any public place, any alcoholic beverages . . . (MISS. CODE ANN. § 67-1-81[2])	No exception provided
Missouri	No exception provided	No exception provided

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Montana	No exception provided	Except in the case of an alcoholic beverage provided in a nonintoxicating quantity . . . by his parent . . . , . . . a person may not sell or otherwise provide an alcoholic beverage to a person under 21 years of age. (MONT. CODE ANN. § 16-6-305[1][a]) A parent, . . . may not knowingly sell or otherwise provide an alcoholic beverage in an intoxicating quantity to a person under 21 years of age. (MONT. CODE ANN. § 16-6-305[1][b])
Nebraska	. . . consume, or have in his or her possession . . . any alcoholic liquor in any tavern or in any other place, including public streets, alleys, roads, or highways, upon property owned by the State of Nebraska or any subdivision thereof, . . . (NEB. REV. STAT. § 53-180.02) . . . except that a minor may consume, possess, or have physical control of alcoholic liquor in his or her permanent place of residence . . . (NEB. REV. STAT. § 53-180.02)	No exception provided
Nevada	. . . possesses any alcoholic beverage in public . . . Possession "in public" includes possession: (a) On any street or highway; (b) In any place open to the public; and (c) In any private business establishment which is in effect open to the public. (NEV. REV. STAT. § 202.020[2],[4]) The term [in public] does not include: . . . Possession in private clubs or private establishments; . . . (NEV. REV. STAT. § 202.020[5][d])	The term [in public] does not include: . . . Possession in the presence of the person's parent . . . (NEV. REV. STAT. § 202.020[5][b])

continued

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
New Hampshire	No exception provided	No exception provided
New Jersey	. . . who knowingly possesses . . . or . . . consumes any alcoholic beverage in any school, public conveyance, public place, or place of public assembly, . . . (N.J. STAT. ANN. § 2C:33-15[a]) It is not a violation . . . , when a parent . . . of a minor serves alcoholic beverages to that minor on real property, other than licensed premises, under the control of the parent . . . (N.J. STAT. ANN. § 60-7B-1[B])	[offers, serves, or makes available an alcoholic beverage] . . . This subsection shall not apply to a parent . . . (N.J. STAT. ANN. § 2C:33-17[a]) This subsection shall not apply to any person in his home . . . who offers or serves or makes available an alcoholic beverage . . . in the presence of and with the permission of the parent . . . (N.J. STAT. ANN. § 2C:33-17[a])
New Mexico	No exception provided	It is not a violation . . . , when a parent . . . of a minor serves alcoholic beverages to that minor on real property, other than licensed premises, under the control of the parent . . . (N.M. STAT. ANN. § 60-7B-1[B])
New York	No exception provided	. . . may possess any alcoholic beverage with intent to consume if the alcoholic beverage is given: . . . to the person . . . by that person's parent . . . (N.Y. ALCO. BEV. CONT. LAW § 65-c[2][b])
North Carolina	No exception provided	No exception provided
North Dakota	No exception provided	No exception provided
Ohio	No exception provided	No underage person shall knowingly possess or consume any low-alcohol beverage in any public or private place, unless accompanied by a parent, . . . (OHIO REV. CODE ANN. § 4301.631[H])

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Oklahoma	. . . possession of any intoxicating beverage . . . while such person is upon any public street, road, or highway or in any public building or place. (OKLA. STAT. Tit. 21, § 1215)	No exception provided
Oregon	Except when such minor is in a private residence accompanied by the parent . . . and with such parent's consent, . . . no person . . . shall have personal possession of alcoholic liquor. (OR. REV. STAT. § 471.430[1])	Except when such minor is in a private residence accompanied by the parent . . . and with such parent's consent, . . . no person . . . shall have personal possession of alcoholic liquor. (OR. REV. STAT. § 471.430[1])
Pennsylvania	No exception provided	No exception provided
Rhode Island	No exception provided	No exception provided
South Carolina	No exception provided	No exception provided
South Dakota	No exception provided	No exception provided
Tennessee	. . . has in such person's possession in any public place, any alcoholic beverage, . . . (TENN. CODE ANN. § 57-4-203 [b][2][A])	No exception provided
Texas	No exception provided	A minor may possess an alcoholic beverage: . . . if the minor is in the visible presence of his adult parent, . . . (TEX. ALCO. BEH. CODE ANN. § 106.05[b][2])
Utah	. . . to possess or consume any alcoholic beverage while riding in a limousine or chartered bus. (UTAH CODE ANN. § 32A-12-209[3])	No exception provided
Vermont	No exception provided	No exception provided
Virginia	No exception provided	Except, . . . where possession of the alcoholic beverages . . . is due to . . . an order of his parent; . . . (VA. CODE ANN. § 4.1-305[A][ii])

continued

TABLE 8-1 Continued

State	Private Property Exceptions	Exceptions When Parents Are Involved
Washington	It is unlawful . . . to be in a public place, . . . while exhibiting the effects of having consumed liquor . . . , . . . exhibiting the effects means . . . odor . . . close proximity to container . . . speech, manner, appearance, . . . (WASH. REV. CODE § 66.44.270[2][b]) . . . no person shall open the package containing liquor or consume liquor in a public place. (WASH. REV. CODE § 66.44.100)	This subsection (2)(b) [exhibiting the effects of having consumed liquor] does not apply if the person is in the presence of a parent . . . (WASH. REV. CODE § 66.44.270[2][b])
West Virginia	No exception provided	No exception provided
Wisconsin	No exception provided	No exception provided
Wyoming	[an offender is he or she] . . . who has any alcoholic or malt beverage in his possession or who is drunk or under the influence of alcoholic liquor, . . . on any street or highway or in any public place . . . (WYO. STAT. ANN. § 12-6-101[b])	Any person who . . . furnishes, gives . . . any alcoholic liquor . . . who is not . . . [a] member of his own immediate family, is guilty . . . (WYO. STAT. ANN. § 12-6-101[a]) This subsection does not apply to possession . . . by a person [under 21] . . . : Who is in the physical presence of his parent . . . ; (WYO. STAT. ANN. § 12-6-101[b][I])

Local Ordinances

A third arena in which prohibitions against underage drinking have been enacted is at the local or municipal level. Local governments are becoming increasingly active in legislating against crime in general and specifying related sanctions (Logan, 2001), and a number of communities have enacted legislation that targets underage drinking. Local ordinances can send a strong message about what a community considers to be acceptable norms, and this often has been the rationale for adopting such laws (Humphrey, 2000). However, like state laws, local ordinances vary considerably in how they address underage drinking (OIG, 1991; PIRE, 2000).

Many municipalities have ordinances in place that are used to supplement or enforce statewide underage drinking laws even though they may

not be specifically aimed at underage drinking. These include public place restrictions, teen party ordinances, public nuisance laws, and noisy assembly laws. Public place ordinances place restrictions on the availability and use of alcohol in public places often frequented by youth such as parks, recreation facilities, beaches, and parking lots (PIRE, 1999). Teen party ordinances essentially prohibit teen parties in private residences (although liability typically falls on the host family rather than the youth). Public nuisance laws and noisy assembly ordinances allow law enforcement officials to investigate noisy teen parties. The rationale for these ordinances is that underage drinking is most severe in popular gathering places (Mayer et al., 1998; Wolfson, Wagenaar, and Hornseth, 1995).

However, communities are also enacting local ordinances specifically designed to curb underage drinking (Gliksman, Douglas, Rylett, and Narbonne-Fortin, 1995; Humphrey, 2000). In some states, municipalities are permitted by the relevant state law on underage drinking to take steps that are as restrictive as or more restrictive than the state law (e.g., COLO. REV. STAT. § 18-13-122 [2002]). For example, New Jersey law permits underage drinking on private property, but the New Jersey legislature recently passed a law (N.J. STAT. ANN. § 40:48-1 [2002]) that allows municipalities to close this loophole and outlaw underage drinking on private property. So far, about forty New Jersey municipalities have taken advantage of this opportunity (Gallagher, 2001). Similarly, Glastonbury, Connecticut, authorized law enforcement officials to issue a $100 ticket to anyone under 21 who is caught possessing alcohol anywhere in town, even on private property, except when a parent or guardian provided the alcohol and is present (PIRE, 2000).

However, not all local governments are interested in enforcing or extending statewide bans on underage drinking. Burlington, Vermont, for example, recently passed an ordinance that decriminalizes underage drinking by making consumption or possession of alcohol a civil rather than a criminal offense in which the offender receives a small ($50) fine for alcohol violations (*Alcoholism and Drug Abuse Weekly*, 1999).

LAW ENFORCEMENT PRACTICES

Enforcement Techniques

The burden of enforcing underage drinking laws typically falls on county and local law enforcement officials (Wolfson et al., 1995).[4] Law

[4]State administrative agencies such as Alcoholic Beverage Control are typically responsible for enforcing vendor laws, but they may have no authority to cite or arrest youth who violate underage drinking laws (OIG, 1991).

enforcement officials employ a number of techniques to enforce underage drinking laws.

For example, "Cops 'N' Shops" is a technique in which law enforcement officials pose as retail clerks and catch youth attempting to purchase alcohol (PIRE, 1999). Cops 'N' Shops operations can also identify youth using false identification or lying about their age. Some states authorize retailers to confiscate false identifications immediately, then to contact law enforcement officials (e.g., CAL. BUS. & PROF. CODE § 25659 [2002]) (PIRE, 1999).

A party patrol is a method used by law enforcement officials to specifically enforce existing possession and consumption laws. There is some evidence that this technique is effective. Oregon implemented a weekend drunk driving and party patrol program that has law enforcement officers working with schools to identify in advance the anticipated location of teen parties, which the officers then patrol. An unpublished evaluation of this program revealed that arrests of youth for possession of alcohol increased from 60 to 1,000 individuals in one year (with a corresponding decrease of 35 percent in underage drunk driving accidents) (Little and Bishop, 1998).

Law enforcement officials rely considerably on third parties to identify underage drinking. For example, law enforcement officers often become involved in parties at private residences because of a complaint by a neighbor or an ambulance call (Gallagher, 2001). Law enforcement officials may take steps to encourage such reports.

Enforcement Rates

The rates of drinking among youth are quite high (see Flewelling, Paschall, and Ringwalt, 2002). However, existing research suggests that rates of enforcement of underage drinking laws are quite low. For example, Wagenaar and Wolfson (1994) estimated that only two of every thousand illegal drinking episodes by youth under 21 resulted in an arrest.[5] Similarly,

[5]This estimate was calculated by first taking projections based on youth surveys that 90 drinking episodes per month occur for every 100 persons of ages 16 to 20. This translates into 1.08 million drinking episodes per year for every 100,000 members of this age group. Because the median liquor law violation arrest rate in this country at that time was 2,286 per 100,000 persons ages 15 to 20 (a rate of 0.02286), Wagenaar and Wolfson (1994, p. 41) concluded that, on average, only two of every thousand episodes of youth drinking result in an arrest. As discussed, not all underage drinking episodes are illegal (e.g., under state law, such drinking may be permitted when it occurs in the home or in the presence of the youth's parent or guardian). Also, self-report surveys of alcohol-related behavior are somewhat unreliable and could lead to overestimates of the frequency of this behavior. Thus, the estimate provided by Wagenaar and Wolfson (1994) may exaggerate the lack of enforcement of these laws. However, even if they have underestimated enforcement by tenfold, this would still represent a

another study found that in 2000, there were 484 arrests for liquor law violations per 100,000 youth ages 10 to 17 (Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2002).[6] Even though enforcement rates are low, possession laws may be enforced more often than laws targeting vendors. DiFranza and Godshall (1996) found that underage drinkers were arrested for possession of alcohol 47 times more often than vendors were arrested for selling alcohol to underage drinkers.[7]

Differences in rates of arrest by gender and ethnicity have been identified. In 2000, the juvenile male arrest rate for drunkenness was more than three times greater than the female rate (OJJDP, 2002).[8] Similarly, males are involved in more alcohol-related status offense cases that are formally prosecuted than females (OJJDP, 2000). Regarding ethnicity, in 2000, Native American youth had the highest arrest rate for liquor law violations, which was roughly twice that for white youth, which in turn was roughly three times that for African-American and Asian youth (OJJDP, 2002).[9] It has been asserted that these laws are enforced more often against poor youth as compared to middle- and upper-class youth (Mosher, 1998; Wolfson et al., 1995), although data are lacking regarding differences in arrest rates by socioeconomic class.

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dramatic lack of enforcement of these laws. At the same time, it should be noted that enforcing these laws is relatively difficult in general as this behavior is often not readily observable by law enforcement officials in the course of their routine duties nor likely to often generate a complaint that will bring it to their attention.

[6]These arrest statistics do not, however, reflect the response rate of law enforcement officials. They may intervene in underage drinking and disperse the youth involved, but choose not to make an arrest or issue a citation (Hunter Hurst, Jr., National Center for Juvenile Justice, personal communication, August 16, 2002). Data are lacking on how frequently this occurs.

[7]Although not the focus of this chapter, there is some evidence that focusing on retailers is more effective at preventing underage drinking than focusing on underage drinkers (Scribner and Cohen, 2001).

[8]It may also be noted that between 1993 and 2000, the rate of liquor law violation arrests of males ages 10 to 17 increased 22 percent, while the rate for females increased 41 percent (OJJDP, 2002). In assessing these arrest rates, it should be noted that the 2001 National Household Survey of youth ages 12 to 20 found that 22 percent of males reported what was characterized as binge drinking in the past 30 days compared to 16 percent of females (Substance Abuse and Mental Health Services Administration [SAMHSA], 2002).

[9]In assessing these arrest rates, it should be noted that the 2001 National Household Survey of youth ages 12 to 20 found that 22 percent of white youth, 19 percent of Native American youth, 10.7 percent of Asian-American youth, and 10.5 percent of African-American youth reported what was characterized as binge drinking in the past 30 days (SAMHSA, 2002).

Explanations for Low Enforcement Rates

There is considerable conjecture regarding why enforcement rates are low (OIG, 1991; Wolfson et al., 1995; PIRE, 1999; Kelder, 1997; Little and Bishop, 1998; Mosher, 1998), but little supporting data. Part of this low enforcement may be attributed to the fact that this behavior is often not readily observable by law enforcement officials in the course of their routine duties nor likely to generate a complaint that will bring it to their attention. However, there has also been considerable speculation that law enforcement officials are not enforcing these laws as vigorously as they might. Identified barriers to enforcement can be divided into four categories: legal barriers, indifference by prosecutors and the courts, conflicting societal norms (parental, societal, peer), and limited law enforcement resources and negative attitudes about these laws held by law enforcement officers.

An identified legal obstacle to the ability of law enforcement officials to monitor and intervene in underage drinking is that many states do not prohibit youth possession in private residences and permit parents to supply alcohol to their children (PIRE, 1999). Under these circumstances, police may have no legal grounds to intervene, for example, at a teen party.

Some law enforcement officers claim they are frustrated by the absence of a serious response by the court system to these offenses (Wolfson et al., 1995). For example, it is asserted that prosecutors (and judges) view alcohol-related offense cases more as a nuisance than as matters that need to be vigorously prosecuted. As a result, it is asserted that many alcohol-related offenses are not formally accepted for prosecution (OIG, 1991). If a case is prosecuted, prosecutors may seek only a relatively small fine.[10] Judges, it is contended, often dispense light sentences and nominal penalties against youth who violate these laws (Mosher, 1998; Wolfson et al., 1995). Officers may feel it is a waste of their time to arrest youth for underage drinking when prosecutors and judges fail to take the offenses seriously.

Parental and societal attitudes may also be a serious barrier to enforcement efforts (Little and Bishop, 1998). Parents will often plead with law enforcement officials, prosecutors, or judges to be lenient with their child to avoid a permanent record, arguing, "We did this when we were young"

[10]According to one prosecutor, prosecutors who deal with hardened criminals all day find an underage alcohol offense "refreshing." As gatekeepers, they are unlikely to respond to these cases until the individual is in the court for the third or fourth time, at which point they may refer the person for an alcohol assessment. Many prosecutors remember drinking when they were young and, in addition, feel the pressure of parents pleading for leniency for their child (John A. Bobo, Jr., American Prosecutors Research Institute, personal communication, October 18, 2002).

(Wolfson et al., 1995). Similarly, there is considerable public indifference to underage drinking and related laws (NHTSA/NIAAA, 1999). Generally, society is not concerned with youth drinking at parties, as opposed to youth drinking and driving, presumably because the consequences are perceived to be less serious (Little and Bishop, 1998).

Finally, there are identified barriers intrinsic to law enforcement agencies. Law enforcement departments claim that budgets are tight and therefore they are unwilling to commit resources and personnel to combating underage drinking, especially when they have what they consider to be more serious criminal activity requiring their attention (Mosher, 1998; Wolfson et al., 1995). Law enforcement officials also complain that these cases are too time consuming. Because arrested minors are required by federal law (Juvenile Justice and Delinquency Prevention Act of 1974 [Pub. L. 93-415, 424 U.S.C. 5601 et seq.:]) to be held in a separate area from adults, when a minor is arrested the officer may have to stay with the youth for many hours until the parents are located and the officer can release the child to the parents. Leaving the youth in a juvenile detention center often is not an option as centers are either nonexistent, full, or far away (Wolfson et al., 1995). Furthermore, many state guidelines prohibit secure detention for these minor offenses (Hunter Hurst, Jr., National Center for Juvenile Justice, personal communication, August 16, 2002).[11] Law enforcement officers also report that the large volume of paperwork associated with a juvenile arrest is burdensome (Wolfson et al., 1995). It has also been contended that law enforcement officers may disagree outright with such laws and therefore refuse to enforce them (Little and Bishop, 1998).

SANCTIONS USED TO CURB UNDERAGE DRINKING AND THEIR EFFECTIVENESS

Purpose of Sanctions

One response to underage drinking has been to impose sanctions—or a range of sanctions—on violators of underage drinking laws. These sanctions are supposed to convey social norms about appropriate behavior (i.e., the declarative effects of the law). In addition, according to the NHTSA/

[11]A possible solution to this problem is a juvenile holdover program. These programs allow law enforcement officers to, among other things, place the care of a youth with another entity and return to their primary duties while parents/guardians are being located (Mowatt and Chezem, 2002). For example, the Juvenile Assessment Center in Miami, Florida, has incorporated such a juvenile holdover program and documented saving more than 500,000 hours of police officer time in the center's five years of existence (Wansley Walters, Director, Miami-Dade Juvenile Assessment Center, personal communication, November 11, 2002).

NIAAA report (1999), any disposition pertaining to underage drinking should (1) protect the public, (2) hold the offender accountable, and (3) provide education or treatment to the offender to prevent future acts.

A number of sanctions are available for responding to violations of underage drinking laws. States often distinguish among possession, consumption, purchasing, and misrepresentation and may have different sanctions for these various offenses. Sanctions tend to vary in their severity, whether they are considered criminal or civil in nature, and whether they are to be enhanced for subsequent offenses. Some states also make distinctions based on the age of the offender. Types of sanctions and their effectiveness will be discussed following a description of the agents authorized to dispense them.

Agents Dispensing Sanctions

When an underage offender is arrested, the case may be referred to criminal court, juvenile court, or a diversion program, depending in part on the age of the child, the nature of the offense, and the adjudicative structure within the state (NHTSA/NIAAA, 1999). Each of these settings tends to have a different philosophy and consequently may impose different sanctions within the limits of its authorizing statute.

Criminal Court

Criminal courts handle the majority of underage drinking cases for individuals ages 18 to 20 because these individuals have aged out of a juvenile justice system that is typically limited to youth under the age of 18 (NHTSA/NIAAA, 1999). The primary goal of criminal courts when an offense is established is punishment, and therefore offenders are likely to receive a formal disposition that will be part of their permanent criminal record. Dispositions include fines, incarceration, required participation in diversion programs, community service, referral for alcohol assessment and treatment, and mandatory education. Information is lacking on the relative use of these various dispositions and the recidivism rates for convicted underage drinkers.

Juvenile Court

Alcohol possession, consumption, and purchase violations by individuals (typically) under the age of 18 are considered status offenses in that when the minor turns 21 these activities are legal. Because juvenile courts have rehabilitation as their primary goal, it is not surprising that 58 percent of nonmotor vehicle-related cases involving alcohol are handled informally

(i.e., no petition is filed by prosecutors and no adjudicatory hearing is held) (OJJDP, 2002). In contrast, 43 percent of all juvenile court cases were handled in this manner in 1998 (OJJDP, 2002). Juvenile courts tend to impose sanctions that may include probation, referral to a treatment program, a fine, restitution, community service, commitment to a residential facility, or voluntary diversion. Often, a dispositional order includes multiple sanctions (NHTSA/NIAAA, 1999). Information is lacking on the relative use of these sanctions by juvenile courts and the recidivism rates for underage drinking offenders.

Diversion Programs

Diversion programs are alternatives to formal case processing, adjudication, and sanctions. They are designed to hold offenders accountable for their actions while keeping them out of the juvenile justice system (McPhail and Wiest, 1995). The common elements of pretrial diversion programs are community service, parental involvement, continuing education, continuous monitoring and supervision, restitution, and counseling (Panzer, 1997). Congress has recently recognized the importance of pretrial diversion and alternatives to institutionalization (Juvenile Justice and Delinquency Prevention Act of 1997, 42 USCA § 5602). The most widely used diversion program is teen court, although juvenile drug courts are gaining notoriety.[12]

[12]Although not yet widely employed, a few relevant diversion programs other than teen courts and juvenile drug courts do exist. They include informal probation and Youth Accountability Boards. In California, informal probation is a statutory pretrial diversionary program under the supervision of local probation officers (Panzer, 1997). A contract is generally signed by the juvenile and his or her parents agreeing to certain terms such as restitution, community service, counseling, and continuing education. The juvenile is not subject to further adjudication for the offense and has no record of a formal adjudication. However, failure to successfully complete the requirements of the contract may cause the probation officer to file a petition for formal court proceedings on the original affidavit. California has also experimented with Youth Accountability Boards (YABs) (Panzer, 1997). For example, in San Bernardino County, youth may be diverted to a YAB. A YAB panel consists of three to five adult volunteers. A local probation officer provides the police reports of those juveniles who they believe would most benefit from the program and the YAB decides whether to accept the case or return it to the probation officer. If accepted, the case is further investigated and interviews with the parent(s) and child are conducted. A hearing with the juvenile and parent(s) is subsequently held. There is no requirement that the juvenile admit the crime. The panel determines the disposition. A legally binding contract is created detailing the provisions of the disposition, which may include restitution, community service, counseling, specialized education, and a condition to do well in school. An identified weakness of this model is that little parent training is required. A 20-month follow-up revealed a 97 percent success rate (measured as no referral back to the juvenile justice system as a repeat offender) for juveniles completing the program (see Panzer, 1997).

Teen Courts

The philosophy underlying teen courts is that teenagers are less likely to run afoul of the law if they are involved in a judicial proceeding that exerts positive peer pressure in an educational setting (Godwin, Steinhart, and Fulton, 1998). The programs are typically designed for first-time offenders between the ages of 10 and 18 who have already admitted their guilt, often to nonviolent offenses such as alcohol violations. Indeed, alcohol violations are the fourth most common type of offense handled by teen courts (Butts, Buck, and Coggeshall, 2002). Peer juries issue sanctions that include future participation as a teen court juror, financial restitution, obtaining counseling, in-house detention, community service, and writing a letter of apology or an extensive essay (Johnson and Rosman, 1997). Teen courts may attempt to address parental behavior as well. For example, the youth's parent(s) may be required to spend one hour a day with the youth.

Evaluations of teen courts generally find lower recidivism rates for youth who are diverted to the teen court (Butts et al., 2002). There are, however, several notable limitations of this research. First, the effects of individual sanctions have not been examined, so it is unknown whether one sanction is more effective than another sanction (or a combination of sanctions). Second, the mechanisms responsible for behavior change have not been identified and therefore the cause of the change is unknown. Finally, although there is a general teen court model, considerable variations exist from site to site and sanctions are dispensed on an individual case basis, making generalizations difficult (Butts et al., 2002; Panzer, 1997). Because of the wide variability in these programs, it is difficult to conclude that the "teen court model" is effective (see Rossi, Freeman, and Lipsey, 1999:217-218), particularly with regard to alcohol offenses, which have not been studied separately.

Juvenile Drug Courts

The philosophy underlying juvenile drug courts (JDCs) is that a combination of incentives and sanctions, with substantial monitoring, is required to achieve behavior change. JDCs provide immediate and continuous intervention that requires the youth (and the family) to participate in treatment, submit to frequent drug testing, attend regular and frequent status hearings, and comply with other conditions (Danziger and Kuhn, 1999). Most JDCs are postadjudication programs that operate after the guilt of the youth has been determined (by trial or plea). This enables the court to exert more extensive authority over the youth. JDCs tend to focus on youth who have more serious problems—moderate to heavy substance use, multiple convictions, more serious offenses—but who are not dangerous to the community (Cooper, 2001). Some scholars who have studied JDCs estimate that a half

to a third of the cases seen in JDCs involve alcohol (Jeffrey A. Butts, Urban Institute, personal communication, September 10, 2002). However, others assert that alcohol-related cases are not typically diverted to a JDC unless there is a finding in juvenile court that the youth is abusing alcohol (Caroline Cooper, Justice Programs Office, American University, Drug Court Clearinghouse Project, personal communication, November 12, 2002).

The presumption of JDCs is that drug treatment and related sanctions are most effective when initiated soon after the youth's arrest (Johnson and Rosman, 1997). Positive rewards and incentives for compliance with program conditions are considered to be as important as sanctions for program noncompliance (Cooper, 2001). The sanctions available to JDCs include imposition of or increase in curfew conditions, community service, frequent court contacts, treatment contracts and/or urinalysis, and short-term incarceration.[13] Incentives for positive behavior change include promotion to a subsequent program phase, awards or gift vouchers to a local sporting event, certificates or tokens acknowledging the participant's accomplishments, the judge's praise, and the praise of other drug court participants. In essence, the courtroom is supposed to become a therapeutic environment in which the judge is inextricably linked to the imposition of sanctions and incentives (Hora, Schma, and Rosenthal, 1999; Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project, 1999).

JDCs have a fairly short history, so little systematic data exist on their effectiveness. Belenko (2001) reviewed seven evaluations of JDCs that have been released. Unfortunately, these evaluations focused primarily on process rather than outcomes. A few local evaluations have been completed. For example, Miller, Scocas, and O'Connell (1998) conducted an outcome evaluation of a JDC in Delaware.[14] They found no statistical difference in recidivism (defined as rearrest) between the treatment group and the comparison group.[15] However, they did find that individuals who completed

[13]According to Jennifer Columbel, Drug Courts Program Office, Bureau of Justice Assistance, U.S. Department of Justice, many JDC judges across the country routinely impose detention or mandate lengthy terms of treatment, without considering whether these sanctions are developmentally appropriate or whether other behavior modification techniques might be more appropriate (Jennifer Columbel, Office of Justice Programs, Drug Courts Program Office, personal communication, November 8, 2002).

[14]This was an evaluation of a new JDC in Delaware that began in 1995. Participants were 144 individuals between the ages of 11 and 19: 80.4 percent were males, and 59.7 percent were white, and 37.4 percent were African American.

[15]The comparison group (N = 142) was culled from case records for juveniles who had appeared during the first half of 1995. Questions might be raised about whether this constituted an appropriate comparison group as the comparison group had longer histories of and more serious criminal activity than the treatment group. Therefore, the treatment group might have been more inclined to exhibit a lower recidivism rate following appearances before the JDC.

the program were significantly less likely than those who did not complete the program to be rearrested. It should also be noted that this JDC was atypical of most JDCs in that the program targeted new drug offenders with no criminal history. Furthermore, only 5.6 percent of the offenders appearing before the court were there for alcohol-related charges.[16]

Applied Sanctions and Their Effectiveness

As indicated, the courts and associated diversion programs have a number of sanctions available to them for responding to youth brought before them who have engaged in underage drinking. As noted, sanctions vary in their severity, whether they are considered criminal or civil in nature and thus what consequences they have for the youth, whether they are to be enhanced for subsequent offenses, and whether their application varies with the age of the youth. The following section will briefly describe these sanctions and, when available, review the effectiveness of the sanctions. As will be seen, only limited information is available on the effectiveness of sanctions and thus there is a great need for research on the effectiveness of sanctions (Martin, 2000). One particular challenge hindering this research is that more than one sanction is typically imposed on an individual and, therefore, it is difficult to isolate the effectiveness of a particular sanction.

Fines

Fines are perhaps the most common sanction imposed on youth for underage drinking (PIRE, 1999). Fines may be imposed on a preestablished basis and without a court appearance following a citation by an arresting officer or may be assigned as part of a court-ordered sanction (NHTSA/NIAAA, 1999). Typically, fines range from $50 to $100 for a first offense, $200 for a second offense, and $500 for a third and subsequent offenses (e.g., MICH. COMP. LAWS ANN. § 436.1703 [2002]). However, some states impose much harsher fines. For example, Idaho imposes fines of up to $1,000 for first-time offenses (IDAHO CODE § 18-1502 [2002]). They may be civil or criminal in nature.

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[16]Adult drug courts have been evaluated extensively, and generally have been found to be effective at reducing drug use, at least for some offenders (Belenko, 1999). However, because alcohol is legal for adults, there are no alcohol-related cases in adult drug courts. Because they do not address alcohol-related offenses and because the mechanisms for successful interventions for youth offenders may be considerably different from those for adult offenders, considerable caution should be exercised before using the results obtained for adult drug courts as a proxy of the likely effectiveness of JDCs.

Law enforcement officials generally believe that fines are not an effective deterrent to underage drinking for several reasons. First, parents often pay these nominal fines for the youth (Wolfson et al., 1995). Second, because the majority of teens are employed, a $50 fine, for example, is a relatively small amount of money to them (American Savings Education Council, 1999; Teenage Research Unlimited, 2001). Finally, many fines go uncollected and there is often no mechanism to collect on the debts (OIG, 1991). Unfortunately, empirical evidence regarding the effectiveness of fines in deterring underage drinking is lacking.[17]

Community Service

Community service is another common sanction imposed on youth for underage drinking violations (PIRE, 1999). The relevant law may stipulate the boundaries of community service to be imposed (e.g., not less than 24 nor more than 32 hours) (e.g., CAL. BUS. & PROF. CODE § 25658 [2002]), it may establish a minimum that must be imposed (e.g., at least 25 hours) (e.g., N.C. GEN. STAT. § 18B-302.1 [2002]), or it may leave the decision to the discretion of the judge.

Community service is widely viewed as an effective sanction to impose on youth. Wolfson et al. (1995) recommend community service placements in locations where the youth are most likely to see the effects of alcohol abuse. Unfortunately, there is little direct evidence on the effectiveness of community service as a deterrent to underage drinking (NHTSA/NIAAA, 1999). In addition, one concern with imposing community service is that many communities lack the resources necessary to coordinate and supervise the community placements (Canadian Cancer Society, 2001).

Referral for Alcohol-Related Assessment and Mandated Treatment

Referral for assessment and, if necessary, mandated treatment of alcohol dependence or abuse is another response often available to courts (PIRE, 1999). Typically such referral is left to the discretion of the court (e.g., IDAHO CODE § 18-1502 [2002]).

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[17]One somewhat related study was undertaken in conjunction with underage smoking. Jason and Schoeny (in press) examined whether there was any effect on smoking behavior when towns (matched on population and income) in Illinois enforced both tobacco possession laws and laws that targeted tobacco vendors or only the latter. The possession laws imposed fines on underage smokers. The authors concluded that enforcing both sets of laws reduced the rate of increased smoking among sixth- through eighth-grade white students (although not among the minority youth) significantly more than enforcing sales laws alone. This study did not, however, isolate the effects of fines per se.

Unfortunately, the effects of treatment for alcohol dependence of youth in the context of a court order have not been examined. There is evidence that alcohol treatment programs are effective for some youth (see, e.g., Brown, D'Amico, McCarthy, and Tapert, 2001). The question remains, however, whether court-mandated treatment is beneficial for youth. Generally, voluntary treatment is thought to be more effective than mandated treatment. In studies of adults, however, mandatory treatment, along with the threat of alternative consequences such as incarceration for noncompliance, has been shown to be effective (Miller and Flaherty, 2000). One reason this approach may be effective is that more favorable outcomes are associated with longer periods of treatment (Taxman, 1998). If underage drinkers are more likely to stay in treatment when they are under court order, mandating alcohol treatment may be an effective intervention.

License Suspension and Revocation

An increasingly common response by legislatures is to suspend or revoke an offender's driver's license (NHTSA/NIAAA, 1999). Previously, license suspension and revocation were pursued in the context of drunk driving. However, states have expanded the grounds for which driver's licenses may be suspended or revoked to encompass underage drinking offenses that do not involve the operation of a motor vehicle (OIG, 1991). Imposition of the suspension may be mandatory or discretionary, depend on the age of the youth, civil or criminal in nature, decided by the court or an administrative agency, preestablished or of various lengths, and independent of or enhanced by prior offenses. For an examination of these statutes, their permutations, and constitutional challenges that have been lodged against them, see Appendix 8-A.

According to a report by OIG (1991), law enforcement personnel strongly believe that the possibility of license revocation is an effective deterrent because a driver's license is important to most youth. There is some concern, however, that because the threat of detection of driving without a license is so low, youth will simply drive without a license (Canadian Cancer Society, 2001). However, this has not been empirically demonstrated nor has the belief that license revocation is an effective deterrent to underage drinking in general.

Mandatory Attendance at an Educational Program

Another available sanction is required attendance at an educational program, typically an alcohol education program (e.g., COLO. REV. STAT. § 18-13-122 [2002]) (PIRE, 1999). These specialized classes are designed to

deal with alcohol-related issues and to inform youth of the consequences of their alcohol-related behavior (NHTSA/NIAAA, 1999).

The effect of such required education programs on the drinking behavior of youth is unknown. It has been suggested, however, that imposing sanctions that are readily, easily, and cheaply applied, such as education, are likely to be more effective than responses such as incarceration (PIRE, 1989). However, it is doubtful whether education alone will be an effective deterrent given that education-based programs have been ineffective at changing behavior in settings such as school-based substance abuse prevention programs (e.g., Gottfredson, 1997).[18] However, it may be that education that occurs in conjunction with other sanctions enhances the effect of the education program.[19]

School Involvement

Some state laws require that law enforcement and schools collaborate in responding to underage drinking cases (NHTSA/NIAAA, 1999). For example, Iowa requires law enforcement officers to notify the school of an alcohol possession violation (IOWA CODE ANN. § 123.47B [2001]). A Montana law specifies that the teen court must notify the school district when a minor is involved in teen court as a result of a substance violation (MONT. CODE ANN. § 41-5-215 [2002]). The impact of this type of collaboration has not been evaluated. However, it is arguable that such an approach provides greater monitoring of the offender and therefore may help to change behavior.

Commitment to a Residential Facility

Case dispositions may include commitment to a residential facility (e.g., training schools, camps, ranches) for delinquents or status offenders (NHTSA/NIAAA, 1999; OJJDP, 2002). However, commitment to a resi-

[18]Gottfredson (1997) conducted a review of the empirical literature on various school programs designed to reduce drug and alcohol use (no available data on alcohol alone). Her findings generally led to the conclusion that drug education (e.g., information dissemination, fear arousal, moral appeal, and affective education) and law-related education (e.g., laws, the legal process) were ineffective. There were some clear program effects on law-related factual knowledge, but she characterized the other outcome effects as minimal (e.g., the effect size for the 11 delinquency items was 0.22).

[19]For example, Popkin, Stewart, and Lacey (1988) found that a combination of education and license suspension is more effective than license suspension alone among adult driving under the influence offenders.

dential facility is a less commonly used sanction (NHTSA/NIAAA, 1999). For example, the OJJDP *Statistical Briefing Book* (2002) reports that 8 percent of adjudicated liquor law violation cases resulted in placing minors in a residential facility. The deterrent effect of placing youth in a residential facility for underage drinking is unknown.

Incarceration

Incarceration is the most severe form of sanction and appears to be used far less frequently for underage drinking offenses than other sanctions. Unfortunately, as is true of underage drinking sanctions in general, there are no data available on the impact of incarceration on underage drinking, including whether youth are aware that this is a possible sanction and, if they are aware, whether its availability deters this behavior. However, if incarceration is part of the sanctioning response, it has been recommended that incarceration be short term rather than long term because of assertions that short-term incarceration will be more effective (Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project, 1999).

Other Sanctions

As mentioned earlier, a number of sanctions are available to teen court juries. In addition to those sanctions discussed above, other sanctions include future participation as a teen court juror, in-house detention, writing a letter of apology or an extensive essay, and sanctions targeting the parent(s) of the youth (e.g., parent required to spend one hour a day with the minor) (Johnson and Rosman, 1997). Additional sanctions typically used by JDCs include imposition of or an increase in curfew conditions, an increase in frequency of court contacts, intensive probation, a lecture from the court, a loss of sobriety time, home detention, and a change of school placement (National Council of Juvenile and Family Court Judges, 2001). Although teen court and JDC programs have been subjected to some global evaluations, these various sanctions have not been evaluated and therefore it is unknown what individual deterrent effect they have on underage drinking.

Effect of Sanctions for Driving Under the Influence (DUI) Violations

The NHTSA/NIAAA (1999) report reviewed the literature on the effectiveness of a number of individual sanctions imposed for driving while under the influence of alcohol. The sanctions reviewed included incarceration, out-of-home placement, residential weekend intervention (for screening and assessment), probation, home detention, electronic home monitoring, driver's license suspension/revocation, license plate removal/registration

revocation, community service, restitution, victim-offender mediation, attendance at victim impact panels, fines, emergency department visitation, education, and treatment. The report concluded that few of these sanctions have been empirically tested, either for adults or minors. However, one sanction of relevance to this chapter has been tested with youth. Tulsa, Oklahoma, developed an emergency department visitation program in which minors spent time in an emergency room, preferably late at night on the weekend, to view the effects of drunk driving. In addition, youth visited a rehabilitation center for patients with spinal cord injuries, attended a victim impact panel presentation, participated in a small group alcohol counseling session, and wrote an essay about their experiences in the program. A study of this program found reduced recidivism (i.e., rearrest for DUI) among 16- to 25-year-olds over a two-year period. Program participants had a recidivism rate of 1.2 percent compared to the national DUI rearrest rate of approximately 30 percent (Police Executive Research Forum, n.d.).

Probation and Monitoring Compliance with Sanctions

Little has been written about the importance of monitoring compliance, but it appears to be critical for enhancing the deterrent effects of sanctions. In juvenile court, compliance with sanctions is usually monitored by the probation department. Probation (as a form of monitoring compliance) places youth under informal or formal supervision. Also available to courts is intensive probation, which may include biweekly visits, electronic monitoring, and unannounced visits. Judges have wide-ranging discretion in stipulating the probation conditions (NHTSA/NIAAA, 1999). These conditions typically encompass many of the sanctions already discussed. For example, judges may include as a condition of probation the payment of a fine, obtaining an alcohol dependency assessment or periodic testing for alcohol use, attendance at an education program, or community service. A number of conditions can be set simultaneously by the court. Probation provides a mechanism for ensuring that these conditions are satisfied. It can also provide a means to monitor the behavior of the youth, either by regular or sporadic encounters with a probation officer, and to ensure a swift reengagement with the courts should the youth reoffend.

The effectiveness of probation to deter underage drinking has not been studied.[20] Similarly, there have been no evaluations of intensive probation

[20]However, focusing on juvenile offenders in general, Olson and Adams (2002) conducted an outcome evaluation of 821 juvenile probationers in Illinois discharged in November 2000. They concluded that probation is an effective form of supervision and rehabilitation for large numbers of juveniles.

(NHTSA/NIAAA, 1999). Obtaining sufficient resources to permit ongoing monitoring of offenders by probation officers historically has been a challenge for the criminal justice system. To the extent that more resources are available to monitor the ongoing behavior of an underage drinker, this approach may have more promise in this context. Also, some youth may be more accustomed to relatively close supervision and the monitoring of their behavior in general and thus be less resistant and more responsive to periodic monitoring by probation officers.

Other Responses

Public Humiliation

Some communities have responded to underage drinking by making public the names of individuals involved in underage drinking incidents (Wolfson et al., 1995). For example, OIG (1991) reported that Alabama issued press releases listing names of minors arrested for alcohol violations. Similarly, Michigan published the results of vendor sting operations (OIG, 1991). No evaluation of this approach has been conducted.

Parental Notification

The National Highway Traffic Safety Administration (1997) recommends parental notification as a response to underage drinking. For example, law enforcement officials may be required to notify a parent when a minor has been cited (i.e., no arrest occurs) for an alcohol-related violation (e.g., MICH. COMP. LAWS ANN. § 436.1703(6) [2002]). This approach has been recommended because it is believed to engage parents in addressing the problem, allows parents to handle the problem at home, and enables them to use disciplinary means that they have found effective and as they see fit, rather than interjecting the courts into an environment with which they are not familiar. No evaluations of this approach have been conducted. Moreover, evaluation of this approach probably would be difficult because the intervention takes place in the home, where outsiders would not know exactly what transpired and where situations would vary considerably from case to case.

Incentives for Positive Behavior Change

One primary difference between JDCs and other types of courts is the emphasis of JDCs on providing incentives for positive behavior change. Incentives include promotion to a subsequent program phase, providing an award or a gift (e.g., a voucher to a local sporting event), issuing a certifi-

cate or a token acknowledging the participant's accomplishments, and receiving the judge's praise or the praise of other drug court participants. However, there have been no empirical studies of the effect of these various incentives.

Lessons Learned from the Tobacco Literature

Like underage drinking laws, the extent to which tobacco possession laws are enforced in each state is largely unknown (Centers for Disease Control and Prevention [CDC], 1999).[21] Cismoski (1994) argues that these laws are almost never enforced.

Although they may not be enforced frequently, it appears that youth tobacco possession laws are enforced more often than tobacco access laws. This is surprising given the existence of the federal Synar Amendment (Pub. L. 102-321, 1991).[22] This legislation seeks to promote greater vendor vigilance and requires states to achieve a maximum sales-to-minors rate of no more than 20 percent by Fiscal Year 2003 (i.e., a minor attempting to purchase tobacco should be able to complete a purchase less than 20 percent of the time). However, Forster, Komro, and Wolfson (1996) examined a 1992 Minnesota law that prohibited the purchase, attempt to purchase, and possession of tobacco by minors. Forster and colleagues found that the 222 cities included in the study were far more likely to penalize youth than merchants for underage smoking violations. Specifically, she found that more than 90 percent of the cities studied reported at least some action to enforce their underage tobacco possession law, with more than 40 percent of these cities applying serious penalties. In contrast, only 25 percent of the cities studied reported taking enforcement actions against retailers for selling tobacco to underage youth and only 10 percent of these cities reported that serious penalties were imposed for such sales.

Little evidence is available to indicate that the enforcement of tobacco possession laws has decreased underage smoking behavior (Canadian Cancer Society, 2001; Kelder, 1997; Mosher, 1998). However, as noted, one study found that a combination of enforcing sales laws and possession laws reduced the rate of increased smoking among white sixth- to eighth-grade students (Jason and Schoeny, in press). This suggests that enforcing tobacco possession laws does have value when occurring in conjunction with the enforcement of sales laws.

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[21]Nor has research been generated that indicates whether underage drinking laws are more, less, or just as likely to be enforced as underage smoking laws.

[22]The Synar Amendment (there is no equivalent law for alcohol) is designed to reduce, then eliminate, youth tobacco use by curtailing access and availability. This is accomplished by requiring states to govern tobacco sales to minors coupled with compliance monitoring.

Based on his research on underage smoking, one scholar has surmised that sanctions for underage smoking deter youth who are already law abiding, but may be less of a deterrent for other youth (Leonard Buckle, the Tobacco Control Resource Center, Northeastern University School of Law, personal communication, October 4, 2002), particularly if they are applied infrequently and inconsistently. For these youth, a penalty for tobacco use may serve to reinforce their sense of alienation from society, rather than encourage compliance with the law (Hirschhorn, 2000) or serve as a badge of honor enhancing their status with their peer group.

Criminalizing Underage Drinking

Bonnie (1979) recommends that prior to enacting a law, legislators need to determine the purpose of the law and their desired goals, then craft laws that will enable them to meet those goals.[23] The purpose of possession, consumption, purchase, and misrepresentation laws is to protect, not punish, youth. Wolfson and Hourigan (1997) argue that it may not have been the intent of legislatures to criminalize underage drinkers (and thereby to establish a permanent criminal record for such youth), but this has been the result. Criminal penalties tend to accomplish deterrence only when punishment is sufficiently swift, certain, and severe (Zimring and Hawkins, 1973). Wolfson and Hourigan (1997) add that the assumption of legislators may have been that the mere existence of underage drinking laws would deter underage drinking and that enforcement and sanctions would not be necessary. However, there is little indication that this has occurred. But for those youth who have been apprehended and successfully prosecuted, the result may be the imposition of a criminal record with long-term implications.[24]

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[23]Bonnie (1979) studied the effect of decriminalizing marijuana use and found considerable support for this approach. He determined that those states that had taken this step did not experience an increase in the use of marijuana and that a number of other positive benefits resulted, including reduced administrative expenses. He also noted that merely labeling a sanction as criminal or civil does not necessarily change the employment of the sanction and that some sanctions, such as fines, fit well under either label. One advantage of a civil approach is that elements of proof and procedural requirements may be relaxed and a less burdensome process may be employed. Another advantage is that it may deter future behavior while avoiding the establishment of a permanent criminal record that may significantly impact the future well-being of the youth. Also, a civil penalty may be viewed as less severe and more measured to the offense, which in turn may increase support for these laws and enhance their enforcement and prosecution.

[24]In the perhaps related context of marijuana use, Bonnie (1979) provides some guidance for how to decriminalize such behavior but still hold offenders accountable.

Conclusions

In sum, laws and sanctions against underage drinking exist to some extent in all states, although many state laws contain loopholes. It has been recommended that all states should adopt consumption, possession, purchase, and misrepresentation laws (President's Commission on Model State Drug Laws, 1993).[25] It appears from the literature that enforcement of existing laws is low and therefore a major barrier to reducing underage drinking. When arrests are made and sanctions imposed, compliance monitoring is often lacking. The effect of sanctions on underage drinking is unknown because little research has examined this question. However, based on deterrence theory, it could be argued that sanctions as they exist in the current context are not effective. That is, courts impose small fines (i.e., sanctions are not sufficiently severe); enforcement, prosecution, and adjudication are uncertain (i.e., there is little certainty of punishment); and often there are long delays, at least from a youth's perspective, before a case is heard or resolved (i.e., no swiftness).

PROHIBITING POSSESSION, CONSUMPTION, AND PURCHASE OF ALCOHOL BY MINORS IN ELEMENTARY AND SECONDARY SCHOOLS[26]

Federal Law

Within the relatively new federal law, the No Child Left Behind Act of 2001 (Pub. L. 107-110), is the Drug-Free Schools and Campuses Act. This Act requires schools (kindergarten through college) to have written policies regarding the use or possession of alcohol (and other drugs) on school

[25]Although most commentators do not recommend creating new laws in this area (e.g., Mosher, 1998), a review of social science literature was conducted to identify characteristics of laws that might be the most effective at deterring underage drinking behavior (PIRE, 1989). It was concluded that laws could be expected to be the most successful in affecting this behavior (1) when the behavior in question is obvious and public rather than private (e.g., speed law enforcement versus unlicensed driving), (2) when the law targets a relatively few rather than many individuals or is directed at organizations rather than large numbers of individuals (e.g., targeting the alcohol industry versus millions of drivers), (3) when the law is relatively simple in its prohibitions or scope (e.g., a ticket versus detention), (4) when the law's enforcement is relatively inexpensive and mechanical (e.g., when it can be enforced by Breathalyzer tests rather than demonstrated impaired driving), (5) when the law's sanctions are relatively cost-effective (e.g., fines, educational programs), and (6) when the existence of the law is widely known and supported.

[26]The charge associated with the preparation of this chapter was to focus on elementary and secondary schools, with college policies and responses outside the scope of the chapter.

premises and sanctions to be imposed when violations of these policies occur. The federal government provides funds to every state and in turn every state provides funds (on a formula basis) to schools for drug abuse and prevention programs (Bill Modzeleski, Director, Safe and Drug-Free School Program, U.S. Department of Education, October 9, 2002).

State Laws

State law directs and impacts school policies on underage drinking in elementary and secondary schools in several ways. First, states have enacted laws that directly prohibit the consumption and possession of alcohol on school property and at school functions (e.g., MICH. COMP. LAWS ANN. § 436.1904 [2002]). In some instances, states dictate the response of school officials to alcohol violations (e.g., HAW. REV. STAT. § 302A-1134.6 [2002]). State law also influences the behavior of faculty. For example, an Illinois law encourages faculty to intervene when a student appears to have an alcohol problem by providing faculty with immunity when they do intervene (e.g., 105 ILL. COMP. STAT. ANN. 5/24-26 [2002]). In addition to direct influence over school policies, local school policies regarding underage drinking must comport with state law, are subject to review by state officials, and must be approved and registered with state education administrators. Finally, states are the conduit for delivering federal funds to local schools.

School Policies

Nature of School Policies

In accord with federal and state laws, all elementary and secondary schools have alcohol policies (Gottfredson et al., 2000). However, these policies vary from school to school. For example, some schools have relatively sweeping policies that allow a student to be suspended for attending any school-sponsored function, on or off campus, in an intoxicated state (e.g., HAW. REV. STAT. § 302A-1134.6 [2002]).

Prevalence of School Policy Violations

Heaviside, Rowand, Williams, and Farris (1998) conducted a nationally representative survey of 1,234 public elementary, middle, and secondary schools regarding disciplinary practices for school violence for the academic school year 1996-1997. Among other topics, principals were asked to rate the seriousness (serious, moderate, or minor) of each of 17 problem areas contained in the survey. They found that 27 percent of high school

principals reported that alcohol use was a serious or moderate problem in their schools. No such reports were presented for elementary and middle schools, suggesting that alcohol use was not as serious a problem in these schools.[27]

Zero-Tolerance Policies

Many schools are adopting zero-tolerance policies. These policies mandate predetermined consequences or punishments for specific serious student infractions. A large majority (87 percent) of public schools report having zero-tolerance policies for alcohol violations (Heaviside et al., 1998).[28]

Sanctions

When alcohol policies are violated, a common response is suspension or expulsion, a response that may be dictated by state law (see, e.g., HAW. REV. STAT. § 302A-1134.6 [2002]).[29] Gottfredson and colleagues (2000) conducted a national survey of school principals, which among other things asked about principals' responses to undesirable behavior. Gary Gottfredson, (Gottfredson Associates, Inc., personal communication, October 9, 2002) calculated the rates of suspension and expulsion exclusively for alcohol infractions and found some consistency across grade levels. According to elementary school principals surveyed, for alcohol policy violations, 65.4 percent of the principals reported that their students are automatically suspended or expelled, while 24.2 percent of the principals said their students receive a hearing, but this hearing usually results in suspension or expulsion. For middle schools, 74 percent of the principals said that when alcohol policy violations occur, students violating the policies are

[27]In contrast to these reports from principals, Gottfredson et al. (2000) directly surveyed students. They found that 9 percent of middle school students and 17 percent of high school students reported going to school drunk or high on drugs.

[28]Interestingly, schools with no reported violence were less likely to have a zero-tolerance policy for violence than schools with reported violence (Heaviside et al., 1998).

[29]It should be noted that for other problem behaviors, schools tend to use incentives in lieu of or in addition to sanctions (e.g., greater free time following positive behavior). Such an approach tends to be used more with younger students. In addition, schools often employ mild forms of social control in response to undesirable behavior, such as notifying parents or holding conferences with the parents, talking to or providing oral reprimand to the students, and short-term withdrawal of privileges (Gottfredson et al., 2000). There is no indication of whether or how frequently these approaches have been used in response to alcohol use or an evaluation provided of their effectiveness.

automatically suspended or expelled, and another 23 percent of the principals said their students are usually suspended or expelled after a hearing. Finally, for high school, 67.5 percent of the principals surveyed said students violating alcohol policies are automatically suspended or expelled, and another 24 percent are usually suspended or expelled after a hearing for an alcohol policy violation. Thus, suspension or expulsion is the dominant response to alcohol violations regardless of the grade level.

Other studies that have not focused exclusively on alcohol use report similar findings. Heaviside et al. (1998) asked principals to report the number of expulsions, transfers to alternative schools, and out-of-school suspensions lasting five or more days for possession, distribution, or use of alcohol, drugs, and tobacco. They found that 27 percent of all school principals surveyed reported taking a total of about 170,000 disciplinary actions for these offenses, and of these actions, 62 percent of the disciplinary actions were out-of-school suspensions lasting five days or longer, 20 percent were transfers to alternative schools or programs, and 18 percent were expulsions. Clearly, suspension was the most common response to substance-related problems in schools.

In the context of tobacco use, there is evidence that schools are much more likely to use punitive sanctions than nonpunitive responses when dealing with youth violators. Martin, Levin, and Saunders (2000) surveyed all public high school principals in South Carolina. They found that one-third of these schools employed out-of-school suspension as the sanction for first-time tobacco violations and two-thirds of them employed out-of-school suspension for second or third violations. Expulsion was rarely used at the first or second violation, but 28 percent of the schools employed expulsion for third violations of tobacco policy.

Law Enforcement Involvement

Other responses to violations of school alcohol policy include involving law enforcement in some way. For example, in some states, school officials either may or must inform local law enforcement of such violations (e.g., IOWA CODE ANN. § 123.47B [2002]). Studies have not been conducted of the effectiveness of this approach.

Effectiveness of Sanctions

There is little empirical evidence regarding the effectiveness of sanctions for alcohol policy violations imposed by schools. However, many school officials argue that school-imposed sanctions for smoking on school property have less deterrent effect than sanctions such as a fine imposed by some other entity (Canadian Cancer Society, 2001).

Furthermore, some researchers argue that schools should deemphasize punitive practices such as the automatic removal of students from school following the use of alcohol, tobacco, or other substances (Gottfredson et al., 2000). It has been suggested that schools should focus instead on assisting students who demonstrate such behavior to obtain needed treatment (CDC, 1994; Gottfredson et al., 2000). There is some movement in this direction. Some schools that previously expelled youth arrested for substance offenses have begun working with other systems (e.g., JDCs) to keep these youth in school (McPhail and Wiest, 1995; Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project, 1999). However, the effectiveness of this approach has not been tested. In addition, a number of influential governmental agencies believe that programs should be encouraged that increase the interaction and coordination between schools and the community in responding to youth smoking (CDC, 2000, 2001; U.S. Department of Health and Human Services, 2000).

CONCLUSIONS

In sum, the vast majority of elementary and secondary schools have alcohol-related policies and the majority of schools have adopted zero-tolerance policies. When alcohol violations are detected, suspension and expulsion are the typical responses. However, it is presently unknown what effect school sanctions have on the prevalence of underage drinking, whether schools are an appropriate venue for addressing this behavior, or, when compared to other possible venues, whether schools are better, worse, or equally effective in deterring or modifying this behavior.

Although the research on the topic is limited, there are some inferences that can be drawn about efforts to deter underage drinking. For example, all states and a number of municipalities have some type of prohibition against youth drinking, although these prohibitions vary from state to state. Relatedly, the nature and severity of the sanctions associated with violations of these prohibitions vary considerably across jurisdictions. It is also apparent that for a variety of reasons, enforcement of these laws is relatively sporadic and inconsistent. In addition, although all schools in this country have an alcohol policy, these policies also vary considerably.

A number of sanctions are being applied by a range of agents in conjunction with underage alcohol offenses. Fines and community service are common sanctions imposed by the legal system for underage drinking violations. Diversion programs continue to grow in popularity. Schools are likely to respond to alcohol policy violations with suspension or expulsion. Unfortunately, little is known about the effectiveness of these responses, and their imposition appears to be rarely guided by supporting empirical evidence regarding their effectiveness.

There does seem to be a general consensus that if sanctions are used, they should be just one part of a constellation of responses to underage drinking violations. Researchers and advocates are calling for comprehensive approaches to underage drinking that involve the youth, their families, and their communities. Teen courts, for example, have adopted this position. Evaluation of the effectiveness of teen courts specifically in conjunction with alcohol-related offenses is needed to test this hypothesis. The suggestion also has been made that sanctions should be aimed at helping youth rather than simply punishing them for alcohol violations.

In addition, it is important to recognize that sanctions will not be equally effective for all youth. Sanctions are often used as a blunt instrument of the courts, virtually ignoring developmental differences among adolescents. However, a sanction (e.g., a fine of $100) that is perceived as particularly onerous by one youth and thus serves as an effective deterrent may be seen as trivial or as an inconvenience by another youth. In general, studies generally have failed to consider the developmental level, gender, ethnicity, and geographic location of the youth, all of which may be important considerations (PIRE, 1999; U.S. Department of Health and Human Services, 2001).

REFERENCES

Alcoholism and Drug Abuse Weekly. (1999, September 20). Vermont city decriminalizes underage drinking. *Alcoholism and Drug Abuse Weekly*, *111*(36), 7.

American Savings Education Council. (1999). *Fact sheet: 1999 youth & money survey*. Student exposure to the real world: Work and savings. Available: http://www.asec.org/fact2ys.htm [accessed 06/05/03].

Belenko, S. (1999). Research on drug courts: A critical review, 1999 update. *National Drug Court Institute Review*, *II*(2), 1-58.

Belenko, S. (2001, June). *Research on drug courts: A critical review, 2001 update*. Princeton, NJ: Robert Wood Johnson Foundation.

Bonnie, R.J. (1979). Decriminalizing the marijuana user: A drafter's guide. *University of Michigan Journal of Law Reform*, *11*(1), 3-50.

Brown, S.A., D'Amico, E.J., McCarthy, D.M., and Tapert, S.F. (2001). Four-year outcomes from adolescent alcohol and drug treatment. *Journal of Studies on Alcohol*, *62*, 381-388.

Butts, J.A., Buck, J., and Coggeshall, M.B. (2002, April). *Research report: The impact of teen court on young offenders*. Washington, DC: Urban Institute.

Canadian Cancer Society. (2001, September). *Youth tobacco possession laws: Policy analysis*. Ottawa, Ontario: Author.

Centers for Disease Control and Prevention. (1994). Guidelines for school health programs to prevent tobacco use and addiction. *Morbidity and Mortality Weekly Report*, *43*, (no. RR-2), 1-19.

Centers for Disease Control and Prevention. (1999). *Best practices for comprehensive tobacco control programs*. Atlanta: Author.

Centers for Disease Control and Prevention. (2000, February). *CDC's guidelines for school health programs: Preventing tobacco use and addiction*. Atlanta: Author.

Centers for Disease Control and Prevention. (2001, August 10). *Morbidity and Mortality Weekly Report* School-based tobacco use prevention programs. *Highlights*, *50*(31).

Cismoski, J. (1994). Blinded by the light: The folly of tobacco possession laws against minors. *Wisconsin Medical Journal*, *93*(11), 591-612.

Cooper, C.S. (2001, May). *Juvenile drug court programs*. Office of Justice Programs and U.S. Department of Justice Juvenile Accountability Inventive Block Grants Program (JAIBG) Bulletin. Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

Cooper, C.S., and Bartlett, S. (1998). *Juvenile and family drug courts: Profile of program characteristics and implementation*. U.S. Department of Justice, Office of Justice Programs, Drug Courts Program Office. Washington, DC: Drug Court Clearinghouse and Technical Assistance Project at American University.

Danziger, G., and Kuhn, J.A. (1999). Drug treatment courts: Evolution, evaluation, and future directions. *Journal of Health Care Law and Policy*, *3*, 166-191.

DiFranza, J., and Godshall, W. (1996). Tobacco industry efforts hindering enforcement of the ban on tobacco sales to minors: Actions speak louder than words. *Tobacco Control*, *5*, 127-131.

Flewelling, R.L., Paschall, M.J., and Ringwalt, C. (2002, October). *The epidemiology of underage drinking in the United States: An overview*. Paper presented at the Workshop on Underage Drinking: Issues and Approaches, Washington, DC.

Forster, J.L., Komro, K.A., and Wolfson, M. (1996). Survey of city ordinances and local enforcement regarding commercial availability of tobacco to minors in Minnesota, United States. *Tobacco Control*, *5*, 46-51.

Gallagher, M.P. (2001, July 2). Empowered to pass laws against teen drinking, towns just say no: New Jersey ordinances prohibiting underage drinking on private property. *New Jersey Law Journal*, *165*(1), 1-4.

Gliksman, L., Douglas, R.R., Rylett, M., and Narbonne-Fortin, C. (1995). Reducing problems through municipal alcohol policies: The Canadian experiment in Ontario. *Drugs: Education, Prevention and Policy*, *2*(2), 105-118.

Godwin, T.M., Steinhart, D.J., and Fulton, B.A. (1998). *Peer justice and youth empowerment: An implementation guide for teen court programs*. Washington, DC: The Council of State Governments, American Probation and Parole Association.

Gottfredson, D.C. (1997). School-based crime prevention. In L.W. Sherman, D. Gottfredson, D. MacKenzie, J. Eck, P. Reuter, and S. Bushway (Eds.), *Preventing crime: What works, what doesn't, what's promising: A report to the United States Congress* (pp. 56-165). Washington, DC: National Institute of Justice.

Gottfredson, G.D., Gottfredson, D.C., Czeh, E.R., Cantor, D., Crosse, S.B., and Hantman, I. (2000, November). *Summary: National study of delinquency prevention in schools*. Washington, DC: U.S. Department of Justice, National Institute of Justice and the Office of Juvenile Justice and Delinquency Prevention.

Heaviside, S., Rowand, C., Williams, C., and Farris, E. (1998, March). *Violence and discipline problems in U.S. public schools: 1996-1997*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Hirschhorn, N. (2000, August). *Tobacco industry tactics: How they target youth worldwide*. Presentation to 11th World Conference on Tobacco or Health, Chicago, IL.

Hora, P.F., Schma, W.G., and Rosenthal, J.T.A. (1999). Therapeutic jurisprudence and the drug treatment court movement: Revolutionizing the criminal justice system's response to drug abuse and crime in America. *Notre Dame Law Review*, *74*, 439.

Humphrey, T. (2000). *Community volunteers in Missouri champion new alcohol-related ordinances at the local level*. Available: http://www.udetc.org/success_stories/woad_missouri.htm [accessed 06/11/03].

Jason, L.A., Pokorny, S.B., and Schoeny, M.E. (2003). Evaluating the effects of enforcements and fines on youth smoking. *Critical Public Health*, *13*, 33-45.

Johnson, B.G., and Rosman, D. (1997). Recent developments in nontraditional alternatives in juvenile justice. *Loyola University of Chicago Law Journal*, *28*, 719.

Jones, N.E., Pieper, C.F., and Robertson, L.S. (1992). The effect of legal drinking age on fatal injuries of adolescents and young adults. *American Journal of Public Health*, *82*, 112-115.

Juvenile Justice and Delinquency Prevention Act of 1974. Pub. L. 93-415, 42 U.S.C. 5601 et seq.

Kelder, G.E. (1997). *The perils, promises and pitfalls of criminalizing youth possession of tobacco*. Available: http://www.tobacco.neu.edu/tcu/3-97/YPFINAL.THM [accessed November 2002].

Little, B., and Bishop, M. (1998). Minor drinkers/major consequences: Enforcement strategies for underage alcoholic beverage law violators. *FBI Law Enforcement Bulletin*, *67*(6), 1-4.

Logan, W.A. (2001). The shadow criminal law of municipal governance. *Ohio State Law Review*, *62*, 1409.

Martin, M.W., Levin, S., and Saunders, R. (2000). The association between severity of sanction imposed for violation of tobacco policy and high school drop out rates. *Journal of School Health*, *70*(18), 327-330.

Martin, S.E. (2000). Alcohol, youth, and the justice system: Underage drinking as normative behavior, a status offense, and a risk factor for delinquency. In Susan O. White (Ed.), *Handbook of youth and justice* (pp. 159-189). New York: Kluwer Academic/Plenum.

Mayer, R.R., Forster, J.L., Murray, D.M., and Wagenaar, A.C. (1998). Social settings and situations of underage drinking. *Journal of Studies on Alcohol*, *59*(2), 207-215.

McPhail, M.W., and Wiest, B.M. (1995). *Combining alcohol and other drug abuse treatment with diversion for juveniles in the justice system*. Treatment Improvement Protocol (TIP) Series, No. 21. Rockville, MD: U.S. Department of Health and Human Services.

Miller, M.L., Scocas, E.A., and O'Connell, J.P. (1998). *Evaluation of the juvenile drug court diversion program*. City of Wilmington Comprehensive Communities Program. Dover, DE: Statistical Analysis Center.

Miller, N.S., and Flaherty, J.A. (2000). Effectiveness of coerced addiction treatment (alternative consequences): A review of the clinical research. *Journal of Substance Abuse Treatment*, *18*, 9-16.

Mosher, J.F. (1998). The merchants, not the customers: Resisting the alcohol and tobacco industries' strategy to blame young people for illegal alcohol and tobacco sales. *Journal of Public Health Policy*, *16*, 412-432.

Mothers Against Drunk Driving. (2002, September). *Alcohol-related laws*. Available: http://www.madd.org/laws [accessed November 2002].

Mowatt, R.M., and Chezem, L. (2002). *Implementation guide for juvenile holdover programs*. Lexington, KY: American Probation and Parole Association.

National Council of Juvenile and Family Court Judges. (2001). *Drug court planning initiative: Operationalizing workshop*. Reno, NV: National Council of Juvenile and Family Court Judges, Alcohol and Other Drugs Division.

National Highway Traffic Safety Administration. (1997). *Youth DWI and underage enforcement*. Washington, DC: U.S. Department of Transportation.

National Highway Traffic Safety Administration and National Institute on Alcohol Abuse and Alcoholism. (1999, September). *Sentencing and dispositions of youth DUI and other alcohol related offenses: A guide for judges and prosecutors*. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration; U.S. Department of Health and Human Services, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism.

Office of Inspector General. (1991). *Youth and alcohol: Laws and enforcement: Is the 21-year-old drinking age a myth?* Washington, DC: U.S. Department of Health and Human Services.

Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project. (1999). *Juvenile and family drug courts: An overview*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Drug Court Program Office.

Office of Juvenile Justice and Delinquency Prevention. (2000, October). *Offenders in juvenile court, 1997* (NCJ 181204). Juvenile Justice Bulletin. Washington, DC: Author.

Office of Juvenile Justice and Delinquency Prevention. (2002). *Statistical briefing book*. Available: http://ojjdp.ncjrs.org/ojstatbb/index.html [accessed April 25, 2002].

Olson, D., and Adams, S. (2002). *Results of the 2000 Illinois Probation Outcome Study*. Chicago: Illinois Criminal Justice Information Authority.

O'Malley, P., and Wagenaar, A.C. (1991). Effects of minimum drinking age laws on alcohol use, related behaviors, and traffic crash involvement among American youth 1976-1987. *Journal of the Study of Alcohol*, *52*, 478-491.

Pacific Institute for Research and Evaluation. (1989). *Effective systemwide strategies to combat youth drug and alcohol abuse: An agenda for action*. Washington, DC: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

Pacific Institute for Research and Evaluation. (1999). *Regulatory strategies for preventing youth access to alcohol: Best practices*. Washington, DC: U.S. Department of Justice, Office of Justice Programs.

Pacific Institute for Research and Evaluation. (2000). *A practical guide to preventing and dispersing underage drinking parties*. Washington, DC: U.S. Department of Justice, Office of Justice Programs.

Panzer, C. (1997). Reducing juvenile recidivism through pre-trial diversion programs: A community's involvement. *Journal of Juvenile Law*, *18*, 186.

Police Executive Research Forum. (n.d.). *The Tulsa Police Department—Case history*. Washington, DC: Author.

Popkin, C.L., Stewart, J.R., and Lacey, J.H. (1988). *A follow-up evaluation of North Carolina's alcohol and drug education traffic schools and mandatory substance abuse assessments: Final report*. Chapel Hill: University of North Carolina, Highway Safety Research Center.

President's Commission on Model State Drug Laws. (1993, December). *Drug-free families, schools, and workplaces* (Model Underage Alcohol Consumption Reduction Act). Washington, DC: The White House.

Rossi, P.H., Freeman, H.E., and Lipsey, M.W. (1999). *Evaluation: A systematic approach*. 6th ed. Thousand Oaks, CA: Sage.

Scribner, R., and Cohen, D. (2001). The effect of enforcement on merchant compliance with the minimum legal drinking age law. *Journal of Drug Issues*, *31*(4), 857-866.

Substance Abuse and Mental Health Services Administration. (2002). *Results from the 2001 National household survey on drug abuse: Volume I, summary of national findings*. Office of Applied Statistics, NHSDA Series H-17, DHHS Publication No. SMA 02-3 758. Rockville, MD: U.S. Department of Health and Human Services, National Institutes of Health.

Taxman, F.S. (1998). 12 steps to improved offender outcomes: Developing responsive systems of care for substance-abusing offenders. *Corrections Today*, *60*(6), 114-117, 166.

Teenage Research Unlimited. (2001, January 25). *Teens spend $155 billion in 2000*. Available: http://www.teenresearch.com/PRview.cfm?edit_id=75 [accessed June 2003, originally November 2002].

U.S. Department of Health and Human Services. (2000). *Reducing tobacco use: A report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

U.S. Department of Health and Human Services. (2001). *Youth violence: A report of the Surgeon General.* Rockville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; Substance Abuse and Mental Health Services Administration, Center for Mental Health Services; and National Institutes of Health, National Institute on Mental Health.

U.S. General Accounting Office. (1987). *Drinking-age laws: An evaluation synthesis of their impact on highway safety.* Washington, DC: Author.

Virginia Department of Alcoholic Beverage Control. (2002, January). *Report to Virginia Tobacco Settlement Foundation.* Richmond, VA: Bureau of Law Enforcement Operations.

Wagenaar, A.C., and Wolfson, M. (1994). Enforcement of the legal minimum drinking age in the United States. *Journal of Public Health Policy*, *15*(1), 37-53.

Wolfson, M., and Hourigan, M. (1997). Unintended consequences and professional ethics: Criminalization of alcohol and tobacco use by youth and young adults. *Addiction*, *92*(9), 1159-1164.

Wolfson, M., Wagenaar, A.C., and Hornseth, G.W. (1995). Law officers' views on enforcement of the minimum drinking age: A four-state study. *Public Health Reports*, *110* (July/August), 428-438.

Zimring, F.J., and Hawkins, G.J. (1973). *Deterrence: The legal threat in crime control theory.* Chicago: University of Chicago Press.

APPENDIX 8-A

At least 33 states[30] plus the District of Columbia have specific statutory provisions pertaining to the suspension, revocation, or denial of the driver's licenses of underage drinkers for alcohol offenses that did not involve the use of a motor vehicle.[31] A number of variations are manifested in these statutory provisions.

For example, in 24 states and the District of Columbia, the suspension, revocation, or denial of a license is mandatory (e.g., Delaware), in eight states it is left to the discretion of the court or agency presiding over the

[30]In addition, Wyoming continues to have a statute in its code that requires that driver's licenses be suspended for the possession of alcohol by youth under the age of 19, (WYO. STAT. § 31-7-128 [2002]), but the Wyoming Supreme Court ruled that this provision violated the Wyoming state constitution in Johnson v. State Hearing Examiner's Office, 838 P.2d 158 (Wyo. 1992).

[31]These are distinct from provisions that provide for the suspension or revocation of driver's licenses for driving while under the influence of alcohol, many of which employ a zero-tolerance policy that stipulates that such suspension or revocation shall occur regardless of the quantity of alcohol in a youth's blood or breath at the time of the offense (see, e.g., OKLA. STAT. tit. 47, §§ 754, 756 [2002]).

matter (e.g., Arizona), and in Utah it is discretionary for first offenses and mandatory for second or subsequent offenses. Some states permit the suspension, revocation, or denial of a youth's driver's license for the full range of underage drinking offenses in that state (e.g., Michigan), while in other states it is limited to only certain specific offenses, such as using false identification in an attempt to obtain alcohol (e.g., Minnesota).[32] Most states assign the imposition of this sanction to the judge presiding over the underage drinking offense (e.g., North Carolina), but some states have the court refer the matter to an administrative agency (e.g., New Hampshire).

Twenty-nine states plus the District of Columbia make this sanction available for a first-time offender (e.g., Kansas), while four states limit its availability to repeat offenders (e.g., Iowa). Some states make distinctions based on the age of the offender, limiting the imposition of this sanction to youth under a specified age (e.g., 18 in Utah) or over a specified age (e.g., 12 in California), or providing for a different range of suspensions depending on the age of the youth (e.g., Louisiana).

Some states dictate that suspension, revocation, or denial be for a specified period of time (e.g., Massachusetts), some states provide a range of times (e.g., Montana), some states provide only a maximum length of time (e.g., Iowa), and some states do not dictate the length of time, but leave that determination to the judge presiding over the matter (e.g., Tennessee).

When the length of time is specified, states also differ in the length of suspension, revocation, or denial that can be imposed. The length of sanction ranges from thirty days (e.g., Kansas) to two years (e.g., Idaho for repeat offenders). However, New Mexico requires that licenses be suspended for two years or until the age of 21, whichever is greater, for youth who have committed three or more such offenses, while Pennsylvania, which imposes a two-year suspension for third and subsequent offenses, stipulates that any multiple suspensions be served consecutively.

In some states, the sanction is the same regardless of whether the youth is a first-time or repeat offender (e.g., New Jersey), while in other states the severity of the sanction is increased for repeat offenders (e.g., New Mexico). Among the latter, some only distinguish between first-time and second-time

[32]In addition, although not targeting specifically underage drinking and thus not reviewed here, some states provide for the suspension of driving privileges when a person has fraudulently used a license or identification card, which would encompass youth who attempt to obtain alcohol by using false identification (see, e.g., N.D. CENT. CODE § 39-06-32[3]) (Matthew Bender, personal communication, 2001).

offenders (e.g., Georgia), while others distinguish among first-, second-, and third-time offenders (e.g., New York).

Some states require that a driver's license suspension, revocation, or denial must accompany the imposition of other sanctions such as a fine (e.g., Idaho), while in other states the inclusion of license suspension, revocation, or denial in addition to other sanctions is optional (Kansas). Alternatively, in Mississippi license suspension can be used in lieu of other sanctions. In Mississippi, a youth whose license is suspended is placed on probation for 90 days subject to such conditions as the judge deems appropriate. If the youth successfully completes this probation, the suspension does not constitute a "conviction." If the youth violates any of the conditions, the court revokes the youth's driver's license and imposes any fines or penalties that the judge would otherwise have assigned, and designates the disposition as a "conviction."

Some states apply this sanction only to offenders with a current driver's license (e.g., Tennessee), while other states also encompass youth who may subsequently apply for a license by postponing eligibility or delaying the issuance of a license or a permit for a given period of time (e.g., Texas). Some states permit youth to obtain or retain restricted driving privileges (e.g., Oregon), although in some states the youth must establish a "hardship" to qualify for this option (e.g., Virginia). Finally, a few states dictate that the suspension shall not affect the insurance premiums of the offender (e.g., Louisiana) or that any subsequent reinstatement of the youth's license shall be without further expense to the youth (e.g., Rhode Island).

Constitutional Validity of Statutes That Suspend Driver's Licenses

Because the loss or denial of driving privileges can be of considerable importance to a youth, a number of lawsuits have challenged legislative efforts to suspend, revoke, or deny driver's licenses for underage drinking when the youth's activity did not involve the use or operation of a motor vehicle. These challenges can be divided into two groups, although both may appear in the same lawsuit. The first group consists of substantive attacks on the legislation, that is, that the substance of the legislation exceeded the legislature's authority and thereby violated either the federal or state constitutional rights of the youth being sanctioned. The second group encompasses procedural claims that assert that the procedures used were inadequate to protect the due process rights of the youth under either the federal or a state constitution.

Both groups of lawsuits have been relatively unsuccessful, although the procedural claims have had somewhat more success than the substantive claims. The courts that have ruled on these claims, however, have indicated some concern that there is insufficient linkage between these sanctions and goals that legislatures were purportedly attempting to accomplish with

these sanctions. From this it may be implied that there are some limits on their use, particularly if lengthy suspensions are imposed on first-time offenders for relatively innocuous acts.

Substantive attacks generally have involved one or more of three basic claims. These three claims are that a statute authorizing the loss or denial of a driver's license for underage drinking for behavior that did not involve the operation of a motor vehicle violated (1) substantive due process, (2) equal protection, or (3) prohibitions of cruel and unusual punishment.

The substantive due process claims typically consist of an argument that there is no obvious connection between underage drinking that was not associated with the operation of a motor vehicle and dangerous driving. Proponents of this argument assert that the loss of a driver's license should only occur when there has been a demonstration of dangerous driving or there is at least a relatively strong indication that it is likely to occur. The Wyoming Supreme Court found this argument sufficiently convincing to strike down a statute suspending a youth's driver's license for underage drinking, but it did so only under what it characterized as the broader and more protective Wyoming state constitution rather than the federal constitution.[33]

Other courts that have considered this argument have rejected it.[34] They typically begin their analyses by noting that obtaining a driver's license is a privilege and not a right, a position that has been widely accepted in a range of contexts involving obtaining or losing a driver's license. As a result, the courts' rationale typically continues, legislation imposing the loss or denial of a driver's license as a sanction is not subject to a relatively rigorous "strict scrutiny" review. Instead, there need only be a "rational basis" for the legislation.[35] Furthermore, under this test, the legislation is generally entitled to a presumption of constitutionality, the burden to es-

[33]Johnson v. State Hearing Examiner's Office, 838 P.2d 158 (Wyo. 1992).

[34]State v. Niedermeyer, 14 P.3d 264 (Alaska 2000); People v. Valenzuela, 5 Cal. Rptr. 2d 492 (Cal. App. Dep't Super. Ct. 1991); Freed v. Ryan, 704 N.E.2d 746 (Ill. App. Ct. 1998); Frantz v. Commonwealth, 649 A.2d 148 (Pa. Commw. Ct. 1994); Commonwealth v. Strunk, 582 A.2d 1326 (Pa. Super. Ct. 1990). See also In re Appeal in Maricopa County, Juvenile Action, 770 P.2d 394 (Ariz. Ct. App. 1989) (mandatory suspension of driver's license of juvenile for selling marijuana); People v. Zinn, 843 P.2d 1351 (Colo. 1993) (revocation of driver's license after selling cocaine); Quiller v. Bowman, 425 S.E.2d 641 (Ga. 1993) (suspension of driver's license for possession of marijuana); Plowman v. Commonwealth, 635 A.2d 124 (Pa. 1993) (suspension of license for possession of small amount of marijuana at license holder's residence).

[35]The exact wording of this test varies somewhat, but a typical example was provided by the Alaska Supreme Court when it defined it (the test) as "allow[ing] a law to pass muster as long as it bears any rational relation to a legitimate legislative goal." State v. Niedermeyer, 14 P.3d 264, 267 (Alaska 2000).

tablish that it is unconstitutional is placed on the person attacking it, and the legislature may not be required to provide empirical proof of the validity of its rationale, but can instead rely on rational speculation.[36] The bases for the legislation that are typically asserted and accepted are (1) that youth who drink alcohol are likely to drink while driving at some point and that drinking while driving endangers the public safety, or (2) that the ingestion of alcohol by youth endangers their health and safety and that the loss or threatened loss of driving privileges will deter this ingestion. At the same time, courts have noted that these chains of inference "may be tenuous."[37] Nevertheless, absent empirical evidence that directly refutes these inferences, the courts, with the exception of the Supreme Court of Wyoming, have concluded that these inferences are sufficient to provide a rational basis for this legislation.[38]

A second attack that may be raised focuses on the Equal Protection Clause of either the federal or a relevant state constitution. Some youth offenders have attempted to argue that their equal protection rights are violated when they are subjected to the loss or denial of a driver's license for alcohol use, but adults do not face the same sanction. This argument has been widely rejected.[39] Courts have responded that age is not a pro-

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[36]Freed v. Ryan, 704 N.E.2d 746, 748 (Ill. App. Ct. 1998).

[37]State v. Niedermeyer, 14 P.3d 264, 268 (Alaska 2000).

[38]The Supreme Court of Wyoming responded by stating, "the driving force behind enactments such as presented here is to enforce non-use of alcoholic beverages by persons under the age of 19. . . . Fines or jail are not deemed adequate punishment; therefore, driver's license suspension is added to the inflicted deterrent. Realists know that the practical result is more frequent violations of driving without a driver's license and likely no significant reduction in drinking occurrences." Johnson v. State Hearing Examiner's Office, 838 P.2d 158, 166, n.9 (Wyo. 1992). It also noted that "[a] casual acceptance in the cases that a right to drive in this American society is not 'fundamental' lacks both economic and logical application to this present real world." *Id.* at 175, n.12. See also Commonwealth v. Strunk, 582 A.2d 1326, 1333 (Pa. Super. Ct. 1990) (Popovich, J., dissenting) (irrational to apply sanction of suspending driver's licenses only for underage drinking and not for other behaviors, particularly when already a significant penalty associated with driving while intoxicated, which presumably serves a considerable deterrent function). See generally People v. Lindner, 535 N.E.2d 829, 832 (Ill. 1989) (in rejecting suspension of driver's licenses of convicted sex offenders, "[k]eeping off the roads drivers who have committed offenses not involving vehicles is not a reasonable means of ensuring that the roads are free of drivers who operate vehicles unsafely or illegally.").

[39]Carney v. State, 808 S.W.2d 755 (Ark. 1991); People v. Valenzuela, 5 Cal. Rptr. 2d 492 (Cal. App. Dep't Super. Ct. 1991); Frantz v. Commonwealth, 649 A.2d 148 (Pa. Commw. Ct. 1994); State v. Shawn P., 859 P.2d 1220 (Wash. 1993). See generally In re Appeal in Maricopa County, Juvenile Action, 770 P.2d 394 (Ariz. Ct. App. 1989) (mandatory suspension of driver's license of juveniles but not adults for drug offenses is permissible); Davis v. State, 977 P.2d 554 (Wash. 1999) (upholding statute authorizing suspension of driver's licenses of youth under the age of 21 after conviction of certain drug offenses).

tected class under the Equal Protection Clause and the legislature thus need only provide a rational basis for imposing different sanctions on youth than it does for adults for the same behavior. They note that drinking by youth is generally prohibited and assert that the risk of individuals under the age of 21 abusing alcohol and demonstrating a dangerous disregard for the safe operation of motor vehicles is particularly acute. Thus they have concluded that it is permissible to apply this sanction only to youth under the age of 21.

An equal protection argument that has had more success focuses on statutory provisions that expose only youth below a certain age to suspension, and not those youth who are older.[40] For example, Utah, Washington, and New Hampshire provide for the loss or denial of a driver's license if the youth is under the age of 18 at the time of the offense, but not if the youth is 18, 19, or 20. The Supreme Court of Wyoming struck down a similar statutory provision because it did not find a rational basis for a distinction by age group among underage drinkers.[41] In criticizing the imposition of suspensions only on youth below age 18, it has been argued that studies show that youth of ages 18 through 20 are more likely to use alcohol, to drive more often, and to harm the public through drunk driving. One judge concluded, "it is difficult to conceive what rational basis the Legislature would have for excluding those aged 18 and older."[42]

However, the Supreme Court of Washington upheld this age distinction and found several ways in which the law treats youth under the age of 18 differently from youth of ages 18 through 20.[43] The court noted that youth under the age of 18 are subject to the jurisdiction of the juvenile court where the aim of sentencing is both punishment and rehabilitation; that certain restrictions are placed on their ability to obtain a driver's license, including obtaining the approval of their parents or guardians and successfully completing an approved safety education course; and that they cannot own a car, vote, hold office, independently decide to marry, make a will, or

[40]However, equal protection arguments have failed that have challenged the decision of some states to limit these suspensions to youth above a minimum age, such as 13. State v. Shawn P., 859 P.2d 1220 (Wash. 1993). But see Id. at 1229-30 (Madsen, J., dissenting).

[41]Johnson v. State Hearing Examiner's Office, 838 P.2d 158 (Wyo. 1992).

[42]*Id.* at 1228-30 (Madsen, J., dissenting).

[43]State v. Shawn P., 859 P.2d 1220, 1225-26 (Wash. 1993). See also Carney v. State, 808 S.W.2d 755, 758 (Ark. 1991) ("[T]he state's authority to supervise children is broader than that over similar actions by adults. . . . [T]he General Assembly had to draw the age line with accompanying penalties somewhere."); State v. Preston, 832 P.2d 513 (Wash. Ct. App. 1992) (upholding age classification because youth under 18 can be considered less responsible than those who are 18 and older as demonstrated by the fact that in several states the legal drinking age is 18).

serve on a jury. In contrast, the court ascertained, none of these applied to youth 18 and older. In addition, the court determined that youth 18 and older have a greater dependence on a driver's license for education, employment, or family needs and would be significantly harmed by its suspension.

The third substantive attack on the loss or denial of a driver's license for underage drinking unrelated to the operation of a motor vehicle has asserted that such a sanction constitutes cruel and unusual punishment in violation of either the federal or a state constitution because the sanction is disproportionately severe in comparison to the nature of the offense. Typically this argument asserts that the youth's consumption or possession of alcohol was a relatively innocuous or isolated event, such as the drinking of a single can of beer on private property that caused no one any harm. The argument continues that the suspension of a youth's driver's license for a year, for example, causes an extreme hardship for the youth in today's society, where the operation of a motor vehicle is vital to the youth's opportunities to work or pursue other opportunities and the youth's well-being.[44]

This set of assertions, however, also has been generally rejected by the courts. Courts have tended to assert either that (1) these are serious offenses because of the link between underage alcohol consumption and highway fatalities, notwithstanding a lack of empirical evidence establishing this link,[45] or (2) these sanctions are remedial measures intended to ensure public safety on the streets and highways and are not imposed as punishment.[46] In one case, however, the suspension of youth driver's licenses was struck down as disproportionate when the sanction was imposed on youth under age 19, but not on youth ages 19 and 20.[47]

Procedural attacks on the imposition of these sanctions have been somewhat more successful. For example, the Supreme Court of Alaska struck down a driver's license revocation after finding that the administrative

[44]Commonwealth v. Strunk, 582 A.2d 1326, 1330 (Pa. Super. Ct. 1990) ("Their social status, their psychological and physical independence, and their ability fully to participate in peer group activity may all be implicated if this privilege is suspended. Furthermore, a driver's license suspension may affect a youth's economic welfare by limiting his ability to travel to and from a place of employment.").

[45]Commonwealth v. Strunk, 582 A.2d 1326, 1332 (Pa. Super. Ct. 1990) (90-day driver's license suspension is not an excessive penalty).

[46]People v. Valenzuela, 5 Cal. Rptr. 2d 492, 493 (Cal. App. Dep't Super. Ct. 1991) (suspension of driving privilege for one year upheld). But see State v. Niedermeyer, 14 P.3d 264, 270-71 (Alaska 2000) (license revocation is not a remedial measure).

[47]Johnson v. State Hearing Examiner's Office, 838 P.2d 158, 177-78 (Wyo. 1992) (suspension of license for 90 days for first conviction, 12 months for subsequent offenses).

agency responsible for such revocations had acted without providing sufficient procedural safeguards.[48] In Alaska, notice was given to the youth at the time of arrest that the youth's driving privileges were revoked, although a review hearing by telephone could be requested. A conviction on the underlying offense was not required prior to revocation and, indeed, in this case the state ended up not prosecuting the youth for his underage drinking offense (consumption of alcohol). The court concluded that this administrative license revocation constituted a punishment of criminal conduct and necessitated the procedural protections generally accorded criminal prosecutions. The court rejected the state's argument that this was the mere removal of the license of someone who was not fit to be licensed. The court determined that although the youth's alcohol offense placed him in the class of minors who tend to drive more carelessly (thereby satisfying the requirements of substantive due process), the removal of the license should not occur automatically, but required an individualized determination with appropriate procedural safeguards. At the same time, the court distinguished the Alaska procedure from other states where a conviction preceded license removal.

On the other hand, the Supreme Court of Pennsylvania concluded that the loss of driving privileges for underage drinking was a civil collateral consequence of a youth's conviction and thus the youth was not required to be informed of this consequence at the time of his or her submission of a guilty plea.[49] The court noted that although a criminal defendant ordinarily must be informed of the consequences of submitting a guilty plea, Pennsylvania courts had routinely recognized that suspension of a driver's license is a collateral civil consequence of a criminal conviction and that it was not required that the defendant know that it would be imposed at the time of his or her guilty plea. The court rejected the youth's argument that driver's license suspension should be considered a criminal penalty because the statute imposing it was found in the criminal code, asserting that its placement in the legislative code was not determinative. The court also rejected the youth's argument that it was a criminal penalty because it was imposed by the sentencing court. The court acknowledged that under the relevant statute, the judge was required to order a license suspension and to transmit this order to the Department of Transportation for execution. However, the court concluded that the judge's role was "more ministerial in nature than one involving 'control' or 'responsibility'" in that the judge had no control over whether the sentence was actually imposed and the department calculated the period of suspension based on any prior incidents. The

[48]State v. Niedermeyer, 14 P.3d 264, 268 (Alaska 2000).
[49]Commonwealth v. Duffey, 639 A.2d 1174 (Pa. 1994).

court characterized the judge's role as merely guaranteeing that the department receive timely notice of the conviction requiring license suspension. Thus, unlike the Supreme Court of Alaska, this court found that license suspension for underage drinking was not a criminal penalty, but rather a collateral civil consequence of the criminal conviction. It thereby concluded that its imposition required fewer procedural protections than are associated with criminal sanctions in general and the failure to inform the youth of this consequence at the time of the guilty plea did not invalidate the suspension.[50]

STATES THAT SUSPEND, REVOKE, OR DENY DRIVER'S LICENSES FOR UNDERAGE DRINKING OFFENSES NOT INVOLVING OPERATION OF A MOTOR VEHICLE

Alaska (consume/possess): For second offense, may revoke for three months or take possession of the driver's license (ALASKA STAT. § 04.16.050(c)(2),(3) [2001]); habitual offender (three or more offenses or on probation at time), may revoke for six months or take possession of license (ALASKA STAT. § 04.16.050(d)(2),(4) [2001]); if requested by Department of Motor Vehicles, court may require driver to complete alcohol information course (ALASKA STAT. § 28.15.253 [2001]).

Arizona (use fraudulent identification): May suspend driver's license or deny right to apply for license (ARIZ. REV. STAT. § 4-241[F] [2002]).

California (attempt to purchase/consume/possess/use false identification): If age 13 or over, shall suspend driver's license for one year or, if does not have license, delay application for license by one year (CAL. VEH. CODE § 13202.5 [West 2003]).

Delaware (possess/consume): First offense, shall have driver's license revoked for 30 days; second and subsequent offenses, shall revoke for no less than 90 days and no more than 180 days (DEL. CODE. ANN. tit. 4 § 904[f] [2002]).

District of Columbia (purchase/attempt to purchase/possess/drink/falsely represent age/possess or present fraudulent identification): First offense, shall suspend license for 90 days; second offense, shall suspend for 180 days; third or subsequent offense, shall suspend for one year (D.C. CODE ANN. § 25-1002[d][1]-[3] [2002]).

Florida (possess): In addition to any other penalty, for first offense shall withhold, suspend, or revoke license for not less than six months and not more than one year, for second or subsequent offense shall withhold, sus-

[50]See also Rexford v. State, 941 P.2d 906 (Alaska Ct. App. 1997) (administrative revocation not "punishment" for double jeopardy purposes).

pend, or revoke license for two years; court may direct the issuance of a restricted license that limits driving to business or employment purposes (FLA. STAT. ANN. §§ 562.111, 322.056 [West 2002]).

Georgia (attempt to purchase): First offense, shall suspend license for six months; second and subsequent offenses, shall suspend for one year (GA. CODE ANN. § 3-3-23.1[b][3] [2002]).

Idaho (possess/use/procure/attempt to procure): First offense, shall suspend license for not more than one year, though restricted privileges may be allowed if person shows by preponderance of evidence that privileges are "necessary" (IDAHO CODE § 18-1502[d][1] [2002]); second offense, shall suspend license for not more than two years, though restricted privileges may be allowed if person shows by preponderance of evidence that privileges are "necessary" (IDAHO CODE § 18-1502[d][2] [2002]).

Illinois (purchase/possess): May suspend or revoke license or permit (235 ILL. COMP. STAT. 5/6-20, 625 ILL. COMP. STAT. 5/6-206[a][38] [West 2002]).

Indiana (use of fraudulent identification): Shall suspend license for maximum of one year (IND. CODE § 7.1-5-7-1 [West 2002]).

Iowa (purchase/attempt to purchase/possess): Second or subsequent offense, shall suspend license for period not to exceed one year (IOWA CODE § 123.47[3] [2002]).

Kansas (possess/consume/obtain/purchase/attempt to obtain or purchase): Shall suspend license for 30 days or shall not be permitted to obtain a license for 30 days (KAN. STAT. ANN. § 41-727[d][2] [2001]).

Louisiana (possess/use/abuse): For a first offense for a person over 12 and under 19, shall deny driving privileges for not less than 90 days but not more than one year or until the person reaches the age of 18, whichever is longer; for a first offense for a person over 18, shall deny driving privileges for not less than 90 days but not more than one year; for a second or subsequent offense, shall deny driving privileges for one year or until the person reaches the age of 19, whichever is longer; may issue restricted driver's license after first 30 days of suspension if shown that hardship would result from being unable to commute to school or work; no insurer may increase premium rates unless offense directly related to operation of a motor vehicle (LA. REV. STAT. ANN. § 430 [West 2002]).

Massachusetts (purchase/attempt to purchase/misrepresent age): Shall suspend license for 180 days (MASS. GEN. LAWS ANN. ch. 138, § 34A [West 2002]).

Michigan (purchase/attempt to purchase/consume/attempt to consume/possess or attempt to possess/use fraudulent identification to purchase): Shall suspend license (MICH. COMP. LAWS § 436.1703[4] [2002]).

Minnesota (purchase/attempt to purchase using false identification): Shall suspend license for 90 days (MINN. STAT. § 171.171 [2002]).

Mississippi (purchase/possess in a "public place"): Shall suspend license for not more than 90 days and may place on probation; license suspension shall not constitute a "conviction"; if probation violated, license shall be returned, fines or penalties that would otherwise have been imposed shall be imposed, and action shall constitute a conviction (MISS. CODE ANN. § 67-1-81[4] [West 2002]).

Montana (consume/possess): May suspend license for not less than 60 days or more than one year, although restricted license may be made available after 30 days of suspension period (MONT. CODE ANN. § 45-5-624[2][b] [2001]).

New Hampshire (sell/possess/use/abuse): For person 15 years or older but not yet 18, court may suspend or deny license and must notify director [of motor vehicles], and director must suspend or deny application for license for no less than 90 days or more than one year for first offense and no less than six months or more than two years for subsequent offenses, although director must first provide opportunity for hearing [similar provisions not provided for youth 18 or older] (N.H. REV. STAT. ANN. § 263:56-b[I] [West 2002]).

New Jersey (possess/consume in motor vehicle): Shall suspend or postpone obtaining of license for six months (N.J. STAT. ANN. § 2C:33-15[b] [West 2002]); purchase/attempt to purchase/consume on premises licensed for retail sale of alcohol/misrepresent age: shall suspend or postpone obtaining of license for six months (N.J. STAT. ANN. § 33:1-81 [West 2002]).

New Mexico (purchase/attempt to purchase/receive/possess/permit self to be served): First offense, shall perform 30 hours of community service related to reducing the incidence of driving while under the influence of intoxicating liquor (N.M. STAT. ANN. § 60-7B-1[G][1] [2002]); second offense, suspend license for 90 days or add 90 days to date would otherwise become eligible to obtain license and shall perform 40 hours of community service related to reducing the incidence of driving while under the influence of intoxicating liquor (N.M. STAT. ANN. § 60-7B-1[G][2] [2002]); third or subsequent offense, suspend license for two years or until reaches age of 21, whichever is greater, and shall perform 60 hours of community service related to reducing the incidence of driving while under the influence of intoxicating liquor (N.M. STAT. ANN. § 60-7B-1[G][3] [2002]).

New York (use license to purchase/attempt to purchase): First offense, may suspend or deny application for license for three months (N.Y. ALCO. BEV. CONT. LAW § 65-b[6][a] [West 2002]); second offense, may suspend or deny application for license for six months (N.Y. ALCO. BEV. CONT. LAW § 65-b[6][b] [West 2002]); third or subsequent offense, may suspend or deny application for license for one year or until reaches age of 21, whichever is greater (N.Y. ALCO. BEV. CONT. LAW § 65-b[6][c] [West 2002]).

North Carolina (fraudulent use of identification/assist another person who is underage/purchase/attempt to purchase): Court shall file conviction report with Division of Motor Vehicles and Division shall suspend (pursuant to G.S. 20-17.3) (N.C. GEN. STAT. § 18B-302 [West 2002]).

Ohio (use fraudulent identification): Shall suspend license for one year (OHIO REV. CODE § 4507.163 [West 2002]).

Oregon (misrepresent age in attempt to purchase or acquire): Shall suspend license or right to apply for license for maximum of one year, though may withdraw upon petition and may recommend to Department of Transportation that hardship permit be granted (OR. REV. STAT. § 471.430[5] [2001]).

Pennsylvania (misrepresent age to obtain/purchase/consume/possess/carry false identification): First offense, shall suspend for 90 days; second offense, shall suspend for one year; third or subsequent offense, shall suspend for two years; any multiple suspensions shall be imposed consecutively; if without license at time, time periods come into force when application for license submitted; if under age 16 at time, eligibility to apply for license delayed by these periods of time (18 PA. CONS. STAT. § 6310.4 [West 2002]).

Rhode Island (consume in retail outlet/purchase/attempt to purchase/have another purchase for/misrepresent age): First offense, may suspend for not more than three months; second offense, may suspend for not more than six months; third or subsequent offense, may suspend for not more than one year (R.I. GEN. LAWS § 3-8-6d][1] [Matthew Bender 2001]); No suspension shall affect insurance rating of offender and license shall be reinstated without further expense (R.I. GEN. LAWS § 3-8-6[d][2] [Matthew Bender 2001]).

Tennessee (purchase/attempt to purchase/possess/misrepresent age/use false identification): Shall suspend license (TENN. CODE ANN. § 57-4-203 [West 2002]).

Texas (purchase/attempt to purchase/consume/possess): First offense, suspend or deny issuance of license or permit for 30 days; second offense, suspend or deny issuance of license or permit for 60 days; third or subsequent offense, suspend or deny issuance of license or permit for 180 days (TEX. ALCO. BEV. CODE ANN. § 106.071[d][2][A]-[C] [West 2001]).

Utah (purchase/attempt to purchase/solicit another person to purchase/possess/consume): If at least 13 but under 18, first offense may suspend license, second offense shall suspend driver's license (UTAH CODE ANN. §§ 32A-12-209, 78-3a-506 [Matthew Bender 2002]).

Vermont (falsely represent age/possess for purpose of consumption/consume): Second offense, shall suspend license for 120 days (VT. STAT. ANN. tit. 7 § 657[d][2] [2002]).

Virginia (purchase/possess/attempt to purchase or possess): May suspend license for not more than one year, although court may upon demonstration of hardship authorize restricted use (VA. CODE ANN. § 4.1-305[C][ii] [West 2002]).

Washington (possess/consume/acquire): If age 13 or older and under 18, for first offense, shall suspend license for one year or until reaches age of 17, whichever is longer; for second offense, shall suspend for two years or until reaches age of 18, whichever is longer (WASH. REV. CODE ANN. §§ 66.44.270[2][a], 66.44.365, 46.20.265 [West 2002]).

Wisconsin (procure/attempt to procure/possess or consume on licensed premises/presence in retail outlet/falsely represent age/possess/consume): First offense, may suspend license; second or subsequent offense within 12 months, may suspend license, unless involved motor vehicle then shall suspend license (WIS. STAT. § 125.07[4][bs],[c] [West 2002]).

9

The Effects of Price on Alcohol Use, Abuse, and Their Consequences

Frank J. Chaloupka

Over the past two decades, a growing number of economists have examined the impact of alcoholic beverage prices on alcohol consumption and heavy drinking. Similarly, many studies have considered the impact of price on a wide range of problems caused by alcohol use and abuse, including nonfatal and fatal accidents caused by drinking and driving, liver cirrhosis and other alcohol-related diseases, violence and other crime linked to alcohol, decreased educational attainment, and more. Several of these studies have focused on high-risk populations, such as youth and young adults, including college students. This research, using a variety of different data and empirical approaches, generally has found that increases in the prices for alcoholic beverages lead to reductions in drinking, heavy drinking, and the consequences of alcohol use and abuse.

These findings confirm perhaps the most fundamental law of economics—that of the downward-sloping demand curve. This law states that as the price of a product rises, the quantity demanded of that product falls. Given this law, policies that raise the prices of alcoholic beverages can be effective in reducing the health, economic, and social consequences resulting from alcohol use and abuse.

This chapter begins with a brief review of the assortment of policies that can impact the prices of alcoholic beverages. The review is followed by a discussion of the large and growing economics literature examining the impact of price on alcohol use, heavy drinking, and the consequences of alcohol use and abuse, with a particular emphasis on studies focused on

youth and young adults.[1] Given the size and scope of the economic literature on alcohol use and its consequences, this review does not claim to be comprehensive, but instead highlights key studies and the general conclusions that emerge from these and other studies not described in detail.

Public Policies and Alcoholic Beverage Prices

Federal, state, and local governments have adopted a wide variety of public policies with the intent of reducing the consequences of alcohol use and abuse. Many of these policies impact the "full price" of alcoholic beverages. In the context of economic research on alcohol, "full price" includes not only the monetary prices of alcoholic beverages, but also many other "costs" associated with drinking and related behaviors. Two other costs most commonly included in this research are the time costs associated with obtaining alcoholic beverages and the expected legal costs associated with drinking and related outcomes. This review, however, will focus on policies that impact the monetary prices of alcoholic beverages.

Taxation

Of the policies directly influencing the prices of alcoholic beverages, excise taxation is the most widely employed. The popularity of alcoholic beverage taxation is largely due to the revenue-generating potential of these taxes, although public health arguments supporting increased beer, wine, and spirits taxation have been used more frequently in recent years. Most alcohol excise taxes are specific taxes applied based on the quantity or volume of a given alcoholic beverage.

Federal alcoholic beverage taxation. Federal excise taxes on alcohol date back to the late eighteenth century and have been raised over time, most often to generate new revenues during wartime.[2] Over the past half-century, however, federal excise taxes on alcoholic beverages have been increased infrequently, with the most recent increases aimed at reducing gov-

[1]This chapter draws heavily on several recent reviews, including Chaloupka, Grossman, and Saffer (1998, 2002), Cook and Moore (2000, 2002), and U.S. Department of Health and Human Services (DHHS) (2000).

[2]See the Bureau of Alcohol, Tobacco, and Firearms Web site (http://www.atf.treas.gov/alcohol/stats/historical.htm) for a detailed history of federal alcoholic beverage excise taxes and for examples of the increases in these taxes during the U.S. Civil War, both World Wars, and the Korean War.

TABLE 9-1 Federal Alcoholic Beverage Excise Taxes

Beverage Type	Tax as of 11/1/51	Current Tax	Inflation-Adjusted Value of 11/1/51 Tax
Distilled spirits	$10.50/proof gal.	$13.50/proof gal.	$71.87/proof gal.
Wine			
Not over 14%	$0.17/wine gal.	$1.07/wine gal.	$1.16/wine gal.
14-21%	$0.67/wine gal.	$1.57/wine gal.	$4.59/wine gal.
21-24%	$2.25/wine gal.	$3.15/wine gal.	$15.40/wine gal.
Beer	$9.00/barrel	$18.00/barrel	$61.60/barrel

NOTES: Current taxes were set January 1, 1991. Other wine taxes include taxes on champagne/sparkling wines and artificially carbonated wines. Inflation-adjusted values are based on the All Urban Consumers consumer price index series using the values of the index from November 1951 to August 2002.
SOURCE: Bureau of Alcohol, Tobacco, and Firearms (2002).

ernment budget deficits (see Table 9-1).[3] In addition, the rates applied to the alcohol contained in different beverages vary, with current federal taxes amounting to approximately 21 cents per ounce of pure alcohol in spirits, 10 cents per ounce of pure alcohol in beer, and 7 cents per ounce of pure alcohol in table wine (DHHS, 2000).

Because of the infrequent and modest increases in these taxes, their real (inflation-adjusted) value has declined substantially. The federal beer excise tax, for example, was set at $9 per 31-gallon barrel (16 cents per six-pack) on November 1, 1951, and maintained at that level until being doubled to $18 per barrel (32 cents per six-pack) on January 1, 1991. In real terms, however, the current federal beer excise tax is well below its 1951 value of $61.60 (August 2002 dollars). The same is true for spirits taxes, which were set at $10.50 per proof gallon ($1.68 per fifth of 80-proof alcohol) in 1951, raised to $12.50 per proof gallon in 1985, and then raised to their current level of $13.50 per proof gallon ($2.16 per fifth of 80-proof alcohol) in 1991. Again, the current tax is well below the $71.87 (August 2002 dollars) that would be needed to reach the real value of the distilled spirits tax in effect in late 1951. Federal wine taxes are more varied, with different taxes applied based on alcohol content. These taxes currently range from $1.07 per wine gallon for wine with alcohol content not more than 14 percent to $3.40 per wine gallon for champagne and sparkling wines. As with the other federal alcoholic beverage excise taxes, the inflation-adjusted values

[3]For example, federal beer and wine excise taxes were last increased in 1991 (the first increases in both since 1951) as part of the Omnibus Budget Reconciliation Act of 1990; this legislation also increased the distilled spirits tax for only the second time since 1951, with the previous increase in 1985 also the result of deficit reduction legislation.

of these taxes have fallen considerably since 1951, with the exception of the more modest decline in the real-value tax on wines with not more than 14 percent alcohol content.

State alcoholic beverage taxation. In general, the same patterns emerge at the state level, with state distilled spirits taxes typically at the highest rate per drink, taxes increasing infrequently and modestly over time, and, as a result, real values of state alcoholic beverage excise taxes falling significantly over time. State alcoholic beverage excise taxes are more mixed, with some states applying specific taxes and others using ad valorem taxes (taxes expressed as a percentage of price, rather than based on quantity or volume). As of January 1, 2000, the average state excise tax applied to a typical serving of alcohol was 4.13 cents for distilled spirits (1.5 ounces), 2.82 cents for wine (5 ounces), and 2.51 cents for beer (12 ounces) (Alcohol Epidemiology Program [AEP], 2000). Beer taxes (the easiest to compare across states and over time because nearly all states apply a specific excise tax to beer) have been eroded sharply by inflation, with the real value of the average state beer tax in 2000 about one-third of its level in 1968 (AEP, 2000). Some states have increased these taxes periodically, but only six states increased their beer taxes enough to keep up with or outpace inflation since 1968, while 35 states saw the real value of their beer tax fall by more than 50 percent since 1968 (AEP, 2000).

Excise taxes and price. Excise taxes are expected to be an important component of alcoholic beverage prices at the retail level. However, little is known either about the extent to which changes in alcoholic beverage excise taxes are passed along to drinkers in the form of higher prices or about the market conditions that affect this passthrough.[4] Cook (1981) provides some early evidence that suggested that distilled spirits taxes were more than passed on in the form of higher distilled spirits prices in license states. This finding was confirmed by Young and Bielinska-Kwapisz (2002) in their more recent econometric analysis of the relationship between alcohol taxes and beverage prices. They concluded, for example, that the doubling of the federal beer tax in 1991 (a $9-per-barrel increase) led to a much larger ($15 to $17) and relatively rapid increase in retail beer prices.

Given this limited empirical evidence, it is almost certain that the stability of the nominal federal and state excise taxes on alcoholic beverages has played a major role in the substantial declines in the inflation-adjusted

[4]In contrast, several studies have examined the extent to which federal and state cigarette excise taxes are passed on in the form of higher cigarette prices, with most concluding that increases in cigarette taxes result in at least comparable increases in cigarette prices (Chaloupka, Hu, Warner, Jacobs, and Yurekli, 2000).

prices of alcoholic beverages over time. For example, the average price of alcoholic beverages after adjusting for inflation fell by nearly 32 percent from 1953 to 2001. Given the research I will discuss, allowing the real value of alcoholic beverage excise taxes and, consequently, prices, to decline over time will result in increased drinking and its consequences.

Policies Affecting Distribution, Competition, and Price

In addition to taxation, a number of other alcohol-related policies directly or indirectly influence the prices of alcoholic beverages. Since the repeal of Prohibition, a three-tier system for the distribution of alcoholic beverages has evolved. This system includes producers/suppliers, wholesalers/distributors, and retailers. A complex set of policies affects how alcohol is distributed, priced, and promoted at each level.

Direct state control. Over time, states have taken differing degrees of control over various aspects of this distribution system, with some states monopolizing the retail sale (for off-premise consumption) and wholesale sale (including sales to outlets licensed to sell for on-premise consumption) of some alcoholic beverages (most often distilled spirits and, in some states, wine), while others employ a license system. Currently, 18 states retain some monopoly power, with 3 states exerting control over wholesale and retail sales of table wine, spirits, and other moderate- to high-alcohol content beverages (New Hampshire, Pennsylvania, and Utah), 8 states controlling wholesale and retail sales of high-alcohol content beverages only (Idaho, Michigan, Montana, North Carolina, Ohio, Oregon, Vermont, and Washington), and the other 7 states exerting control in wholesale markets only (Alabama, Iowa, Maine, Mississippi, Virginia, West Virginia, and Wyoming) (AEP, 2000). Changes in the nature of state monopoly control over the alcohol distribution system have been rare and tend to apply to minor aspects of the system.

States with monopoly control over some parts of the alcohol distribution system directly set the prices for the alcoholic beverages they control at the wholesale and, where applicable, retail level. Economic theory predicts that prices will be higher in markets that are monopolized or highly concentrated than they will be in more competitive markets. However, there is little empirical research on the impact of the structure of alcoholic beverage markets on the prices of alcoholic beverages, with the existing research producing mixed findings. Nelson (1990), for example, concluded that alcoholic beverage prices in monopoly states are at best slightly higher than in license states, while MacDonald (1986) found that increased availability resulting from changes in the control system led to lower prices in some, but not all, markets.

Other State Policies

Likewise, states have adopted a number of other policies that aim to directly or indirectly influence the prices of alcoholic beverages, with policies often varying in their applicability to different beverage types and multiple policies being used together. For example, in addition to direct state involvement in the alcohol distribution system, states regulate competition in alcoholic beverage markets in a variety of other ways, ranging from limiting availability through the licensing of retailers and wholesalers to the adoption of exclusive territory policies that grant monopoly power over a particular geographic area to a specific distributor. As with the impact of taxation on alcoholic beverage pricing, relatively few studies have examined the impact of these policies on prices, with those that have focused on the impact of exclusive territories policies for beer distribution (Jordan and Jaffee, 1987; Culbertson, 1989; Culbertson and Bradford, 1991; Sass and Saurman, 1993, 1996). These studies did find that exclusive territories policies result in higher beer prices.

Similarly, a number of states have regulations that require wholesalers to post or file prices for alcoholic beverages, with the stated or implicit intent of at least some of these policies to reduce price competition in the alcoholic beverage markets. Others restrict wholesalers' ability to price discriminate by granting volume discounts that would result in lower per-unit prices for retailers that buy in large quantities, which could result in lower retail prices in these outlets. Still others restrict wholesalers' and retailers' capacity to engage in price-related promotions and other marketing efforts that again could lead to lower prices for alcoholic beverages.

In addition, state and local governments have adopted policies limiting price-related promotions in on-premise establishments, including, for example, restrictions on "happy hour" specials or on the sale of beer by the pitcher. Others have similarly banned the free sampling of alcoholic beverages.

Other state policies that can indirectly influence the price of alcoholic beverages relate to policies that affect the distribution of alcoholic beverages. These policies include "at rest" laws, "primary source" laws, "direct shipping" laws, and "reciprocity" laws. At rest laws require that alcoholic beverages actually be delivered to (come to rest with) wholesalers before being passed on to retailers. The intent of these policies is to keep retailers from negotiating favorable prices directly with suppliers. Primary source laws limit the sources of alcoholic beverages to wholesalers to only those suppliers licensed to sell within the state, potentially restricting competition at the supplier level and, consequently, increasing prices at the wholesale and retail levels. Direct shipping laws are similar in that they prevent consumers from buying directly from suppliers or wholesalers at prices that are

likely lower than would be available when buying from retailers. Some states have somewhat relaxed versions of these laws that allow direct shipments to consumers in their state (state A) if the shipments originate in a state (state B) that allows such shipments from their state (state A); these provisions are known as reciprocity laws.

The direct shipment and reciprocity laws have been the subject of much debate in recent years as Internet use has increased. Much of this debate has focused on direct sales of wine from small wineries and/or retailers to consumers via a Web site. Some states allow these direct sales with no restrictions, others allow them only from sellers in states that have reciprocity agreements, others allow them only to consumers who have obtained a permit, still others allow them but limit the quantities that can be purchased, and others prohibit them completely.

In general, resulting in part from legal challenges initiated by alcoholic beverage wholesalers or retailers, state laws and regulations limiting competition in the alcoholic beverage markets have been relaxed over time. Some states, for example, have eliminated their price posting policies and/or restrictions on price discrimination after legal challenges from wholesalers, while others have successfully defended such challenges. Numerous challenges have been brought against state policies affecting direct shipments, and many of these have yet to be resolved. Those challenging the laws typically argue that they unduly restrict interstate competition and are, as a result, in conflict with the Constitution's interstate commerce clause that prohibits discrimination against out-of-state businesses. Defenders argue that these policies are allowed by the 21st Amendment, which repealed prohibition and gave states the power to regulate the distribution of alcoholic beverages.

Finally, some states have limited the ability of retailers to advertise prices for alcoholic beverages, arguing that price advertising would result in greater price competition in the alcoholic beverage markets, lower alcoholic beverage prices, and increased drinking and its consequences.

Overall, challenges to many of these laws have been successful (with rare exceptions) and state control over the distribution, pricing, and advertising/promotion of alcoholic beverages has been lessened. The increases in competition that result from these changes have almost certainly contributed to the reductions in the real prices of alcoholic beverages that have been observed over the past few decades. However, empirical evidence on the impact of changes in these policies on alcoholic beverage prices, drinking, and its consequences is almost nonexistent. Clearly, more research is needed to fully understand the impact of the complex and varied policies that affect alcoholic beverage distribution, marketing, and pricing on the retail prices of these beverages.

Alcoholic Beverage Prices and Consumption

One of the most fundamental laws of economics is that of the downward-sloping demand curve, which states that as the price of a product rises, the quantity consumed of that product falls. Some have suggested that this law may not apply to the demands for addictive products, including alcohol. Numerous studies over the past two decades have addressed this question, generally concluding that increases in alcoholic beverage prices do result in reductions in drinking. These studies have used a variety of econometric and other statistical methods applied to different types of data. Many have examined the impact of price on overall alcohol demand, using aggregated or beverage-specific alcoholic beverage sales data at the national or state level. Others have estimated the impact of price on an individual's decision to drink, frequency of alcohol consumption, number of drinks consumed, and heavy drinking behaviors, using data taken from a variety of surveys.

Some studies use measures of actual alcoholic beverage prices taken from various data sources, while others employ measures of alcoholic beverage taxes (most frequently beer taxes) as a proxy for alcoholic beverage prices. These studies attempt to control for a variety of other factors that may also impact alcohol demand, including age, income, race/ethnicity, education, and more. Similarly, many of these studies also have attempted to control for other alcohol-related policies that may be correlated with alcoholic beverage prices and taxes, including measures of alcohol availability, laws related to drinking and driving, and others.

Overall Alcohol Demand

Economists use the price elasticity of demand to describe the sensitivity of alcohol consumption to a change in the prices of alcoholic beverages. The price elasticity of demand is defined as the percentage change in consumption resulting from a 1 percent increase in price, all else constant. In their 1993 review of the studies based on aggregate data from the United States (either national or state level) and other countries, Leung and Phelps concluded that the price elasticities of demand for beer, wine, and distilled spirits are –0.3, –1.0, and –1.5, respectively, implying that beer consumption is relatively insensitive to changes in the price of beer, while increases in wine and spirits prices would lead to proportional or greater reductions in the overall consumption of wine and spirits. Analyses using individual-level data suggest that the impact of price on alcohol consumption may be even greater than that obtained in studies using aggregated data. These differences may be partly due to the differential response to price of different population subgroups (such as youth and young adults) that are often the focus of studies using individual-level data.

More recent studies of alcohol demand (Nelson, 1997, 1999; Kenkel, 1993, 1996; Manning, Blumber, and Moulton, 1995) confirm that higher alcoholic beverage prices lead to reductions in alcohol consumption. However, as with the earlier studies, the range of estimates of the price elasticity of demand produced by these studies is relatively wide. Nelson (1997), for example, estimated that the overall price elasticity of alcohol demand was –0.52, with beverage-specific elasticities of –0.16 for beer, –0.58 for wine, and –0.39 for distilled spirits.

In addition, several studies have attempted to estimate the cross-price elasticities of alcoholic beverages, which provide an indication of the substitutability of one beverage for another. However, this has been quite difficult given the relatively high correlation between alcoholic beverage prices and taxes, which makes it difficult to sort out the impact of a change in the price of one beverage from changes in the prices of others. In general, these studies provide limited evidence of substitutability, with cross-price elasticities that are relatively small or statistically insignificant (Edwards et al., 1994).

Price and Teen Drinking

A relatively large share of the economic research on the effects of alcohol prices on drinking has focused on drinking among youth and young adults. This is due to the relatively high levels of drinking, particularly heavy or binge drinking, in these age groups, as well as to the relatively high incidence of alcohol-related problems in this population (DHHS, 2000). For example, fatal motor vehicle accidents are the leading cause of death for persons under age 35, and alcohol is involved in more than half of these fatal crashes. Similarly, drinking behavior tends to be initiated in adolescence, with problem drinking increasing through the early 20s before beginning to fall. Data from the Monitoring the Future surveys, for example, indicate that more than half of all eighth graders nationally have drunk alcohol at least once, rising to about 80 percent among high school seniors (Johnston, O'Malley, and Bachman, 2002). More importantly, about one-quarter of eighth graders indicate having been drunk at least once, while nearly two-thirds of seniors do so. In addition to the short-term consequences of heavy drinking during these ages, there can also be substantial adverse effects in the long run as a result of the negative impact of drinking on educational attainment and other factors.

Grossman and his colleagues were the first to study the impact of alcoholic beverage prices on youth alcohol use, using data from the first and second waves of the National Health and Nutrition Examination Surveys conducted in the 1970s (Grossman, Coate, and Arluck, 1987; Coate and Grossman, 1988). Both studies found that increases in beer prices and

higher minimum legal drinking ages would lead to significant reductions in youth beer consumption. Of particular interest was their examination of the differential impact of prices on different types of youth drinkers, categorized based on their frequency or level of consumption. They defined infrequent drinkers as those consuming less than once per week, fairly frequent drinkers as those consuming one to three times per week, and frequent drinkers as those consuming four or more times per week. Grossman and colleagues found that higher beer prices reduced consumption in each of the three subgroups, but that the fractions of youth who consumed fairly frequently and frequently fell by more in both absolute and percentage terms than did the fraction of infrequent drinkers when prices rose. Similarly, they defined light drinkers as those who consumed one or two cans of beer on a typical drinking occasion, fairly heavy drinkers as those consuming three to five cans, and heavy drinkers as those consuming six or more beers on a typical drinking occasion. Again, they found that the increases in price would have a greater impact (in both absolute and percentage terms) on the fractions of heavy and fairly heavy drinkers than they did on the fraction of light drinkers.

Laixuthai and Chaloupka (1993) addressed this issue using more recent data from the 1982 and 1989 Monitoring the Future surveys of high school seniors. They defined three alternative measures of alcohol consumption reflecting frequency of drinking in the past year, frequency of drinking in the past 30 days, and participation in binge drinking (6 or more drinks on a single occasion) during the past 2 weeks. The data from the two years were analyzed separately in order to observe changes in the price sensitivity of drinking over time. Laixuthai and Chaloupka's findings were similar to those of Grossman and his colleagues in that higher beer taxes were associated with reductions in the frequency of drinking and the probability of heavy drinking among youth. Similarly, they found that higher taxes would lead to larger reductions in the fractions of frequent and fairly frequent drinkers than in the fraction of infrequent drinkers. Perhaps most interestingly, they found that the impact of price on youth drinking was smaller in 1989 than it was in 1982, attributing the change in price sensitivity over time to the increases in drinking ages that occurred during the 1980s. Laixuthai and Chaloupka contended that the increases in state drinking ages reduced the share of monetary price in the full price of alcohol for youth, which includes the legal and other costs associated with underage drinking. Thus, when drinking ages are relatively low, a given increase in the monetary price of alcoholic beverages has a larger impact on the full price of alcohol for youth than does the same increase when drinking ages are higher.

More recently, Cook and Moore (2001) used data from the National Longitudinal Survey of Youth (NLSY) to examine the impact of alcoholic

beverage prices and drinking ages on youth drinking. The NLSY first surveyed youth ages 14 to 21 in 1979, then reinterviewed them periodically over time, collecting information on alcohol consumption in several waves. Two measures of drinking were employed—one reflecting any alcohol consumption in the 30 days prior to the survey and a second indicating consumption of 6 or more drinks on a single occasion. Cook and Moore found that higher beer taxes and drinking ages were associated with reductions in both measures of drinking. Interestingly, they also found that the alcohol-related environment earlier in one's youth (based on the drinking age and tax a youth faced at age 14) has a significant impact on later drinking behavior, supporting the notion of habit formation or addiction.

In contrast, Dee (1999) used data from the 1977 through 1992 Monitoring the Future surveys of high school seniors to estimate the impact of beer taxes and drinking ages on the prevalence of youth drinking, concluding that higher beer taxes would not reduce youth drinking. Three levels of drinking were examined: any drinking in the past month; ten or more drinks in the past month; and five or more drinks on a single occasion at least once in the past two weeks, using state-level measures constructed from the survey data. In addition to a limited set of covariates, Dee included state-level fixed effects in his models to capture the unobserved, state-specific factors that might affect alcohol consumption. In contrast to the earlier research on price and youth drinking, including the studies described, Dee found that beer taxes do not significantly affect any of his measures of teen drinking when the state fixed effects are included.

Dee's findings, however, should be treated with caution before rejecting the findings from the earlier research that concluded that higher taxes and prices would lead to significant reductions in youth drinking, particularly heavy and frequent drinking. Although there is a potential omitted variables bias in the earlier studies that fails to account for the unobserved state sentiment toward drinking that may be reflected in state alcoholic beverage excise taxes and drinking ages, it is not clear in which direction this bias goes. For example, states with strong antidrinking sentiment where consumption is relatively low may enact higher taxes and stronger alcohol control policies, which could lead to an overestimate of the impact of price on drinking. On the other hand, states with greater prodrinking sentiment and higher alcohol consumption may view alcohol taxation as an attractive source of revenues, adopting higher taxes and, as a result, leading to an underestimate of the impact of price on drinking. This is further complicated by the fact that alcoholic beverage taxes, as discussed, have been relatively stable over time, making them highly correlated with a set of state fixed effects. One consequence of this high correlation when estimating demand models that include state fixed effects is that it is difficult to separate the independent effects of alcoholic beverage prices or taxes from the

state indicator variables, leading to insignificant estimates for the correlated variables.

In addition, Dee's measures of drinking are problematic given that they are state-level measures constructed from the Monitoring the Future survey data. The Monitoring the Future survey is a multistage, school-based survey that is designed to be nationally representative (Johnston, O'Malley, and Bachman, 2002). The sample of schools, however, is not designed to produce state-representative estimates. In any given year, between 120 and 145 schools participate in the twelfth-grade survey, with some states infrequently represented and others represented by one or two schools. Thus, there is substantial variation for each state over time in the measures of drinking Dee used because of changes in the sample of schools representing each state. Much of this variation is unlikely to reflect real change in drinking among teens in the state, but is instead the result of changes in the socioeconomic and demographic characteristics of the students at the schools that participate in the survey.

Finally, as noted, a variety of other policies, in addition to the tax, can affect the prices of alcoholic beverages. Failing to account for these, particularly during a time when these policies are changing in many states, can lead to measurement errors in models that use taxes as a proxy for price, producing biases that are exacerbated when fixed effects are included.

To summarize, the majority of studies on price and youth drinking conclude that higher alcoholic beverage prices significantly reduce the probability, frequency, and level of drinking among youth. Given the limitations of these studies, additional research would be useful in clarifying these relationships.

Price and Young Adult Drinking

Several recent studies have examined the impact of price on drinking among young adults. Grossman, Chaloupka, and Sirtalan (1998), for example, explored the impact of price on young adult drinking in an econometric application of Becker and Murphy's (1988) economic model of addictive behavior. The key features of the Becker and Murphy model include (1) the idea that current consumption of an addictive substance (such as alcohol) will depend on past consumption, so that current consumption will be greater as past consumption is greater, and (2) the assumption that addicts are "farsighted" in that they will consider, at least to some extent, the future consequences of their current consumption decisions. Together, these assumptions have several implications concerning the impact of price on addictive consumption, including a greater long-run response to permanent price changes as addicted consumers gradually adjust to the new price,

and reductions in current consumption of an addictive product in response to anticipated changes in future prices and other costs.

Grossman and colleagues used the longitudinal data from the panels formed by the 1976 through 1985 baseline Monitoring the Future surveys of high school seniors and their follow up surveys through 1989. These data produced a sample ranging in age from 17 through 29, the ages during which alcohol dependence and abuse are at their peak and for which an approach accounting for the addictive aspects of alcohol consumption is likely to be most relevant. In addition to estimating models that account for addiction, the authors also estimated more traditional models that ignored the addictive aspects of alcohol consumption. Estimates from the addictive models provided strong support for the hypothesis that alcohol consumption is an addictive behavior for this age group in the sense that strong interdependency exists between past, current, and future alcohol consumption. Regardless of the approach, the authors found consistent evidence that higher alcoholic beverage prices led to significant reductions in alcohol consumption among young adults. Their estimated price elasticity of demand from models that did not account for addiction was –0.29. When accounting for the potentially addictive nature of alcohol consumption, however, they estimated an average long-run price elasticity of demand of –0.65, which, as predicted by the theory, was approximately 60 percent higher than the estimated short-run elasticity (which was higher than the estimates obtained from the models that ignored addiction).

Many recent studies of the impact of price on young adult drinking have focused on the effects on college students, a particularly high-risk group. Chaloupka and Wechsler (1996) conducted the first study for this population, using data from the 1993 Harvard College Alcohol Survey, a nationally representative survey of students at United States four-year colleges and universities. In addition to including measures of beer taxes and prices in their demand equations, the researchers also included a measure of alcohol availability and an index of state drinking and driving-related legislation. Finally, given differences in drinking patterns by age and gender, Chaloupka and Wechsler estimated separate demand equations for underage and older students and for males and females. In general, they found that prices did not have a significant impact on drinking among male college students or on older female students, while having a small but statistically significant effect on underage female students. The authors suggested that this was partly due to substantial measurement errors in their measure of alcoholic beverage prices taken from a retail price survey conducted by the American Chamber of Commerce Researchers Association, given the widespread promotion of alcohol on and around college campuses and the ready availability of alcohol at fraternity and other parties.

To address this issue more fully, Wechsler and colleagues added price-related questions to subsequent waves of the Harvard College Alcohol Survey. In response to these questions, students provided information on the average price they paid for a drink and on their participation in so-called "fixed-price" events where a flat price was paid for admission, with no additional charge per drink consumed. In addition, information on state and local price-related alcohol policies has been collected for the location of each campus, including information on policies limiting happy hour promotions and the sale of beer by the pitcher. Several recent studies have employed these data as an alternative to the tax and price data used in the initial Chaloupka and Wechsler study on price and college student drinking. Czart (2001), in her Ph.D. dissertation, for example, used the self-reported price information from the 1997 and 1999 waves of the Harvard College Alcohol Survey to examine the impact of prices on drinking by college students. She found generally consistent evidence that higher average alcohol prices reduced the likelihood, frequency, and prevalence of drinking among college students. Similarly, Williams, Chaloupka, and Wechsler (2002) used the self-reported price and drinking information taken from the 1997 and 1999 surveys to examine the impact of price and other factors on the transition from no drinking to moderate drinking and from moderate drinking to heavy or binge drinking. They found that students who faced a higher price for alcohol were less likely to make the transitions from abstainer to moderate drinker and from moderate drinker to heavy drinker, with the impact of price similar across the two thresholds. Similarly, they found that the greater availability of fixed-price events increased the probability of crossing both thresholds, consistent with the hypothesis that these events significantly reduced the per-drink cost.

Alcoholic Beverage Prices and the Consequences of Alcohol Use and Abuse

Economists have studied the impact of alcoholic beverage taxes and prices on numerous outcomes associated with alcohol use and abuse, including nonfatal and fatal traffic crashes caused by drinking and driving, self-reported drinking and driving behavior, other accidents, liver cirrhosis and other alcohol-related mortality, violence and other crime, suicide, risky sexual behavior, and decreased educational attainment. These studies are based on a conceptual framework in which higher alcohol taxes and prices lead to reduced problem drinking, resulting in reductions in the observed consequences of drinking. As with the demand studies already described, many other factors are included in the equations estimated in order to control for other potential determinants of the outcome(s) being examined.

Alcohol Prices and Drinking and Driving

Economists have conducted numerous econometric analyses of the impact of alcohol taxes and prices on drinking and driving. Most of these studies have used state-level information on fatal motor vehicle accidents taken from the Fatal Accident Reporting System as a proxy for drinking and driving, given the high degree of alcohol involvement in these accidents. For example, the National Highway Traffic Safety Administration (NHTSA) estimates that over 40 percent of all fatal traffic accidents involved alcohol (NHTSA, 2003). Several studies have used a subset of these accidents more likely to be alcohol involved, based on the time of day or number of vehicles involved. For example, NHTSA estimates that the rate of alcohol involvement is over three times higher in nighttime fatal accidents than in those during the day (NHTSA, 2003). Similarly, several have focused on the role of the individual killed in the accident (e.g., driver, passenger), and others have used information on the blood alcohol content of dead drivers to construct alcohol-involved measures. Other studies have used more disaggregated information (such as county-level data for a given state), and still others have used information on self-reported involvement in nonfatal accidents (including self-reports of those after consuming alcohol) and on self-reported drinking and driving behavior. Finally, many of these studies include estimates for high-risk subpopulations, particularly for youth and young adults.

Nearly every study that has considered the impact of alcoholic beverage prices on drinking and driving concludes that higher prices lead to significant reductions in drinking and driving. Saffer and Grossman (1987a, 1987b), for example, were the first to consider the impact of beer taxes on state-level motor vehicle accident fatality rates, using data from all states from 1975 through 1981 and controlling for other factors expected to impact the probability of fatal crashes, including drinking ages. They focused on youth and young adults, separately estimating the impact of taxes on 15- to 17-year-olds, 18- to 20-year-olds, and 21- to 24-olds. Both studies concluded that increases in beer taxes would significantly reduce youth motor vehicle accident fatality rates, a disproportionate number of which are the result of drinking and driving. Chaloupka, Saffer, and Grossman (1993) updated and expanded this research using similar data from 1982 through 1988, but also including adult fatality rates as well as several alternative fatality rates defined based on likelihood of alcohol involvement. In addition, they controlled for a wide range of state policies related to drinking and driving. Chaloupka and colleagues concluded that significant increases in alcoholic beverage excise taxes are among the most effective policies for reducing drinking and driving in all segments of the population, with the largest reductions occurring among teens and young adults.

More recently, Ruhm (1996), using data from the same period, extended this analysis by including state fixed effects in his models. In contrast to the Dee study on youth drinking discussed earlier, the inclusion of state fixed effects in the motor vehicle accident fatality equations did not change the findings, with Ruhm concluding that higher beer taxes would lead to significant reductions in fatal traffic crashes. In general, the estimates from econometric analyses of alcoholic beverage taxes or prices and fatal traffic crashes imply that a 10 percent increase in price would reduce overall traffic crashes by 5 to 10 percent, with even larger reductions—7 to 17 percent—for youth.

These estimates are consistent with the findings from studies using survey data on self-reported drinking and driving and on involvement in nonfatal traffic crashes. Kenkel (1993), for example, using data from the 1985 National Health Interview Survey, estimated that a 10 percent increase in price would reduce the probability of drinking and driving by 7.4 percent among males and 8.1 percent among females, with even larger reductions—12.6 percent and 21.1 percent—among young males and females, respectively. Chaloupka and Laixuthai (1997), using data taken from the 1982 and 1989 Monitoring the Future surveys, concluded that higher beer taxes would significantly reduce the probability of nonfatal traffic accidents among youth.

A few recent studies have questioned the general conclusion drawn from the relatively large economic literature on the impact of alcohol beverage prices or taxes on drinking and driving. Dee (1999) and Dee and Evans (2001) used various state-level motor vehicle accident fatality rates for 18- to 20-year-olds reflecting different levels of alcohol involvement for the periods from 1977 through 1992 and 1997, respectively. Both studies found significant negative effects of beer taxes on the various fatality rates employed, but the authors rejected these findings because the estimates of the effects of the beer tax were similar across the different fatality rates, in contrast to their hypothesis that the impact of taxes should increase as the degree of alcohol involvement increased (as found by Chaloupka et al., 1993). Mast, Benson, and Rasmussen (1999) used data for all ages in their analysis of motor vehicle accident fatality rates for 1984 through 1992. They found insignificant effects of beer taxes in some of their fixed effects models for the overall fatality rates, but negative and significant effects of beer taxes in models using nighttime single-vehicle accident fatality rates (where alcohol involvement is much greater). However, they put little weight on these findings because of changes in the magnitude of the estimates when different variables are included in the models.

To summarize, the majority of studies that have examined the impact of alcoholic beverage taxes or prices on drinking and driving behavior

conclude that increases in taxes and prices would lead to significant reductions in the likelihood of drinking and driving and in the nonfatal and fatal accidents that result. Further research would be useful in addressing the inconsistencies that have been raised between a few recent studies and the large body of existing evidence.

Alcohol Prices, Liver Cirrhosis, and Other Alcohol-Related Mortality

Several studies have examined the impact of alcohol taxes and prices on liver cirrhosis mortality rates, an adverse health outcome caused by long-term, heavy alcohol consumption. The earliest of these studies was by Cook and Tauchen (1982), who used state-level cirrhosis mortality rates for license states over the period from 1962 through 1977 to examine the impact of distilled spirits taxes. They concluded that significant tax increases would lead to large reductions in cirrhosis deaths, estimating that a $1 increase in the distilled spirits tax would reduce the cirrhosis death rate between 5.4 to 10.8 percent. This finding was confirmed by Grossman (1993) in his application of Becker and Murphy's economic model of addiction to heavy alcohol consumption, as reflected by the liver cirrhosis mortality rate. Using data from all states for 1961 through 1984, Grossman estimated that a 10 percent increase in the price of alcoholic beverages would reduce the cirrhosis death rate by 8.3 to 12.8 percent in the long run.

In contrast, Sloan, Reilly, and Schenzler (1994) found little impact of alcoholic beverage prices on deaths for which alcohol is a primary cause, including liver cirrhosis deaths, using state-level data from 1982 through 1988. However, they did find that higher alcoholic beverage prices led to significant reductions in a number of other alcohol-related death rates, including suicides, diseases for which alcohol is a contributing factor (including various cancers), and other accidental deaths (including drowning, accidental falls, fires, and others). This latter finding is confirmed by Ohsfeldt and Morrisey's (1997) examination of the impact of beer taxes on nonfatal workplace injuries. They used state-level data for 1975 through 1985, concluding that higher beer taxes would lead to significant reductions in workplace injuries. For example, they estimated that a 25-cent increase in the beer tax in 1992 would have reduced work days lost from nonfatal workplace injuries by 4.6 million, lowering the costs of lost productivity due to alcohol by $491 million.

Similarly, Markowitz, Chatterji, Kaestner, and Dave (2002) confirmed the finding that higher alcohol prices reduce suicidal behavior. Using data from the 1991 Core Institute's Alcohol and Drug Surveys of College Students, they examined the impact of beer prices and other factors on various measures of suicidal thoughts and actions among college students. The

researchers concluded that the likelihood of both suicidal thoughts and actions is lower among students on campuses in states where the beer prices are higher.

Chesson, Harrison, and Kasser (2000) used state-level data for all states over the period from 1981 through 1995 in their examination of the impact of alcoholic beverage taxes on risky sexual behavior, as reflected by sexually transmitted disease rates. Based on estimates from models including state and year fixed effects, they concluded that increases in beer and spirits taxes result in significant reductions in gonorrhea and syphilis rates. For example, they predicted that a $1 increase in the distilled spirits tax would reduce gonorrhea rates by 2.1 percent, while a 20-cent increase in the tax on a six-pack of beer would reduce gonorrhea rates by 8.9 percent, with similar, and in some cases larger, effects on syphilis rates.

Again, the general conclusion that can be drawn from the studies examining the impact of alcoholic beverage taxes and prices on various health outcomes related to alcohol is that increases in taxes and prices would lead to significant reductions in the health consequences of alcohol use and abuse.

Alcohol Prices, Violence, and Other Crime

Over the past decade, several studies have considered the impact of alcoholic beverage taxes and prices on violence and other crime. In the first of these studies, Cook and Moore (1993b) used state-level data on crime rates taken from the Uniform Crime Reports for the years from 1979 through 1987 to look at the impact of beer excise taxes on various violent crimes, including murder, rape, assault, and robbery. In relatively parsimonious specifications that included only state and year fixed effects in addition to the tax, they found that higher beer taxes would reduce some violent crime rates (rape and robbery), but have little impact on others (homicides and assaults). Sloan and his colleagues (1994) reached a somewhat different conclusion in their analysis of comparable data on homicides taken from the Vital Statistics, where they found that higher alcoholic beverage prices and reduced alcohol availability would reduce homicide deaths.

A series of recent studies by Markowitz and Grossman has contributed significantly to this literature. In their 1998 analysis, for example, Markowitz and Grossman used data from the 1976 National Family Violence survey to examine the impact of beer taxes and other alcohol control policies, as well as illegal drug prices and related policies, on child abuse. They concluded that an increase in beer taxes would lead to significant reductions in child abuse. They predicted that a 10 percent increase in the beer excise tax would reduce the probability of any child abuse by 1.2 percent,

while reducing the probability of severe child abuse by 2.1 percent. Using data on the number of children who are victims of child abuse, the investigators estimated that a 10 percent beer tax increase would have reduced the number of children who were victims of severe child abuse by 132,500. In a subsequent analysis, Markowitz and Grossman (2000) extended their research on the impact of alcohol on child abuse by adding the 1985 National Family Violence survey and considering the impact on abuse by men and women separately in models that also included state fixed effects. Based on their gender-specific analyses, the investigators concluded that increases in the beer tax are effective in reducing the probability that a woman commits child abuse, but do not significantly affect the probability of child abuse by men.

Using the longitudinal data from the 1985 National Family Violence survey and its 1986 and 1987 follow ups, Markowitz (2000) looked at the impact of alcohol prices and other policies on spousal abuse. In models that included individual specific fixed effects, she found that higher alcoholic beverage prices would lead to significant reductions in the probability of severe violence by husbands against their wives. Based on an average of estimates from alternative specifications, Markowitz predicted that a 1 percent increase in the price of pure alcohol would reduce the probability that a woman would be a victim of severe spousal abuse by 1 to 9.7 percent.

More recently, Grossman and Markowitz (2001) examined the impact of alcoholic beverage prices on violence and other delinquent behavior among college students, using data from the 1989, 1990, and 1991 Core Alcohol and Drug Surveys of College Students. They concluded that increases in beer prices would lead to significant reductions in each of the outcomes they considered, estimating that a 10 percent increase in beer prices would reduce the overall number of students involved in some sort of violent behavior by about 4 percent.

Finally, Saffer (2001) used data from the 1991 National Household Survey on Drug Abuse to examine the impact of alcohol and drug prices and control policies on self-reported involvement in several indicators of crime and violence, including arrests, property crime, property damage, use of force, and drug selling. Saffer found consistent evidence that higher beer taxes lead to significant reductions in crime, with estimates for subsamples based on age showing a relatively larger impact on crime and violence among those under age 21 than on older individuals.

The rapidly growing research on the impact of alcoholic beverage prices and control policies on violence and other crime produces generally consistent findings that increases in taxes and prices lead to significant reductions in violence.

Alcohol Prices and Educational Outcomes

A small but growing number of studies have examined the impact of alcohol taxes and prices on various measures of educational attainment. The first studies in this area used data from the National Longitudinal Survey of Youth to examine the impact on high school graduation (Yamada, Kendix, and Yamada, 1996) and on post-high school educational attainment (Cook and Moore, 1993a). Both studies concluded that higher alcoholic beverage taxes would improve educational attainment. Yamada and his colleagues, for example, estimated that a 10 percent increase in the beer tax would raise the probability of high school graduation by approximately 3 percent. Similarly, Cook and Moore predicted that, in 1982, an increase in the beer tax from 90-cents per case to $1 per case would have increased a student's probability of attending and graduating from a four-year college or university by 6.3 percent.

Two recent papers using data from the 1997 and 1999 waves of the Harvard College Alcohol Survey provide additional evidence on the impact of alcoholic beverage taxes and prices on measures of study habits and school performance among college students. Williams, Powell, and Wechsler (2002) concluded that higher beer excise taxes and policies limiting low-priced alcohol promotions (limits on happy hours and sale of beer by the pitcher) are effective in reducing alcohol use among college students and that the reductions in drinking that result lead to improvements in student grade point averages. Similarly, Powell, Williams, and Wechsler (2002) found that increases in alcohol prices (including limits on fixed-price events) would lead to improved educational outcomes by reducing the likelihood of students missing classes and/or the probability of falling behind in school as a result of their alcohol consumption.

Although some studies produce mixed findings concerning the impact of alcohol use on educational attainment (for example, Dee and Evans, 1997; Chatterji, 1998), most studies on this issue find some evidence that increased drinking during adolescence reduces schooling. Several of these studies concluded that higher alcoholic beverage taxes and prices would significantly improve school outcomes, including the probability of graduation, better study habits, and higher grade point average.

SUMMARY AND CONCLUSIONS

A large and growing body of research conducted by economists over the past two decades has examined the impact of alcoholic beverage taxes and prices on drinking prevalence, frequency, and intensity, as well as on a host of adverse outcomes related to alcohol use and abuse. The majority of these studies support the hypothesis that increases in alcoholic beverage

prices, which can be achieved by raising federal and state alcohol excise taxes as well as through a variety of other policies, are effective in reducing alcohol use. Many of these studies clearly show that these reductions in use are not limited to drinking by light or infrequent drinkers; significant reductions are also seen in heavy and/or frequent drinking and its consequences. In addition, studies that look at drinking by youth generally find even larger effects of taxes and prices than are found for the overall population, suggesting that increases in prices are particularly effective in reducing youth drinking and its consequences. Although a few studies produce contradictory findings, the overall weight of the evidence supporting the effectiveness of alcohol price increases in reducing alcohol use, abuse, and related problems is substantial.

REFERENCES

Alcohol Epidemiology Program. (2000). *Alcohol policies in the United States: Highlights from the 50 states*. Minneapolis: University of Minnesota.

Becker, G.S., and Murphy, K.M. (1988). A theory of rational addiction. *Journal of Political Economy*, *96*(4), 675-700.

Bureau of Alcohol, Tobacco, and Firearms. (2002). Available: www.atf.treas.gov/alcohol/stats/historical.

Chaloupka, F.J., Grossman, M., and Saffer, H. (1998). The effects of price on the consequences of alcohol use and abuse. In M. Galanter (Ed.), *Recent developments in alcoholism, volume 16: The consequences of alcohol* (pp. 331-346). New York: Plenum.

Chaloupka, F.J., Grossman, M., and Saffer, H. (2002). The effects of price on alcohol consumption and alcohol related problems. *Alcohol Research and Health*, *26*(1), 22-34.

Chaloupka, F.J., Hu, T.W., Warner, K.E., Jacobs, R., and Yurekli, A. (2000). The taxation of tobacco products. In P. Jha and F.J. Chaloupka (Eds.), *Tobacco control in developing countries* (pp. 237-272). Oxford: Oxford University Press.

Chaloupka, F.J., and Laixuthai, A. (1997). Do youths substitute alcohol and marijuana? Some econometric evidence. *Eastern Economic Journal*, *23*(3), 253-276.

Chaloupka, F.J., Saffer, H., and Grossman, M. (1993). Alcohol-control policies and motor-vehicle fatalities. *Journal of Legal Studies*, *22*(1), 161-186.

Chaloupka, F.J., and Wechsler, H. (1996). Binge drinking in college: The impact of price, availability, and alcohol control policies. *Contemporary Economic Policy*, *14*(4), 112-124.

Chatterji, P. (1998). The effects of adolescent substance use on educational attainment, adult substance use, and the adult wage rate. Ph.D. dissertation, School of Hygiene and Public Health, The Johns Hopkins Univesrity.

Chesson, H., Harrison, P., and Kassler, W.J. (2000). Sex under the influence: The effect of alcohol policy on sexually transmitted disease rates in the United States. *Journal of Law and Economics*, *43*(1), 215-238.

Coate, D., and Grossman, M. (1988). Effects of alcoholic beverage prices and legal drinking ages on youth alcohol use. *Journal of Law and Economics*, *31*(1), 145-171.

Cook, P.J. (1981). The effects of liquor taxes on drinking, cirrhosis and auto fatalities. In M. Moore and D. Gerstein (Eds.), *Alcohol and public policy: Beyond the shadow of prohibition* (pp. 255-285). Washington, DC: National Academy Press.

Cook, P.J., and Moore, M.J. (1993a). Drinking and schooling. *Journal of Health Economics*, *12*, 411-429.

Cook, P.J., and Moore, M.J. (1993b). Economic perspectives on reducing alcohol-related violence. In S.E. Martin (Ed.), *Alcohol and interpersonal violence: Fostering multidisciplinary perspectives* (pp. 193-212). National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 24, NIH Publication No. 93-3496. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Cook, P.J., and Moore, M.J. (2000). Alcohol. In A.J. Culyer and J.P. Newhouse (Eds.), *Handbook of health economics* (pp. 1629-1673). New York: Elsevier.

Cook, P.J., and Moore, M.J. (2001). Environment and persistence in youthful drinking patterns. In J. Gruber (Ed.), *Risky behavior among youth: An economic perspective* (pp. 375-437). Chicago: University of Chicago Press.

Cook, P.J., and Moore, M.J. (2002). The economics of alcohol abuse and alcohol-control policies. *Health Affairs*, *21*(2), 120-133.

Cook, P.J., and Tauchen, G. (1982). The effect of liquor taxes on heavy drinking. *Bell Journal of Economics*, *13*(2), 379-390.

Culbertson, W.P. (1989). Beer cash laws: Their economic impact and antitrust implications. *Antitrust Bulletin*, *34*, 209-229.

Culbertson, W.P., and Bradford, D. (1991). The price of beer: Some evidence from interstate comparisons. *International Journal of Industrial Organization*, 275-289.

Czart, C. (2001). The impact of prices and alcohol control policies on alcohol use and abuse among college students. Ph.D. dissertation, Department of Economics, University of Illinois at Chicago. Unpublished.

Dee, T.S. (1999). State alcohol policies, teen drinking and traffic accidents. *Journal of Public Economics*, *72*(2), 289-315.

Dee, T.S., and Evans, W.N. (1997). *Teen drinking and educational attainment: Evidence from two sample instrumental variables (TSIV) estimates*. Working Paper No. 6082. Cambridge, MA: National Bureau of Economic Research.

Dee, T.S., and Evans, W.N. (2001). Teens and traffic safety. In J. Gruber, (Ed.), *Risky behavior among youth: An economic perspective* (pp. 121-165). Chicago: University of Chicago Press.

Edwards, G., Anderson, P., Babor, T.F., Casswell, S., Ferrence, R., Giesbrecht, N., Godfrey, C., Holder, H.D., Lemmens, P., Makela, K., Midanik, L.T., Norstrom, T., Osterberg, E., Romelsjo, A., Room, R., Simpura, J., and Skog, O.J. (1994). *Alcohol policy and the public good*. Oxford: Oxford University Press.

Grossman, M. (1993). The economic analysis of addictive behavior. In M.E. Hilton and G. Bloss (Eds.), *Economics and the prevention of alcohol-related problems* (pp. 91-123). National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 25, NIH Publication No. 93-513. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Grossman, M., Chaloupka, F.J., and Sirtalan, I. (1998). An empirical analysis of alcohol addiction: Results from the Monitoring the Future panels. *Economic Inquiry*, *36*(1), 39-48.

Grossman, M., Coate, D., and Arluck, G.M. (1987). Price sensitivity of alcoholic beverages in the United States. In M.H. Moore and D.R. Gerstein (Eds.), *Control issues in alcohol abuse prevention: Strategies for states and communities* (pp. 169-198). Greenwich, CT: JAI.

Grossman, M., and Markowitz, S. (2001). Alcohol regulation and violence on college campuses. In M. Grossman and C.R. Hsieh (Eds.), *Economic analysis of substance use and abuse: The experience of developed countries and lessons for developing countries* (pp. 257-289). Cheltenham, United Kingdom: Edward Elgar.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2002). *Monitoring the future national survey results on drug use, 1975-2001*. Bethesda, MD: National Institute on Drug Abuse.

Jordan, W.J., and Jaffee, B.L. (1987). The use of exclusive territories in the distribution of beer: Theoretical and empirical observations. *Antitrust Bulletin*, *32*, 137-64.

Kenkel, D.S. (1993). Drinking, driving and deterrence: The effectiveness and social costs of alternative policies. *Journal of Law and Economics*, *36*(2), 877-914.

Kenkel, D.S. (1996). New estimates of the optimal tax on alcohol. *Economic Inquiry*, *34*(2), 296-319.

Laixuthai, A., and Chaloupka, F.J. (1993). Youth alcohol use and public policy. *Contemporary Policy Issues*, *11*(4), 70-81.

Leung, S.F., and Phelps, C.E. (1993). "My kingdom for a drink . . . ?" A review of estimates of the price sensitivity of demand for alcoholic beverages. In M.E. Hilton and G. Bloss (Eds.), *Economics and the prevention of alcohol-related problems* (pp. 1-32). National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 25, NIH Publication No. 93-513. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

MacDonald, S. (1986). The impact of increased availability of wine in grocery stores on consumption: Four case histories. *British Journal of Addiction*, *81*(3), 381-387.

Manning, W.G., Blumber, L., and Moulton L.H. (1995). The demand for alcohol: The differential response to price. *Journal of Health Economics*, *14*(2), 123-148.

Markowitz, S. (2000). The price of alcohol, wife abuse and husband abuse. *Southern Economic Journal*, *67*(2), 279-303.

Markowitz, S., Chatterji, P., Kaestner, R., and Dave, D. (2002). *Substance use and suicidal behaviors among young adults*. Working paper No. 8810. Cambridge, MA: National Bureau of Economic Research.

Markowitz, S., and Grossman, M. (1998). Alcohol regulation and domestic violence towards children. *Contemporary Economic Policy*, *16*(3), 309-320.

Markowitz, S., and Grossman M. (2000). The effects of beer taxes on physical child abuse. *Journal of Health Economics*, *19*(2), 271-282.

Mast, B.D., Benson, B.L., and Rasmussen, D.W. (1999). Beer taxation and alcohol-related traffic fatalities. *Southern Economic Journal*, *66*(2), 214-249.

National Highway Traffic Safety Administration. (2003). *Traffic safety facts: Alcohol.* U.S. Department of Transportation, Washington DC. Available: http://www-fars.nhtsa.dot.gov/pubs/2.pdf. Accessed May 28, 2003.

Nelson, J.P. (1990). State monopolies and alcoholic beverage consumption. *Journal of Regulatory Economics*, *2*(1), 83-98.

Nelson, J.P. (1997). Economic and demographic factors in U.S. alcohol demand: A growth accounting analysis. *Empirical Economics*, *22*(1), 83-102.

Nelson, J.P. (1999). Broadcast advertising and U.S. demand for alcoholic beverages. *Southern Economic Journal*, *65*(4), 774-790.

Ohsfeldt, R.L, and Morrisey, M.A. (1997). Beer taxes, workers' compensation and industrial injury. *The Review of Economics and Statistics*, *79*(1), 155-160.

Powell, L.M., Williams, J., and Wechsler, H. (2002). *Study habits and the level of alcohol use among college students*. Impact Teen Research paper Series #19. Chicago: University of Illinois.

Ruhm, C.J. (1996). Alcohol policies and highway vehicle fatalities. *Journal of Health Economics*, *15*(4), 435-454.

Saffer, H. (2001). Substance abuse control and crime: Evidence from the National Survey of Drug Abuse. In M. Grossman and C.R. Hsieh (Eds.), *Economic analysis of substance use and abuse: The experience of developed countries and lessons for developing countries* (pp. 291-307). Cheltenham, United Kingdom: Edward Elgar.

Saffer, H., and Grossman, M. (1987a). Beer taxes, the legal drinking age, and youth motor vehicle fatalities. *Journal of Legal Studies*, *16*(2), 351-374.

Saffer, H., and Grossman, M. (1987b). Drinking age laws and highway mortality rates: Cause and effect. *Economic Inquiry*, *25*(3), 403-417.

Sass, T.R., and Saurman, D.S. (1993). Mandated exclusive territories and economic efficiency: An empirical analysis of the malt-beverage industry. *Journal of Law and Economics*, *36*(1), 153-177.

Sass, T.R., and Saurman, D.S. (1996). Efficiency effects of exclusive territories: Evidence from the Indiana beer market. *Economic Inquiry*, *34*(3), 597-615.

Sloan, F.A., Reilly, B.A., and Schenzler, C. (1994). Effects of prices, civil and criminal sanctions, and law enforcement on alcohol-related mortality. *Journal of Studies on Alcohol*, *55*, 454-465.

U.S. Department of Health and Human Services. (2000). *10th special report to the U.S. Congress on alcohol and health*. Washington, DC: Author.

Williams, J., Chaloupka, F.J., and Wechsler, H. (2002). Are there differential effects of price and policy on college students' drinking intensity? ImpacTeen Research Paper No. 16, University of Illinois at Chicago. Unpublished.

Williams, J., Powell, L.M., and Wechsler, H. (2002). Does alcohol consumption reduce human capital accumulation? Evidence from the college alcohol study. ImpacTeen Research Paper No. 18, University of Illinois at Chicago.

Yamada, T., Kendix, M., and Yamada, T. (1996). The impact of alcohol consumption and marijuana use on high school graduation. *Health Economics*, *5*, 77-92.

Young, D.J., and Bielinska-Kwapisz, A. (2002). Alcohol taxes and beverage prices. *National Tax Journal*, *55*(1), 57-73.

10

Media Intervention Impact: Evidence and Promising Strategies

Charles Atkin

Devising effective mass communication alcohol prevention interventions poses a difficult challenge to campaign design specialists and media professionals. This chapter reviews conventional strategies from the general health campaign literature and offers some promising innovative approaches that may achieve greater success in addressing the underage drinking problem. Unlike the current national drug campaign, which is funded sufficiently to disseminate a huge volume of prominently placed messages with sophisticated design and professional executions, underage alcohol campaigns are far more limited in quantity and quality.

MEDIA CAMPAIGN DESIGN

Disciplined campaign design begins with an assessment of the behavioral aspects of the youth drinking problem in order to determine which actions should be performed by which segments of the population. In particular, the designer needs to specify focal segments of youth whose drinking behavior is to be changed. For each segment, one can trace backward from the ultimate focal behaviors to identify the proximate and distal determinants, then create models of the pathways of direct and indirect media influence. The communication strategy involves specifying target audiences and target behaviors that can be influenced directly by campaign messages.

In formulating the plan, the campaign strategist is faced with basic decisions about allocating resources among the prospective pathways, focal behaviors, types of messages, channels, and dissemination options. Should

the campaign seek to change fundamental behaviors, or chip away at more readily altered peripheral actions? Should the most resistant or most receptive segments be the focus of campaign efforts? What proportion of the resources should be devoted to direct influence on the focal segment versus indirect pathways via stimulating interpersonal influencers and leveraging or combating environmental determinants? Which influencers should be targeted? What is the optimum combination of awareness messages, instructional messages, and persuasive messages? How many messages should attack the competition (ranging from drinking initiation to drunkenness to impaired driving) versus promote healthy alternatives? Is it more effective to disseminate the messages via expensive TV channels or to utilize primarily minimedia? Should the campaign messages be scheduled in concentrated bursts or spread out over a lengthy period of time?

In media-based campaigns, development of the strategy entails sensitive application of mass communication theories and best practices principles. The strategic guidelines presented in this chapter draw on models, processes, generalizations, and recommendations in the voluminous research literature on media health campaigns, particularly theoretical perspectives and reviews by communication researchers such as Atkin (1981, 1994, 2001); Atkin and Wallack (1990); Backer and Rogers (1993); Backer, Rogers, and Sopory (1992); Bracht (2001); Cappella, Fishbein, Hornik, Ahern, and Sayeed (2001); DeJong and Winsten (1990, 1998); Donohew, Sypher, and Bukoski (1991); Dozier, Grunig, and Grunig (2001); Hale and Dillard (1995); Maibach and Parrott (1995); McGuire, (1989, 1994); Singhal and Rogers (1999); Slater (1999); Stephenson and Witte (2001); Wallack and DeJong (1995); and Wartella and Middlestadt (1991).

The applicability of the general principles depends on the specific context (especially types of audiences to be influenced and type of product being promoted), so effective campaign design usually requires extensive formative evaluation inputs and message pretests. Surveys, focus groups, and lab testing provide useful information to guide campaign development and to provide feedback on effective and ineffective components. Alcohol-related examples of formative evaluation are described by Atkin and Freimuth (2001).

Direct Effects on Underage Individuals

In general, health campaigns that are targeted directly to the focal segment of the population tend to have a modest degree of impact, with limited effects on fundamental behavior patterns. But impact is highly variable, depending on the palatability of the advocated behavior and the receptivity of the target audience. Recent meta-analysis studies of comprehensive community-based campaigns show that the media contribute to a 5 to

10 percent change in behavior (Snyder, 2001). The meager literature on underage drinking prevention presented in this chapter is consistent with the limited-effects conclusion based on other health campaigns aimed at youth.

The limited potency of the media leads to several implications for campaign designers. First, designers should set realistic expectations of success, especially in the short run. They should be prepared for a long haul because many campaigns take years to achieve and maintain significant impact. Second, designers should employ some of the promising ideas presented throughout this chapter, and take care to avoid wasting resources on ineffective strategies. They should give more emphasis to relatively attainable impacts by aiming at more receptive segments of the audience and by creating or promoting more palatable positive products. Campaign designers should augment the relatively small set of packaged campaign stimuli with message multipliers by stimulating information seeking and sensitization and by generating public relations publicity. Furthermore, they should use a greater variety of persuasive incentives to motivate the audience, and include more educational material to help them perform the behaviors. Finally, the meager direct effects may be overcome by shifting campaign resources to indirect pathways of facilitating and controlling the behavior of the focal segment via interpersonal, organizational, and societal influences. Most of these strategies involve a broader diversity of approaches than conventionally employed in health campaigns.

Diversification of Campaign Approaches

Over the past few decades, a relatively limited array of strategies typically has been utilized in media-based health campaigns. The field may be well advised to diversify the approaches to campaign design beyond conventional practices. Alcohol prevention campaigns rely on a narrow set of approaches (e.g., social norming, threat of physical harm), which may be improved by considering a broader set of communication tactics that are coordinated in a more conceptually sophisticated manner.

In creating a media campaign strategy, there are many dimensions to consider, each with multiple options. For example, designers can choose among 10-15 direct and indirect pathways to be taken, about 30-40 basic persuasive appeals to be selected, perhaps 25-30 different channels to be utilized, 5-10 types of target behaviors to be advocated, 10-15 types of target audiences to be influenced, 10-15 kinds of source messengers to deliver the content, 5-10 types of instructional skills to be taught, and an array of stylistic executions to be created.

A basic theme of this chapter is that disciplined diversification can yield greater success in alcohol campaigns. Rather than putting too many eggs in

one basket, it's advisable to use a large variety of messages. Even excellent messages are subject to wear out with heavy repetition, especially if the message features highly distinctive stylistic devices (e.g., clever slogan, humorous portrayal). Most messages can achieve near-maximum impact after a relatively small number of exposures; presentation of additional variations will achieve greater incremental impact because the degree of effectiveness of alternative versions tends to be roughly equivalent. There are a large number of potentially influential persuasive appeals, so a scattershot of incentives can strike multiple responsive chords across segments with diverse predispositions.

Similarly, there are a variety of focal segments of the population that the campaign might seek to influence, both directly and indirectly via messages targeted to audiences of influencers and policy makers. The next section suggests factors to consider in deciding which focal segments should be identified and given varying degrees of emphasis in allocating campaign resources.

Priority Focal Audience Segments

A typical health campaign might subdivide the population on a dozen dimensions (e.g., age, sex, ethnicity, stage of change, susceptibility, self-efficacy, values, personality characteristics, and social context), each with multiple levels. Combining these dimensions, there are thousands of potential subgroups that might be defined for targeting purposes.

Because audience receptivity is often a more central determinant of campaign effectiveness than the potency of the campaign stimuli, there will be differential success depending on which segment is targeted. For example, one form of segmentation might be based on the stage of readiness for a change in health practices. To achieve the maximum degree of communication impact, campaign designers often attempt to pick off the easy targets. In the case of drinking prevention campaigns, two basic predispositional categories of young people are most readily influenced by media messages. These categories are described in the following paragraphs.

Reinforcing the healthy core. Just as political campaigners try to protect their base constituency, health campaigners need to maintain the healthy practices of the "choir" by devoting a portion of resources to reinforcing messages. Adolescent-targeted campaigns seek to give support to youth who have delayed drinking initiation in order to maintain the "loyal franchise." This segment merits moderate priority: On the plus side, these nonusers are favorably predisposed to abstinence messages; on the other hand, they are only slightly likely to use alcohol in the absence of campaign reinforcement.

Targeting "at-risk" preusers. Another key segment is younger adolescents who haven't yet tried alcohol, but whose background characteristics suggest a probability that they might drink in the near future. Compared to the core, this segment of the population is higher priority because of the greater risk of alcohol use combined with momentary receptivity. However, it's difficult to produce longer-term abstinence effects because situational forces and opportunities may change rapidly and because campaign messages might inadvertently accelerate temptation. Health campaigners face a more challenging advance-marketing task than commercial advertisers, who can readily induce youthful anticipation of forbidden fun when preselling beer, cigarettes, cosmetics, and motorcycles.

Ignoring the hard core. On the other hand, frequent binge drinkers are not readily influenced by media campaigns. Although this segment is in greatest need of change, it may be fruitless to invest heavy resources to induce immediate discontinuation or moderation of drinking. As they mature or experience negative consequences, some of these individuals may progress to a readiness stage where they are receptive to cessation messages at some later point in time.

Beyond this set of examples, campaigners also need to consider other demographic, social, and psychological-based subgroups (e.g., higher versus lower income, high versus low sensation seekers). Influencing these varied population segments requires a complex mix of narrowly customized messages and broadly applicable multi-targeted messages that use diverse appeals and optimally ambiguous recommended actions.

Addressing the Competition

Prevention campaign messages often focus on the harmful consequences of the unhealthy practice rather than promoting a positive alternative to compete with it. This is especially the case for alcohol, where the positive product (e.g., abstinence, delay, moderation) lacks inherently appealing features. Although threats can be effective if handled skillfully, the heavy reliance on negatively attacking the competition tends to restrict the strategic arsenal to a narrow array of options.

The overly negative approach can be lightened by implementing two forms of diversification. First, the nature of attacks might be shifted from the conventional emphasis on severity of harm to a refutational discounting of supposed advantages of the unhealthy practice. Messages can acknowledge that the competition has certain attractive aspects, and then argue that each seeming positive consequence is unlikely to be experienced, not so positive after all, or relatively unimportant. The classic persuasion literature on one-sided versus two-sided messages indicates that it's more effec-

tive to raise and refute the opposing side if audience members are sophisticated and knowledgeable about the topic, are predisposed against the position being advanced, perceive a manipulative intent, and are already aware of the pro-arguments. For example, a message might employ the straw man refutation technique by citing and disproving the inflated claim that "everybody drinks."

Second, the predominant anticompetition tenor of campaign messages can be diversified by shifting the emphasis from negative incentives associated with an unhealthy practice to mirror-image positive incentives associated with the healthy practice, which is one of the strategies described in the next section.

Persuasive appeals. Unlike superficial awareness messages or simple exhortations, persuasive messages add a motivational element in the form of positive or negative reasons to perform the desired behavior. In selecting incentives, the key criteria are the salience of the promised or threatened consequences, the malleability of beliefs about the likelihood of experiencing these outcomes, and the potential persuasiveness of the arguments that can be advanced. Incentive appeals should build on the existing needs and values that are identified in formative evaluation, rather than seeking to change fundamental orientations. It is usually more effective to emphasize mild but likely consequences rather than remote or improbable consequences that are more strongly valued (e.g., hangovers versus alcohol poisoning).

Thus, threats of death, illness, injury, or other serious physical harm have a significant but limited role in health campaigns. Alarming fear appeals can be quite influential if handled adeptly, but other incentives also should be emphasized: threats of a less severe nature, negative incentives beyond the physical health domain, and positive incentives.

Intense Fear Appeals

A pervasive strategy in health campaigns is to motivate behavior change by threatening the audience with harmful consequences from initiating or continuing an unhealthy practice. Fear appeals can be risky because there may be boomerang effects or null effects due to defensive responses by the audience members who attempt to control their fear rather than control the danger. The three crucial defensive mechanisms are selective avoidance of the message itself (due to unpleasant or alarming depictions), selective perception of the information (particularly the perceived likelihood of negative outcomes), and denial of applicability to self.

Despite these problems, the research indicates that well-designed fear appeals are quite effective in changing behavior. Several types of message

content increase the odds of a functional response. First, provision of efficacy information is crucial; if the fear-arousing message (or companion messages in the campaign) presents credible and understandable ways for the individual to address the threat effectively, then constructive responses are more likely. Depending on the prior beliefs and abilities of the message recipient, there may be a need for self-efficacy instructional material (demonstrating how to perform behaviors and boosting the confidence that the individual can do so successfully) or response efficacy material (convincing the individual that the recommended behavior will reduce the danger).

Second, messages need to overcome people's natural tendency to be unrealistically optimistic about odds of avoiding negative events. This can be achieved by emphasizing susceptibility evidence and personal applicability, and by featuring negative outcomes that are less severe but more probable. It's also advantageous to coordinate claims with reality forces that can't be readily dismissed in order to avoid the perception of empty threats.

Third, fear appeals are inherently compelling and thus have great potential to attract attention and impel greater involvement during processing. However, care must be taken to avoid overly disturbing depictions or noncredible content that might turn off the audience at early stages of message response.

Minor health threats. Although serious harm is a major motivator, the severity × susceptibility formula also can be maximized by featuring nonsevere outcomes that have a higher probability of occurrence. In the case of youth alcohol campaigns, minor negative incentives include diminished athletic performance, weight gain, or hangovers. Not only are these outcomes far more frequent, but levels of perceived susceptibility may be elevated due to observed or experienced conditions misattributed to alcohol rather than other origins.

Other negative incentives. Beyond the realm of physical health, there are dozens of potential motivational appeals along the social, psychological, economic, or legal dimensions. In the social incentive category, alcohol campaigns can present negative appeals about looking uncool, alienating friends, incurring peer disapproval, losing trust of parents, or having a detrimental influence on others such as younger siblings. The constellation of psychological, cognitive, moral, and aspirational incentives might include reduced ability to concentrate, low grades, feeling lazy and unmotivated, losing control, making bad decisions, and anxiety about getting caught or experiencing harm, guilt, and loss of self-respect. Among the economic incentives are diminished job prospects, fines, cumulative cost of purchasing alcohol, and inability to spend on other needs and desires.

Messages can also highlight penalties for violating laws and policies, such as loss of driver's license or suspension from school.

Positive incentives. As in political campaigns that feature mudslinging, audiences consistently receiving negative messages about health practices are often turned off. To achieve greater diversification, the facile prescription is "don't always say don't." Because campaign messages that attack the unhealthy behavior with warnings and threats are overused, there's a need to give careful attention to implementing the positive approach.

For each of the negative consequences of performing the proscribed practice, there is usually a mirror-image positive outcome that can be promised for performing the healthy alternative (e.g., enjoying moderation, maintaining abstinence, practicing safe driving). In the physical health dimension, messages can offer prospects ranging from enhanced athletic performance to survival. Positive social incentives include conforming to prevalent social norms (see next section), being cool, gaining approval and respect, forming deeper friendships, building trust with parents, and being a good role model. On the psychological dimension, messages might promise outcomes such as gaining control over one's life, having a positive self-image, attaining one's goals, feeling secure, or acting intelligently. Exaggerated rewards may work well as motivators, even though the likelihood is rare; just as negative strategies frequently use long-shot prospects of severe harm, positive approaches could promise lottery-type payoffs that are more believable to positivists.

Multiple incentives. Dozens of persuasive appeals are potentially effective, and the degree of potency is fairly equivalent in many cases. Thus, campaigns can usually achieve greater impact by employing a variety of different appeals rather than concentrating on a handful of persuasive incentives or a single narrow strategy such as social norming. In prioritizing among incentives, the designer should consider the absolute potency and the relative contribution vis à vis other concurrent appeals and influence that already has been achieved in the past. Preproduction research can test basic concepts to determine the absolute effectiveness of each one and to examine optimum combinations, and pretesting research can compare the relative influence of executions of various appeals.

Social Norming Strategies

In the past decade, a majority of colleges have sponsored alcohol education and prevention programs (Werch et al., 2000), and an estimated 20 percent of colleges have used the social norms approach (Wechsler and Kuo, 2000). Most of these interventions have included media components,

typically using newspaper ads that highlight lower-than-expected statistics on campus drinking practices. The basic assumption is that students drink more heavily as a function of the inflated perception of normative consumption levels by fellow students, so provision of the actual figures should serve to correct the misperception. The portrayal of actual drinking rates for the overall student body (or key segments such as freshmen or fraternity/sorority members) is typically framed in a positive manner, demonstrating with survey evidence that most students drink moderately rather than using a negative appeal that portrays excessive drinking rates as deviant because relatively few consume at these high levels. Thus, the persuasive appeal emphasizes positive social incentives rather than negative threats of physically harmful outcomes.

Dozens of campuses nationwide have implemented major media-based social norms campaigns, including extensive and sophisticated efforts during the early and mid-1990s at Northern Illinois, Arizona, Hobart and William Smith, Western Washington, and Washington State. Following the dissemination of norm correction information presented in student newspapers, posters, Web sites, and other channels (including classroom units and meetings with student groups), several evaluation studies show a substantial decrease in binge drinking rates within one year.

An early and notable social norming campaign was carried out by Haines (1996) at Northern Illinois University. This broad-scale, multiyear intervention featured numerous messages in the student newspaper (classified and display ads, news items, and a column), flyers, posters, brochures, and various interpersonal components. After the first year, binge drinking rates dropped from 44.8 percent to 37.6 percent, a 16 percent reduction; alcohol-related injuries also declined. After six years of campaign efforts, binge drinking on campus had dropped further to 27.7 percent (whereas national rates stayed between 40 percent and 43 percent over this period). Over the full campaign, alcohol-related injuries to self fell by 31 percent and injuries to others decreased by 54 percent.

At Hobart and William Smith Colleges, Perkins and Craig (2002) evaluated a comprehensive campaign utilizing posters, electronic media, and interactive Web site components (along with class projects and curriculum infusion). They reported a 21 percent reduction in drinking increases in the freshman year, a 56 percent to 46 percent reduction in binge drinking campuswide, and decreases in alcohol-related arrest rates over four years. These outcomes consistently decreased over a five-year period.

Posters were used in a norm-setting intervention for college students at Washington State University (Barnett, Far, Mauss, and Miller, 1996). Unlike newspaper ads or radio spots that reach broad and diverse audiences, posters were tailored for specific subgroups such as fraternity and sorority members and dorm residents. The informational posters produced a de-

crease in perceived drinking in reference groups, and perceptual changes were associated with reduced drinking; however, the impact of the intervention on drinking behavior was modest.

A poster-based campaign at University of Virginia was followed by decreases in drinks per week. For women and nonfraternity males, the drinking behavior of the entering freshman class increased less than in the prior freshman class (Odahowski and Miller, 2000).

A randomized, controlled study of a campus social norm intervention (via feedback regarding personal drinking) showed a reduction in alcohol use among heavy drinking college students (Agostinelli, Brown, and Miller, 1995).

At Rutgers University, social norming campaigners created a core message that was placed in the student newspaper and displayed on posters: a top-ten list of misperceptions at Rutgers, with three norm correction items (e.g., "everyone who parties gets wasted" versus data showing that two-thirds of students consume three or fewer drinks); this effort was supplemented by a public relations campaign that generated extensive local news coverage, and misperception information at a Web site (Lederman et al., 2001). More than four-fifths of first-year dormitory residents accurately recalled the campaign message, and accuracy of perceptions rose from 17 percent to 55 percent in one year.

On the other hand, some campaign interventions have not yielded significant effects on student drinking patterns (Werch et al., 2000; Clapp, Russell, and DeJong, 2001). Using a carefully controlled field experimental design, first-year students at a southern university received a series of three greeting cards providing norming information (Werch et al., 2000). The evaluation showed no overall differences between experimental and control group students on alcohol use and risk-factor measures, although positive and negative effects were found for subgroups based on stage of readiness to engage in binge drinking.

There is considerable debate regarding the adequacy of research evaluation, message content, and dosage across the numerous demonstrations of social norm campaign effectiveness (Keeling, 1999, 2000; Werch et al., 2000; Wechsler and Kuo, 2000; Campo et al., 2002). Among the methodological problems are lack of longitudinal cohorts, nonrandom assignment to experimental conditions, and focus on heavy drinkers (which increases the risk of regression to the mean over the intervention period).

Nevertheless, it appears that well-designed norming campaigns can contribute to a reduction in quantity of drinks consumed by college students (Perkins, 2002; Haines, 1996). According to the latest data available at the National Social Norms Resource Center Web site, declines in heavy episodic alcohol consumption have been achieved on the following campuses: 44 percent in ten years at Northern Illinois, 40 percent over four

years at Hobart and William Smith, 28 percent over five years at Arizona (Johannessen, Collins, Mills-Novoa, and Gilder, 1999), 21 percent over two years at Missouri, 21 percent over four years at State University of New York-New Paltz, 20 percent over one year at Santa Clara, and 20 percent over three years at Western Washington.

It should also be noted that a normative appeal was tested with a TV spot designed for young adolescents. Compared to an informational anti-drinking message and a control message, sixth-graders viewing the normative public service announcement made lower estimations of peer acceptance of alcohol and were more resistant to influence when viewing beer commercials (Godbold and Pfau, 2000).

Strategic Ambiguity

The conventional rule of thumb in message construction is to be clear and straightforward, a proven technique for facilitating comprehension in educational and persuasive applications. In general, there is greater learning of material conveyed with simplified vocabulary, short sentences, sparse copy, graphic depictions, and a single major point per message.

In certain situations, however, it may be advantageous to communicate basic content components with ambiguous visual and verbal message executions that produce differential interpretations among audience segments. During message processing, ambiguity should reduce counterarguing and reactance, and increase introspection and elaboration (thus minimizing the boomerang effect and maximizing audience involvement).

This approach is typically implemented by featuring vaguely worded behavioral recommendations or by presenting suggestive portrayals, arguments, and evidence. The ambiguity allows the individual receivers to draw their own implications based on predispositions; the strategic aspect involves manipulating the message content in a manner that plays off the perceptual tendencies of various subgroups.

Multitargeted messages. Strategically ambiguous executions are especially applicable to spot messages on TV, where targeting tends to be imprecise. If multiple audience segments will receive the message, it can be both efficient and effective to influence several simultaneously with obliquely targeted or multitargeted messages.

The strategic ambiguity approach is employed quite shrewdly by the alcohol companies in their "private service" campaigns dealing with risky drinking. These campaigns use ambiguous slogans such as "know when to say when" or "think when you drink" to attain multiple objectives simultaneously: combat the drunk driving or alcohol poisoning problems among extreme drinkers (without significantly undermining consumption levels by

regular heavy drinkers, who perceive the drinking limitations in a liberal manner); favorably impress opinion leaders and the general public, who perceive that the companies are exhibiting social responsibility by ostensibly targeting heavy drinkers with moderate-drinking messages; and promote product usage by portraying consumption in what viewers perceive to be a noncommercial context (Atkin, Wallack, and DeJong, 1992). In the next three subsections, this simpler form of strategic ambiguity will be applied to the presentation of recommendations, consequences, and evidence in genuine public service campaign messages.

Recommended response. An explicitly specified ideal behavior often falls outside the focal audience's latitude of acceptance, and explicit advocacy tends be highly admonishing with words such as "don't" and "never." The alternative is to present vaguely worded, softened recommendations (e.g., indefinite time frames, limited situational applications) or to specify nothing and let recipients construct their own implication. Implicit conclusions tend to be more effective if the audience is knowledgeable about the topic, is predisposed against the position being advanced, or perceives a manipulative intent. For college students under age 21, explicit recommendations to abstain (in accordance with the drinking laws) would have limited acceptance. For adolescent audiences, the ambiguous recommendation demands less psychological sacrifice and triggers less reactance than with idealized exhortation, and plays to youths' self-concept as independent thinkers who reach their own conclusions.

Portrayal of consequences. Certainly there are advantages of presenting explicit and graphic depictions of harmful outcomes that can vividly demonstrate severity or intensify fearful emotions. Nevertheless, ambiguous portrayals may be functional in overcoming defensive reactions and unleashing creatively imaginative interpretations.

Messages can be vague in specifying exactly what the harmful consequence is by using subtle symbolic representations of harm or depicting someone experiencing distress of an uncertain nature; this ambiguity allows the audience to mentally or emotionally imagine their own harmful outcome as they would while watching a nonexplicit horror film. For high-threat messages that seek to emphasize severity of harm, it may be advantageous to cite ambiguous consequences that are not readily observable (e.g., damaged brain cells or silent disapproval by peers), and thus are not readily refutable by those in a counterarguing mode. Messages might also cite concrete consequences of ambiguous origin (e.g., bad grades in school or loss of friends), for which the audience member can attribute the consequences to risky behavior rather than other sources.

Presentation of evidence. Support for persuasive incentives with convincing evidence is often important, particularly to augment the credibility of susceptibility claims. For fear appeals where there is a low level of actual vulnerability (e.g., fatal alcohol overdose), the likelihood of harm can be buttressed by depicting rare but vivid cases rather than underwhelming statistical figures; this tactic may also heighten relevance and comprehensibility. In implementing social norming appeals where the actual norm isn't highly impressive (e.g., only 56 percent of adolescents have never consumed alcohol, which hardly makes abstinence normative), it may be ineffective to cite the exact statistic. Instead, the message can present words such as "most" or "majority" (which might be interpreted as 60 percent or 80 percent), cite raw figures such as "millions," or refer to the "increasing number" (which has the added feature of momentum).

Campaign Pitfalls

As with other health topics, drinking prevention campaigns targeted to the focal segments of youth must address resistance barriers at each stage of audience response, from exposure to processing to learning to yielding to behavioral implementation. Perhaps the most elemental problem is reaching the youthful audience and attracting attention to the messages. Other key barriers include misperception of susceptibility to negative outcomes, deflection of persuasive appeals, denial of applicability to self, rejection of unpalatable recommendations, and inertia.

Because of the wide variety of pitfalls, audience members are lost at each stage of message response. The messages may be regarded as offensive, disturbing, boring, stale, preachy, confusing, irritating, misleading, irrelevant, uninformative, useless, unbelievable, or unmotivating. Moreover, insufficient quantitative dissemination may render some of the campaign messages as just plain invisible. This section focuses on one significant problem area, where messages that do attract attention may end up producing counterproductive boomerang effects.

Avoiding boomerangs. Designers need to be vigilant of unintended side effects that run counter to the campaign objectives or that undermine other health practices. The motto "first do no harm" is applicable to real-world media campaigns because imprecisely targeted messages reach a variety of audiences and because there's limited control over how receivers interpret the content. The problem is more acute for negative messages that depict problem behaviors and attempt to threaten individuals. In making strategy decisions, campaigners should be mindful of the following types of boomerang effects.

Inadvertent social norming may occur when alarming prevalence statistics or portrayals of misbehavers or victims (which serve to impress sponsors and to motivate influencers) may serve to normalize underage drinking behaviors. Portraying the proscribed behavior (early drinking or bingeing) as undesirable may promote the competition as follows: audience becomes curious, learns it is fun, or regards it as challenging; in particular, it may be risky to portray risky behavior because it may be appealing to risk takers in the audience.

Campaigners are constantly wrestling with the question of whether the forbidden fruit appeal might sell the fruit. If adolescents are told they are too young to perform a behavior or simply warned not to do it, there is always the chance that psychological reactance may lead to the opposite response.

Highly threatening fear appeals may backfire without a strong efficacy component, and the use of exaggerated claims may undermine source credibility for other messages in the campaign. Frequent emphasis on a negative incentive may produce desensitization as the audience becomes accustomed to this harmful outcome. On the other hand, an underwhelming threat may also be counterproductive if the harmful outcome is less severe than expected, yielding a negative violation of expectations.

Finally, there are larger issues involving counterproductive problem shifting within the broader health domain. For example, if adolescents are successfully scared away from marijuana or club drugs, they may drink more alcohol because it is seen as relatively less harmful. If teenage drinkers adopt the heavily promoted designated driver practice, drunkenness among their nondriving companions may be disinhibited. If teenage drivers are convinced that safety belts will protect them, they may drive faster and suffer high-speed crashes. More fundamentally, the conventional campaign focus on individual behavior change puts the onus of responsibility on the "victim" while deflecting attention from social and structural determinants of the health problem (Wallack and Dorfman, 2001).

Exercising self-discipline. In designing and implementing successful health campaigns, the disciplined approach requires that the campaign team perform a thorough situational analysis, develop a pragmatic strategic plan, and execute the creation and placement of messages in accordance with principles of effective media campaign practices. It is usually advantageous to rely on research inputs at each phase in the production process.

This approach is seldom fully practiced because many organizations that sponsor health campaigns (and campaign designers) succumb to various irresistible temptations: they are occasionally contemptuous (regarding the focal segment as misbehavers who are ignorant and misguided), righteous (admonishing unhealthy people about their incorrect behavior), ex-

tremist (rigidly advocating unpalatable ideals of healthy behavior), politically correct (staying within tightly prescribed boundaries of propriety to avoid offending overly sensitive authorities and interest groups), colleague oriented (seeking to impress professional peers and overly reliant on normative practices for the genre), and/or self-indulgent (attempting slick executions where creativity and style overwhelm substantive content considerations).

Thus, campaigns tend to overemphasize creative self-expression, clever sloganeering, artistic production values, celebrity spokespersons, exciting visual channels, and powerful fear appeals threatening severe harm. This approach can occasionally produce creatively brilliant messages, which win awards and generate positive reactions from the audience, but the overall campaign does not necessarily contribute to changes in health behavior.

Instructional Messages

Beyond the emphasis on persuasive devices, there is also a practical need for the media to present mundane educational content that simply facilitates audience learning. This type of material serves to "show and tell" the audience how to perform complex behavior, to feel personally efficacious, to resist peer pressure, and to avoid being corrupted by unhealthy messages in the media environment. Although schools often try to teach peer resistance and media literacy skills, campaign messages can serve a valuable supplementary function in arming the audience to cope with environmental influences. Given the potentially detrimental health effects of beer and liquor advertising, glamorized entertainment media portrayals of drinking, and brewer/distiller Web sites, a modest proportion of campaign messages should be devoted to inoculating viewers and listeners against these influences that might undermine the campaign.

Several campaigns have been designed to counteract the influence of alcohol ads (Agostinelli and Grube, 2002; Godbold and Pfau, 2000). One study examined college student responses to antidrinking PSAs versus commercial alcohol advertisements (Austin, Pinkleton, and Fujioka, 1999); although the students rated the PSAs as less enjoyable and appealing, the spots were perceived as more realistic, honest, and effective than TV commercials.

It should be noted that anti-tobacco campaigns have prominently featured direct attacks on the tobacco industry in order to inoculate the audience against advertising and marketing practices and to generate public support for restrictions on the industry. This approach has more limited potential in the case of the alcohol industry, which has achieved a higher degree of perceived legitimacy and has conducted effective public relations campaigns.

Awareness Messages

A key role of awareness messages is to arouse interest or concern and to motivate further exploration of the subject. Awareness of underage alcohol problems is probably more crucial for mobilizing adult segments of the audience to support environmental measures or undertake individual prevention efforts with youth, but this type of message also plays a significant role for the focal segments of teenagers and college students.

Information seeking. Campaign messages that have the broadest reach can deliver only a superficial amount of informational and persuasive content that is seldom customized to the individual recipient. The conventional mass media are inherently a somewhat crude tool for health campaigns because of targeting imprecision and depth limitations that restrict the presentation of multiple appeals, elaborate evidence, and detailed instruction. To overcome these shortcomings, campaigners should stimulate the audience to seek out additional material from specialized sources.

In particular, messages should include elements designed to prompt active seeking from information sources such as Web sites, hotline operators, books, counselors, parents, and opinion leaders. Campaigners need to refine triggering strategies to motivate or facilitate search activity (e.g., health Web sites should feature related links, and topical material should be positioned adeptly on search engines for self-initiated searching).

Facilitating information seeking not only extends the exposure to the campaign material, but the content and style of the specialty messages will be more on target for individual needs and tastes and the capacity of these channels enables more extensive information to be accessed.

Sensitization. The everyday environment experienced by the focal segment of the population has a rich array of existing influences that can complement the health campaign messages, but many of these stimuli are simply not salient enough to be recognized or processed. In the mass media, numerous news stories, advertisements, entertainment portrayals, and other public service campaigns present content consistent with alcohol campaign goals. Similarly, individuals may not be conscious of certain social norms, interpersonal influences, behavioral models, or societal conditions that might contribute to performance of the target behavior. A small proportion of campaign messages can serve a triggering function for priming the audience to cue into the procampaign stimuli.

For example, the media-cuing messages in an alcohol campaign might help recipients to take notice of daily news reports of crackdowns on minor in possession or zero-tolerance driving violations, feature stories about celebrities whose careers are impaired by alcohol abuse, sports telecasts

exhibiting athletes who pursue an alcohol-free lifestyle, or little-noticed drinking-related PSAs. The campaign messages can also raise consciousness of behaviors and consequences that are absent in an environment: that there are no TV network commercials for distilled spirits, that heavy-drinking entertainment characters seldom attain rewards, and that no government or business leaders advocate underage drinking.

Indirect Effects on Drinker's Environment

In the case of underage drinking problems, it's important to supplement the direct approach (educating and persuading the focal segment) by influencing other target audiences who can exert interpersonal influence or help reform environmental conditions that shape behaviors of the segment to be changed. Mass media campaigns have considerable potential for producing effects on institutions and groups at the national and community levels, as well as motivating personal influencers in close contact with the focal individuals. These audiences are more likely to be receptive to media messages, and their indirectly stimulated control activities are more likely to be effective than campaign messages directly targeted to the focal segment. The first section will focus on interpersonal influencers; the next section examines higher-order organizations.

In the past decade, several major community-based interventions have at least partially addressed underage drinking problems. The role of media has been relatively limited in these projects, and the media messages have been designed primarily to achieve environmental change rather than direct impact on the behavior of underage audiences.

Community-based prevention of alcohol problems typically utilizes educational approaches where information produces changes in individuals' knowledge and attitudes as a means to changing behavior, and environmental approaches where behavior change is attained through changes in policies and drinking context (Allamani et al., 2000).

According to Giesbrecht and Rankin (2000), education and information dissemination components of community action projects serve the functions of informing the community about alcohol-related problems, engaging community involvement in project activities, and countering problematic alcohol messages in the media. They report that the basic trend in community-based interventions is to emphasize environmental policy changes rather than target drinkers. Mass media can play an important role in galvanizing public support for environmentally based alcohol initiatives (Casswell, Gilmore, Maguire, and Ransom, 1989).

The Midwestern Prevention Project sought to address adolescent use of alcohol, tobacco, and other drugs in general; the treatment in Kansas City area communities encompassed intensive school programming, parent or-

ganization inputs, community leader training, and media coverage of the program (Johnson et al., 1990). Compared to control communities with only community organization and media coverage, there was no decrease in alcohol use.

In the Community Trials Project (Holder et al., 2000), news media were used in three treatment communities to increase awareness in an intervention primarily focused on policy initiatives (law enforcement of drunk driving and retail sales to minors, server training, regulation of alcohol outlets). Sales rates to underage-appearing buyers were reduced to only 17 percent in intervention communities, compared with 44 percent in control sites (Grube, 1997); self-reported rates of binge drinking and impaired driving also decreased for the overall population in intervention sites. The primary role of the media was to mobilize community support for the prevention interventions via media advocacy techniques drawing attention to alcohol problems and issues, and news coverage of the policy implementation activities (Holder and Treno, 1997).

Media campaigning played a modest supplemental role in the Project Northland intervention in 20 Minnesota school districts (Perry et al., 1996, 2000). In the intervention sites, prevention and reduction of alcohol use among adolescents was approached primarily via school curricula, peer and parent activities, and community task forces. The media component relied primarily on newspaper messages (e.g., columns and news stories) that promoted project events, supported action teams, highlighted local underage alcohol use, and advanced policy initiatives via media advocacy by local groups; postcards and posters were also used, but placing messages on television and radio was not possible because of the proximity of intervention and reference communities. One notable phase of the project was the "Don't Provide" poster/postcard campaign aimed at persuading young adults (aged 18 to 22) not to provide alcohol to high school students; the messages used appeals warning of legal consequences and positive appeals to the young adults' social responsibility and maturity. The researchers reported high levels of exposure to these various project-generated messages among parents, young adults, religious congregations, and other community members. However, it is difficult to isolate the degree of contribution of the media campaign components to the distal reductions in youth drinking attained in the overall project.

The large-scale Saving Lives program in Massachusetts also involved community mobilization to combat impaired driving (Hingston et al., 1996). Compared to control communities, self-reported drinking and driving among 16- to 19-year-olds decreased by 40 percent at the intervention sites. The intervention relied primarily on enforcement strategies, but again the media contribution to this outcome is unclear.

Another major intervention project to prevent drinking and impaired

driving was the Communities Mobilizing for Change on Alcohol program in Minnesota and Wisconsin (Wagenaar, Murray, and Gehan, 2000). Focusing on policy changes to reduce youth access to commercial and social sources of alcohol, the project changed alcohol merchant practices relating to underage purchasers, and reduced the extent to which 18- to 20-year-olds gained access to alcohol in bars and provided alcohol to younger teens.

Social Environment

For adolescent segments of the population, a variety of peer and authority figures are in positions to personally educate, persuade, or control the focal individuals: parents, siblings, friends, co-workers, bosses, teachers, club leaders, coaches, medical personnel, police officers, and store clerks. Through the two-step flow, the media messages first affect these influentials, who subsequently intervene to facilitate or compel individual behavioral practices.

These influencers offer added types of persuasive potency that the media lack because they can provide positive and negative reinforcement, exercise control (by making rules, monitoring behavior, and enforcing consequences), shape opportunities, facilitate behavior with reminders at opportune moments, and serve as role models. Furthermore, influencers can customize their messages to the unique needs and values of the individual.

An important role of the campaign is to stimulate interpersonal influence attempts by inspiring, prompting, and empowering influencers, especially those who are hesitant to wield their authority. The influencers are likely to be responsive to negative appeals that arouse concern about harmful consequences to those they're trying to help behave appropriately. For example, campaigners can avoid the defensive resistance problem of directly targeted fear appeals by aiming the threats to audiences who care about these harmful consequences and who are in a position to influence the focal segment. Thus, messages should be designed to motivate facilitators and enforcers to take action.

In the case of alcohol prevention, parents can play a major role by initiating dialog with their children and teenagers about drinking (and more basic issues of right and wrong), by clearly establishing expectations and aggressively enforcing rules, by using praise to boost self-esteem, by teaching them to resist peer pressure, by participating in joint recreational activities, by regulating or co-viewing corruptive media content, and by making efforts to provide an experiential taste of harmful health consequences.

Persuasive appeals may be needed to influence parents regarding the vulnerability of their own family members (e.g., "the problem doesn't just apply to other children . . . your children are at risk"), the degree of risk (e.g., "harm is more severe than in the past due to new drinks such as

alcopops"), and parental efficacy (e.g., "you are a stronger influence than you realize . . . you can make a difference").

Educational materials are also needed to inform parents about which actions to take and how to successfully implement the guidelines. In particular, campaigners need to educate parents who are heavy drinkers on how to avoid hypocrisy by directly confronting it through the use of talking points.

Just as youth-targeted educational messages can induce greater resistance to negative influences, campaign messages can enhance their receptivity to enforcement and interpersonal persuasion. By softening up the focal segment so they'll respond constructively to indirect prohealth influences, the campaign can heighten the likelihood that individuals will accept attempts by others to control their behavioral decisions. One message theme is to put a positive spin on the motives of these interpersonal sources, so the focal segment perceives the influencers to be acting out of altruism, concern, or responsibility to fulfill their authority role.

Drinking Environment

Individuals' decisions about health practices are strongly shaped by the constraints and opportunities in their societal environment, including monetary expenses, laws, entertainment role models, commercial messages, social forces, and community services (e.g., price of drugs, penalties for possession, drug abuse depictions in movies, prohibition of advertising for marijuana, peer approval of drug use, drug interdiction efforts, and access to rehab or recreational facilities). Through the interventions of government, business, educational, medical, media, religious, and community organizations, many of these influential factors can be engineered to increase the likelihood of healthy choices or discourage unhealthy practices. In particular, media messages tend to be more effective when supplemented with direct service delivery components.

Policy initiatives. A promising campaign thrust involves carefully targeted efforts designed to influence policy makers who can change the environment that impinges on a health practice. These leaders can raise taxes and pass laws to reduce minors' access to alcohol (from retail outlets, bars, and older people) and to tighten regulations pertaining to impaired driving by underage individuals (and heighten enforcement priorities of police). They can also facilitate appropriate behavior by creating alternative opportunities for teenagers or college students.

DeJong (2002) describes a media campaign to create a climate of support for environmental change involving college student drinking. Using media advocacy techniques to be described, students at Cornell, Arkansas-Little Rock, and North Carolina attempted to combat high-risk drinking by

other students. In the "Had Enough!" campaign, student newspaper ads, posters, flyers, and a Web site advise students how to address the problem by organizing alcohol-free activities, joining a local coalition, and changing institutional policies.

A special case is regulation of alcohol advertising content and placement, which serve to undermine alcohol prevention campaigns. Aggressive organizations such as Center for Science in the Public Interest attempt to reduce these corruptive influences by prodding regulators to impose restrictions or bans on TV commercials and billboards for beer, malt liquor, and liquor, and by encouraging social responsibility on the part of corporations and media organizations presenting these messages.

Media advocacy. Over the past decade, advocates of reform have refined techniques that combine community organizing and media publicity to advance healthy public policies (Wallack, Dorfman, Jernigan, and Themba, 1993; Wallack and Dorfman, 2001). A portion of campaign messages is designed to influence public opinion, government policy makers, and organization leaders in order to change the environmental conditions affecting public health that shape behaviors of individuals. This approach crosses over into the political sphere by seeking to raise the volume of voices for social change, to increase the sense of urgency, and to acquire greater legitimacy for advocated policies.

The media advocacy strategy relies heavily on agenda setting of health issues. By generating publicity in the news media, the elevated media agenda can shape the public agenda and the policy agenda pertaining to new initiatives, rules, and laws. An important element is changing the public's beliefs about the effectiveness of policies and interventions that are advanced, which leads to supportive public opinion (and direct pressure) that can help convince institutional leaders to formulate and implement societal constraints and opportunities. The ultimate target audience may be government officials, employers, business executives, health care system administrators, religious leaders, media professionals, school administrators, or heads of civic organizations; they are reached directly by the news and editorial content and indirectly via inputs from the aroused public.

Source, Channel, and Dissemination Factors

Regardless of whether interventions are directly targeting young people or indirectly attempting to impact youth via environmental initiatives, the campaign designers must also consider the other key factors that determine campaign effectiveness: the source messengers and sponsors, the myriad channels for reaching various audiences, and the quantity of messages to be disseminated.

Message Sources

The "source" of campaign messages combines both the sponsor (the sender who is responsible for placing the messages, typically an organization) and the messenger (the model appearing in the message who delivers information, demonstrates behavior, or provides a testimonial). Messages addressing underage alcohol problems may be sponsored by prevention-oriented organizations such as National Institute on Alcohol Abuse and Alcoholism or Mothers Against Drunk Driving, alcohol companies such as Anheuser-Busch or Seagram, or media institutions such as CBS or MTV. The perceived motives and credibility of the sponsor can affect how the message is processed and interpreted by youthful audiences. In a message response-testing study, Atkin et al. (1992) reported that brewer-sponsored "private service" ads that ostensibly promoted moderate or safe drinking were regarded by high school and college students as less informative, believable, on target, and effective than PSAs sponsored by government agencies or associations. Students displayed skepticism of the motives of the beer companies, perceiving their main goals to be improving the company image and promoting their products.

The messenger in an alcohol message is helpful in attracting attention, personalizing abstract concepts by modeling actions and consequences, bolstering belief formation due to source credibility, and facilitating retention due to memorability. The leading categories of alcohol campaign messengers are expert specialists such as doctors, famous figures such as celebrities and trade characters, individuals with health-related experiences such as crash victims and overdose survivors, ordinary real persons, and leaders such as university presidents or government health officials.

Although health campaigners conventionally favor certain types of messengers, none is necessarily superior to others in all situations. In selecting the appropriate messenger, the crucial factor is which component of influence model needs a boost. For example, celebrities help draw attention to a dull topic, experts enhance response efficacy, ordinary people heighten self-efficacy, victims convey the severity of harmful outcomes, and victims who share similar characteristics of the audience can help to augment susceptibility claims.

Mediated Channels

Conceptually, channel selection is dictated by the usage patterns of the target receivers and the nature of the message. Pragmatically, the limited resources of the campaigner also play a role. It's usually more feasible to stage a pseudoevent that generates news coverage than to acquire time or space in the ideal media vehicle, it's more feasible to achieve a minor

designated-driver product placement in an entertainment program than to capture the whole plotline, and it's more feasible to place a PSA on a low-rated mature adult radio station than a hot teen station. In these circumstances, campaign designers should adapt the message to the channel that can be accessed and the audience that can be reached. Although the practical "take what you can get" philosophy often yields a less than optimal strategy, the tradeoff is that it can actually be implemented.

TV spots. In disseminating messages, campaign designers most commonly rely on television spots. This vehicle has the advantage of broad reach and fairly high credibility. However, there are several crucial drawbacks. TV spots seldom can be targeted precisely to audience segments, and the brief format does not allow for in-depth information. Moreover, gaining access to free PSA time slots has become increasingly difficult, so placement of televised spots must rely on cooperation with national networks and local stations, or acquisition of sufficient support for paid time.

Public service announcements have long been a mainstay in campaigns to prevent impaired driving. DeJong and Atkin (1995) reviewed the content of nationally aired PSAs during the period of heaviest dissemination in the late 1980s and early 1990s. Less than one-tenth of the spots were directed to youth, and these tended to focus narrowly on the high school prom and graduation occasions. Most of the spots emphasized either awareness of the problem of impaired driving or advocated individual behavior change (more than half promoted the designated driver concept). A remarkable two-thirds of the PSAs featured celebrities as the messenger delivering the content (most of these were network-sponsored messages promoting actors from network series). The spots rarely focused on environmental approaches such as building public support for changes in institutional structures, public policy, or law.

Newspapers and TV news. Health campaigners have traditionally underutilized public relations techniques for generating news and feature story coverage in the mass media. Health topics such as alcohol are increasingly central among journalistic priorities for newspapers, newsmagazines, and television newscasts, along with the long-standing interest by specialty magazines and cable channels and by daytime TV talk shows; alcohol campaigns should take greater advantage of these opportunities for message dissemination.

Public relations (PR) includes not only the passive distribution of press releases, but aggressive placement of guests on talk shows, provision of compelling story ideas to feature writers, and creative staging of pseudo-events to attract journalist attention (including the dramatization of health-related statistics using "creative epidemiology" techniques). The sponsor-

ing organization and source messengers of PR-oriented campaign messages are especially important; there is wider media gatekeeper acceptance when sponsored by high-profile and widely respected organizations that feature distinctive or compelling messengers (e.g., celebrity spokespersons, government officials, and charismatic experts who have gained prominence, along with victims and survivors who provide a human interest angle).

In achieving impact on the audience, PR messages have several advantages over prepackaged stimuli such as PSAs, pamphlets, and Web sites. First, there is likely to be greater audience reach at a lower cost. In particular, placements in the mainstream media can attract attention from influencers and policy makers, which is useful for indirect and media advocacy strategies. On the other hand, there may be limitations on the frequency of disseminating certain ideas that are considered to be "old news" by the gatekeepers, and it may be difficult to reach key focal segments of youth unless diligent efforts are made to place the messages in alternative channels.

Second, messages appearing in the news media (and some entertainment settings) tend to have greater credibility than messages such as PSAs that are packaged in an advertising format; this enhanced credibility should facilitate belief formation regarding health consequences and acceptance of recommended behaviors. Third, health issues gaining visibility in the mainstream news media can benefit from the agenda-setting effect, whereby problems and solutions are perceived as more urgent and significant. This is particularly important in media advocacy strategies targeted to opinion leaders and policy makers.

Entertainment-education. The practice of embedding health-related material in entertainment programming (or creating entertainment programming as a vehicle for health education) has become widespread in developing countries (Singhal and Rogers, 1999). Because the interesting and enjoyable style of presentation attracts large audiences and conveys information in a relevant and credible manner, this approach has been quite successful in promoting health in Africa, Asia, and South America. Entertainment-education has been used sparingly in the United States, with narrow applications in efforts to promote the designated driver, safety belts, safer sex, and drug abstinence. An early example of entertaining alcohol education was the Be Smart Don't Start campaign aimed at predrinkers (Atkin, 1989). A five-minute TV music video (suitable for inserting in Saturday morning programming) and two companion PSAs featured a popular preteen musical group delivering themes relating to health risks, nonuse norms, and resistance to prodrinking peer pressure. However, there have been no subsequent attempts to use this mode for alcohol prevention. Despite reticence on the part of the domestic entertainment industry (and recent controversy in the case of drug-related themes in TV shows), enter-

tainment-education has considerable promise for campaigns to prevent underage drinking problems.

Interactive media stimuli. There are now thousands of Web sites and CD-ROM disks offering a wide array of health materials, and many campaigns are utilizing this channel. Alcohol Web sites have been created for both adolescents and college students. In addition to the provision of prepackaged pages and streaming video, the interactive capacity of these technologies offers a promising advance over standard media messages. Screening questionnaires can assess each individual's capabilities, readiness stage, stylistic tastes, knowledge levels, and current beliefs, then direct them to narrowly targeted or individually tailored, customized messages that are precisely designed to address their needs and predispositions. Tailoring is particularly useful for social norm correction messages. This approach increases the likelihood of learning and persuasion, and it decreases the possibility of boomerang effects. Furthermore, entertaining interactive formats such as games are particularly well suited for youthful focal segments.

Minimedia. Rather than confining strategies to the major mass communication channels, campaigns can broaden the approach to include secondary media such as billboards, posters, pamphlets, flyers, comic books, theater slides, and direct mail newsletters and cards. These modes of communication are especially appropriate for youthful audiences because the messages can be targeted more precisely to focal subgroups that the campaign seeks to reach. Although lacking the glamour of a TV spot or the depth of a full-length booklet, these forms of communication can serve valuable functions in a campaign at a fairly low cost. The numerous alcohol prevention projects that have used minimedia indicate that campaign designers appreciate these inexpensive but potent channels.

Multiaudience media. While certain media channels allow precise targeting, others such as broadcast news and public service spots, newspapers, general interest magazines, and billboards reach broader audiences. Messages in the general-audience media should be carefully designed to include components that will simultaneously influence several distinct audiences, as discussed earlier in the strategic ambiguity section. This approach typically encompasses a combination of fundamental themes, broadly appealing incentives, and multilevel implications in order to hit two or more birds with one stone. For example, a feature story might include elements that will alarm and motivate influencers, warn preusers, and increase fear among those practicing unhealthy behaviors.

Quantity of Message Dissemination

The elusive ideal in campaign design is the magic bullet, where the right message appeal is sent through the right channel to the right target audience with impressive effects. Wallack (1989) refers to this unlikely scenario as the "media fantasy." In reality, the media function more like a shotgun than a rifle, spraying tiny pellets across broad audiences. In certain respects, this scattershot approach may actually be functional for hitting the moving targets and reaching the evasive quarry; besides, it's difficult to aim precisely with the modest budget for ammunition. The primary implication, however, is that a large amount of messages must be disseminated in order to achieve meaningful impact. Although not sufficient to ensure success without high-quality content, substantial quantity is almost invariably a necessary condition for effective campaigns.

Quantitative factors. A great volume of stimuli is needed to attain adequate reach and frequency of exposure. Moreover, maximum saturation conveys significance of the problem, which is an essential facilitator of agenda setting and heightened salience. Prominent placement of messages in conspicuous positions within media vehicles serves to enhance both exposure levels and perceived significance. To provide a common thread unifying the varied messages, the campaign should feature continuity devices (e.g., logo, slogan, jingle, messenger), which increase memorability and enable the audience to cumulatively integrate material across multiple exposure impressions. Another quantitative consideration involves the scheduling of a fixed number of presentations; depending on the situation, campaign messages may be most effectively concentrated over a short duration, dispersed thinly over a lengthy period, or distributed in intermittent bursts of "flighting" or "pulsing."

Unfortunately, the limited resources available for most public service campaigns greatly restrict the quantity of messages disseminated. Unlike commercial advertisers who can place numerous messages in the media and rely on high-repetition, soft-sell strategies based on principles of mere exposure or other peripheral paths of influence, campaign designers need to achieve the most "bang for the buck" by making each message provocative, involving, and engaging in order to attract attention and facilitate processing.

To maximize quantity, campaigners need to diligently pursue monetary resources from government, industry, or association sources to fund paid placements and leveraged media slots, to aggressively lobby for free public service time or space, to skillfully employ public relations techniques for generating entertainment and journalistic coverage, and to utilize the low-cost Internet channel of communication. Moreover, pseudoquantity can be

boosted by sensitizing audiences to appropriate content already available in the media and by stimulating information seeking from specialty sources.

The perpetual campaign. Although campaigns ostensibly have a beginning and an end, the realities of health promotion and prevention often require exceptional persistence of effort over long periods of time. Campaigners can seldom let up because focal segments of the population are in constant need of influence. This is particularly true for underage alcohol prevention campaigns because of the rapidly changing attitudes and behavior patterns of young people, and the constant stream of prodrinking messages from the alcohol industry and drinking peers.

Each year, there are newcomers who are moving into the "at risk" stage of vulnerability, backsliders who are reverting to prior misbehavior, evolvers who are gradually adopting the recommended practice at a slow pace, waverers who are needing regular doses of reinforcement to stay the course, and latecomers who are finally seeing the light after years of unhealthy habits.

Whether campaigns are aimed at predrinkers, alcohol experimenters, college freshmen, indirect influencers, or even policy makers/implementers, it is clear that one-shot interventions are likely to have minimal persisting impact; campaigns must be sustained, repeated, and updated indefinitely because of the nature of youth drinking. This is clearly demonstrated in the major multiyear trials, where reduction in drinking-related problems typically requires several years of intervention activities—and decay sets in during periods between campaign phases (Hingston et al., 1996; Holder et al., 1997; Perry et al., 1996; Perry et al., 2000).

CONCLUSION AND RECOMMENDATIONS

The research literature on media-based interventions to address underage drinking problems is extremely meager and narrow. The only significant bodies of studies deal with social norm campaigns on college campuses (which rely heavily on media channels) and comprehensive community interventions (where media tend to play a minor supplemental role). Thus, the chapter devotes considerable attention to promising strategies for designing future campaigns in the alcohol domain.

Research and theory of media health campaigns indicates that relatively few messages score exactly on target, although some come close; the perfect message requires greater customization than normally can be attained through mass communication channels. Nevertheless, campaigners keep using the media because the extremely large audiences can be reached efficiently; even if a relatively small percentage are influenced, the small

impact may translate to millions of individuals practicing healthier behaviors.

The odds of success can be improved if more effective strategies are employed in developing and implementing campaigns. This chapter has advocated greater diversification of pathways, products, incentives, and channels beyond the approaches conventionally used in health campaigns. This requires the disciplined formulation of strategies based on careful analysis of the situation, sensitive application of communication theory, and regular collection of formative evaluation information. In particular, the formulation of a comprehensive strategic plan is needed to effectively integrate the optimum combinations of campaign components that will directly and indirectly influence behaviors. Maximizing the likelihood of success requires a greater investment of resources in order to ensure heavy dissemination of media messages, paralleling the money and talent behind drug and tobacco prevention campaigns.

The mass media can be utilized most efficiently to address drinking problems on college campuses. Students are widely exposed to campus newspapers and radio stations, and these vehicles can disseminate localized versions of prevention messages that are developed at the national level. The key to success is the creation of more effective persuasive incentive strategies, particularly a greater diversification of message appeals beyond the conventional social norming approach. There is a need to feature a greater variety of reasons to motivate students to drink responsibly, with both positive and negative incentives drawn from the health, social, psychological, and legal dimensions. Social norming messages should continue to play a major role, but there is a need for refining and fine tuning the basic themes and for diversifying the content to include norms related to various student body segments (e.g., females, fraternity and sorority members, freshmen), to protective behaviors, and to social interventions. Moreover, media advocacy techniques should be used in campus newspapers to mobilize initiatives for environmental change, particularly with messages targeted to those who are experiencing negative secondhand effects from excessive drinkers.

To combat underage drinking in noncollege settings, a national campaign should be targeted to parents of teenagers and to community leaders, using TV spots, magazine ads, and news publicity items to provide support for localized environmental efforts. Specifically, the campaign would be intended to stimulate parents to prevent drinking activities by their teenagers and to mobilize community efforts to implement policies to reduce access to alcohol. Messages could feature evidence demonstrating the prevalence and seriousness of underage drinking, and efficacy components to bolster the confidence of adults in successfully addressing the problem.

The adult-oriented campaign should be supplemented with a national media campaign aimed at younger adolescents, featuring broadcast spots (and perhaps entertainment-education program inserts) on relatively low-cost radio stations and cable TV networks appealing to youthful audiences, along with attractively designed Web sites. These messages can attempt to delay drinking onset by reinforcing abstinence, using positive norming information and minor negative threats on the social and psychological incentive dimensions.

Older teenagers can be targeted effectively with local campaigns on radio and billboards, using a combination of legal incentives related to zero-tolerance laws and health and safety threats emphasizing harmful consequences of high-risk drinking practices.

REFERENCES

Agostinelli, G., Brown, J., and Miller, W. (1995). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education*, *25*(1), 31-40.

Agostinelli, G., and Grube, J.W. (2002). *Alcohol counter-advertising and the media: A review of recent research*. National Institute on Alcohol Abuse and Alcoholism Publications: Available: www.niaaa.nih.gov/publications/arh26-1/15-twenty-one.htm. Accessed December 14, 2002.

Allamani, A., Casswell, S., Graham, K., Holder, H.D., Holmila, M., Larsson, S., and Nygaard, P. (2000). Introduction: Community action research and the prevention of alcohol problems at the local level. *Substance Use and Misuse*, *35*, 1-10.

Atkin, C. (1981). Mass media information campaign effectiveness. In R. Rice and W. Paisley (Eds.), *Public communication campaigns* (pp. 265-280). Beverly Hills, CA: Sage.

Atkin, C. (1989). Be Smart. Don't Start! In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 221-224). Newbury Park, CA: Sage.

Atkin, C. (1994). Designing persuasive health messages. In L. Sechrest, T.E. Backer, E.M. Rogers, T.F. Campbell, and M.L. Grady (Eds.), *Effective dissemination of clinical health information. AHCPR Publication No. 95-0015* (pp. 99-110). Rockville, MD: Public Health Service, Agency for Health Care Policy and Research.

Atkin, C. (2001). Designing effective media campaigns. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 49-68). Thousand Oaks, CA: Sage.

Atkin, C., and Freimuth, V. (2001). Formative evaluation research in campaign design. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 125-145). Thousand Oaks, CA: Sage.

Atkin, C., and Wallack, L. (1990). *Mass communication and public health: Complexities and conflicts*. Newbury Park, CA: Sage.

Atkin, C., Wallack L., and DeJong, W. (1992). *The influence of responsible drinking TV spots and automobile commercials on young drivers*. Washington, DC: AAA Foundation for Traffic Safety.

Austin, E., Pinkleton, B., and Fujioka, Y. (1999). Assessing prosocial message effectiveness: Effects of message quality, production quality, and persuasiveness. *Journal of Health Communication*, *4*(3), 195-210.

Backer, T., and Rogers, E. (1993). *Organizational aspects of health communication campaigns: What works?* Newbury Park, CA: Sage.

Backer, T., Rogers, E., and Sopory, P. (1992). *Designing health communication campaigns: What works?* Newbury Park, CA: Sage.

Barnett, L., Far, J., Mauss, A., and Miller, J. (1996). Changing perceptions of peer norms as a drinking reduction program for college students. *Journal of Alcohol and Drug Education*, *41*(2), 39-63.

Bracht, N. (2001). Community orientations to campaign design and implementation. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 323-342). Thousand Oaks, CA: Sage.

Campo, S., Brossard, D., Frazer, M., Marchell, T., Lewis, D., and Talbot, J. (2002). *Are social norms campaigns really magic bullets? Assessing the effects of students' misperceptions on drinking behavior.* Paper presented at the annual conference of the National Communication Association, New Orleans, LA.

Cappella, J., Fishbein, M., Hornik, R., Ahern, R., and Sayeed, S. (2001). Using theory to develop messages in anti-drug media campaigns: Reasoned action and media priming. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 214-230). Thousand Oaks, CA: Sage.

Casswell, S., Gilmore, L., Maguire, V., and Ransom, R. (1989). Changes in public support for alcohol policies following a community-based campaign. *British Journal of the Addictions*, *84*, 515-522.

Clapp, J., Russell, C., and DeJong, W. (2001). *Done 4 did zip: Evaluating a failed social norms marketing campaign.* Paper presented at the fourth national conference on the social norms model, Anaheim, CA.

DeJong, W. (2002). The role of mass media campaigns in reducing high-risk drinking among college students. *Journal of Studies on Alcohol*, (Suppl. 14), 182-192.

DeJong, W., and Atkin, C. (1995). A review of national television PSA campaigns for preventing alcohol-impaired driving, 1987-1992. *Journal of Public Health Policy*, *16*(1), 59-80.

DeJong, W., and Winsten, J. (1990). The use of mass media in substance abuse prevention. *Health Affairs*, *2*, 30-46.

DeJong, W., and Winsten, J.A. (1998). *The media and the message: Lessons learned from past public service campaigns.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Donohew, L., Sypher, H., and Bukoski, W. (1991). *Persuasive communication and drug abuse prevention.* Hillsdale, NJ: Erlbaum.

Dozier, D., Grunig, L., and Grunig, J. (2001). Public relations as communication campaign. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 231-248). Thousand Oaks, CA: Sage.

Giesbrecht, N., and Rankin, J. (2000). Reducing alcohol problems through community action research projects: Contexts, strategies, implications, and challenges. *Substance Use and Misuse*, *35*, 31-53.

Godbold, L., and Pfau, M. (2000). Conferring resistance to peer pressure among adolescents: Using inoculation theory to discourage alcohol use. *Communication Research*, *27*, 411-437.

Grube, J. (1997). Preventing sales of alcohol to minors: results from a community trial. *Addiction*, *92*(Suppl 2), S251-S260.

Haines, M. (1996). *A social norms approach to preventing binge drinking at colleges and universities.* Higher Education Center for Alcohol and Other Drug Prevention Available: www.edc.org/hec/pubs/socnorms.html. Accessed 9/22/02.

Hale, J.L., and Dillard, J.P. (1995). Fear appeals in health promotion: Too much, too little or just right? In E. Maibach and R. Parrott (Eds.), *Designing health messages: Approaches from communication theory and public health practice* (pp. 65-80). Newbury Park, CA: Sage.

Hingston, R., McGovern, T., Howland, J., Heeren, T., Winter, M., and Zakos, R. (1996). Reducing alcohol-impaired driving in Massachusetts: The impact of the Saving Lives Program. *American Journal of Public Health*, *86*, 1-7.

Holder, H., Gruenewald, P., Ponicki, W., Treno, A., Grube, J., Saltz, R., Voas, R., Reynolds, R., Davis, J., Sanchez, L., Gaumont, G., and Roeper, P. (2000). Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *Journal of the American Medical Association*, *284*, 2341-2347.

Holder, H., Saltz, R., Gruge, J., Voas, R., Gruenewald, P., and Treno, A. (1997). A community prevention trial to reduce alcohol-involved accidental injury and death: Overview. *Addiction*, *92*(Suppl. 2), S155-S171.

Holder, H., and Treno, A. (1997). Media advocacy in community prevention: news as a means to advance policy change. *Addiction*, *92*(Suppl. 2), S189-S199.

Johannessen, K., Collins, C., Mills-Novoa, B., and Gilder, P. (1999). *A practical guide to alcohol abuse prevention: A campus case study in implementing social norms and environmental management approaches*. Tucson: Campus Health Services, University of Arizona.

Johnson, C., Pentz, M., Weber, M., Dwyer, J., Baer, N., MacKinnon, D., Hansen, W., and Flay, B. (1990). Relative effectiveness of comprehensive community programming for drug abuse prevention with high-risk and low-risk adolescents. *Journal of Consulting and Clinical Psychology*, *98*, 447-456.

Keeling, R. (1999). Proceed with caution: understanding and changing campus norms. *Journal of American College Health*, *47*, 243-246.

Keeling, R. (2000). Social norms research in college health. *Journal of American College Health*, *497*, 53-56.

Lederman, L., Stewart, L., Barr, S., Powell, R., Laitman, L., and Goodhart, F. (2001). Using communication theory to reduce dangerous drinking on a college campus. In R. Rice and C. Atkin, Eds., *Public communication campaigns* (pp. 295-299). Thousand Oaks, CA: Sage.

Maibach, E., and Parrott, R. (1995). *Designing health messages: Approaches from communication theory and public health practice*. Thousand Oaks, CA: Sage.

McGuire, W. (1989). Theoretical foundations of campaigns. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 43-66). Newbury Park, CA: Sage.

McGuire, W. (1994). Using mass media communication to enhance public health. In L. Sechrest, T. Backer, E. Rogers, T. Campbell, and M. Grady (Eds.), *Effective dissemination of clinical health information. AHCPR Publication No. 95-0015* (pp. 125-151). Rockville, MD: Public Health Service, Agency for Health Care Policy and Research.

Odahowski, M., and Miller, C. (2000). *Results of the 2000 health promotion survey on the class of 2003*. Office of Health Promotion. Available: www.virginia.edu/student health/hp/norms. Accessed 9/17/02.

Perkins, H.W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol*, (Suppl 14), 164-172.

Perkins, H.W., and Craig, D. (2002). *A multifaceted social norms approach to reduce high-risk drinking*. Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention.

Perry, C., Williams, C., Veblen-Mortenson, S., Toomey, T., Komro, K., Anstine, P., McGovern, P., Finnegan, J., Forster, J., Wagenaar, A., and Wolfson, M. (1996). Outcomes of a community-wide alcohol use prevention program during early adolescence: Project Northland. *American Journal of Public Health*, *86*, 956-965.

Perry, C., Williams, C., Komro, K., Veblen-Mortenson, S., Forster, J., Bernstein-Lachter, R., Pratt, L., Dudovitz, B., Munson, K., Farbakhsh, K., Finnegan, J., and McGovern, P. (2000). Project Northland high school interventions: Community action to reduce adolescent alcohol use. *Health Education and Behavior*, *27*, 29-49.

Singhal, A., and Rogers, E. (1999). *Entertainment-education: A communication strategy for social change*. Mahwah, NJ: Erlbaum.

Slater, M. (1999). Integrating application of media effects, persuasion, and behavior change theories to communication campaigns: A stages-of-change framework. *Health Communication*, *11*(4), 335-354.

Snyder, L. (2001). How effective are mediated health campaigns? In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 181-190). Thousand Oaks, CA: Sage.

Steffian, G. (1999). Correction of normative misperceptions: An alcohol abuse prevention program. *Journal of Drug Education*, *29*(2), 115-138.

Stephenson, M., and Witte, K. (2001). Fear appeals in health communication message design. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 88-103). Thousand Oaks, CA: Sage.

Wagenarr, A., Murray, D., and Gehan, J. (2000). Communities mobilizing for change on alcohol (CMCA): Effects of a randomized trial on arrests and traffic crashes. *Addiction*, *95*, 209-217.

Wallack, L. (1989). Mass communication and health promotion: A critical perspective. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 353-368). Newbury Park, CA: Sage.

Wallack, L., and DeJong, W. (1995). Mass media and public health: Moving the focus from the individual to the environment. In S.E. Martin (Ed.), *The effects of the mass media on the use and abuse of alcohol* (pp. 253-268). NIAAA Research Monograph No. 28, NIH Publication no. 95-3743. Bethesda, MD: Department of Health and Human Services.

Wallack, L., and Dorfman, L. (2001). Critical and advocacy approaches to campaigns. In R. Rice and C. Atkin (Eds.), *Public communication campaigns* (pp. 389-402). Thousand Oaks, CA: Sage.

Wallack, L., Dorfman, L., Jernigan, D., and Themba, M. (1993). *Media advocacy and public health*. Newbury Park, CA: Sage.

Wartella, E., and Middlestadt, S. (1991). The evolution of models of mass communication and persuasion. *Health Communication*, *3*, 205-215.

Wechsler, H. (2000). Binge drinking: Should we attack the name or the problem? *The Chronicle of Higher Education.* October 20, B 12-13.

Wechsler, H., and Kuo, M. (2000). College students define binge drinking and estimate its prevalence: Results of a national survey. *Journal of American College Health*, *49*, 57-64.

Werch, C., Pappas, D., Carlson, J., DiClemente, C., Chally, P., and Sinder, J. (2000). Results of a social norms intervention to prevent binge drinking among first-year residential college students. *Journal of American College Health*, *49*, 85-92.

11

Alcohol in the Media: Drinking Portrayals, Alcohol Advertising, and Alcohol Consumption Among Youth

*Joel W. Grube**

Widespread concern exists about the potential effects that media portrayals of drinking, alcohol product placements, and alcohol advertising may have on alcohol consumption and problems among young people. Television, radio, film, and popular music are often identified as potential sources through which young people learn about alcohol and as potential influences on young people's drinking and drinking problems (e.g., American Academy of Pediatrics, 1996; Gerbner, 1995; Stockdale, 2001; Strasburger, 1993a, b; Villani, 2001). In particular, public health advocates routinely call for stricter self- or governmental regulation of television, film, music, and alcohol advertising (e.g., American Academy of Pediatrics, 1996; Hacker and Stuart, 1995; Hill and Casswell, 2001; Mosher, 1994; Strasburger, 1993a, b). Community action is frequently focused on reducing local alcohol advertising (e.g., Center for Science in the Public Interest, 1992; Woodruff, 1996). The effects of alcohol portrayals and advertising on young people (e.g., Atkin, 1993; Strasburger, 1993a, b) and targeting of youth (Center of Alcohol Marketing, and Youth, 2000a, 2000b, 2003) and minority communities by advertisers (e.g., Abramson, 1992; Alaniz and Wilkes, 1995; Scott, Denniston,

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and Magruder, 1992) have been raised as particularly salient issues. Recent changes in alcohol advertising policies, such as the decision by distillers to end a self-imposed ban and begin advertising on television, has raised further concerns about alcohol advertising and its potential effects on young people (Snyder, Fleming-Milici, Mitchell, and Proctor, 2000).

DRINKING PORTRAYALS IN THE MEDIA

Television

Adolescents are heavy users of television. Extrapolating from recent data obtained from a nationally representative survey, 11- to 13-year-olds watch 27.7 hours and 14- to 18-year-olds watch 20.2 hours of broadcast and taped television programming each week (Roberts, Foehr, Rideout, and Brodie, 1999a). As a result, they are immersed in drinking portrayals and alcohol product placements. A recent content analysis of primetime television from the 1998-1999 season, for example, indicates that 71 percent of all programming depicted alcohol use and 77 percent contained some reference to alcohol (Christensen, Henriksen, and Roberts, 2000). Among those programs most popular with teenagers, 53 percent portrayed alcohol use; 84 percent of TV-14-rated programming, 77 percent of TV-PG programming, and 38 percent of TV-G programming depicted alcohol use. More episodes portrayed drinking as an overall positive experience (40 percent) rather than a negative one (10 percent), although negative consequences were mentioned or portrayed in 23 percent of episodes. Underage drinking was relatively rare. Only 2 percent of regular characters under the age of 18 were depicted drinking alcohol. In another recent content analysis, however, characters between the ages of 13 to 18 were found to account for 7 percent of all alcohol incidents portrayed (Mathios, Avery, Bisogni, and Shanahan, 1998). When it occurs, youthful drinking or expressed desire to drink is often presented as a means of appearing to be adult and grownup (Grube, 1995). Other research suggests that drinkers tend to be regular characters, of high socioeconomic status, attractive, and glamorous (Mathios et al., 1998; Wallack, Grube, Madden, and Breed, 1990), although youthful drinkers are depicted in a less favorable light than older drinkers. Drinking is often treated as humorous and is associated with valued outcomes such as camaraderie (Hundley, 1995). Although common when considered at the program level, the prevalence of drinking characters is considerably below that for the U.S. population. Thus, in a recent analysis of primetime programming, only 11 percent of characters over the age of 34 were drinkers compared with 52 percent of similarly aged adults in the U.S. population (Long, O'Connor, Gerbner, and Concato, 2002). Only 14 percent of characters between ages 18 and 34 drank and only 2 percent

of those under 18 drank, compared with 61 percent and 19 percent, respectively, for the U.S. population in these age groups.

Little research has addressed the potential effects of exposure to drinking on television on young people's drinking beliefs and behaviors. Generally speaking, correlational studies have found small, but statistically significant, relations between television viewing and alcohol-related beliefs and behaviors. Thus, Tucker (1985) found that high school boys who were heavier television viewers drank more than lighter viewers. Similarly, Neuendorf (1985) reported that television viewing was related to beliefs about drinking among 10- to 14-year-old adolescents: Heavier viewers were more likely than lighter viewers to agree that people who drink are happy and you have to drink to have fun at a sporting event.

More recently, in a prospective study of 1,533 ninth-grade students, it was found that television viewing was related to initiation of drinking over an 18-month period (Robinson, Chen, and Killen, 1998). Specifically, each 1-hour increase in television viewing at baseline was associated with a 9 percent increased risk of initiating drinking during the following 18 months (OR = 1.09), after controlling for age, gender, and other media use. Unexpectedly, however, each hour of watching taped programming and movies on video was associated with an 11 percent average *decrease* in drinking initiation. Moreover, drinkers and nondrinkers did not differ in weekly hours of television viewing at baseline, and television viewing was not associated with increases in consumption among those young people who were already drinkers at baseline. A final study investigated reported television viewing and scores on a risky behavior scale that included drinking for a sample of 14-to 16-year-old adolescents (Klein et al., 1993). Although significant positive relations were found between viewing and involvement in risky behaviors for specific genres (e.g., cartoons), the results were inconsistent across genres and no effect was found for overall TV viewing. Moreover, data relating specifically to drinking were not presented.

These correlational studies suffer from potentially serious conceptual and methodological problems. Conceptually, none of the studies directly measured exposure to televised drinking portrayals. Rather, they relied only on measures of overall television viewing. The problem with such measures is that children watching equal amounts of television may be differentially exposed to alcohol portrayals depending on their program preferences and attention levels. More importantly, all of these studies used correlational analyses that cannot provide evidence for the direction of the relationship between television viewing and drinking beliefs and behaviors. Some unconsidered third variable may influence both viewing and drinking. This interpretation cannot be entirely discounted, even for the single longitudinal study.

In addition to the correlational studies, the influence of televised portrayals of drinking on young people has been addressed in experimental studies (Kotch, Coulter, and Lipsitz, 1986; Rychtarik, Fairbank, Allen, Foy, and Drabman, 1983). In both of these studies, children who were shown videotaped segments from popular television series containing drinking scenes expressed more favorable attitudes and beliefs about drinking than did children exposed to similar segments without drinking.

Although these studies are suggestive, they are problematic. First, the effects were small and selective. In one case (Kotch et al., 1986) significant effects were found for boys but not girls, and then only for a few of the measures of alcohol beliefs that were obtained. Second, the possibility exists that the children may have perceived the drinking in the video as representing the experimenter's expectations regarding their task in the experimental situation. Thus, they may have been responding to what they believed the experimenter wanted them to do, rather than the actual drinking scenes. Third, the experimental situation in both cases is highly artificial, making it difficult to generalize the results to the real world. Self-selection, differential attention, and other factors that operate in the natural viewing situation are not present. A major concern is the fact that exposure to the drinking portrayals in these studies is brief. The experimental situation simply cannot provide a parallel to the real world where exposure occurs more or less regularly over relatively long periods of time. It is likely that the cumulative effects of such long-term exposure are far more important than any effects of short-term exposure.

In sum, the available evidence regarding the influence of televised alcohol portrayals on young people is inconclusive, at best. Further research using more sophisticated research designs and analytic techniques will be necessary to provide a more definitive answer to this question.

Film

Adolescents spend considerably less time viewing movies and movie videos than they do television. Extrapolating from recent national survey data, 11- to 13-year-olds spend an average of 6.2 hours per week and 14- to 18-year-olds spend an average of 4.7 hours per week watching movies (Roberts et al., 1999a). In terms of alcohol content in films, recent content analyses indicate that alcohol was shown or consumed in 93 percent of the 200 most popular movie rentals for 1996-97 (Roberts, Henriksen, and Christensen, 1999b). Underage use of alcohol occurred in only about 9 percent of these films. Alcohol and drinking were presented in an overwhelmingly positive light. Drinking was associated with wealth or luxury in 34 percent of films containing alcohol references, and pro-use statements or overt advocacy of use occurred in 20 percent of these films. Anti-use statements

appeared in 9 percent of films with alcohol references; 6 percent contained statements on limits as to when, where, and how much alcohol should be consumed; and 14 percent depicted refusals to drink. Drinking in film is often associated with risky activities such as crime or violence (38 percent), driving (14 percent), and sexual activity (19 percent).

Portrayals of negative consequences of drinking are relatively rare. In all, 57 percent of films with alcohol references portrayed no consequences to the user. Similar findings have emerged from other content analyses. Thus, at least one lead character drank in 79 percent of the top money-making American films from 1985 to 1995 (Everett, Schnuth, and Tribble, 1998). Moreover, 96 percent of those films contained references supportive of alcohol use whereas only 37 percent contained references discouraging alcohol use. Surprisingly, an analysis of all G-rated English-language, animated feature films available on video cassette revealed that 47 percent (38 of 81) depicted alcohol or drinking (Thompson and Yokota, 2001). Of the 81 films, 13 contained scenes set in bars or nightclubs. In 15 of the 38 films containing alcohol, some consequences were depicted, but in most cases these consequences were minor (hiccupping, staggering, flushing). None of the films contained an overt health warning about alcohol use, and good or neutral characters accounted for the majority of drinking portrayals (67 percent).

Studies on the effects on youth of exposure to depictions of drinking in films are rare. In one study (Bahk, 2001), college students were exposed to one of two versions of *A Star Is Born*, one of which depicted negative consequences of drinking for the lead character (e.g., performing poorly at a concert, fighting, dying in a drinking-related crash) and the other with the negative consequences edited out, leaving primarily positive consequences. The results indicated that viewing the positive consequences version, relative to the negative consequences version, led to more favorable attitudes toward drinking and to stronger intentions to drink. The effects were strongest for attitudes toward drinking for tension reduction and amusement and intentions to drink for stress management.

In a similar study (Kulick and Rosenberg, 2001), college students were exposed to a series of eight film clips with or without depictions of spirits consumption. Participants were randomly assigned to one of three conditions: a negative portrayal condition, a positive portrayal condition, or a control condition. In the negative portrayal condition, five of the clips contained drinking scenes portraying undesirable outcomes. In the positive portrayal condition, six of the clips contained drinking scenes with desirable outcomes. In the control condition, none of the clips contained drinking scenes. After viewing all of the clips twice, the participants completed measures of intentions to drink spirits and alcohol expectancies. Results indicated that participants in the positive portrayal condition had signifi-

cantly more positive alcohol expectancies compared with controls, although they did not differ significantly from those in the negative portrayals condition ($p < 0.09$). The negative portrayals condition did not differ significantly from controls. In terms of negative expectancies, participants in both the positive and negative portrayals conditions had higher scores than the controls, but did not differ from one another. The groups did not differ in intentions to drink spirits in the next week.

In sum, alcohol portrayals are common in films, even in those with ratings indicating they are intended for children and adolescents. These portrayals are typically positive or neutral and drinking is associated with desirable outcomes and characteristics. Few studies have investigated the effects of film portrayals of drinking on young adults, adolescents, and children. The findings from these studies are mixed. Although evidence from one study shows that such portrayals can have small effects on drinking attitudes and intentions, the results from a second study are ambiguous. In addition, as with experimental studies of alcohol portrayals on television, it is not clear how relevant these studies are to the real-world viewing situation because they address only the short-term effects of limited and brief exposures in an artificial setting. Experimental demand also remains an issue for these studies.

Music and Music Video

Music, either radio or recordings, is a popular form of entertainment for young people. Thus, 11- to 13-year-olds spend 11.2 hours per week and 14- to 18-year-olds spend 9.3 hours per week listening to music on radio, CD, or tape (Roberts, 1999a). Research on alcohol-related content in song lyrics is comparatively rare. A recent content analysis (Roberts et al., 1999b) examined 1,000 of the most popular songs in 1996-97 across five genres of music popular with youth. This study found that 17 percent of all the lyrics contained references to alcohol and that alcohol was mentioned more frequently in rap music (47 percent) than in other genres such as country-western (13 percent), top 40 (12 percent), alternative rock (10 percent), and heavy metal (3 percent). Overall, 22 percent of songs with alcohol mentions referred to beer or malt liquor, 34 percent to wine or champagne, 36 percent to hard liquor or mixed drinks, and 31 percent to generic terms such as "booze." A common theme was getting intoxicated or high (24 percent), although drinking was also associated with wealth and luxury (24 percent), sexual activity (34 percent), and crime or violence (13 percent). Consequences of drinking were mentioned in only 9 percent of the songs with alcohol references, and anti-use messages occurred in only 3 percent. Product placements or brand-name mentions occurred in 30 percent of them and were especially common in rap music (48 percent).

An analysis of alcohol depictions in rap music (Herd, 1993) found the portrayal of alcohol use to convey elements of disinhibition, rebellion, identity, pleasure, sensuality, and personal power. Similar to the ambivalent attitudes toward alcohol use expressed in country-western music (Chalfant and Beckley, 1977; Connors and Alpher, 1989), rap music vacillated between pro-drinking and anti-drinking attitudes. This analysis further associated the commodification of rap music by the malt liquor industry with an increase in malt liquor portrayals in rap songs.

DuRant et al. (1997) analyzed 518 music videos from MTV, BET, CMT, and VH1 for portrayals of alcohol and tobacco use. They found that portrayals of substance use varied by network and music genre, with MTV having the highest percentage of videos that portrayed alcohol and tobacco use, and CMT with the lowest percentage of tobacco use in videos. In terms of music genre, rap music videos contained the highest percentage of depictions of alcohol use, whereas rhythm and blues videos showed the least alcohol use. Additionally, alcohol use was found in a higher proportion of music videos that had any sexual content than in videos that had no sexual content.

In one of the only studies to address the relationship between music video viewing and alcohol use, Robinson et al. (1998) examined the association between media exposure and self-reported alcohol use. They collected baseline and 18-month follow-up data on media usage (television watching, video watching, playing computer or video games, and watching music videos) and lifetime and 30-day alcohol use for a sample of ninth graders. They found a 31 percent increased risk of drinking initiation within the next 18 months for each 1-hour increase in watching music videos. Although longitudinal in nature, causality is an issue in this study and the possibility remains that both exposure to music videos and initiation to drinking are related to a third unmeasured predisposing factor.

ALCOHOL ADVERTISING

In part, concern about alcohol advertising may stem from its pervasiveness. In 2000 the alcoholic beverage industries spent $1.42 billion advertising alcohol in the U.S. (Center for Science in the Public Interest, 2002). Most of these expenditures ($893 million) were concentrated in broadcast media (see Figure 11-1). Beer advertising accounted for the majority of alcohol advertising expenditures ($910.3 million). Overall, 95 percent of all televised beer advertising expenditures are in sports programming, more than half of televised beer advertisements appear on Saturday or Sunday afternoons, and more than a third appear during primetime, when large segments of the audience are underage (Snyder et al., 2000). Moreover, alcohol advertising expenditures in the United States (Figure 11-2) have

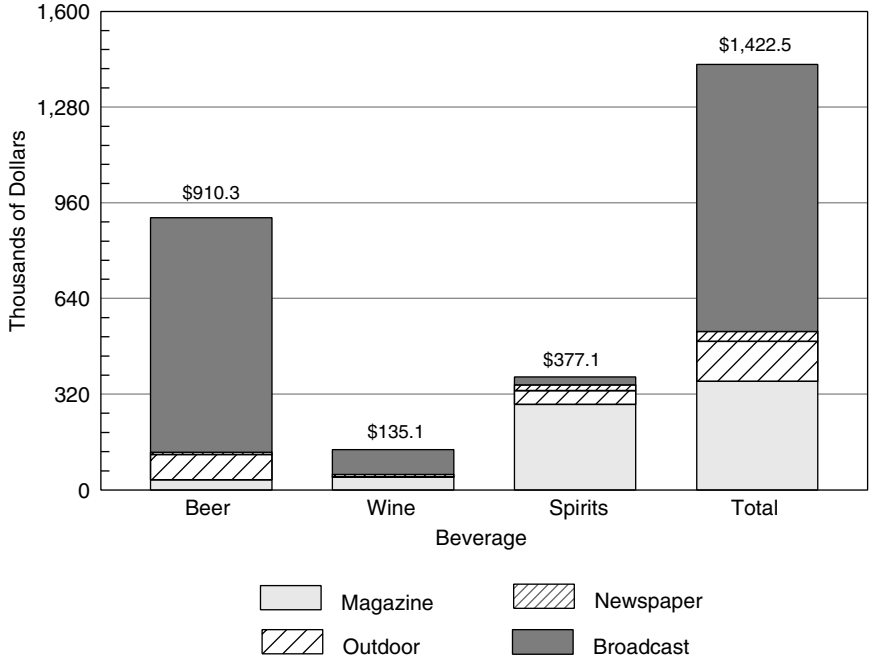

FIGURE 11-1 Alcohol advertising expenditures by beverage by medium, 2000.
SOURCE: Center for Science in the Public Interest (2002).

risen steadily in recent years. Thus, for example, between 1995 and 2000, these expenditures rose 37 percent, from $1.04 billion to $1.42 billion (Center for Science in the Public Interest, 2002). Whether young people are deliberately targeted by alcohol advertisers or not, they are exposed to alcohol advertising on television, in print media, and on radio (Center for Science in the Public Interest, 2000a, b; 2003). Estimates show, for example, that televised alcohol advertising reached 89 percent of the youth audience, with an average underage television viewer being exposed to 245 alcohol advertisements annually and the 30 percent heaviest viewers being exposed to 780 alcohol advertisements (Center for Science in the Public Interest, 2000b).

Images in Alcohol Advertising

Content analysis suggests that many alcohol advertisements link drinking with valued personal attributes such as sociability, elegance, and physical attractiveness and with desirable outcomes such as success, relaxation, romance, and adventure (e.g., Atkin and Block, 1981; Postman, Nystrom,

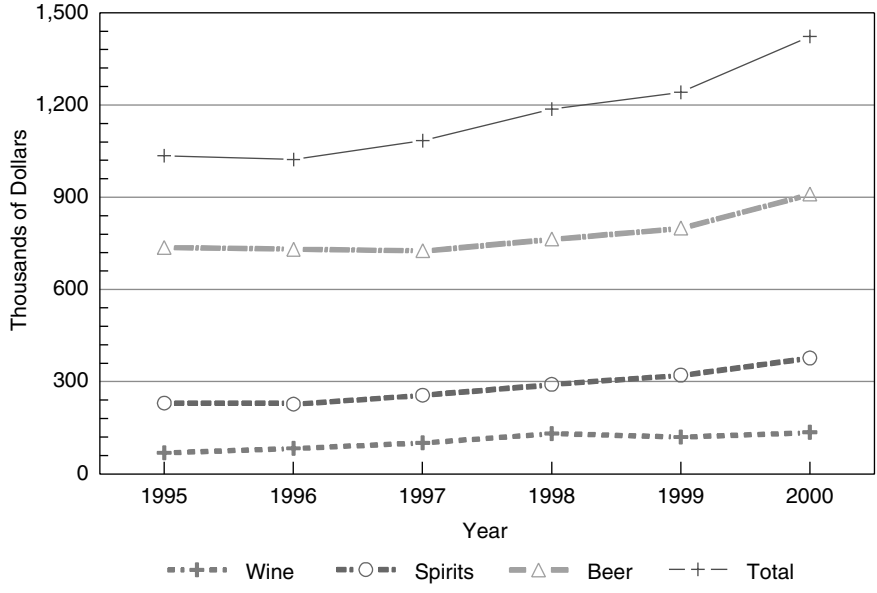

FIGURE 11-2 Alcohol advertising expenditures, 1995-2000.
SOURCE: Center for Science in the Public Interest (2002).

Strate, and Weingartner, 1988; Strickland, Finn, and Lambert, 1982). Moreover, young people find some alcohol advertising appealing and are attracted to it. In a recent study (Chen and Grube, 2001; Martin et al., 2002), 450 fifth through eleventh graders were asked to rate 20 beer and soft drink advertisements. Overall, soft drink advertisements were rated more favorably than beer advertisements. Nonetheless, the young people identified some beer advertisements as being among their favorites in the 20 (Figure 11-3). In fact, the most liked advertisement overall was for beer and featured the Budweiser® lizards and ferret. More than 90 percent of the young people liked this advertisement. Other beer advertisements were also popular, including a Bud Light advertisement featuring a computer-animated mouse (76 percent) and a Budweiser advertisement featuring the Clydesdale horses and Dalmatian dogs (84 percent). In general, children and adolescents find alcohol advertising with celebrity endorsers, humor, animation, and popular music to be particularly appealing (Atkin and Block, 1983; Chen and Grube, 2001; Martin et al., 2002). Adolescent boys are especially attracted to alcohol advertisements depicting sports (Slater et al., 1997; Slater et al., 1996). In general, adolescents and adults find lifestyle or image-oriented alcohol advertising to be more appealing than alcohol ad-

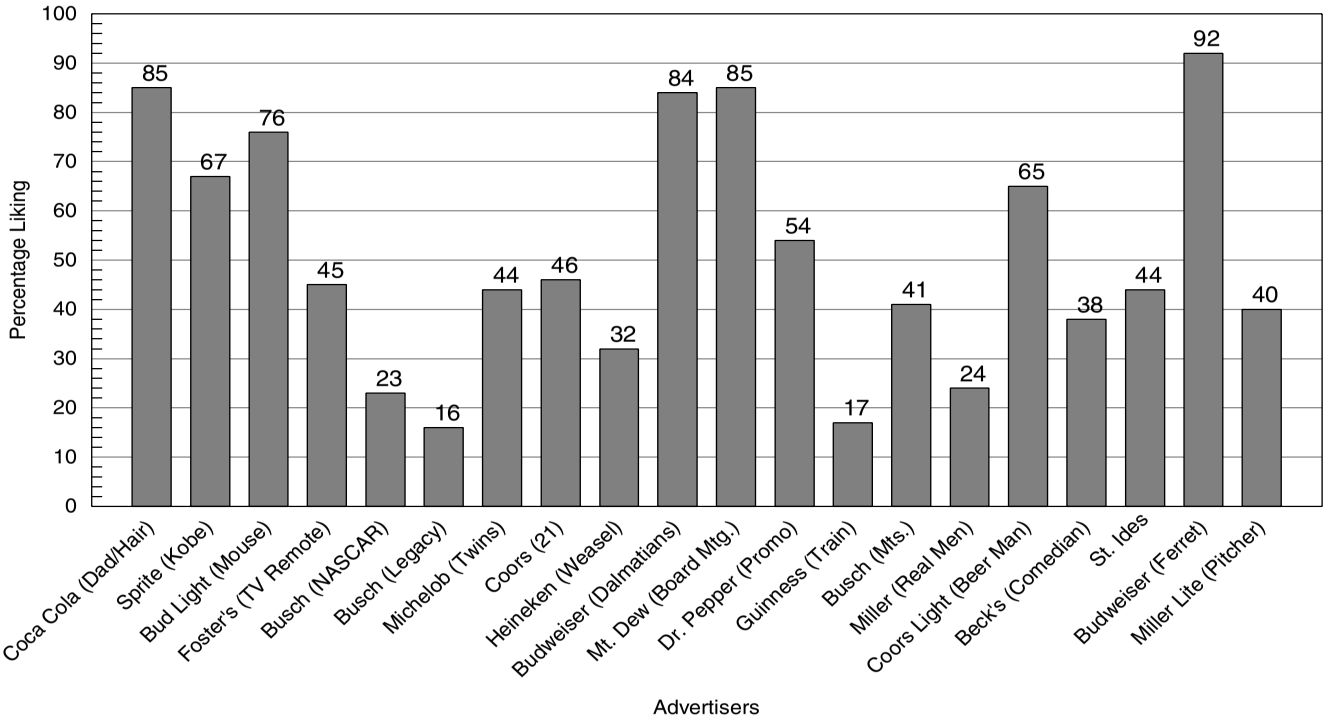

FIGURE 11-3 Percentage of fifth to eleventh graders who strongly like alcohol and soft drink advertisements.

vertisements that promote only product quality (Covell, Dion, and Dion, 1994; Kelly and Edwards, 1998; Kelly, Slater, and Karan, 2002). Image advertising is especially preferred among younger adolescents (e.g., seventh graders) and particularly by younger males (Kelly and Edwards, 1998). Lifestyle or image-oriented advertising also appears to result in more favorable attitudes toward alcohol brands and products among young people when compared with strictly product-oriented or informational advertising (Kelly et al., 2002).

Does alcohol advertising increase alcohol consumption and problems among youth? This question is addressed here by reviewing the recent research on alcohol advertising and by critically considering the evidence about the effects that exposure to these advertisements may have on alcohol beliefs and attitudes and on the prevalence of drinking and drinking problems among young people.

Does Alcohol Advertising Affect Drinking or Drinking Problems?

Earlier reviews have concluded that the evidence for the effects of alcohol advertising on drinking beliefs and behaviors is limited at best (e.g., Atkin, 1995; Calfee and Scheraga, 1994; Fisher, 1993; Nelson, 2001). The available research on the effects of alcohol advertising can be grouped into three types of studies: (1) experimental or laboratory studies, (2) ecological studies, and (3) survey and other correlational studies. Each of these types of studies will be considered in turn.

Experimental Studies

Experimental studies investigate the effects that short-term exposure to alcohol advertising under controlled conditions has on drinking beliefs and behaviors. Typically, a group of experimental participants will be exposed to one or more alcohol advertisements embedded within a television program, within a series of "neutral" advertisements, or, in the case of print advertising, within a booklet or magazine. The drinking beliefs or behaviors of this experimental group are then compared to a control group that watches the same program, sees the same collection of advertisements, or reads the same booklet, but without the embedded alcohol advertisements. The results of earlier experimental studies have been mixed with some studies finding no effects (e.g., Kohn, Smart, and Ogborne, 1984; Sobell et al., 1986) and other studies finding small or short-term effects for some study participants (e.g., Kohn and Smart, 1987).

Apparently only a single recent study has been published that experimentally manipulated exposure to alcohol advertising (Lipsitz, Brake, Vincent, and Winters, 1993). This study was intended to investigate the

effects of television beer advertising on alcohol expectancies among young people who were not yet regular drinkers. Groups of fifth and eighth graders were exposed to videotapes containing five beer commercials, the same five beer commercials plus two antidrinking public service advertisements, or five soft drink commercials. Results of a memory task indicated that the children paid attention to the advertisements and remembered seeing the beer and soft drink commercials. Despite the attention given to the advertisements, however, neither exposure to the beer advertisements alone nor to the beer advertisements in combination with the antidrinking PSAs affected scores on the alcohol expectancy scales.

The results of these experimental studies offer only very limited evidence that alcohol advertising promotes more favorable drinking beliefs or increases consumption. Laboratory studies of alcohol advertising effects, however, can be criticized on at least four grounds (cf. Atkin, 1995; Grube, 1993; Lastovicka, 1995; Thorson, 1995). First, although laboratory experimental studies can control for extraneous factors and allow for strong causal inferences, they often lack realism. In the typical study, respondents will be exposed to alcohol advertising in an artificial setting (e.g., schoolroom) that does not resemble the natural viewing situation. As a result, it is difficult to draw conclusions about the "real-world" effects of alcohol advertising on beliefs and behaviors based on these laboratory studies.

Second, it has been noted that advertisers target specific audiences with particular advertisements (Thorson, 1995). If the stimulus advertisements do not contain images, themes, or music that appeal to the participants in a specific study, then it is unlikely that any effects will be observed.

Third, laboratory experiments on the effects of alcohol advertising can only address the effects of short-term exposure to a limited number of advertisements. The relevance of such studies for understanding the cumulative effects of exposure to hundreds or thousands of alcohol advertisements over many years is questionable. Laboratory studies may be more appropriate for studying short-term disinhibitory or priming effects than ascertaining if advertising has long-term effects on beliefs or behaviors. That is, this research paradigm may be most relevant to understanding if exposure to alcohol advertising elicits immediate and short-term increases in consumption among those already favorably predisposed to drinking (e.g., Kohn and Smart, 1987).

Fourth, it may be naive to expect alcohol advertising experiments, as typically implemented, to produce significant effects on beliefs or behaviors. In particular, it seems unlikely that exposure to a handful of alcohol advertisements in a laboratory setting could produce a measurable effect against the high background rates of such advertising to which respondents are already exposed in their everyday lives.

Ecological Studies

Generally, ecological or econometric studies have focused on the relationship between alcohol industry advertising expenditures and aggregated (e.g., per capita) alcohol consumption, sales, or problems. A few studies have investigated the effects of alcohol advertising restrictions or bans.

Advertising Expenditures

In a recent study (Saffer, 1997), the relationship between variations in local television, radio, and outdoor alcohol advertising and motor vehicle fatalities was investigated using data for the years 1986 to 1989 in the top 75 media markets in the United States. Alcohol advertising was represented as the sum of expenditures over media types (television, radio, outdoor) weighted for relative media impact based on the estimated number of people exposed to each. Alcohol advertising was found to be significantly related to total and nighttime vehicle fatalities, although the effects appeared to be greater for older than for younger (18- to 20-year-old) drivers. The effect of variations in the cost of advertising on motor vehicle fatalities was also investigated in separate analyses. The cost of advertising was found to be negatively related to motor vehicle fatalities, presumably because higher costs reduce the amount of advertising and thus consumption.

This study has a number of strengths and offers the strongest ecological evidence that alcohol advertising might influence drinking problems. The investigation of local variations in advertising and including a consideration of different media types are important innovations that have not been duplicated in other ecological studies. They are important because the lack of variation in advertising expenditures when aggregated across media at the national level may make it difficult to detect advertising effects (e.g., Saffer, 1995). Nonetheless, making causal inferences based on this study is problematic. Even though important background and demographic variables were controlled, the possibility that the relationship between alcohol advertising and motor vehicle fatalities is spurious and results from some third variable such as differences in regional drinking norms cannot be entirely discounted.

The remaining recent ecological studies of alcohol advertising expenditures have generally produced null findings regarding the effects of advertising on overall consumption and problems. Thus, for example, using annual data from the United States from 1964 to 1990, Nelson and Moran (1995) investigated the effects of real advertising expenditures for beer, wine, and spirits on consumption of these beverages. Although the results varied somewhat among estimation procedures, none of the same beverage advertising coefficients were significant for beer or spirits. The same-beverage coeffi-

cients for wine, however, were significant and positive. That is, wine advertising was related to increased wine consumption. All of the advertising effects, however, were quite small. Moreover, wine advertising decreased spirits consumption while spirits advertising decreased wine consumption. Alcohol advertising expenditures were unrelated to total alcohol consumption once income, price, age structure, and advertising for all other goods were controlled. Overall, these results were interpreted as indicating that alcohol advertising does not increase total consumption, but rather reallocates market shares among brands and beverages.

Similar conclusions were reached in a study of the effects of brand-level advertising on spirits consumption in the United States from 1976 to 1989 (Gius, 1996). Specifically, it was found that brand advertising was positively related to own-brand consumption for spirits, whereas rival brand advertising was not significantly related to own-brand consumption. This pattern was interpreted as indicating that alcohol advertising does not change overall consumption of spirits, but rather leads simply to a reallocation of market shares.

The effects of advertising on alcohol consumption and on spirits consumption also have been investigated using national data from the United States for the years 1959 through 1982 (Goel and Morey, 1995). This study found that the effects of both current and lagged (previous year's) advertising expenditures for alcohol were negative. That is, advertising appeared to *decrease* consumption. These effects were interpreted by the authors as indicating that alcohol advertising leads to a redistribution of market shares without increasing overall demand. One further possibility is that the alcohol manufacturers may increase advertising when demand begins to decrease. That is, advertising may be a function of sales as well as sales being a function of advertising (cf. Saffer, 1995, 1996, 1998).

Beer, wine, and spirits advertising were investigated using quarterly data from 1963 to 1992 for the United Kingdom (Duffy, 1995). This study did not consider cross-beverage advertising effects, but did allow for the possibility that changes in advertising do not immediately affect consumption, but rather may have lagged or delayed effects. Advertising was represented in this study by quarterly per capita expenditures on television, radio, and press. Alcohol consumption was measured by quarterly consumer expenditures on beer, wine, and spirits. The effects for wine and spirits advertising were occasionally positive and significant in some models, but were small and most often nonsignificant. The advertising effects for beer advertising were not significant and positive in any of the models, although a small negative effect was found in one model. When the most stable and best predictive model was considered, one advertising coefficient for spirits was significant and positive, but small. Although this study has

many strengths, aggregating advertising across media types and the lack of consistency among the models raise some issues.

Fisher and Cook (1995), using U.S. data for the years 1970 to 1990, investigated changes in per capita consumption as a function of changes in advertising as well as cross-sectional associations. Considering the cross-sectional analyses first, they found that expenditures on magazine advertising were associated with increased spirits consumption. This finding is consistent with the fact that spirits advertising in the U.S. is primarily through print media (Center for Science in the Public Interest, 2002; Snyder et al., 2000). They also found that total wine and spirits advertising (across all media) increased wine, spirits, beer, and total consumption. Interestingly, total beer advertising decreased spirits consumption, as would be expected if market shares were being shifted. Overall, the authors concluded that these findings provided some support for the effects of advertising on consumption, and in some cases the observed advertising effects were substantial. When models of change, rather than static models, were considered, no evidence that changes in advertising expenditures were related to changes in consumption was found. Spirits advertising, however, was found to decrease wine market share. The findings of this study provide little or no evidence that changes in alcohol advertising increase overall alcohol consumption, although it may realign market shares.

Other recent ecological studies reach similar conclusions. Thus Coulson, Moran, and Nelson (2001) report a series of analyses using quarterly advertising expenditures, taking into account the relative audience reach of different media types. Some significant effects of alcohol advertising were found, although they were quite small. Thus, spirits advertising had a positive effect on spirits consumption one quarter (3 months) later, and a contemporaneous positive effect on wine consumption. Wine advertising, however, had a negative effect on spirits consumption after one quarter and a positive contemporaneous effect on wine consumption. It was concluded that the effects of alcohol advertising on overall consumption were negligible.

Similar results have been reported for advertising expenditures on per capita alcohol consumption in Ontario, Canada (Larivière, Larue, and Chalfant, 2000). Although the results were unstable and varied considerably depending on model specification, they suggested that spirits consumption was positively related to advertising expenditures, whereas beer and wine consumption were negatively related to advertising expenditures. Larivière et al. concluded that advertising effects were subtle, may vary by beverage, and probably affect brand or product allocation, rather than overall consumption. On the basis of similar data for the United Kingdom and United States, respectively, Duffy (2001) and Nelson (1999) conclude

that a 100 percent increase in alcohol advertising would result in a 1 percent increase in total consumption.

Advertising Restrictions

In addition to considering alcohol advertising expenditures, some ecological studies have attempted to ascertain if restrictions on alcohol advertising have a discernible effect on drinking and drinking problems. Early studies in this area concluded that advertising restrictions have little, if any, overall effect on increasing consumption. Thus, for example, a study of state-level alcohol control laws in the United States (Ornstein and Hanssens, 1985) indicated that allowing outdoor (billboard) advertising was actually related to *decreased* spirits consumption and had no effect on beer consumption. However, allowing price advertising, especially on billboards, significantly increased both spirits and beer consumption. This effect was interpreted as indicating that price advertising leads to greater competition, lower prices, and therefore greater consumption. The analyses also suggested that allowing retailers and distributors to give away alcohol-related novelties (a form of promotion) increased consumption of both spirits and beer. Even so, the effects of price advertising and novelties were relatively small compared with those of other regulatory policies (e.g., drinking age) and economic factors (e.g., price). In another study (Makowsky and Whitehead, 1991), the effects of removing a total ban on alcohol advertising in Saskatchewan, Canada, were investigated for beer, spirits, wine, and total alcohol sales. The analyses indicated that lifting the ban increased beer sales, decreased spirits sales, and had no effect on wine or total sales. That is, lifting the ban may have resulted in a substitution effect of beer for spirits, but did not appear to increase overall consumption.

Some support for the effectiveness of restrictions on broadcast alcohol advertising in reducing alcohol consumption and alcohol problems (i.e., liver cirrhosis mortality, motor vehicle fatalities) is provided by a study of 17 European and North American countries (Saffer, 1991, 1993a). In a series of analyses controlling for income, price, tourism, kilometers of roadway, and percentage of alcohol consumed in the form of beer and wine, it was found that restrictions on alcohol advertising were related to lower rates of consumption and reduced motor vehicle fatalities. Specifically, countries with partial restrictions had alcohol consumption rates that were about 16 percent lower than countries with no restrictions, and countries with complete restrictions had consumption rates that were 11 percent lower than countries with partial restrictions. The corresponding reduced rates for motor vehicle fatalities were 10 percent and 23 percent, respectively. No significant effects were observed for cirrhosis mortality rates.

This study, however, has been seriously criticized. A reanalysis of the

data (Young, 1993) suggested there was evidence of model misspecification and reverse causation, with those countries experiencing low rates of alcohol problems being more likely to adopt alcohol advertising bans than countries with high rates of alcohol problems. That is, it appears that both low problem rates and advertising restrictions may be a result of preexisting conservative drinking styles. Moreover, the reanalysis also suggested that partial alcohol advertising bans might actually *increase* alcohol consumption through substitution. For example, bans on spirits advertising were associated with increases in beer consumption. Other studies (Nelson and Young, 2001; Nelson, 2001) using more recent data and a somewhat longer time series have investigated the effects of bans on broadcast alcohol advertising in the same 17 countries on per capita alcohol consumption, cirrhosis deaths, and traffic fatalities. These studies concluded that a total ban on broadcast alcohol advertising had no measurable effects on alcohol consumption, cirrhosis deaths, or traffic fatalities, although the number of countries with such bans was quite small ($N = 4$). Bans on broadcast spirits advertising were related to *increases* in consumption and road fatalities and were not significantly related to cirrhosis rates. The authors also note that such bans may be relatively ineffective because they are often circumvented through substitution of nonbanned media and the use of new technologies and marketing strategies. Contamination from neighboring areas where no bans are in effect is also problematic.

In contrast, a more recent analysis of longer time series of data (1970-1995) from 20 countries indicated that both partial bans and complete bans on alcohol advertising may reduce consumption (Saffer and Dave, 2002). It was estimated that each added restriction on alcohol advertising (e.g., disallowing spirits advertising on television) reduced consumption by 5 to 8 percent. These effects were found even after controls for price, income, alcohol culture (percentage of alcohol consumed as beer and wine), cigarette advertising bans, and government activism in the economy. Importantly, this study addressed criticisms raised concerning previous studies (e.g., Young, 1993). In particular, it took into account reciprocal effects between consumption and alcohol advertising bans. In this regard, it was found that not only did advertising bans decrease consumption, but consumption also affected advertising bans. Specifically, countries with *higher* alcohol consumption were *more* likely to institute total bans on alcohol advertising compared with lower consumption countries.

In general, the findings from the ecological studies provide little consistent support for a relationship between aggregate alcohol advertising expenditures or advertising restrictions and aggregate alcohol sales, consumption, or problems. They do provide stronger evidence that alcohol advertising may lead to changes in brand or beverage preferences without increasing total consumption. The ecological research on alcohol advertis-

ing, however, has been criticized on a number of grounds (cf. Calfee and Scheraga, 1994; Fisher, 1993; Saffer, 1993b, 1995, 2002). Aggregation of advertising data across media types is one recurrent problem; it is interesting to note that one study that took differential media impact into account found significant advertising effects (Saffer, 1997). It is worth noting, however, that other studies investigating the independent contributions of separate media types have found no such effects (e.g., Nelson, 1999). In a related aggregation issue, it has been argued (Saffer, 1993b) that ecological studies have not considered the possible cumulative effects of advertising over many years. As a result, they may underestimate advertising effects. Studies investigating lagged effects of advertising over relatively lengthy time series, however, have found no advertising effects (e.g., Fisher and Cook, 1995; Coulson et al., 2001), although time series analysis, even with lags, may not be an appropriate method for detecting cumulative effects. Although the effects of advertising on brand or product preferences may decay rapidly, this may not be the case for any effects of advertising on overall drinking predispositions. Conversely, because advertising is pulsed or concentrated in relatively short intervals, using data that are aggregated at the yearly level may mask or hide short-term advertising effects (Saffer, 1993b, Saffer and Dave, 2002). Again, however, ecological studies considering quarterly data have not found advertising effects (e.g., Nelson, 1999; Coulson et al., 2001). Aggregating advertising expenditures and sales data over large geographical areas (e.g., nationally) may mask potential advertising effects because of the relative lack of variability in such data. In this regard, it is important to note that the one study that considered variations in alcohol advertising at the regional level (Saffer, 1997) found significant effects on vehicle fatalities. In a related issue with studies using aggregated data, it has been suggested that studying alcohol advertising cross-nationally is potentially important because variations in such advertising are usually at the margin, and quite small in relation to the total amount of alcohol advertising in the environment within any one country. As a result, normally occurring changes in levels of alcohol advertising can be expected to have only minimal effects, if any, in single-country studies (Saffer, 1995, 1996, 1998).

An additional cautionary note regarding ecological analyses of alcohol advertising is that they may misspecify the underlying models by ignoring mediated effects. For example, one effect of advertising may be to increase competition among brands, thereby reducing price and, as a result, increasing consumption (Nelson, 2001; Nelson and Young, 2001; Tremblay and Okuyama, 2001). If such a model holds, then one would not expect a significant direct effect from advertising to consumption if price is also included in a simple series analysis. This would be the case even if advertising were, in fact, an important indirect determinant of alcohol consumption

and problems through its effects on price. Although some researchers have dismissed the significance of such indirect effects (Nelson, 2001), they may be practically important. In the present example, if advertising does indeed lead to reductions in prices, then restricting advertising might increase price and reduce consumption. Thus, for example, a case study (Tremblay and Okuyama, 2001) tentatively suggests that lifting the ban on broadcast spirits advertising may have led to price reductions and consequently to increased consumption of spirits. Unfortunately, appropriate analytic procedures that allow for assessing indirect effects, as well as direct effects, for the most part have been lacking in the ecological literature on alcohol advertising.

Another limitation of the existing ecological studies is that they have not considered special populations that may be more susceptible to or exposed to advertising. In particular, it has been argued that young people, or certain groups of young people, may be especially influenced by alcohol advertisements (e.g., Atkin, 1993) and that minority populations have been specially targeted by alcohol advertising (e.g., Scott et al., 1992; Abramson, 1992). It is possible that advertising may be more important at some stages of the drinking process (e.g., initiation) than others (continuation of established drinking patterns). Although aggregate consumption rates for youth are highly correlated with those for adults (Nelson, 2001), they are not identical. The effects of alcohol advertising on aggregated youth drinking thus remains an empirical question.

Survey and Other Correlational Studies

For the most part, survey studies of alcohol advertising have focused on children and adolescents. In general, the survey studies have addressed a fundamentally different question from those addressed in the ecological studies. Rather than asking *if* alcohol advertising affects overall consumption among young people, these studies ask *who* might be affected and by what processes. These are questions that cannot be addressed with aggregated data and the types of analyses typically used in ecological studies. In addition, rather than relying on measures of potential exposure at the population level (e.g., advertising expenditures), survey studies have focused at the individual level and specifically on young people known to be more or less exposed to, attentive to, or attracted to alcohol advertising. Early survey studies found small, but significant, positive relationships between reported exposure to alcohol advertising and drinking beliefs and behaviors among young people (Aitken, Eadie, Leather, McNeill, and Scott, 1988; Atkin and Block, 1981; Atkin, Hocking, and Block, 1984; Atkin, Neuendorf, and McDermott, 1983). These effects were small, however, and some studies failed to find substantively meaningful relationships between

alcohol advertising and drinking beliefs and behaviors among young people (e.g., Adlaf and Kohn, 1989; Strickland, 1982, 1983).

More recently, research has focused more on attentional and affective processes that may mediate between exposure to alcohol advertising and drinking beliefs and behaviors. Specifically, it has been proposed that attention to and positive affect toward alcohol advertising and the characters and images it contains may be factors that are important in determining whether alcohol advertising influences drinking beliefs and behavior (e.g., Austin and Nach-Ferguson, 1995; Grube, 1995; Grube and Wallack, 1994; Thorson, 1995). In one study a small sample of high school students were exposed to videotaped television beer advertising with and without sports content (Slater et al., 1997). The advertisements were embedded in either a sports program or an entertainment program. It was found that girls responded more negatively to beer advertisements and counter-argued them more than boys did, particularly when they had sports content. Of most relevance here, non-Hispanic white adolescents who were more favorable toward the beer advertisements were also more likely to report current drinking and future intentions to drink. The effects, however, were small and were not replicated among Latino adolescents. Moreover, because of the cross-sectional nature of the study, it is not clear what the causal relationship is. In particular, it cannot be determined if a favorable orientation to alcohol advertisements predisposes young people to drinking or if being predisposed to drinking makes young people more favorable toward alcohol advertisements.

The relationship between evaluation of alcohol advertising and drinking was also investigated in a study of 7- to 12-year-old children (Austin and Nach-Ferguson, 1995). It was found that liking alcohol advertisements was positively related to experimentation with alcohol. This effect was relatively robust, accounting for about 11 percent of the variance in the drinking measure. In a similar study with at-risk preadolescents, it was found that identification with the characters in alcohol commercials predicted expectancies regarding the positive effects of drinking (Austin and Meili, 1994). In a similar study, with third, sixth, and ninth graders, both rated desirability of characters in alcohol advertisements and identification with those characters predicted positive alcohol expectancies and, indirectly, a risky behavior index that included drinking (Austin and Knaus, 2001). These patterns of results were replicated and extended using a sample of ninth and twelfth graders from central California (Pinkleton, Austin, and Fujioka, 2001). A "predrinking behavior" index was also constructed by having the respondents rate the extent to which they would like to have each of a series of clothing and toy items with alcohol-related logos. Perceived desirability, identification, and ratings of advertisement production and content quality were found to be related to alcohol expectancies, the

predrinking index, and an alcohol-behavior index. Again, however, all of these studies were cross-sectional and rely on simple correlational and regression techniques, thus precluding causal interpretations of these relationships.

Another study used survey data obtained from fifth- and sixth-grade school children (Grube and Wallack, 1994; Grube, 1995). Awareness of alcohol advertising was ascertained by presenting them with a series of still photographs taken from television commercials for beer. In each case, all references to product or brand were blacked out. They were asked whether they had seen each advertisement and, if so, to identify the product being advertised, and, if they knew that, the brand of the product. The most important findings from this survey were that awareness of advertising was related to increased knowledge of beer brands and slogans and to more positive beliefs about drinking. Awareness of alcohol advertising also had a significant indirect effect on intention to drink as an adult that was mediated through positive beliefs. Importantly, these effects were maintained even though the reciprocal effects of beliefs and knowledge on awareness of advertising were controlled through the nonrecursive modeling. The findings were interpreted as suggesting that awareness of alcohol advertising *may* predispose young people to drink rather than the other way around.

A series of recent studies from New Zealand have reached similar conclusions. In one study of 10- to 17-year-olds (Wyllie, Zhang, and Casswell, 1998b), respondents were given a written description of and shown a still photograph taken from three television beer advertisements. They were then asked how often they had seen each advertisement and how much they liked each of them. Liking was significantly related to intention to drink as an adult. This effect accounted for a substantial proportion of the variance in these drinking intentions. The effect of liking on current drinking behaviors was more modest and nonsignificant ($p < 0.06$). Importantly, the reciprocal effects of drinking and drinking intentions on liking were not significant. Stronger results were reported in a recent study of 18- to 29- year-olds (Wyllie, Zhang, and Casswell, 1998a) using similar procedures. In this case, liking of alcohol advertisements was positively related to endorsement of positive statements about drinking and to current alcohol consumption. Most importantly, liking of the advertisements was related to increased numbers of self-reported drinking problems. The reciprocal effects of drinking and drinking beliefs on liking of alcohol advertisements were not significant in the model.

Another recent survey study (Connolly, Casswell, Zhang, and Silva, 1994) represents an advance over previous studies because it used a longitudinal design. Recall of alcohol advertisements at age 15 was positively related to beer drinking 3 years later at age 18 among young men. Unexpectedly, among young women, those who recalled more alcohol advertis-

ing at age 15 reported drinking less beer at age 18 than did those recalling fewer advertisements. Although this study is important because it reports the first published longitudinal data showing a significant relationship between alcohol advertising and later drinking, it is problematic for a number of reasons. Most importantly, the analyses did not control for drinking or predisposition to drink at the earlier waves of the study. It is possible that those young men who recalled more advertisements at age 15 were already drinkers at that time and that the differences observed 3 years later were simply a continuance of this pattern. The fact that recall of alcohol advertising was related to decreased drinking among the young women further obscures the interpretation of this study.

A final survey study (Casswell and Zhang, 1998) investigated the relations among liking of alcohol advertising at age 18 and beer drinking and drinking-related aggression at age 21. The study used data from later waves of the previously described study (Connolly et al., 1994). The results indicated that liking alcohol advertising at age 18 was related to higher levels of beer consumption at age 21 and to alcohol-related aggression at that same age. The effects of liking of advertising on aggression were mediated through effects on drinking. Importantly, these effects were obtained even though drinking at age 18 was included as a predictor in the analyses. These findings are thus most consistent with the interpretation that alcohol advertising predisposes young people to drink, rather than drinking predispositions influencing attention to and affect toward alcohol advertising.

Preliminary analyses from other more recent studies (summarized in Martin et al., 2002) have replicated and extended these findings. Thus, one of these studies found that young people with more positive affective responses to alcohol advertising held more favorable drinking expectancies, perceived greater social approval for drinking, believed drinking was more common among peers and adults, intended to drink more as adults, and drank with higher frequency and in greater quantities. Interestingly, the effects of affective response to alcohol advertising on drinking behavior and intentions appear to be largely mediated through expectancies and normative beliefs. That is, a major consequence of alcohol advertising may be to increase young people's beliefs about the likelihood of positive consequences of drinking and the normativeness of drinking. In a second of these recent studies, exposure to alcohol advertising was found to be related to increases in drinking over time. The converse, that drinking would affect exposure to alcohol advertising, was not supported.

In sum, survey studies generally find significant associations between reported exposure to, attention to, and recall of alcohol advertising, on the one hand, and drinking beliefs and behaviors, on the other. These relationships, however, tend to be modest for the most part. Moreover, a number

of these studies have used small and nonrepresentative samples, raising questions about generalizability. In addition, because of the cross-sectional designs of most of these studies and the failure to control for previous drinking in one of the longitudinal studies, it is difficult to make statements about causality. The emerging studies (Martin et al., 2002) are suggestive of advertising effects and may provide a more definitive answer once more complete analyses become available.

SUMMARY

Alcohol portrayals are relatively common on television, in film, and in music and music videos. These portrayals are largely positive or neutral, often associating drinking with positive consequences or desirable attributes. Negative consequences of drinking are rarely portrayed. Only a few studies have investigated the effects of exposure to alcohol portrayals in popular media. Generally, the findings from these studies are mixed and inconclusive.

Overall, the research on the effects of alcohol advertising also presents mixed and inconclusive findings. With some notable exceptions (e.g., Saffer, 1997), experimental and ecological studies have produced little or no evidence that alcohol advertising affects drinking beliefs, behaviors, or problems among young people. In contrast to experimental and ecological studies, however, survey research studies on alcohol advertising and young people consistently indicate that there are small, but significant, correlations between awareness of and affect toward alcohol advertising and drinking beliefs and behaviors among young people. Children and adolescents who are more aware of and favorably disposed to alcohol advertisements hold more favorable beliefs about drinking, intend to drink more frequently as adults, and drink more frequently and in larger quantities than do other young people. Taken as a whole, the survey studies provide some evidence that alcohol advertising *may* influence drinking beliefs and behaviors among some children and adolescents.

A growing body of research is confirming and extending these findings (cf. Martin et al., 2002). This evidence, however, is far from conclusive. Because of the cross-sectional design of most of the published studies, causal inferences are difficult. Alcohol advertising may predispose young people to drink or the opposite may be true instead. That is, young people who are favorable toward drinking may seek out information about alcohol and thus be more attentive to alcohol advertisements.

Although studies using longitudinal data and nonrecursive modeling techniques suggest that responses to advertising affect many drinking behaviors, further research is needed. Longitudinal studies that follow the

samples of young people from childhood to late adolescence and that adequately control for past drinking behaviors and predisposition would be particularly useful.

REFERENCES

Abramson, H. (1992). Booze makers buy into racial/ethnic communities. *Marin Institute for the Prevention of Alcohol and Other Drug Problems*, *4*(Winter), 1-12.

Adlaf, E.M., and Kohn, P.M. (1989). Alcohol advertising, consumption and abuse: A covariance-structural modeling look at Strickland's data. *British Journal of Addiction*, *84*, 749-757.

Aitken, P.P., Eadie, D., Leathar, D., McNeill, R.E.J., and Scott, A. (1988). Television advertisements for alcoholic drinks do reinforce under-age drinking. *British Journal of Addiction*, *83*, 1399-1419.

Alaniz, M.L., and Wilkes, C. (1995). Reinterpreting Latino culture in the commodity form: The case of alcohol advertising in the Mexican-American community. *Hispanic Journal of Behavioral Sciences*, *17*, 430-451.

American Academy of Pediatrics. (1996). Impact of music lyrics and music videos on children and youth. *Pediatrics*, *98*, 1219-1221.

Atkin, C.K. (1993). Effects of media alcohol messages on adolescent audiences. *Adolescent Medicine: State of the Art Reviews*, *4*, 527-542.

Atkin, C.K. (1995). Survey and experimental research on effects of alcohol advertising. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 39-68). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Atkin, C.K., and Block, M. (1981). *Content and effects of alcohol advertising* (Report No. PB-82-123142). Washington, DC: Bureau of Tobacco, Alcohol, and Firearms.

Atkin, C.K., and Block, M. (1983). Effectiveness of celebrity endorsers. *Journal of Advertising Research*, *23*, 57-61.

Atkin, C.K., Hocking, J., and Block, M. (1984). Teenage drinking: Does advertising make a difference? *Journal of Communication*, *28*, 71-80.

Atkin, C.K., Neuendorf, K., and McDermott, S. (1983). The role of alcohol advertising in excessive and hazardous drinking. *Journal of Drug Education*, *13*, 313-325.

Austin, E.W., and Knaus, C. (2001). Predicting the potential for risky behavior among those "too young" to drink as a result of appealing advertising. *Journal of Health Communication*, *5*, 13-27.

Austin, E.W., and Meili, H.K. (1994). Effects of interpretations of televised alcohol portrayals on children's alcohol beliefs. *Journal of Broadcasting and Electronic Media*, *38*, 417-435.

Austin, E.W., and Nach-Ferguson, B. (1995). Sources and influences of young school-age children's general and brand-specific knowledge about alcohol. *Health Communication*, *7*, 1-20.

Bahk, C.M. (2001). Perceived realism and role attractiveness in movie portrayals of alcohol drinking. *American Journal of Health Behavior*, *25*, 433-446.

Calfee, J.E., and Scheraga, C. (1994). The influence of alcohol advertising on alcohol consumption: A literature review and an econometric analysis of four European nations. *International Journal of Advertising*, *13*, 287-310.

Casswell, S., and Zhang, J.F. (1998). Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: A longitudinal study. *Addiction*, *93*, 1209-1217.

Center for Science in the Public Interest. (1992). *Mad at the ads! A citizens' guide to challenging alcohol advertising practices*. Washington, DC: Author.

Center for Science in the Public Interest. (2002). *Alcohol advertising expenditures, 2001*. Available: http://www.cspinet.org/booze/fctindex.htm [April 21, 2003].

Center on Alcohol Marketing and Youth. (2000a). *Overexposed: Youth as a target of advertising in magazines*. Washington, DC: Author.

Center on Alcohol Marketing and Youth. (2000b). *Television: Alcohol's vast adland*. Washington, DC: Author.

Center on Alcohol Marketing and Youth. (2003). *Radio daze: Alcohol ads tune in underage youth*. Washington, DC: Author.

Chalfant, H.P., and Beckley, R E. (1977). Beguiling and betraying: The image of alcohol use in country music. *Journal of Studies on Alcohol*, *38*, 1428-1433.

Chen, M.J., and Grube, J.W. (2001, June). *TV beer and soft drink advertising: What young people like and what effects*. Paper presented at the annual meeting of the Research Society on Alcoholism, Montreal, Quebec, Canada.

Christensen, P.G., Henriksen, L., and Roberts, D.F. (2000). *Substance use in popular primetime television*. Washington, DC: Office of National Drug Control Policy.

Connolly, G.M., Casswell, S., Zhang, J.F., and Silva, P.A. (1994). Alcohol in the mass media and drinking by adolescents: A longitudinal study. *Addiction*, *89*, 1255-1263.

Connors, G.J., and Alpher, V.S. (1989). Alcohol themes within country-western songs. *International Journal of the Addictions*, *24*, 445-451.

Coulson, N.E., Moran, J.R., and Nelson, J.P. (2001). The long-run demand for alcoholic beverages and the advertising debate: A cointegration analysis. *Advertising and Differentiated Products*, *10*, 31-54.

Covell, K., Dion, K.L., and Dion, K.K. (1994). Gender differences in evaluations of tobacco and alcohol advertisements. *Canadian Journal of Behavioural Science*, *26*, 404-420.

Duffy, M. (1995). Advertising in demand systems for alcoholic drinks and tobacco: A comparative study. *Journal of Policy Modeling*, *17*, 557-577.

Duffy, M. (2001). Advertising in consumer allocation models: Choice of functional form. *Applied Economics*, *33*, 437-456.

DuRant, R.H., Rome, E.S., Rich, M., Allred, E., Emans, S.J., and Woods, E.R. (1997). Tobacco and alcohol use behaviors portrayed in music videos: A content analysis. *American Journal of Public Health*, *87*, 1131-1135.

Everett, S.A., Schnuth, R.L., and Tribble, J.L. (1998). Tobacco and alcohol use in top-grossing American films. *Journal of Community Health*, *23*, 317-324.

Fisher, J.C. (1993). *Advertising, alcohol consumption, and abuse: A worldwide survey*. Westport, CT: Greenwood Press.

Fisher, J.C., and Cook, P.A. (1995). *Advertising, alcohol consumption, and mortality: An empirical investigation*. Westport, CT: Greenwood Press.

Gerbner, G. (1995). Alcohol in American culture. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 3-29). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Gius, M.P. (1996). Using panel data to determine the effect of advertising on brand-level distilled spirits sales. *Journal of Studies on Alcohol*, *57*, 73-76.

Goel, R.K., and Morey, M.J. (1995). The interdependence of cigarette and liquor demand. *Southern Economic Journal*, *62*, 451-459.

Grube, J.W. (1993). Alcohol portrayals and alcohol advertising on television. *Alcohol Health and Research World*, *17*(1), 61-66.

Grube, J.W. (1995). Television alcohol portrayals, alcohol advertising, and alcohol expectancies among children and adolescents. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 105-121). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Grube, J.W., and Wallack, L. (1994). Television beer advertising and drinking knowledge, beliefs, and intentions among schoolchildren. *American Journal of Public Health*, *84*, 254-259.

Hacker, G.A., and Stuart, L.A. (1995). *Double dip: The simultaneous decline of alcohol advertising and alcohol problems in the United States*. Washington, DC: Center for Science in the Public Interest.

Herd, D. (1993). Contesting culture: Alcohol-related identity movements in contemporary African-American communities. *Contemporary Drug Problems*, *20*, 739-758.

Hill, L., and Casswell, S. (2001). Alcohol advertising and sponsorship: Commercial freedom or control in the public interest? In N. Heathers, T.J. Peters, and T. Stockwell (Eds.), *International handbook of alcohol dependence and problems* (pp. 823-846). New York: John Wiley.

Hundley, H.L. (1995). The naturalization of beer in *Cheers*. *Journal of Broadcast and Electronic Media*, *39*, 350-359.

Kelly, K.J., and Edwards, R.W. (1998). Image advertisements for alcohol products: Is their appeal associated with adolescents' intention to drink? *Adolescence*, *33*, 47-59.

Kelly, K.J., Slater, M.D., and Karan, D. (2002). Image advertisements' influence on adolescents' perceptions of the desirability of beer and cigarettes. *Journal of Public Policy and Marketing*, *21*(2), 295-304.

Klein, J.D., Brown, J.D., Childers, K.W., Oliveri, J., Porter, C., and Dykers, C. (1993). Adolescents' risky behavior and media use. *Pediatrics*, *92*, 24-31.

Kohn, P., and Smart, R. (1987). The impact of television advertising on alcohol consumption: An experiment. *Journal of Studies on Alcohol*, *48*, 161-166.

Kohn, P., Smart, R., and Ogborne, A. (1984). Effects of two kinds of alcohol advertising on subsequent consumption. *Journal of Advertising*, *13*, 34-48.

Kotch, J.B., Coulter, M.L., and Lipsitz, A. (1986). Does televised drinking influence children's attitudes toward alcohol? *Addictive Behaviors*, *11*, 67-70.

Kulick, A.D., and Rosenberg, H. (2001). Influence of positive and negative film portrayals of drinking on adolescents' alcohol outcome expectancies. *Journal of Applied Social Psychology*, *31*, 1492-1499.

Larivière, É., Larue, B., and Chalfant, J. (2000). Modeling the demand for alcoholic beverages and advertising specifications. *Agricultural Economics*, *22*(2), 147-162.

Lastovicka, J.L. (1995). A methodological interpretation of experimental and survey research evidence concerning alcohol advertising effects. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 69-81). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Lipsitz, A., Brake, G., Vincent, E.J., and Winters, M. (1993). Another round for the brewers: Television ads and children's alcohol expectancies. *Journal of Applied Social Psychology*, *23*, 439-450.

Long, J.A., O'Connor, P.G., Gerbner, G., and Concato, J. (2002). Use of alcohol, illicit drugs, and tobacco among characters on prime-time television. *Substance Abuse*, *23*, 95-103.

Makowsky, C.R., and Whitehead, P.C. (1991). Advertising and alcohol sales: A legal impact study. *Journal of Studies on Alcohol*, *52*, 555-567.

Martin, S.E., Snyder, L., Hamilton, M., Fleming Milici, F., Slater, M., Stacy, A., Chen, M.J., and Grube, J.W. (2002). Alcohol advertising and youth. *Alcoholism: Clinical and Experimental Research*, *26*, 900-906.

Mathios, A., Avery, R., Bisogni, C., and Shanahan, J. (1998). Alcohol portrayal on prime-time television: Manifest and latent messages. *Journal of Studies on Alcohol*, *59*, 305-310.

Mosher, J.F. (1994). Alcohol advertising and public health: An urgent call for action. *American Journal of Public Health*, *84*, 180-181.

Nelson, J.P. (1999). Broadcast advertising in the U.S. and demand for alcoholic beverages. *Southern Economic Journal*, *66*, 774-790.

Nelson, J.P. (2001). Alcohol advertising and advertising bans: A survey of research methods, results, and policy implications. *Advertising and Differentiated Products*, *10*, 239-295.

Nelson, J.P., and Moran, J.R. (1995). Advertising and U.S. alcoholic beverage demand: System-wide estimates. *Applied Economics*, *27*, 1225-1236.

Nelson, J.P., and Young, D.J. (2001). Do advertising bans work? An international comparison. *International Journal of Advertising*, *20*, 273-296.

Neuendorf, K.A. (1985). Alcohol advertising and media portrayals. *Journal of the Institute of Socioeconomic Studies*, *10*, 67-78.

Ornstein, S.I., and Hanssens, D.M. (1985). Alcohol control laws and the consumption of distilled beer and spirits. *Journal of Consumer Research*, *12*, 200-212.

Pinkleton, B.E., Austin, E.W., and Fujioka, Y. (2001). The relationship of perceived beer ad and PSA quality to high school students' alcohol-related beliefs and behaviors. *Journal of Broadcasting and Electronic Media*, *45*, 575-597.

Postman, N., Nystrom, C., Strate, L., and Weingartner, C. (1988). *Myths, men and beer: An analysis of beer commercials on broadcast television, 1987*. Falls Church, VA: AAA Foundation for Traffic Safety.

Roberts, D.F., Foehr, U.G., Rideout, V.J., and Brodie, M. (1999a). *Kids and media @ the new millennium*. Palo Alto, CA: Kaiser Family Foundation.

Roberts, D.F., Henriksen, L., and Christensen, P.G. (1999b). *Substance use in popular movies and music*. Washington, DC: Office of National Drug Control Policy.

Robinson, T.N., Chen, H.L., and Killen, J.D. (1998). Television and music video exposure and risk of adolescent alcohol use. *Pediatrics*, *102*, e54.

Rychtarik, R.G., Fairbank, J.A., Allen, C.M., Foy, D.W., and Drabman, R.S. (1983). Alcohol use in television programming: Effects on children's behavior. *Addictive Behaviors*, *8*, 19-22.

Saffer, H. (1991). Alcohol advertising bans and alcohol abuse: An international perspective. *Journal of Health Economics*, *10*, 65-79.

Saffer, H. (1993a). Advertising under the influence. In M.E. Hilton and G. Bloss (Eds.), *Economics and the prevention of alcohol-related problems* (pp. 125-140). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Saffer, H. (1993b). Alcohol advertising bans and alcohol abuse: Reply. *Journal of Health Economics*, *12*, 229-234.

Saffer, H. (1995). Alcohol advertising and alcohol consumption: Econometric studies. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 83-99). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Saffer, H. (1996). Studying the effects of alcohol advertising on consumption. *Alcohol Health and Research World*, *20*, 266-272.

Saffer, H. (1997). Alcohol advertising and motor vehicle fatalities. *Review of Economics and Statistics*, *79*, 431-442.

Saffer, H. (1998). Economic issues in cigarette and alcohol advertising. *Journal of Drug Issues*, *28*, 781-793.

Saffer, H., and Dave, D. (2002). Alcohol consumption and alcohol advertising bans. *Applied Economics*, *34*(11), 1325-1334.

Scott, B.M., Denniston, R.W., and Magruder, K.M. (1992). Alcohol advertising in the African-American community. *Journal of Drug Issues*, *22*, 455-469.

Slater, M., Rouner, D., Domenech-Rodriquez, M., Beauvais, F., Murphy, K., and Van Leuven, J.K. (1997). Adolescent responses to TV beer ads and sports content/context: Gender and ethnic differences. *Journalism and Mass Communication Quarterly*, *74*, 108-122.

Slater, M., Rouner, D., Murphy, K., Beauvais, F., Van Leuven, J.K., and Domenech-Rodriquez, M. (1996). Adolescent male reactions to TV beer ads: The effects of sports content and programming context. *Journal of Studies on Alcohol*, *57*, 425-433.

Snyder, L.B., Fleming-Milici, F., Mitchell, E.W., and Proctor, D.C.B. (2000). Media, product differences and seasonality in alcohol advertising in 1997. *Journal of Studies on Alcohol*, *61*, 896-906.

Sobell, L., Sobell, M., Riley, D., Klanjer, F., Leo, G., Pavan, D., and Cancilla, A. (1986). Effect of television programming and advertising on alcohol consumption in normal drinkers. *Journal of Studies on Alcohol*, *47*, 333-340.

Strasburger, V.C. (1993a). Adolescents, drugs, and the media. *Adolescent Medicine: State of the Art Reviews*, *4*, 391-415.

Strasburger, V.C. (1993b). Children, adolescents, and the media: Five critical issues. *Adolescent Medicine: State of the Art Reviews*, *4*, 479-493.

Stockdale, J.E. (2001). The role of the media. In E. Houghton and A.M. Roche (Eds.), *Learning about drinking* (pp. 209-242). Philadelphia: Brunner-Routledge.

Strickland, D.E. (1982). Alcohol advertising: Orientations and influence. *Journal of Advertising*, *1*, 307-319.

Strickland, D.E. (1983). Advertising exposure, alcohol consumption and misuse of alcohol. In M. Grant, M. Plant, and A. Williams (Eds.), *Economics and alcohol: Consumption and controls* (pp. 201-222). New York: Gardner Press.

Strickland, D.E., Finn, T.A., and Lambert, M.D. (1982). A content analysis of beverage alcohol advertising: Magazine advertising. *Journal of Studies on Alcohol*, *43*, 655-682.

Thompson, K.M., and Yokota, F. (2001). Depiction of alcohol, tobacco, and other substances in G-rated animated feature films. *Pediatrics*, *107*, 1369-1373.

Thorson, E. (1995). Studies of the effects of alcohol advertising: Two underexplored aspects. In S.E. Martin (Ed.), *The effects of the mass media on use and abuse of alcohol* (pp. 159-195). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Tremblay, V.J., and Okuyama K. (2001). Advertising restrictions, competition, and alcohol consumption. *Contemporary Economic Policy*, *19*, 313-321.

Tucker, L.A. (1985). Television's role regarding alcohol use among teenagers. *Adolescence*, *20*, 593-598.

Villani, S. (2001). Impact of media on children and adolescents: Ten year review of the research. *Journal of the American Academy of Child Adolescent Psychiatry*, *40*, 392-401.

Wallack, L., Grube, J.W., Madden, P.A., and Breed, W. (1990). Portrayals of alcohol on prime-time television. *Journal of Studies on Alcohol*, *51*, 428-437.

Woodruff, K. (1996). Alcohol advertising and violence against women: A media advocacy case study. *Health Education Quarterly*, *23*, 330-345.

Wyllie, A., Zhang, J.F., and Casswell, S. (1998a). Positive responses to televised beer advertisements associated with drinking and problems reported by 18 to 29-year-olds. *Addiction*, *93*, 749-760.

Wyllie, A., Zhang, J.F., and Casswell, S. (1998b). Responses to televised alcohol advertisements associated with drinking behavior of 10-17-year-olds. *Addiction*, *93*, 361-371.

Young, D.J. (1993). Alcohol advertising bans and alcohol abuse: Comment. *Journal of Health Economics*, *12*, 213-228.

12

Alcohol Advertising and Promotion

David Jernigan and James O'Hara

The supply of alcohol, including its production, marketing, and retail sale, can play a significant role in alcohol consumption and problems (Holder, 2000). In the United States, marketing is a crucial part of the alcohol supply chain. Alcohol companies spent at least $4 billion to advertise and promote their products to Americans in 2001. Of this amount, $1.57 billion was in the traditional measured media (television, radio, print, and outdoor) (Impact Databank, 2002b). According to the Federal Trade Commission (FTC) (1999), alcohol producers spend two to three times their measured media expenditures in unmeasured promotions such as sponsorships, Internet advertising, point-of-sale materials, product placement, items with brand logos, and other means. Growth in measured alcohol advertising has outstripped inflation by 20 percent since 1975 (Impact Databank, 2002a; Taylor Nelson Sofres, 2002; U.S. Department of Labor, 2002).

One effect of this marketing is to create high barriers to entry (Jain, 1994), which in turn contributes to the concentration of market share in the hands of a small number of companies. These companies face a market that, until recently, essentially had been declining or flat for most of the past two decades. To maintain their markets, alcohol companies must continue to invest heavily in advertising and promotion; to expand the market, they must encourage drinkers to switch brands or increase their consumption, or persuade nondrinkers to begin drinking. Young people are one audience for their efforts. Although the precise effects of this marketing on individuals are difficult to calibrate, it is increasingly ubiquitous, and ben-

efits from technologies that are at the cutting edge of information societies. The regulatory frameworks for alcohol marketing, in contrast, were developed in the first part of the previous century and have changed little in the interim.

This chapter will begin with a brief summary of the shape of and trends in the alcohol market in the United States, with particular attention to youth consumption. It will then describe the nature of and trends in alcohol marketing, particularly as these pertain to young people; the structure of the alcohol industry and key players in it; and the shape and effectiveness of regulatory and self-regulatory frameworks within which those players operate. The paper will conclude with a discussion of needs for further developments both in research and in public policies.

THE UNITED STATES ALCOHOL MARKET

In 2001, Americans paid more than $135 billion for alcoholic beverages (Impact Databank, 2002a). Per capita alcohol consumption among Americans peaked in 1980. It is now 16 percent lower than it was in 1980 (see Figure 12-1), although it has begun to increase again in recent years.

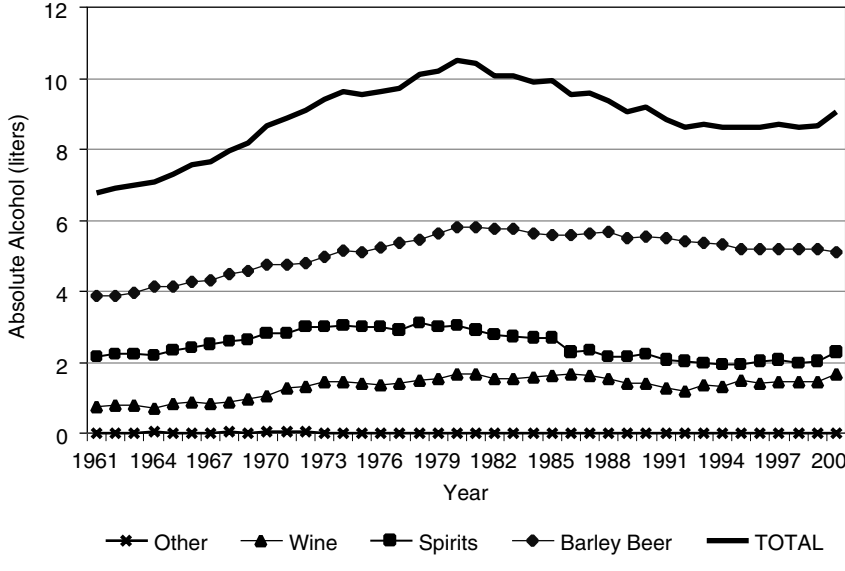

FIGURE 12-1 Adult (15+) per capita alcohol consumption in the United States, 1961-2000.
SOURCE: World Health Organization, 2002.

Per capita consumption of alcohol has also fallen relative to other consumer beverages: from 21 percent of the total in 1980 to 15 percent in 1997 (Putnam and Allshouse, 1999).

According to the National Household Survey, fewer than half of Americans age 12 or older are current drinkers (had a drink in the past 30 days), and fewer than 5.7 percent drink heavily (five or more drinks on an occasion on at least five different days in the past month) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2002). Of United States drinkers, the heaviest drinking 5 percent (those who average 4.2 drinks or more per day over the course of a year) consume 42 percent of the alcohol (Greenfield and Rogers, 1999), while the top 15 percent drinks 73 percent of the alcohol. More than half of all alcoholic beverages in the United States (and 76 percent of beer) are consumed at high-risk levels, that is, when drinkers had five or more drinks on a single occasion (Rogers and Greenfield, 1999).

Consumption among young people is even more concentrated in a small group of heavy users. Young people (under age 21) account for an estimated 12 percent of the total market (U.S. Department of Justice, 2002), and the majority of young people who drink report binge drinking[1] (SAMHSA, 2002). These binge drinkers consume the vast majority of the alcohol drunk by young people: 92 percent for 12- to 14-year-olds, and 96 percent for 15- to 17-year-olds and 18- to 20-year-olds (U.S. Department of Justice, 2002).

The number of new teenage drinkers appears to be increasing. According to the National Household Survey on Drug Abuse (NHSDA), between 1995 and 1999 (the latest year for which data are available), the total number of people who began drinking alcohol increased significantly from 3.5 million to 5 million. The majority of those initiates were teens: between 1995 and 2000, the number of persons aged 12 to 17 who started drinking alcohol grew from 2.2 million to 3.1 million. At the same time, the average age of initiation of alcohol use has generally decreased since 1965 (National Institute on Drug Abuse, 2002).

Growing the Alcohol Market: "Total Marketing"

In modern alcohol markets, the advertising and promotion of alcohol are central to the product itself. Whereas in earlier eras, alcohol may have been marketed based on the quality, purity, and price of the product, now the identity of the brand is paramount (Jernigan, 2001). As the Chief Ex-

[1]Defined as five or more drinks on a single occasion at least once in the past 30 days.

ecutive Office of a leading Asian brewer remarked, "A beer is a beer is a beer . . . so therefore it is all about brands . . . We are not selling beer, we are selling image" (quoted in Jernigan, 1997:9).

Marketing is what creates brands and brand images. In the past 20 years, viewing alcohol marketing as confined to advertising has become more inaccurate. A total marketing strategy has five steps: product development, pricing, market segmentation and targeting, advertising and promotion campaigns, and physical availability (Cowan and Mosher, 1985). Pricing the product so that it is affordable to the target consumer and making it available wherever those consumers may be are important parts of the marketing mix that are beyond the scope of this chapter. Following a brief discussion of market segmentation and targeting, this chapter will focus on the areas of new product development and advertising and promotion.

Market segmentation and target marketing are standard business practices that assist in expanding the number of consumers in the population (Kotler, 1992). The NHSDA shows that nonwhites drink less than whites (National Institute on Drug Abuse, 2002). Nonwhites and other lower consuming groups are thus particularly important to the growth of the market (Scott et al., 1992). Notably, recent research suggests that alcohol availability and advertising, particularly billboard and point-of-purchase advertising, are becoming significantly more prevalent in African-American and Latino communities (Altman et al., 1991; Alaniz, 1998; Alaniz and Wilkes, 1998). Women are also a critical area for market growth because prevalence of alcohol use is lower among women for all groups except 12- to 17-year-olds, and heavy use is more common in all age groups among males. Finally, evidence shows that young people are also a target audience for the marketers. This will be discussed in greater detail.

Product Development

New product development has been a particularly active area in recent years. Alcohol producers have pursued product differentiation through variations such as ice beer and dry beer, line extensions such as flavored vodkas, creation of new categories such as "malternatives" (to be discussed), and expansion of existing categories, such as premixed drinks. Of particular interest to the prevention of youth alcohol problems have been several categories with apparent (and some demonstrated) appeal to youth.

Following their introduction to Australia and the United Kingdom in 1994 and 1995, alcoholic lemonades, or "alcopops," made their debut in the United States and were followed by the so-called "malternatives," malt-based products with spirits brand names. Like the wine cooler craze of the 1980s, sales of malternatives at least initially took off rapidly: a national survey of retail sales during a 12-week period in the spring of 2001 esti-

mated sales at $129 million, a 90 percent increase over the same period a year earlier (Nielsen, 2002).

Wine coolers, alcopops, and malternatives share certain product attributes, resembling soft drinks in their fruity, sweet flavoring and their colorful single-serving sized packaging. According to Monitoring the Future, the federal government's annual survey of drinking and drug use in a sample of 50,000 students across the country, wine coolers are the only alcoholic beverage category more popular with girls than boys (Flewelling et al., 2002). Their bright colors, cartoon spokes-characters, and confusing labels have drawn criticism from others in the industry and from government regulators for having youth appeal and for being misleading to consumers (Blackwell, 1996; Bureau of Alcohol Tobacco and Firearms, 2002). Their sweet flavorings may also be particularly suited to convincing nondrinkers to drink. Since the late 1980s, a substantial body of studies on rats has found that the use of sweeteners can affect rates of initiation of alcohol use. Sweeteners have been used in laboratory experiments to induce alcohol initiation in rat strains bred both to prefer and not to prefer alcohol (see, e.g., Samson, 1986; Tolliver et al., 1988; Samson et al., 1989).

Epidemiological research on underage drinking in the United States has not, for the most part, broken out these drinks as a separate category. Monitoring the Future asks about wine cooler consumption, but only in a subsample of high school seniors. The PRIDE survey also asks about wine cooler consumption by students in grades 6 through 12. PRIDE's findings show that both annual and monthly prevalence of cooler consumption fell slightly in 2001 relative to prior years. Annual prevalence figures range from 33.8 percent for eighth graders to 53.6 percent for twelfth graders. Ten percent of eighth graders and 24 percent of twelfth graders reported drinking coolers monthly (Parents' Resource Institute for Drug Education [PRIDE], 2002). However, given the confusion in the marketplace because of new product introductions—such as malternatives, alcopops, ready-to-drink mixed distilled spirits drinks such as "Kahlua Mudslide Cocktail," and so on—it is unclear at this point what the "wine cooler" category is measuring.

The only data available on alcopop consumption is anecdotal, from a national poll conducted in the United States in the spring of 2001. The poll found teens and adults in agreement that alcopops were more popular among teens than adults. According to self-reports, teens were three times as likely to be aware of alcopops and nearly twice as likely to have tried them (Center for Science in the Public Interest, 2001).

Research from other western countries may shed some light on the impact of these products on youthful alcohol consumption. Research done on a sample of 1,078 Canadian teens between the ages of 12 and 18 in 1989, during the heyday of wine coolers, found that wine coolers were the

alcoholic beverage of choice in general and for initiation into alcohol use for all teens and more markedly so in the case of the younger teens (Goldberg et al., 1994).

Alcopops were introduced into the United Kingdom in 1995. The Welsh Youth Survey, developed in collaboration with the World Health Organization-sponsored Health Behavior in School-aged Children study, was conducted every other year from 1988 to 1996. The Welsh survey added questions about alcopops consumption to its 1996 questionnaire. Results showed that 17 percent of 11- to 16-year-olds in Wales in 1996 drank alcopops at least weekly. Many of these appeared to be new drinkers. Researchers found that alcopops consumption matched the entire increase in weekly drinking of alcohol between 1994 and 1996 among 11- and 12-year-olds, half the increase for 13- and 14-year-olds, and most of the increase for 15- and 16-year-old girls (Roberts et al., 1999).

Swedish surveys have found that alcopops and sweet ciders accounted for more than half the recorded increase in alcohol consumption among 15- and 16-year-old boys between 1996 and 1999, and two-thirds of the increase in consumption among girls, at a time when alcohol consumption among Swedish adults remained stable while youth consumption was increasing (Romanus, 2000).

Alcopops and malternatives tend to have an alcohol content of approximately 5 percent, as opposed to 4.5 percent or slightly less for most popular beers. According to Scottish researchers, this increased alcohol content in sweet, colorful drinks targeted at young drinkers is attributable to a change in alcohol marketers' view of their market: " . . . drinks manufacturers no longer think of themselves as in the alcohol business, but the mood-altering substance business" in competition with the illicit drugs popular in the youth clubbing scene (Jackson et al., 2000:S599).

Advertising and Promotion

In 1985 August Busch III, now Chairman of the Board and President of the Anheuser-Busch Companies, described the marketing strategy of what has become the world's largest brewer: "Advertising is joined by sales promotion, merchandising, field sales, sales training, and sports programming, enabling us to market not only on a national plane, but also at the grass-roots level" (McBride and Mosher, 1985:143). The ability of the industry to market at the grass-roots level has increased in recent years through the use of technologies such as the Internet; the adoption of racial, ethnic, and other holidays and celebrations, such as Cinco de Mayo and Halloween, as alcohol marketing opportunities (Alaniz and Wilkes, 1998); and the expansion of sponsorship from sporting events to popular music

concerts to events in which alcohol is often a central part of the activities such as the recent "Mardi Gras" celebrations put on by Diageo in Seattle and Philadelphia.

This growth in the importance of nonmeasured marketing expenditures and activities is in keeping with a trend among consumer product producers in the United States in general. Corporations as diverse as Nike, Kraft, and Intel have demonstrated to the business world the value of brands, as opposed to manufacturing facilities or processes or other hard assets. According to the 1998 United Nations Human Development Report, global advertising spending is now outpacing the growth of the world economy by a third (Klein, 1999). Among U.S. brand names, the ratio spent on direct advertising as opposed to other promotional activities flipped between the years 1983 and 1993. By the latter year, only 25 percent of total spending went to direct advertising, while 75 percent went to other promotional activities, such as sponsorships, product tie-ins and placements, contests and sweepstakes, and special promotions. The FTC (1999) estimate that the costs of non-measured alcohol marketing activities are two to three times the costs of measured expenses suggests that alcohol companies are not an exception to this trend.

These kinds of marketing practices have the potential to embed brands in the lives and lifestyles of consumers, creating an intimate relationship and sense of kinship between the brand and the user, to the point that " . . . the brand becomes an extension or an integral part of the self" (Aaker, 1996:156). Alcohol marketers themselves speak in the language of intimacy and relationships when they describe what they are doing. Diageo's director of global commercial strategy, Ivan Menezes, described the company's approach to marketing Johnnie Walker whisky:

> We've got to own the emotional heartland of the category and connect with the consumer in a way that goes beyond the rational aspects of the brand . . . The emotional high ground we believe Johnnie Walker [whisky] can hold surrounds the area of inspiring personal progress. That whole area carries a set of values that works extremely well across borders (quoted in Fleming and Zwiebach, 1999:18).

Thus it is not a whisky but a set of values that is being marketed. In Malaysia, this led to a Johnnie Walker-sponsored and branded campaign where consumers were asked to choose their favorite role model from among six major world figures. The list included Martin Luther King, Jr., Nelson Mandela, Mother Theresa, and, to the dismay of the local Indian community, the abstaining and temperance-advocating Mahatma Gandhi (Assunta, 2001).

This example illustrates the new form that marketing is increasingly taking. As described by Canadian journalist Naomi Klein (1999:21):

> The old paradigm had it that all marketing was selling a product. In the new model, however, the product always takes a back seat to the real product, the brand, and the selling of the brand acquires an extra component that can only be described as spiritual. Advertising is about hawking product. Branding, in its truest and most advanced incarnations, is about corporate transcendence . . . the products that will flourish in the future will be the ones present not as "commodities" but as concepts: The brand as experience, as lifestyle.

As described, these marketing techniques seek to create a unique experience that consumers identify with the product. For many products, including beer, this experience is also quintessentially a youth experience. Across products, the ubiquity of the global mass media has contributed to the emergence of a global mass youth culture, or rather, a set of youth subcultures. Seabrook (2000:163) describes the relationship of these subcultures to brands:

> The branding is done by combining a commercial trademark with one or another subcultural motif, a subculture the buyer belongs to or wants to join . . . The brand is the price of your admission to this subculture. The brand is neither quite marketing nor culture; it's like the catalyst, the filament of platinum that makes culture and marketing combine.

Successful youth brands not only attach themselves to the subculture, but as Seabrook indicates, position themselves to be among its defining features. Some of the newest alcohol products attach themselves to the all-night clubbing scene. Energy drinks, loaded with caffeine, help young people to stay awake through all-night activities such as clubbing. Premixed energy drinks were a natural successor to the common practice of mixing nonalcoholic energy drinks such as Red Bull with vodka or other distilled spirits. In 1998, a U.K. start-up company called GBL International introduced a premixed vodka and energy drink called "Vodka Kick." Now imported into the United States and Asia as well as the rest of Europe, the product comes in a range of fruity flavors and bright colors. The company's total revenue grew 154-fold between 1998 and 2001 (GBL International, 2002). Virgin, the firm that broke a longstanding self-imposed ban on broadcast advertising by spirits marketers in the United Kingdom, introduced two new "energy drinks," one alcoholic and one nonalcoholic, in that country in the spring of 2000. Months later, the makers of the hypercaffeinated Jolt Cola in the United States introduced another new category, alcoholic spring water. DNA Alcoholic Spring Water is dubbed the "pure water that's lost its innocence," and contains spring water, fruit flavors, and 5 percent alcohol (Food Management, 2000). Finally, the popularity of premixed cocktails such as the Kahlua drinks Mudslide and B-52 prompted Brown-Forman Beverages to introduce Jack Daniels Hard Cola in the summer of 2002, with a Web site that includes online games, music samples, and free downloads.

The marketing of these beverages provides a case study in embedding products in young people's lifestyles and daily practices. Although the alcoholic beverage industry is not the only industry to develop and employ such marketing strategies, some brewers have been early adopters of these strategies. For example the Internet has become an important channel for alcohol companies. Marketing beer to young people via the Internet made headlines in the United States in 1998, when a media watchdog group charged that 82 percent of beer industry sites were using marketing tactics attractive to youth, such as contests, games, slang, and cartoons (Center for Media Education, 1998). Internet sites seek out "sticky content," that is, activities that will keep users at the site for long periods of time and cause them to return frequently. Anheuser-Busch has also used "viral marketing" techniques on its site to encourage users to bring their friends to the site, including features that permit users to send e-mail and mobile phone text messages to friends using the "Whassup" phrase made popular in the company's television ads (Cooke et al., 2002). Little research has been done to date on the impact of such marketing on young people. However, according to *Marketing Week*, young people are the heaviest Internet users in developed countries (Buckley, 1998).

Paid placements of products in films, television, books, and video games is another way to embed alcoholic beverages in the daily lives of young people. Anheuser-Busch established its own placement firm in 1988, becoming the first company and the first brewery to do so. Anheuser-Busch products have appeared in films and on such television shows as Survivor. Heineken has been very active in this area in recent years, with paid placements in and merchandising tie-ins with Austin Powers and James Bond movies. Godzilla has promoted Kirin beer, with an accompanying sweepstakes offering 6-foot inflatable Godzillas. Carlsberg was prominently featured in the recent Spiderman film.

Identifying the product with popular music is also standard marketing practice. After an advertising agency survey found that the Budweiser frogs and lizards were the most popular out of 240 commercials ranked by children, including spots for McDonalds and Barbie, an *Advertising Age* editorial complained about a new CD compiled and released by Anheuser-Busch. Titled "Wrong Gig for Bud Ads," the editorial charged that the CD compilation of its controversial cartoon lizards' favorite hits from the 1960s, '70s and '80s was an instance of inappropriate marketing to young people (*Advertising Age*, 1999).

There is a two-decade history of beer and other alcohol sponsorships of rock concerts. Latino groups charged Bacardi with targeting young Latinas by using Gloria Estefan's comeback tour in the early 1990s as an opportunity to promote the Bacardi Breezer wine cooler (Jernigan and Wright, 1994). Miller and Molson's "Blind Date" concerts in North America have

paved new ground by featuring the Miller brand far more prominently than the bands involved. The concerts were held in clubs much smaller than the usual venues, and the identity of the band was kept a secret until patrons had already arrived. Thus the name people associated with the event was Miller rather than the performers'—as one concert promoter put it, "In a funny way the beer is bigger than the band" (Klein, 1999:48).

Spirits marketers are increasingly copying the techniques of the beer companies. This may be in part to counter falling consumption among their older consumers. One trade journal reported that the entire scotch category was bent on reinventing itself, targeting young people with pin-up girls, "cool" graphics, irreverence, and rock concert sponsorships (Furlotte, 2000). For example, Cutty Sark scotch whisky reversed its decline in U.S sales by taking on a new, beer-like theme: "Booze, Babes and Bands." Three rock-and-roll tours promoted the brand, while outlets offered free playing cards, t-shirts, and caps (Kane's Beverage Week, 2000), and the www.cuttysarkusa.com Web site offered sexually explicit downloadable movies of a Cutty Sark party at Mardi Gras. Smirnoff billboards took on beer directly as a competitor, through billboards depicting a Smirnoff vodka bottle lying on its side against a red background with the caption, "Beer doesn't mix well with cranberries."

While overall vodka sales were dropping, Skyy Vodka sales increased by 21 percent as the company focused on promotions and advertisements in hip clubs and in media outlets such as *Spin* magazine, with substantial overrepresentation of young people in its readership (Fulmer, 1999; Center on Alcohol Marketing and Youth, 2002). Courvoisier brandy spent $5 million to target young African Americans in the hip-hop culture, using event sponsorships, billboards, and print advertising (Stamler, 2000). The brand achieved double-digit sales increases when hip-hop stars Busta Rhymes and Sean ("P. Diddy") Combs released the single "Pass the Courvoisier." Although Rhymes and Combs did not receive compensation from Courvoisier for featuring the brand, their demonstration of the selling power of hip-hop prompted leading hip-hop label Island Def Jam records to purchase and take over the marketing of Armadale Vodka (Holloway, 2002).

THE UNITED STATES ALCOHOL INDUSTRY

Behind this marketing is a small group of companies. Looking at the overall market, in 2000 four companies sold more than half of the alcohol in the United States, measured in pure alcohol: Anheuser-Busch (28.4 percent), Miller Brewing (12.1 percent), Diageo (6.2 percent), and Coors Brewing (6.1 percent) (calculated from Impact Databank, 2001a,b; Impact Databank, 2002a,b). Breaking the figures out into the three principal mar-

ket sectors—beer, distilled spirits, and wine—the leading five companies in each sector account for more than half of U.S. sales in that sector. Table 12-1 shows the leading companies in each category.

There is considerable overlap in ownership, particularly in the wine and spirits segments. In addition to Constellation Brands, which ranks among the top five in both spirits and wine, Brown-Forman Beverages Worldwide (the sixth largest distiller), UDV/Diageo, Allied-Domecq, and Bacardi-Martini all have substantial interests in both segments. The advent of the "malternatives" category has brought about new collaboration among spirits and beer companies: Miller produces malternatives with Allied-Domecq and Gruppo Campari brand names, while Anheuser-Busch makes Bacardi Silver for the eponymous spirits maker.

TABLE 12-1 Leading U.S. Alcohol Marketers

Company	% Share of Market[a]
Beer	
Anheuser-Busch, Inc.	49.7
Miller Brewing Co. (Philip Morris)[b]	19.9
Coors Brewing Co.	10.4
Pabst Brewing Co.	4.4
Heineken USA, Inc.	2.4
Total top five	86.8
Distilled Spirits	
Guinness-UDV (Diageo)	21.5
Future Brands LLC[c]	13.2
Constellation Brands, Inc.	10.0
Bacardi-Martini USA, Inc.	7.7
Allied-Domecq Spirits, USA	6.6
Total top five	59.0
Wine	
E. & J. Gallo Winery	22.3
Constellation Brands, Inc.	14.9
The Wine Group	12.0
Robert Mondavi Winery	3.6
Trinchero Family Estates	3.5
Total top five	56.3

[a]2001 figures for beer; 2000 figures for distilled spirits and wine.
[b]Majority sold to South African Breweries in 2002; Philip Morris retains 20 percent interest.
[c]Joint venture between Jim Beam Brands and Vin and Sprit to market both companies' brands in the United States.
SOURCES: Impact Databank (2001a); Impact Databank (2001b); Impact Databank (2002a).

The remainder of the industry is less concentrated and is required by law to be independent of the alcohol producers. In the pre-Prohibition era, the saloon was seen as a center of excessive drinking, political patronage, and working-class organization and social life (Aaron and Musto, 1981; Levine, 1983). After the repeal of Prohibition, the federal government sought to undercut the saloon's social and economic role by banning vertical integration in the alcohol industry. "Tied-house" laws introduced in 1933 mandated three independent tiers in the alcohol industry: producers, wholesalers and distributors, and retailers. Companies in one tier are forbidden to hold interests in either of the other tiers.

However, some alcohol producers have recently moved to enhance loyalty in the wholesaling sector. Anheuser-Busch has mandated that its distributors may only carry its products. Because the company sells nearly a third of the alcohol in the United States, this mandate created a national distribution network that, although made up of independent operators, is closely aligned with a single company. The company has generated controversy and legal action in Florida for placing control of its distributorships in the hands of relatives, former executives, and family friends (Associated Press, 2001; Barnett, 2001). Diageo and its venture partner Moët Hennessy, meanwhile, contributed to the concentration of spirits distribution in fewer hands by awarding exclusive distribution rights for their spirits brands to a single distributor per state in five key states, and announced plans to do the same elsewhere (Press Diageo plc, 2002).

Regarding the retail level, following the repeal of Prohibition the framers of alcohol legislation took as a high priority the removal of profit from alcohol sales (Levine, 1983). Upon repeal, states were offered two choices for alcohol control regimes: a monopoly system, based on the Nordic model in which states fulfilled the functions of wholesaling and/or retailing alcohol; or a license system, modeled on the British system of licensing private businesses to distribute and sell alcohol. Eighteen states elected some form of monopoly. These states vary in the level at which they exert monopoly control, from wholesale to retail. They also vary in how they treat the various beverages, such as exercising monopoly control over distilled spirits, or over spirits and sales of liquor by the drink, or over all beverages above a certain level of alcohol content, regardless of beverage type. Those states that elected to adopt licensing systems usually began with limits on the number, placement, and hours of sale permitted to alcohol retailers. In addition, some states gave jurisdictions at the county level (and in some cases, at the precinct level) the option of remaining dry. However, over time, the general trend in the physical availability of alcohol at the retail level has been toward fewer restrictions and greater and more widespread availability (Moore and Gerstein, 1981).

THE REGULATORY AND SELF-REGULATORY ENVIRONMENT

Alcohol companies conduct their marketing activities within the context of a complex array of standards, including federal and state regulations as well as voluntary codes of good practice promulgated by trade associations, broadcasters and the companies themselves. This section will review the principal features of that array, drawing in particular on federal government studies of the regulatory framework and its effectiveness. Finally, the standards will be viewed from the perspective of recent empirical research on youth exposure to alcohol marketing.

1991 DHHS OIG Review

In 1991, in response to a request from then, Surgeon General Antonia Novella, the Office of the Inspector General (OIG) of the U.S. Department of Health and Human Services (DHHS) issued a report reviewing federal and state laws and regulations regarding alcohol industry advertising and marketing standards and practices (Office of Inspector General, 1991). Because this regulatory system has changed little since 1991, the OIG's findings remain relevant. In addition to reviewing the government's role, the OIG also surveyed the voluntary codes of the alcohol industry and television networks.

The main findings of the OIG review were as follows:

- Federal jurisdiction was "fragmented" and lacked specific prohibitions against advertising appealing to youth, and the enforcement authority of the Bureau of Alcohol, Tobacco and Firearms (BATF) was "limited."
- State regulatory power was limited, and states had "difficulty" passing legislation in this area.
- Alcohol industry standards were "unenforceable" and did "not effectively restrict" advertising appealing to youth.
- Network standards had little effect because they were "based on negotiation with advertisers" (Office of Inspector General, 1991:ii)

Federal regulation. The OIG inspection found federal jurisdiction split among three principal agencies: BATF, housed in the Treasury Department; the U.S. Food and Drug Administration (FDA), part of DHHS; and the Federal Trade Commission, an independent regulatory agency. For wines with 7 percent or more alcohol, distilled spirits, and malt beverages to a degree, BATF has primary authority over advertising and labeling. For wines with less than 7 percent alcohol content, the FDA has jurisdiction over labeling. The FTC has broad powers to prohibit "deceptive and unfair advertising" and, while it has concurrent jurisdiction with BATF, it "generally defers to BATF's decisions" (Office of Inspector General, 1991:6). The

end result of this jurisdictional splintering was "confusion," in the opinion of the OIG (Office of Inspector General, 1991:7).

For all three federal agencies, the OIG found that regulatory authority was aimed at ensuring "that consumers receive truthful and accurate information about products" (Office of Inspector General, 1991:7). No federal regulations specifically prohibit alcohol advertisements appealing to youth—any protections that accrue to this arena arise out of BATF's mandate to prevent deceptive, unfair, or misleading advertising.

A major limitation for BATF in enforcing its alcohol advertising regulations stemmed from its underlying statute, the Federal Alcohol Administration Act. Specifically, the OIG pointed to the statute's failure to require brewers to have BATF permits. As a result, BATF cannot use administrative sanctions against brewers and has to "resort to criminal prosecution" (Office of Inspector General, 1991:8). As examples of the limitations on BATF, the OIG pointed to an enforcement action against Coors that took 2 years, and to BATF's inability to act against an ad for St. Ides malt liquor in the state of California.

State regulation. In the course of its work, the OIG staff interviewed state Alcoholic Beverage Commissions (ABCs) across the country and found that 17 states believed they had regulations that prohibited advertising that appeals to youth. However, they also reported that state officials faced many hurdles either in enforcing existing rules or in seeking new authority. The OIG cited as the main obstacles to effective state action lobbying by the alcohol industry, disagreements within state ABCs, narrow or vague wording in state regulations, and the cumbersome nature of state regulatory processes.

Alcohol industry standards. The OIG reviewed the voluntary codes then in effect under the auspices of the Beer Institute, the Wine Institute, the Distilled Spirits Council of the United States (DISCUS), and an alcohol industry umbrella group, the Century Council. In particular, the review looked at the elements of the voluntary codes that were related to "youth appeal" (Office of Inspector General, 1991:13). The OIG concluded: "While the industry advertising standards purport to guide alcohol advertisers towards responsible behavior, they fail to prevent advertising considered to have youth appeal" (Office of Inspector General, 1991:14).

The review focused its criticisms of the industry standards on four areas:

1. A vagueness of standards without specific examples.
2. A narrowness of standards that allows for misleading ads or appeals to youth.

3. An inconsistency in how youth appeal was defined.
4. A failure by the industry to address its marketing and promotional activities.

This last element caused the OIG to conclude: "Alcohol industry standards are unenforceable" (Office of Inspector General, 1991:15). In response, the industry pointed to positions taken by the FTC and the United States Department of Justice, which, the industry said, required it to maintain voluntary standards without penalties or risk antitrust action.

Current Industry Standards

A review of the current industry codes shows many similarities to the codes reviewed by the OIG, with a few individual differences.

The Beer Institute. Each of the trade groups begins its advertising guidelines with a statement of broad principles. For The Beer Institute these are that:

- Advertising cannot "suggest" that any alcohol laws be broken.
- The standards of "candor and good taste" expected of any other advertising should be followed by brewers.
- Advertising should reflect that brewers recognize "the problems of the society" and act as good corporate citizens (all quotations in this section are from The Beer Institute, 2002).

Flowing from each of the principles is a number of specific prohibitions. For example any beer advertising should not in any way condone drunk driving, excessive drinking, or any other illegal activity.

With regard to youth exposure to beer advertising, the Institute's code first calls on companies to review regularly ("at least semi-annually") the placement of television ads, using "Nielsen or other recognized TV viewer composition data," and then lists a number of specific prohibitions. The code prohibits placement of ads (in television, radio, and print media) "where most of the audience is reasonably expected to be below the legal purchase age." In addition to placement, the code also calls on companies to use in their ads models and actors who are at least 25 years old and "reasonably appear to be over 21 years of age."

Prohibitions on content include symbols, language, music, gestures, cartoon characters, or an entertainment figure or group with "primary appeal" to persons under the legal purchase age. That appeal is defined as "special attractiveness to such persons above and beyond the general attractiveness it has for persons above the legal purchase age, including young adults above the legal purchase age." There is a specific prohibition against

the use of Santa Claus, and beer logos, trademarks, and names are not to be used on "clothing, toys, games or game equipment . . . intended for use primarily by persons below the legal purchase age." Finally, the Institute's code calls on beer companies not to use "lewd or indecent language or images," portrayals of "sexual passion . . . as a result of consuming beer," or religious themes.

As for beer advertising on the Internet, the Institute's code puts the responsibility on parents, but offers that it "will provide manufacturers of parental control software the names and Web site addresses of all member-company Web sites" and that companies "will post reminders" on their sites of the legal purchase age.

Enforcement of the code is left up to the individual companies.

Distilled Spirits Council of the United States. In the DISCUS Code of Good Practice, the two starting principles call for:

1. "Responsible, tasteful, and dignified" advertising to legal age adults.
2. Avoiding the "targeting (of) advertising and marketing of distilled spirits to individuals below the legal purchase age" (except as otherwise noted, all quotations in this section are from Distilled Spirits Council of the United States, 1998).

Like The Beer Institute, the DISCUS code calls for advertising not to be placed "where most of audience is reasonably expected to be below the legal purchase age." In addition, distilled spirits companies are told not to advertise on "college or university campuses," including their newspapers; however, marketing activities are allowed if they are "in licensed retail establishments located on such campuses." The DISCUS code also prohibits billboards within 500 feet "of an established place of worship or an elementary school or a secondary school except on a licensed premise." In a particularly significant development regarding advertising placements, in 1996 DISCUS lifted its self-imposed ban on distilled spirits advertising on the broadcast airwaves by removing this prohibition from its code (Roman, 1996).

The content restrictions of the DISCUS code are, like The Beer Institute's, a mix of general and specific provisions. The general admonitions are that advertising content be intended for adults and not "appeal primarily" to persons under the legal purchase age. Specific prohibitions include the portrayal of a child or objects, images or cartoon figures that are popular predominantly with children; the depiction of Santa Claus or any religious figure; and advertisements on comic pages.

Youth exposure to distilled spirits advertising on the Internet is to be restricted by companies' placement of a "reminder of the legal purchase

age" on Web sites and by DISCUS providing parents and makers of parental control software with the Web site addresses of each member company.

The DISCUS code also calls on its member companies to portray "responsible" consumption, "not imply illegal activity of any kind," "not portray, encourage or condone drunk driving," and only use advertising copy and illustration that is "dignified, modest, and in good taste." Specifically, companies should not "claim or depict sexual prowess" because of alcohol consumption and should not "degrade the image, form, or status of women, men, or of any ethnic, minority, sexually-oriented, religious, or other group."

The DISCUS code provides for a five-member board to hear complaints, make findings, and forward those findings to advertisers, and in some instances, to all DISCUS board members.

The Wine Institute. The Wine Institute's Code of Advertising Standards was last amended in 2000 and is most noteworthy for the number of provisions that are different from those of the Beer Institute and DISCUS.

For example, the wine code calls on companies not to advertise in any media if the audience is "more than 30 percent" underage, using standard audience composition data (all quotations in this section are from Wine Institute, 2000). In addition, this set of guidelines calls for models in ads to "appear to be 25 years of age or older." Besides the standard prohibition against the use of the image of Santa Claus, the Wine Institute also calls for its members not to use the Easter Bunny (Wine Institute, 2000). Lacking in the Wine Institute's code is the other codes' concern for avoiding "sexual passion" or "sexual prowess," although it does call for not using "provocative or enticing poses." With regard to the Internet, the wine code says that companies should realize Web advertising may be seen by underage individuals and therefore that companies should ensure that Web content "remains consistent with provisions of this code."

Coors Brewing Company. Coors follows not only The Beer Institute guidelines, but also more restrictive ad placement guidelines of its own. To ensure that it follows both sets of guidelines, Coors now participates in the Better Business Bureau Advertising Pledge Program (BBB APP). The company's participation in the BBB program is, at least in part, its attempt to respond to an FTC recommendation in 1999 (to be discussed) for third-party monitoring (Alexander, 2002). The BBB APP provides for complaints about participating companies' ads to be resolved by a process managed by the Council of Better Business Bureaus (Better Business Bureau, 2002).

The Coors Pledge calls for ad placements only in media venues where the audience composition is at least 60 percent individuals ages 21 and older, or in other words, where the underage audience is 40 percent or less.

Coors billboards are not to be placed "within 1,000 feet of elementary or secondary schools, established places of worship, or public playgrounds" (Coors Inc., 2002).

The content restrictions of the Coors Pledge basically mirror those of The Beer Institute and mandate that the company not use "any symbol, language, music, gesture, entertainment figure or group, cartoon character, or animal" with "primary appeal" to persons under 21; that the Coors logo not be used on "toys, games, game equipment, clothing or other materials used primarily by those under 21"; that illegal activity not be "condoned" or "encouraged"; and that "sexual passion, promiscuity or other amorous activity" not be portrayed as a result of consumption of Coors products (Coors Inc., 2002).

Federal Trade Commission

Beginning in 1997, the congressional appropriations committees requested that the Federal Trade Commission review the adequacy of the alcohol industry's self-regulation of advertising and marketing as they relate to underage youth. The FTC responded in September 1999 with a report titled, *Self-Regulation in the Alcohol Industry: A Review of Industry Efforts to Avoid Promoting Alcohol to Underage Consumers* (Federal Trade Commission, 1999). To gather information and data for its report, the FTC sought and received "special reports" from eight companies, estimated to account for 80 percent of the advertising in traditional measured media, such as television, radio, and print publications. FTC staff also interviewed industry trade associations and government and consumer groups, and reviewed company Web sites. Because the alcohol companies expressed concerns about confidentiality to the Commission, the data were publicly presented either in the aggregate or anonymously.

Underlying the FTC's analysis were two public policy concerns. The first was the public health issue of underage drinking. The Commission recognized that "underage alcohol use is a significant national concern" and cited a number of statistics about prevalence and trends in underage drinking (Federal Trade Commission, 1999:i). The Commission stated that, although many factors may influence a young person's drinking decisions, "there is reason to believe that advertising also plays a role" (Federal Trade Commission, 1999: 4). The second public policy concern was the regulatory principle that industry self-regulation of its promotional efforts is the preferred course. The Commission called self-regulation a "realistic, responsive and responsible approach" that also avoided First Amendment concerns (Federal Trade Commission, 1999:i).

In the Commission's analysis, companies were found "for the most part" to be abiding by their voluntary codes and in some instances to be

following stricter company standards. However, in an implicit recognition that the codes themselves had weaknesses, the FTC called on the industry to strengthen the codes and their implementation (Federal Trade Commission, 1999:iii).

The FTC's recommendations fell into three broad categories:

1. A call for an independent, third-party monitoring system with "responsibility and authority" to address complaints about companies' practices (Federal Trade Commission, 1999:ii). The FTC called this reform necessary to show an industry commitment. It also noted that the industry's then-current enforcement procedures "fall short of the advertising industry's model for effective self-regulation" (Federal Trade Commission, 1999:15). As mentioned earlier, one company, Coors, currently participates in an evaluation program run by the Better Business Bureau (Alexander, 2002).
2. A call for the industry to raise significantly the standard for the placement of advertising because the then-current standard "permits alcohol advertising to reach large numbers of underage consumers" (Federal Trade Commission, 1999:iii). In contrast to a 50 percent threshold for underage audience composition in vehicles in which ads are placed, the Commission pointed out that some companies used a more stringent 25 percent threshold.
3. A call for the industry to adopt a number of "best practices" with regard to ad placement, ad content, product placement in movies and television, online advertising, and marketing on college and university campuses.

In looking at each of the areas where the Commission called for the alcohol companies to adopt "best practices," the FTC analysis based its recommendations on what it found companies actually to be doing at the time.

Regarding the placement of advertising, the FTC found "mixed compliance" with the voluntary codes, pointing out that four of the eight companies providing data could show they met the 50 percent standard, but that two others had no data to show compliance, and the remaining two had "weeks when a large portion of ads (for one, 25 percent of its TV ads, for another, 11 percent of its radio ads) were delivered to a majority underage audience" (Federal Trade Commission, 1999:9). To limit the exposure of underage audiences to alcohol ads, the Commission pointed to three "best practices": lowering the percentage of an underage audience that is acceptable; regularly reviewing audience composition data; and maintaining "no buy" lists for programs and magazines "popular with underage audiences" (Federal Trade Commission, 1999:10).

In the area of ad content, the Commission discerned "a significant effort" to comply with the voluntary codes but also found substantial marketing to 21-year-olds, in part because of industry research on "the importance of attracting new drinkers, noting that many consumers continue to drink, at least occasionally, the brands with which they started" (Federal Trade Commission, 1999:10-11). Industry reports to the Commission showed at least one instance where focus groups had told companies that an advertisement was likely to appeal more to underage consumers than young adults, but the advertisement was still broadcast. The Commission wrote that this on-the-line advertising could have the effect of appealing to underage youth as well as to legal-age consumers. The Commission also found that some of the brands targeted to 21-year-olds "may not comply" with prohibitions on promoting irresponsible drinking. According to the report,

> Some marketing materials alert consumers to the usefulness of a brand for heavy drinking occasions—for example, promoting new or existing drinking rituals, or using ad language designed to communicate subtly the potency of the product. One company's market planning report noted that the top objective of 21-26 year old drinks was "to get wild, blitzed and be crazy" (Federal Trade Commission, 1999:11).

To limit the possibility of appeal to underage youth, the Commission named as "best practices" some companies' policies of setting 25 years old as a minimum target age for advertising and avoiding "'wild' party" themes (Federal Trade Commission, 1999:11).

The Commission also reported that company documents indicated that intent to target underage drinkers with advertising content was often not considered by the companies as necessary to demonstrate a violation of the codes. The Commission recommended clarification of the codes' intent language, "to convey that intent is not required for a violation" (Federal Trade Commission, 1999:23).

In terms of placements of alcohol products in films and television, the Commission found that the 8 reporting companies had made product placements in 233 motion pictures and in one or more episodes of 181 different television series in 1997-98. These included placements in "PG" and "PG-13" films and "on eight of the 15 TV shows most popular with teens" (Federal Trade Commission, 1999:12). To limit underage audience exposure through this advertising technique, the Commission pointed out as best practices some companies' restriction of product placement to "R" movies, and one company's total avoidance of movies that "deal strictly with college life" (Federal Trade Commission, 1999:12). It recommended further that companies prohibit placements in films where an underage person is a primary character, and that they apply standards for placing traditional commercials to product placement on television.

Looking at online advertising, the Commission found that most company Web sites did, in fact, have "reminders" that a person should be of legal age, and that the Beer Institute and DISCUS were providing information about company Web sites to companies that produce parental control software. The Commission also concluded there are "no foolproof measures" to prevent underage access on the Web (Federal Trade Commission, 1999:12). As "best practices," the Commission pointed to some companies' revisions of Web site content, asking visitors for date of birth, and adding "responsibility" messages to company sites.

In the area of college marketing, the Commission found inherent tensions between the significant underage audience and the high incidence of abusive drinking on college campuses on the one hand, and the reliance of colleges and universities on the revenue produced by alcohol company sponsorship of teams and athletic events on the other. The Commission also found a growing unease about alcohol marketing on college and university campuses on the part of the academic institutions, the United States Congress, and DHHS. As "best practices," the Commission pointed to the DISCUS prohibition on marketing activities on campus, as well as many companies' termination of promotions of spring break activities, and efforts to limit advertising and marketing activities to bars and other licensed retail establishments where the audience is assumed to be of legal age.

Regarding enforcement of the voluntary codes, the Commission noted that even where, as in the case of DISCUS, a trade association has a panel charged with handling complaints under the code, this raised "concerns that the responsibility of the association to represent its members in the best light might conflict with its responsibility under the code to criticize member behavior" (Federal Trade Commission, 1999:15). The Commission also recognized that none of the codes provided for any public notice either of complaints or of their resolution. A common justification used by the trade associations for not enforcing their codes is the argument that such actions would run afoul of antitrust statutes. The FTC disagreed, finding that antitrust laws " . . . do not bar reasonable self-regulation designed to prevent alcohol advertising from being targeted to underage persons" (Federal Trade Commission, 1999:16).

NBC Proposed Guidelines

Negotiations between the NBC television network and Diageo, the leading spirits marketer in the world and in the United States, to permit Diageo to advertise on NBC broadcasts produced another set of guidelines in 2001. These guidelines were ultimately not implemented because NBC withdrew from the negotiations in the face of public pressure. However, they offer an interesting alternative set of voluntary standards.

These guidelines had a number of provisions that differed from the existing industry guidelines:

- Product ads were to be limited to the hours of 9 to 11 p.m. Eastern Standard Time and to whatever time the Tonight Show was broadcast.
- If a product ad was to be aired outside this time slot, NBC would consider it only if the program had a minimum audience of 85 percent adults ages 21 and older.
- Distilled spirits manufacturers would have to commit to a minimum of 4 months of "100 percent paid branded social responsibility messages" before product ads could be aired, and after that at least 20 percent of the companies' ads had to continue to be "branded social responsibility messages" (NBC Corporation, 2001).
- The models and actors in the ads had to be 30 years or older.

With regard to content restrictions, the NBC guidelines paralleled the standard elements found in the codes of the three alcohol trade associations.

Empirical Research on Youth Exposure to Alcohol Advertising

Numerous attempts have been made to assess the influence of the content of alcohol advertising on young people, and these will be covered in other chapters prepared for this panel. Another set of important decisions made by alcohol marketers, however, has received far less research attention. Media placement decisions are the result of extensive market research and the use of standard market research databases to assess the demographic profiles of the audiences for various media vehicles, as well as the effectiveness of such vehicles in delivering target audiences to firms interested in placing advertising in them. The FTC was able to audit alcohol industry compliance with voluntary code provisions regarding placement through its ability to require the industry to provide, on a confidential basis, detailed demographic information about its advertising placements. However, for the most part and until recently, such data have been unavailable to researchers seeking to assess the effectiveness of the industry's advertising placement standards.

Although demographic information is available for broadcast and print, magazines are the most tightly targeted of the measured media. Two studies to date have looked at alcohol advertising in this medium. Following on research suggesting that cigarette brands popular among youth ages 12 to 17 were more likely than other brands to be advertised in magazines (King et al., 1998), Sanchez et al. (2000) selected a convenience sample of 15 magazines—11 with the highest youth readership (greater than 1.9 million

readers) and 4 with the lowest youth readership (less than 0.8 million)—and assessed the volume of influence by counting advertising pages for alcohol and tobacco in each magazine. *Rolling Stone* had the highest number of alcohol ad pages in the sample, while *Sports Illustrated* had the most alcohol and tobacco ads. The authors suggested there was a bimodal relationship between alcohol and tobacco advertisements and youth readership in their sample, with magazines with fewer youth readers delivering fewer alcohol and tobacco ads. They compared *Time* and *Sports Illustrated* and found that although the two magazines had identical adult audiences, *Sports Illustrated* had five times more alcohol ads and twice the audience under age 18. This buttressed their conclusion that alcohol advertisers target youth (Sanchez et al., 2000).

The Center on Alcohol Marketing and Youth at Georgetown University extended this work on youth exposure to alcohol advertising in magazines. The Center used advertising industry databases, standards, and techniques, going beyond analysis of ad placement and audience composition to measure exposure in terms of the standard market research measures of reach, frequency, gross ratings points, and impressions (Center on Alcohol Marketing and Youth, 2002a). Looking at all available data on beer, distilled spirits, wine, and "low alcohol refresher" (e.g., malternatives, alcopops) advertising in United States magazines in 2001, the Center's analysis ultimately reviewed $320 million in product advertising, representing 80 percent of the expenditure on alcohol product advertising in magazines that have measured audiences.

The Center found that magazine advertising placements exposed youth, ages 12 to 20, to 45 percent more beer advertising, 27 percent more spirits advertising, and 58 percent less wine advertising than adults of legal drinking age. The primary demographic target for the placements was clearly those ages 21 to 34. However, the ages 12-to-20 demographic received only 16 percent less exposure for beer advertising and 26 percent less in the case of distilled spirits, but 95 percent greater coverage in beer advertising and 63 percent greater exposure in spirits advertising than adults aged 35 and over.

The Center also conducted the more traditional analysis of ad placement and audience composition. Its analysis confirmed and extended the findings of Sanchez et al. (2000): 10 magazines with a youth (ages 12 to 20) readership of 25 percent or more, each delivering audiences of 1 million or more youth readers, accounted for nearly one-third of alcohol magazine expenditures in 2001. These magazines ranged from *Vibe* with a 12-to-20 audience of 41 percent to *In Style* and *Sports Illustrated* with 12-to-20 audiences of 25 percent. The Center also found that although alcohol advertising was not being placed in magazines with an underage audience of greater than 50 percent, the FTC's "best practice" threshold of 25 percent

was not being met. Furthermore, with 15.8 percent as the threshold, representing the proportion of youth ages 12 to 20 in the general population 12 and over as measured by the leading magazine market research firms, more than half the industry's advertising was in magazines with disproportionate numbers of young readers, and 25 brands placed all their advertising in such magazines.

The Center assessed the effectiveness of the industry's voluntary code provisions again in its study of alcohol advertising on television in 2001, released in December 2002 (Center on Alcohol Marketing and Youth, 2002b). Analyzing 208,909 ad placements, costing $811.1 million, the report had three principal findings. First, the DISCUS and Beer Institute standards for television advertising placements, barring advertisements on programs with majority youth audiences, leave nearly all of the television landscape open for alcohol ads. If youth audiences are defined as persons between the ages of 12 and 20, this standard places only 1 percent of programs (187 out of 14,359) off limits. If youth are defined as ages 2 to 20, the standard still leaves 94 percent of television programs permissible for alcohol advertising. Furthermore, alcohol companies violated even the 50 percent benchmark with 3,262 ads that were placed in 2001 on programs with majority youth audiences.

Second, the result of such a lax standard is that young people see nearly as much alcohol advertising on television as adults. Young people are more likely to see ads for alcoholic beverages than for many obviously youth-oriented products. For example, youth had a greater likelihood of seeing ads for beer and ale than for commercials selling fruit juices and fruit-flavored drinks, gum, skin care products, sneakers, or noncarbonated soft drinks. Overall in 2001, alcohol advertising reached 88 percent of the youth audience, who on average saw 245 alcohol ads. But the 30 percent of youth who were most likely to see alcohol advertising on TV saw at least 780 ads. In programming categories such as situation comedies, youth were exposed to 9 ads for every 10 seen by adults. On music video and entertainment programs, youth saw 48 percent more ads than adults; in variety programming, such as MADtv and Saturday Night Live, youth were exposed to 26 percent more advertising than adults.

Third, this pattern of youth overexposure to alcohol advertising was true of nearly a quarter (51,084) of the ads on television in 2001, representing $119 million in spending. Youth ages 12 to 20 make up 15 percent of Nielsen's national television audience. Ads were judged to be overexposing youth in the Center's report if they aired on programs with disproportionate youth audiences, that is, where the percentage of viewers ages 12 to 20 exceeded 15 percent. In addition to the programming categories already mentioned, several networks—WB, UPN, Comedy Central, BET, and

VH1—systematically exposed more youth to alcohol advertising than adults.

CONCLUSION: THE NEED FOR RESEARCH AND STANDARDS

As alcohol marketing has increased in intensity (as measured by expenditures ahead of inflation), complexity (in terms of venues and strategies employed), and use of cutting-edge information technologies, both research and standards have lagged far behind. Saffer (1997) has suggested that the intensity of alcohol advertising can have important public health consequences, but it needs to be studied with an understanding that advertising occurs in a pulsed fashion and that studies using annual and national data will offer insufficient variation to show these effects. Research on the effects of alcohol advertising has focused primarily on traditional measured outlets such as broadcast and print, and has lagged far behind in looking at effects of the venues and strategies now employing the majority of the industry's resources. Although research on tobacco marketing has looked at the relationship between youth initiation and use of tobacco, and nontraditional and unmeasured marketing such as merchandising of clothing with tobacco logos (Biener and Siegel, 2000), there is no such research yet on alcohol marketing. The effects of sponsorships, whether sports or musical, as well as the effects of product placements, remain unexamined as well. There is also no research to date on the impact on young people of alcohol promotions that use Internet advertising, company-sponsored sites, and techniques building on e-mail and instant-messaging/chat technologies such as viral marketing.

Research into the brand preferences of young people is also needed. Such research provides one indicator of the appeal of alcohol industry marketing campaigns to underage youth. Without such research into the preferences of young people who have recently initiated alcohol use, it is also difficult to assess the public health impact of new product introductions that at least appear to be designed to appeal to young consumers unaccustomed to and not inclined toward the taste of traditional alcoholic beverages.

Finally, in assessing the degree of health harm from exposure to alcohol advertising, research on overall exposure to the harmful agent would seem an obvious public health priority. However, little such research has been done, and what exists suggests that disproportionate levels of exposure exist. Although Coors, Miller, the Wine Institute, and Diageo did make some changes to their marketing guidelines, the FTC's recommendations for regular monitoring and third-party review of alcohol placements have, for the most part, not been implemented. No baseline measures are avail-

able for assessing youth exposure or trends in television or radio advertising. Although numerous individual communities have attempted to inventory outdoor advertising (Alaniz and Wilkes, 1998), no comprehensive effort has been made to assess youth exposure to this form of promotion. There is a need for ongoing independent monitoring of youth exposure to alcohol advertising and promotion.

Although the analysis of the industry's own guidelines and practices points to inconsistent adherence to the FTC's 1999 recommendations, the FTC itself has not conducted any systematic review of implementation. It is critical that such a review be supplemented by research assessments of whether the FTC's proposed standards will be sufficient to protect young people from possible harmful effects of alcohol advertising and promotion. Based on the Center on Alcohol Marketing and Youth's research, tighter standards will likely be required. In addition, given the generally positive normative environment surrounding alcohol use in most areas of society (including, for example, in G-rated children's films) (Goldstein et al., 1999; Thompson and Yokota, 2001), any such standards will likely need to be supplemented by public health messages and counteradvertising (Saffer, 2000).

REFERENCES

Aaker, D.A. (1996). *Building strong brands*. New York: The Free Press.

Aaron, P., and Musto, D. (1981). Temperance and prohibition in America: An historical overview. In M.H. Moore and D. Gerstein, (Ed.), *Alcohol and public policy: Beyond the shadow of Prohibition*, pp.127-181. Washington, DC: National Academy Press.

Advertising Age. (1999). Wrong gig for Bud ads. *Advertising Age*, *70*, 20.

Alaniz, M.L (1998). Alcohol availability and targeted advertising in racial/ethnic communities. *Alcohol Health and Research World*, *22*(4), 286-289.

Alaniz, M.L., and Wilkes, C. (1998). Pro-drinking messages and message environments for young adults: The case of alcohol industry advertising in African American, Latino, and Native American communities. *Journal of Public Health Policy*, *19*(4), 447-471.

Altman, D.G., Schooler, C., and Basil, M.D. (1991). Alcohol and cigarette advertising on billboards. *Health Education Research*, *6*(4), 487-490.

Associated Press. (2001, August). Fla. jury: Maris family owed $50M. Associated Press.

Assunta, M. (2001). Marketing alcohol in Asia. *Globe: International Journal of Alcohol and Drug Problems*, *1*, 20-22.

Barnett, C. (2001). *Beer bully. Florida Trend*. Available: www.fsu.edu/~par/Media/1_06_02.htm [September 29, 2002].

Better Business Bureau. (2002). *Better Business Bureau advertising pledge program*. Available: www.bbb.org/app [August 3, 2002].

Biener, L., and Siegel, M. (2000). Tobacco marketing and adolescent smoking: More support for a causal inference. *American Journal of Public Health*, *90*, 407-411.

Blackwell, D. (1996). Alcopop goes the UK cider market: David Blackwell looks at the effects of these new drinks on the industry. *Financial Times London Edition*, September 12, 32.

Buckley, M. (1998, September). Why Web is the perfect zone for youth marketing. *Marketing Week*, *21*(38), 43.

Bureau of Alcohol Tobacco and Firearms. (2002). *Industry circular: Labeling and advertising of flavored malt beverages*. Washington, DC: Department of the Treasury.

Center for Media Education. (1998). *Alcohol advertising targeted at youth on the Internet: An update*. Available: www.cme.org/publications/alcohol_tobacco/alcrep.html [September 30, 2002].

Center for Science in the Public Interest. (2001). *Summary of findings: What teens and adults are saying about "alcopops"*. Available: http://www.cspinet.org/booze/alcopops_summary.htm [September 29, 2002].

Center on Alcohol Marketing and Youth. (2002a). *Overexposed: Youth a target of alcohol advertising in magazines*. Washington, DC: Institute for Health Care Research and Policy, Georgetown University.

Center on Alcohol Marketing and Youth. (2002b). *Television: Alcohol's vast adland*. Washington, DC: Institute for Health Care Research and Policy, Georgetown University.

Cooke, E., Hastings, G., and Anderson, S. (2002). *Desk research to examine the influence of marketing and advertising by the alcohol industry on young people's alcohol consumption: Research prepared for the World Health Organization*. Glasgow: Centre for Social Marketing at the University of Strathclyde.

Coors Inc. (2002). Available: http://www.coors.com/community/ace.asp [August 3, 2002].

Cowan, R., and Mosher, J.F. (1985). Public health implications of beverage marketing: Alcohol as an ordinary consumer product. *Contemporary Drug Problems*, *12*(4), 621-657.

Distilled Spirits Council of the United States, I. (1998). *Code of good practice for distilled spirits advertising and marketing (1998)*. Available: http://www.discus.org/industry/code/ [July 19, 2002].

Federal Trade Commission. (1999). *Self-regulation in the alcohol industry: A review of industry efforts to avoid promoting alcohol to underage consumers*. Washington, DC: Author.

Fleming, D., and Zwiebach, P. (1999). UDV unveils global campaign for Johnnie Walker, its first ever. *Impact*, *29*(23), 1, 18-19.

Flewelling, R.L., Paschall, M.J., and Ringwalt, C. (2002). *The epidemiology of underage drinking in the United States: An overview*. Washington, DC, paper prepared for the National Academy of Sciences Committee on Developing a Strategy to Reduce and Prevent Underage Drinking.

Food Management. (2000). Fire water. *Food management*, *35*, 104.

Fulmer, M. (1999). Skyy vodka shoots for the hip: Brand makes a pitch for the youth market via trendy venues. Los Angeles, *Los Angeles Times*, 17 April, C1.

Furlotte, N. (2000). Reinventing scotch. *Beverage Dynamics*, *111*, 18.

GBL International. (2002). *Company introduction*. Available: http://www.vkuk.co.uk/trade/companyintro.htm [November 27, 2002].

Goldberg, M.E., Gorn, G.J., and Lavack, A.M. (1994). Product innovation and teenage alcohol consumption: The case of wine coolers. *Journal of Public Policy and Marketing*, *13*(2), 218-227.

Goldstein, A.O., Sobel, R.A., and Newman, G.R. (1999). Tobacco and alcohol use in G-rated children's animated films. *Journal of the American Medical Association*, *281*(12), 1131-1136.

Greenfield, T., and Rogers, J.D. (1999). Who drinks most of the alcohol in the U.S.? The policy implications. *Journal of Studies on Alcohol*, *60*(1), 78-89.

Holder, H. (2000). The supply side initiative as an international collaboration to study alcohol supply, drinking, and consequences: Current knowledge, policy issues, and research opportunities. *Addiction*, *95*(Supplement 4), S461-S463.

Holloway, L. (2002). Media: Hip-Hop sales pop: Pass the Courvoisier and count the cash. *New York Times*, September 2, C1.

Impact Databank. (2001a). *The U.S. distilled spirits market: Impact databank review and forecast*. New York: M. Shanken Communications.

Impact Databank. (2001b). *The U.S. wine market: Impact databank review and forecast*. New York: M. Shanken Communications.

Impact Databank. (2002a). *The U.S. beer market: Impact databank review and forecast*. New York: M. Shanken Communications.

Impact Databank. (2002b). *The U.S. distilled spirits market 2001*. New York: M. Shanken Communications.

Jackson, M.C., Hastings, G., Wheeler, C., Eadie, D., and MacKintosh, A.M. (2000). Marketing alcohol to young people: Implications for industry regulation and research policy. *Addiction*, *95*(Supplement 4), S597-S608.

Jain, S.C. (1994). *Global competitiveness in the beer industry: A case study*. Storrs: University of Connecticut, Department of Agriculture and Resource Economics, Food Marketing Policy Center (Research Report No. 28).

Jernigan, D., and Wright, P.A. (1994). *Making news, changing policy: Case studies of media advocacy on alcohol and tobacco issues*. Rockville, MD: University Research Corporation, Marin Institute, Center for Substance Abuse Prevention.

Jernigan, D.H. (1997). *Thirsting for markets: The global impact of corporate alcohol*. San Rafael: The Marin Institute for the Prevention of Alcohol and Other Drug Problems.

Jernigan, D.H. (2001). Cultural vessels: Alcohol and the evolution of the marketing-driven commodity chain. *Dissertation Abstracts International*, *62*, 349-350-A.

Kane's Beverage Week. (2000). Cutty Sark reverses decline with focus on capturing young "ordinary" guys. *Kane's Beverage Week*, *61*(23), 1-2.

King, C., Siegel, M., and Celebucki, C. (1998). Adolescent exposure to cigarette advertising in magazines: An evaluation of brand-specific advertising in relationship to youth advertising. *Journal of the American Medical Association*, *279*, 516-520.

Klein, N. (1999). *No logo: Taking on the brand bullies*. New York: Picador.

Kotler, P. (1992). *Marketing management: Analysis, planning, implementation, and control (7th edition)*. Englewood Cliffs, NJ: Prentice Hall.

Levine, H.G. (1983). *Regulating daily life: Prohibition, alcohol control, and the legitimacy of law*. Berkeley: Alcohol Research Group.

McBride, R., and Mosher, J.F. (1985). Public health implications of the international alcohol industry: Issues raised by a World Health Organization project. *British Journal of Addiction*, *80*, 141-147.

Moore, M., and Gerstein, D. (1981). *Alcohol and public policy: Beyond the shadow of Prohibition*. Washington DC: National Academy Press.

National Institute on Drug Abuse. (2002). *Results from the 2001 National Household Survey on Drug Abuse: Volume 1. Summary of national findings*. Rockville, MD: SAMHSA, Office of Applied Studies.

NBC Corporation. (2001). *NBC advertising guidelines for alcohol products*. Available: www.nbcmv.com/pw2/corporate/dnr.v25.cgi?cmd=detail&query_id=55735 [July 26].

Nielsen, A.C. (2002). *Trendwatch: Malternatives*. Available: www.acnielson.com/pubs/ci/2002/q2/features/malternatives.htm [September 29, 2002].

Office of Inspector General. (1991). *Youth and alcohol: Controlling alcohol advertising that appeals to youth*. Washington, DC: Department of Health and Human Services, 1.

Parents' Resource Institute for Drug Education. (2002). *PRIDE questionnaire report: 2001-02 national summary grades 6 through 12*. Bowling Green, KY: Pride Surveys.

Press Diageo plc. (2002). *Diageo and Moet Hennessy announce agreement of new distributor relationships in five states*. Available: www.industrypages.com/artman/publish/Industry_News_1414.stm [October 1, 2002].

Putnam, J.J., and Allshouse, J.E. (1999). *Food consumption, prices, and expenditures 1970-1997*. Washington, DC: Food and Rural Economics Division, Economics Research Services, U.S. Department of Agriculture.

Roberts, C., Blakey, V., and Tudor-Smith, C. (1999). Impact of "alcopops" on regular drinking by young people in Wales. *Drugs: Education, Prevention and Policy*, *6*(1), 7-15.

Rogers, J.D., and Greenfield, T. (1999). Beer drinking accounts for most of the hazardous alcohol consumption reported in the United States. *Journal of Studies on Alcohol*, *60*(6), 732-739.

Roman, L.A. (1996). Liquor industry's decision to pursue broadcast ads won't mix in Tennessee. *Memphis Business Journal*, December 9, 1-2.

Romanus, G. (2000). Alcopops in Sweden: A supply side initiative. *Addiction*, *95*(Supplement 4), S609-S619.

Saffer, H. (2000). *Alcohol advertising and youth*. New York: National Bureau of Economic Research.

Samson, H.H. (1986). Initiation of ethanol reinforcement using a sucrose-substitution procedure in food and water-sated rats. *Alcoholism: Clinical and Experimental Research*, *10*(4), 436-442.

Samson, H.H., Tolliver, G.A., Lumeng, L., and Li, T.K. (1989). Ethanol reinforcement in the alcohol nonpreferring rat: Initiation using behavioral techniques without food restriction. *Alcoholism: Clinical and Experimental Research*, *13*(3), 378-385.

Sanchez, L., Sanchez, S., Goldberg, A., and Goldberg, A. (2000). Tobacco and alcohol advertisements in magazines: Are young readers being targeted? *Journal of the American Medical Association*, *283*(16), 2106-2107.

Scott, B.M., Denniston, R., and Magruder, K.M. (1992). Alcohol advertising in the African-American community. *Journal of Drug Issues*, *22*(2), 455-469.

Stamler, B. (2000). A new campaign for Courvoisier, brand of Napoleon, looks for younger, hipper customers. *New York Times*, 29 August, C8.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2002). *National household survey on drug abuse*. Rockville, MD: Office of Applied Studies.

Taylor Nelson Sofres. (2002). *TNS Media Intelligence/CMR*. New York: Author.

The Beer Institute. (2002). *Beer Institute advertising and marketing code*. Available: http://www.beerinstitute.org/admarkcode.htm [July 19, 2002].

Thompson, K.M., and Yokota, M.S. (2001). Depiction of alcohol, tobacco, and other substances in G-rated animated feature films. *Pediatrics*, *107*(6), 1369-1374.

Tolliver, G.A., Sadeghi, K.G., and Samson, H.H. (1988). Ethanol preference following the sucrose-fading initiation procedure. *Alcohol*, *5*(1), 9-13.

U.S. Department of Justice. (2002). *Drinking in America: Myths, realities, and prevention policy*. Calverton, MD: Pacific Institute for Research and Evaluation.

U.S. Department of Labor. (2002). *Inflation calculator*. Available: http://data.bls.gov/cgi-bin/cpicalc.pl [September 29, 2002].

Wine Institute. (2000). Code of advertising atandards. Available: http://www.wineinstitute.org/communications/statistics/Code_of_Advertising.htm [July 17, 2002].

World Health Organization. (2002). *Global alcohol database*. Available: www.who.int/alcohol.

13

Drinking and Coming of Age in a Cross-Cultural Perspective

Robin Room

Over the past two centuries, societies influenced by the 18th-century Enlightenment have constructed an ideal of childhood as a protected and liminal stage of life (Aries, 1962; Kett, 1977). Children became exempted and excluded from participation in the labor market by child labor laws, and the innocence ascribed to them was protected by means such as film classifications and sexual abuse laws. Different age-grades of childhood and adolescence became largely segregated from other age-grades and from the adult world by separate schools at different levels. The child eventually became the woman or man, but the process of becoming a woman or man was conceived of not in terms of a specific rite of passage at a particular time, but in terms of a process with many stages.

COMING OF AGE AS A PROCESS

During the course of this long process, the child/adolescent is defined to some extent as an acolyte to his or her future as an adult. Children are protected to some extent, through arrangements such as juvenile courts and sealed records, from such potential blights on their adult life as a criminal record. But parents, teachers, and other adult guardians define the central task of the child and particularly of the teenager as preparing through education and otherwise to take a full place in adult life, and are concerned about anything that might impede this preparation and about behaviors that may stain future status or injure future functioning in adult life. In this cultural context, there is particular concern about behaviors and experi-

ences that are morally suspect, but legally tolerated in adults. In fact, laws on the protection of children are often the signal of a residual cultural disapproval of behaviors that were at some time not only immoral, but illegal for everyone.

There is also a generalized concern about joining the adult world "too early." Holding a full-time job is not morally suspect and does not necessarily injure a child's future status, but our cultural and legal systems forbid this level of employment below a given age. Where exceptions must be made, as for child actors, the U.S. system imposes elaborate legal restrictions and requirements in an attempt to ensure the actors have a "proper childhood."

The proliferation of legal restrictions on behavior by chronological age is a relatively modern phenomenon. Age minimums for drinking, for example, mostly date back only to the post-Repeal era (Mosher, 1980). Differentiations of status in terms of life stages have a much longer and broader history. But the modern legal restrictions both express and encourage a cultural tendency to think of these status differentiations in a particular way: in terms of chronological age. In a strongly universalistic cultural and legal frame, a fixed chronological age applying to everyone is a legal definition of adulthood that is more comfortable and more easily defended than any criterion based on an individualized assessment of maturity or on a civil status (e.g., marriage) would be. Of course, a more universalistic standard for behaviors seen as inappropriate for children is to forbid them for everyone. Minimum age restrictions cannot exist, of course, for behaviors that also are illegal for adults, such as marijuana use.

Emancipation and Settling Down: The "Social Clock"

Part of growing up is to try out and to adopt new behaviors. Although the process is often fraught with anxiety for the person growing up, it is often even more anxiety producing for parents and other adults involved. This anxiety or disapproval may arise if the adolescent tries out the behavior at all. But often it is also about the age at which the behavior is adopted. Behavior that is seen as too "grown up" for one age may be accepted without too much fuss if it occurs at a later age.

In the context of discussions of social problems and youth, the focus tends to be on behaviors that are taken on "too young." But in a wider frame, there is also growing unease if a young person does not try out and take on a behavior at what is believed to be an appropriate age. Failing to have a full-time job by the age of 25 may be seen as equally inappropriate as holding a full-time job at age 12. Sociologists talk of these normative standards for when a behavior or status should be taken on as the "social clock" (Neugarten, Moore, and Lowe, 1965). The normative standards for

the social clock for any given behavior or status are likely to vary in time and by cultural group.

We can think of the period of adolescence and young adulthood in terms of two complementary processes: emancipation and settling down. The content of emancipation includes the various behaviors for which there are minimum age requirements, as well as such aspects as staying out late at night and moving out of the parental home. By "settling down" we mean the culturally normative process of taking on an accumulation of continuing obligations: a car loan, a "real" (nontemporary) job, a marriage, a child, a house mortgage, and so on.

Along with the general legal provisions we have mentioned, the emancipation process is governed by strong general cultural expectations. By its nature, the process nearly always involves a generational tug-of-war within the family. The general cultural expectations about the settling down process are also quite strong, but legal age minimums and the struggle within the family are usually much less involved in the process. In the individual life history, emancipation and settling down may be linked closely, such as when a daughter does not leave the parents' home until she marries. Characteristic of modernity is a considerable temporal separation of the two processes, leaving a significant liminal space in adolescence and early adulthood. Contrary to common belief, this transitional status and period also have been common in other societies and times (e.g., Sarmela, 1969).

Emancipation and Contested Behaviors

As the existence of the minimum-age laws suggests, the process of emancipation involves many behaviors we may describe as "contested" (Gusfield, 1996). Some of these behaviors—driving a car, getting a job, having sex—are expected for nearly everyone to happen eventually as part of adult life, but to engage in them too early is seen as upsetting or even shocking. Other behaviors are legal but grudgingly tolerated for adults, and there is at least hope the process of emancipation will not include them. Thus most parents hope their children will never take up cigarette smoking. Other behaviors are illegal for everyone, but common in the emancipation process: marijuana smoking, for example, as well as behaviors with victims, such as vandalism and violence.

The contest is generational, between teenagers and young adults on the one hand and adults in general and school and civic authorities on the other. It is also intensely personal within the family: Parents find themselves on the front line, locked into a role as guardians of conventional hopes and expectations against the claims for autonomy and emancipation of their offspring. For many parents, the process of emancipation feels like a long process of grudging retreat from their preferred standards of conduct. As

Williams (1960) has discussed, a last fallback expedient in upholding a norm is a "patterned evasion," that is, ignoring evidence of its violation. The parent scoots past the couch with eyes averted, rather than face up to the reality of the entangled limbs there. There is also considerable patterned evasion of norms at a societal level: Nearly all who will eventually drink alcoholic beverages in the United States start doing so before the legal drinking age.

In terms of the general "social clock" concerning ages at which potentially contested behaviors are found acceptable by a majority of adults in North America, mean ages probably range from about 17½ to 20, judging by data from Ontario (Paglia and Room, 1998). In 1996, adults in Ontario were asked, "Regardless of what the law says, how old do you think a male/female should be before it's OK for him/her" to engage in each of a list of behaviors, with random halves being asked the questions for a male and for a female. For all behaviors except having a full-time job, driving a car alone, and going on a date, some respondents volunteered that it was "never OK," with rates below 10 percent for buying a lottery ticket, drinking beer or liquor, and buying beer, and above 40 percent for getting drunk on beer at home, being a regular smoker, and trying marijuana. Table 13-1

TABLE 13-1 Mean and Standard Deviation of the Acceptable Age for 15 Contested Behaviors, According to Ontario Adults Aged 25 or Older, 1996

Behavior	Mean	Standard Deviation
Go out on a date	16.2	1.4
Buy a lottery ticket	17.4	2.3
Drive a car by himself/herself	17.7*	1.5
Get a full-time job, year round	17.7	2.3
Smoke a cigarette	18.0	2.4
Have sex with a girlfriend/boyfriend	18.4	2.2
Buy a pack of cigarettes	18.6	1.9
Have a drink of beer	18.8*	1.7
Try some marijuana	18.8	2.2
Become a regular smoker	19.0	2.6
Have drink of liquor	19.3*	2.0
Get drunk on beer at home	19.4	2.3
Buy a six-pack of beer	19.5*	1.7
Go to a bar with friends and drink enough to feel the effects	19.8*	1.9
Move in with a girlfriend/boyfriend	20.1	2.6

*Mean age significantly lower for a female to do this than a male. Differences between the genders were all less than half a year. Note that this is based on those who gave an age for the behavior (i.e., excluding those who said it was "never OK").
SOURCE: Paglia and Room (1998).

shows responses among those ages 25 or older among those who did give an age when those behaviors are okay. Acceptable ages to drink or purchase alcohol were in the upper half of the ages for the behaviors in question, ranging between 18.8 and 19.8. Thus the age of acceptability for buying a lottery ticket, driving a car alone, getting a full-time job, smoking a cigarette, or having sex with a girlfriend/boyfriend was lower than the age for having a drink of beer. Of the behaviors asked about, only moving in with a girlfriend/boyfriend had a higher age of acceptability than any of the behaviors involving alcohol.

Table 13-2 compares the responses of Ontario teenagers and adults, grouped by age, about acceptable ages to try marijuana and initiate cigarette smoking, beer drinking, and buying a six-pack of beer (Room and Paglia, 2001). For all behaviors the normative age of initiation is gently curvilinear by age, with the lowest age given by those who are themselves at about that age (eleventh grade students usually would be 16 or 17). At the level of the "public norms," measured as responses to a telephone survey (for the adults) or to items on a questionnaire (for the students), the variation between generations is fairly modest. For the two alcohol items, for example, the average difference between eleventh graders and the adults ages 40 to 54, roughly their parents' generation, is about $2^1/_2$ years.

The alcohol normative ages given by Ontario adults correspond fairly well to the legal minimum age for purchasing or drinking alcohol in Ontario, which is 19. However, the actual ages at which Ontario teenagers start experimenting with drinking alcoholic beverages is about five years younger. Among seventh graders (ages 12-13), 32 percent report alcohol use in the past 12 months, with 58 percent having used at some time in their lives; in ninth and eleventh grades, the proportions drinking in the past 12 months rise to 55 percent and 80 percent, respectively (Adlaf, Ivis, and Smart, 1997: Table 10 and Figure 57). These five years provide an ample arena for contests between the generations. However, the results in Table 13-2 suggest that younger experimenters with alcohol see themselves as breaking rather than conforming to the norms of their own age cohort. In the earlier teenage years, to drink is to do something one is not supposed to be doing yet.

Tracks and Subcultures: Sorting and Differentiation in Adolescence

Along with their functions of preparing every child for adulthood and holding different age-grades apart from each other and from the adult world, schools and other institutions for teenagers also function as major sorting devices in the course of sociocultural reproduction. By the early teenage years, the curriculum diverges for different students, and often students are divided into different streams, which are recognized by all as

TABLE 13-2 Mean (and Standard Deviation) of the Acceptable Age Given, by Grade in School (1997 Ontario Student Survey) and by Adult Age Group (1996 Ontario Survey)

		Grade					Adult Age Group			
Behavior	Total	7	9	11	13	Total	18-24	25-39	40-54	55+
By a male:										
Smoke a cigarette	16.4 (2.5)	17.1[a]	15.9[b]	16.1[b]	17.1[a]	18.1 (2.4)	17.4	18.1	18.2	18.3
Try marijuana	16.3 (2.6)	17.7[a]	15.9[b]	15.8[b]	17.0[a]	18.9 (2.3)	18.5[a]	18.8[a]	18.5[a]	20.4[b]
Have drink of beer	16.7 (2.6)	17.7[a]	16.4[b]	16.2[b]	17.3[a]	18.9 (1.6)	18.2[a]	19.0[b]	18.9[b]	19.0[b]
Buy 6-pack of beer	18.0 (2.3)	19.0[a]	17.9[b,d]	17.6[b,c]	18.3[d]	19.6 (1.7)	18.7[a]	19.8[b]	19.7[b]	19.6[b]
By a female:										
Smoke a cigarette	16.3 (2.9)	17.1[a]	15.9[b]	15.8[b]	17.1[a]	17.9 (2.5)	17.9	17.6	18.2	17.8
Try marijuana	16.3 (2.6)	17.2[a]	15.9[b]	16.0[b,c]	17.0[a,c]	18.6 (2.2)	18.1	18.5	18.6	19.2
Have drink of beer	16.8 (2.8)	17.7[a]	16.4[b]	16.2[b]	17.4[a]	18.6 (1.8)	18.3	18.6	18.8	18.5
Buy 6-pack of beer	18.1 (2.3)	19.0[a]	17.9[b,c]	17.6[b]	18.3[a,c]	19.3 (1.7)	19.0	19.2	19.6	19.3
N range:	448-948	57-186	130-288	187-337	71-149	280-577	49-83	102-210	70-172	34-113

NOTE: Means with the same superscript (*a*, *b*, *c*, *d*) are not significantly different at $p < 0.05$, based on the Scheffe comparison test. Thus, for instance, for smoking a cigarette there is no significant difference in the mean age given between seventh and thirteenth grade students and between ninth and eleventh grade students but there is a significant difference between seventh and ninth grade students and between ninth and eleventh grade students.

SOURCE: Room and Paglia (2001).

having different fates in store as adults. Reactions to errors in marking state examinations illustrate what is seen as being at stake: students may have their "chances in life unfairly damaged" (Bright and Hinsliff, 2002). Although the sorting in the U.S. system is not necessarily final—for many, there are second and third chances—sorting schoolchildren into different schools or different "tracks" in the same school is also potentially fateful.

Before they are teenagers, children have begun to sort themselves out into differentiated crowds and cliques. A 9-year-old child in the United States can usually give an accurate ethnography of the characteristics of those who can be found at recess at different corners of the playground. The American community high school may include adolescents from all parts of the community, but it has long been documented that in their social lives, the students are heavily differentiated and sorted by social class as well as by personal preferences and friendships (Hollingshead, 1961).

Children and youth also construct their own subcultures, which often have substantial continuity across cohorts of children, as the Opies (2001) found for the playground songs and games of young schoolchildren. In adolescence there is not only a general youth subculture, but also a variety of more specific subcultural formations, built around sports, cars and other machines, music, arts, and other interests. Although adults often provide input into these subcultures, attempts to subject the activities to rigorous control are often resisted and evaded. Around the edge of the official adult-controlled version of events, there tends to be a lively social world run by the teenagers themselves. In the 20th century, styles of music and dancing have been particularly productive of subcultural differentiations not only between generations but among youth themselves (Polhemus, 1995; Thornton, 1995). These subcultures have become increasingly internationalized, as with the spread of raves.

Cultural Variations in the Processes

The existence of large cultural variations globally in the processes we have been outlining has been clear for a long time. The processes have some of the same content as the "rites of passage" analyzed by van Gennep (1960) in tribal societies. But such rites of passage as classically described typically take place in a well-defined and limited period, while the processes we are considering occur over a much longer time period and often with less clear temporal definition. Although, as has been remarked, "some have viewed the entire period of adolescence in modern cultures as analogous to the disorienting middle stage of van Gennep's classic three-part scheme" of a rite of passage, that is, as "an extended period of transition characterized by uncertainty and confusion that eventually leads to the adult taking his or

her place in society" (Anonymous, 1997), it seems clear that there are variations both between and within modern cultures in the extent to which any such analogy would make sense.

Cultural variations in expectations about the "social clock" often come into view in stark relief in particular circumstances in multicultural societies. For immigrants to the Nordic countries from Pakistan, for example, the custom may be for parents to make an advantageous marriage for their daughter at age 13. But in a Nordic context, such a practice is seen as shocking, so far outside expectations concerning the "social clock" that legislation must be passed and programs initiated to counter it (e.g., Ministry of Children and Family Affairs, 2001).

Within the general frame of developed societies with European roots, the range of cultural variations in the processes tends to be more limited. The remaining differences, however, still have the capacity to shock. American teenagers are likely to be surprised to discover that the minimum age for a driver's license is 18 in much of Europe, while Europeans tend to be shocked by the relatively low ages at which a teenager can be tried as an adult in the United States and put at risk of a range of penalties up to and including the death penalty.

In some matters, the United States is at the low end in terms of ages at which youth can be put at risk of harm equivalent to adults. The United States remains one of two countries that has not ratified the U.N. Convention on the Rights of the Child, apparently in part over the minimum ages specified for enlisting in military service and for capital punishment. The age at which a person can be tried for a crime as an adult, rather than as a juvenile, is lower in many U.S. states than in European countries.

On the other hand, with respect to minimum drinking age, the United States is at the high end internationally (see Table 13-3). No country has a higher minimum age, and few have an age as high as in the United States. At first sight, at least, the United States seems to be in a contradictory position on these matters. Perhaps one clue to the contradiction is the fact that the debate about minimum drinking age in the United States mostly revolved around and was decided in terms of traffic casualties. In an automobile-oriented culture, with often inadequate public transport that presses parents into service as the chauffeurs for children below the age for a driver's license, the idea of raising the driving age has seemed impossible; raising the drinking age became the only feasible alternative for reducing the serious carnage from teenage driving.

Table 13-3 makes it clear that Europe has tended toward a different solution to separating inexperienced driving and inexperienced drinking. The age for obtaining a driver's license is higher in most parts of Europe than in most parts of the United States.

TABLE 13-3 Minimum Ages for Purchasing Alcohol, Purchasing Cigarettes, and Obtaining a Driver's License, Countries of Europe and U.S. States

	Alcohol Purchases		Cigarette Purchases		Driver's License	
	European Countries	U.S. States	European Countries	U.S. States	European Countries	U.S. States
≤15	1	0	8*	0	0	6
16	6	0	7	0	0	42
17	0	0	0	0	11	1
18	16	0	16	47	23	1
19	0	0	0	3	0	0
20	1	0	0	0	0	0
21	1	50	0	0	0	0

*No minimum age specified. Netherlands is counted as 16; this age limit is effective 2003. Note that a varying number of European countries are included because of limits in the underlying compilations. Minimum age specified for alcohol is the age at which some form of alcoholic beverage can be purchased for on-premise or off-premise consumption. Fractional minimum ages for U.S. driver's licenses coded to the lower year; for example, 16 years 9 months is classed with 16. Ages are for full (not learner's) licenses.

SOURCES: For alcohol: World Health Organization (1999) and International Center for Alcohol Policy (2002). For cigarettes: World Health Organization, *Tobacco or health: a global status report: country profiles by region, 1997*. http://www.cdc.gov/tobacco/who/whoeupro.htm. For driver's licenses, U.S.: http://golocalnet.net/drive (Orchard Park, New York: Golocalnet, 2002); Europe: http://www.theaa.com/staticdocs/pdf/allaboutcars/overseas/european_motoring_advice.pdf. (Newcastle-upon-Tyne, UK: Automobile Association, 2002). All sites accessed 7 October 2002.

Cultural Variation in Meanings of Drinking and Drunkenness

Differences at the General Cultural Level

As physical commodities, alcoholic beverages have a range of use-values (Mäkelä, 1983) reflecting their different properties. As liquids taken into the body, they quench thirst. Cold, they can cool the body; hot, they can warm it. As a source of calories, they provide some sustenance. Traditionally, they were used medicinally; with the findings on their protective value for heart disease, this use is returning, although the net health balance from drinking in the population as a whole is negative. As psychoactive substances, they can act as a mood changer; at heavier doses, they can take one out of oneself, or be a means of psychic escape.

Although these use-values can be distinguished from one another, when an alcoholic beverage is used for one purpose, its other properties are also carried along. To use wine as a food and source of calories, as was done

traditionally by Italian farm laborers, does not preclude it from also having psychoactive effects.

On top of the physical properties of alcohol, and the use-values attached to them, is an extraordinarily wide range of cultural meanings ascribed to drinking, with their own range of use-values. For a majority of Christians, wine is a sacrament with a range of sacred associations. Sacramental wine is not supposed to intoxicate. Old Anglican prayer books therefore addressed the use of consecrated wine left over after communion. It could not be returned to profane status, but it was also not proper for the priest simply to drink it up, risking drunkenness. Instead, he was instructed to gather other communicants and drink the wine with them "reverently" on the spot (Church of England, 1662).

A crucial use of alcohol, from the perspective of the harms associated with it, is the set of use-values surrounding intoxication from drinking. The "prized but dangerous" psychoactive effects of drinking heavily, as Steele and Josephs (1990) term them, are differentially sought by drinkers in different cultures. As the ethnographic literature has long taught us (MacAndrew and Edgerton, 1969; Room, 2001), there are also big cultural differences in comportment from a given level of drinking—often described, differences in the "disinhibition" associated with the drinking. The combined effects of these differences in drinking patterns and in cultural norms of drunken comportment can be quite dramatic: Time-series analyses of the relation between changes in average alcohol consumption and changes in homicide rates suggest that an extra unit of drinking pushes the homicide rate up twice as much in northern European countries such as Sweden as in southern European countries such as Portugal (Rossow, 2001).

A scale of the degree of hazard in the patterns of drinking in a society has been developed, ranging as a first approximation from 1 for the least hazardous patterns to 4 for the most hazardous (Rehm et al., 2001; see Table 13-4). On this scale, Portugal, for example, is scored at 1, the United States at 2, Sweden at 3, and Russia at 4. Although the proportion of drinking occasions which are relatively heavy is factored into the scale, the scale does not include the dimension of demeanor while drunk, that is, the extent to which norms for drunken behavior allow for violence or other bad behavior. Nevertheless, cross-nationally this dimension appears to cluster with the dimensions included in the scale (Rehm et al., 2001). In a factor analysis of data from ethnographic records in the different frame of traditional tribal and village societies, Partanen (1991, p. 213) also found that violence was particularly associated with a pattern of intermittent but heavy drinking occasions.

The scale has been used so far only at the level of societies as a whole, but the same kind of dimensions of variation exist within societies. In particular, there is some evidence that the social trouble per unit of drinking

TABLE 13-4 Proportion Drinking 5 or More Drinks on 3 or More Occasions in Past 30 Days, Proportion Drinking at All on 3 or More Occasions in the Past 30 Days, Ratio of These, and Minimum Drinking Age, European School Survey Project on Alcohol and Other Drugs (ESPAD), 1999

Country and Hazardous Drinking Score	A. 5+ Drinks on 3 or More Occasions in Past 30 Days	B. Any Drinking on 3 or More Occasions in Past 30 Days
Iceland (3)	16	15
Norway (3)	24	23
Poland (3)	31	33
Finland (3)	18	21
Sweden (3)	17	21
Slovenia (3)	25	32
Latvia (3)	14	23
Ireland (3)	31	52
Macedonia (3)	9	15
United Kingdom (2)	30	55
Hungary (3)	12	22
Croatia (3)	12	23
Estonia (3)	14	28
U.S.A. (2)	*10*[a]	*21*
Denmark (2)	30	62
Russia (Moscow) (4)	16	34
Bulgaria (2)	11	25
Ukraine (3)	10	23
Malta (1)	22	52
Cyprus (1)	12	32
France (1)	12	33
Czech Republic (2)	17	49
Portugal (1)	7	24
Romania (3)	5	18
Slovakia (3)	8	30
Lithuania (3)	8	37
Greece (2)	9	49

*Rounding error resulted in ratio >1; reset at maximum possible (1.00).
[a]Drunk 3+ times in past 30 days.
[b]Has been drunk in lifetime, eighth graders.
SOURCES: Drinking behaviors: Hibell et al. (2000); except U.S. data from Johnston et al. (2000). Hazardous drinking score: Rehm et al. (in press).

A/B	Minimum Drinking Age (Any Beverage and Form)	Has Been Drunk by Age 13	Has Been Drunk in Past 30 Days
1.00*	20	17	35
1.00*	18	17	39
0.94	18	11	30
0.86	18	33	51
0.81	18	24	42
0.78	18	17	35
0.61	18	16	27
0.60	18	25	50
0.60	16	8	17
0.55	16	38	50
0.52	18	10	21
0.52	18	19	19
0.50	18	19	31
0.48	*21*	*25*[b]	*23*
0.48	15	42	64
0.47	18	33	24
0.44	16	15	26
0.43	21	22	35
0.42	16	14	19
0.38	18	7	10
0.36	16	12	18
0.35	18	16	39
0.29	18	12	14
0.28	18	22	10
0.27	18	14	26
0.22	18	16	33
0.18	18	9	15

differs between U.S. regions, with higher rates of trouble in the southern regions, and more generally in the traditionally "dryer" southern and prairie regions (Cahalan and Room, 1974; Room, 1982).

Differences at the Level of Young People and Youth Cultures

In societies such as the United States, the drinking patterns described as characteristic of the upper end of the scale of hazardous drinking are quite characteristic of a particular segment of the population, that is, drinking by adolescents and young adults, particularly young males. This raises the question whether there is simply an upward shift in the hazardous drinking scale for young adults' drinking in different cultures, with the cultures maintaining their relative positions, or whether cultural differences in the extent of hazardous drinking are muted or overridden by drinking patterns in a common youth culture. The ethnographic literature has traditionally held to the former position: It has been common to argue, in an American context, that American drinking customs would be improved if children were taught to drink with diluted wine at the family dinner table, as traditionally done in France or Italy (Heath, 1995, p. 339). However, behind this argument lies the assumption that teaching one use-value of alcohol is necessarily preventive of moving on to other use-values. This seems to be a problematic assumption. For example, the early experiences of drinking by young American teenagers typically do not involve intoxication, but this does not imply they will not be drinking to intoxication three years later.

Ethnographic and news reports about young people's drinking in southern Europe do not sound much different from patterns in North American cultures. For example, on weekend nights in Madrid, 200,000 youth reportedly gather in 24 central city squares, swigging drinks such as cheap red wine mixed with Coca-Cola until 4 a.m., in a style of street parties known as the *botellón* (Tremlett, 2002). Adult perceptions in southern Europe are often that these patterns have changed from the time of their youth: that the youth nowadays are drinking in an "Anglo-Saxon" style, treating alcohol as a psychoactive drug. Among the student informants in Pyorälä's study (1995), the Spanish but not the Finns reported a gender gap, with the older generation less accepting of drinking to intoxication. Indeed, much has changed in the environment of young people in southern Europe in the past half-century that might have lent itself to cultural change. Societies are less authoritarian, marriage and family formation occur later, and young people have more money in their pockets. Increasingly, young people in different societies are tied together as a single audience for media and music, and for the promotions of the alcoholic beverage multinationals.

However, there is room for skepticism about how much has really changed in young people's drinking in, say, Italy. The youth drinking par-

ties described by Beccaria and Guidoni (2002) around young men's conscription in northern Italy feature plenty of heavy drinking. One of their informants noted that "you have to drink, to show incredible powers of endurance to alcohol." But the attachment of the parties to an occasion that extends back in history, and features of the parties such as traditional drinking games, suggest that the parties do not constitute a new cultural innovation.

The somewhat puzzling findings concerning attitudes and norms on drinking among adults in northern and southern Europe (Room and Bullock, 2002) suggest that differences in norms about how drunk one may get, and how one may behave at a given level of drunkenness, are not straightforward. But some customs in the north seem to stand out. No equivalent seems to exist elsewhere, for example, of the Norwegian tradition of *russefeiring*, in which each high school graduating class (with some pre-echoes in the graduating class from middle school) devotes the 17 days between May Day and the Norwegian national day to a drunken rite of passage, with negotiated rule breaking that is both individualistic and collectively organized (Sande, 2002).

Quantitative evidence on the issue of cross-cultural variation in hazardous drinking patterns in Europe is available from the European Study of Patterns of Alcohol and Drug Use, or ESPAD (Hibell et al., 2000), which administered a common questionnaire (comparable in a number of items with the U.S. Monitoring the Future Study questionnaire—Johnston, O'Malley, and Bachman, 2000) to 15-year-olds in schools in a total of 30 countries in Europe. Table 13-4 shows some results from the 1999 samples of this study, along with results for tenth graders from the U.S. study. The countries listed in Table 13-4 are ordered according to the results in the third column of figures, that is, in terms of a ratio reflecting the proportion of drinking occasions for which respondents reported drinking 5+ drinks (in the U.S. data, being drunk). This might be taken as an indication of the extent to which heavy drinking occasions predominate as the drinking pattern among 15-year-olds. The United States falls at the median on this table in terms of this ratio, with about half as many respondents reporting being drunk at least 3 times in the past 30 days as those who report drinking any amount at least 3 times in the same period. Although there are some surprises in the order on this ratio (Lithuania, Romania, Russia, Slovakia, and Ukraine are unexpectedly low, and Malta somewhat high), the ratio generally follows the hazardous drinking scores assigned for the society as a whole (Rehm et al., in press). By this measure, then, there does seem to be some relation between teenage drinking patterns and the drinking patterns of the larger society.

In terms of the actual proportion drinking 3 or more times in the past 30 days, the United States is tied for the fourth lowest position; in two of

the three societies with lower percentages, lack of resources is likely to be one factor keeping the frequency of drinking down. The United States also appears to be at the lower end of the distribution on proportions regularly drinking heavily, although no exact comparison on drinking 5 or more drinks is available (26 percent of U.S. tenth graders reported drinking that much at least once in the past 2 weeks). Compared to Europe, U.S. teenagers are less likely to drink regularly at all, and seem to be somewhat less likely to drink heavily on a regular basis. In several countries—the United Kingdom, Ireland, Poland, and Denmark—the proportion of teenagers drinking 5+ drinks on at least 3 occasions in the past month is substantially greater than the proportion of U.S. teenagers drinking that much at least once in the past two weeks.

The last two columns in the table show responses in the different national samples on getting drunk. What it means to be drunk is a matter of cultural definition, and the responses are also affected by idiom and connotations in the local language, so comparisons should be made with caution. In particular, "drunk" may be tend to be defined in more extreme terms in wine cultures. In four societies—Finland, the United Kingdom, Denmark, and Ireland—half or more of the 15- to 16-year-olds report having been drunk in the past month; in the first three of these societies, along with the students in Moscow, one-third or more of the students report having been drunk by age 13. At the other end of the spectrum, having been drunk by age 13 is relatively uncommon in many of the wine cultures and parts of eastern Europe, and rates of having been drunk in the last 30 days are 20 percent or below in eight wine cultures—Croatia, Cyprus, France, Greece, Macedonia, Malta, Portugal, and Romania. U.S. tenth graders are less likely to report having been drunk in the past 30 days than 15-year-olds in many western European countries. On the other hand, the United States is further up the ordering in terms of early drunkenness, comparing the proportion of U.S. eighth graders who report ever having been drunk with the proportions of Europeans who retrospectively report having been drunk by the age of 13.

Trends and Concerns About Teenage Drinking in Europe

The ESPAD study also offers the broadest set of quantitative data on changes in teenage drinking in Europe, because the questions asked in 1999 in many of the countries involved also had been asked in an earlier survey in 1995. The general trend from 1995 to 1999 in many countries was for an increase in the proportion of 15- to 16-year-olds reporting drinking 5+ drinks on 3 or more occasions in the past 30 days (Hibell et al., 2000:71). The increased proportion was considerable in the three countries that al-

ready had the highest rates (Ireland, Denmark, and the United Kingdom) and in Poland and Slovenia, but there were also increases in five other countries, while the proportion stayed much the same in nine countries. No country had a substantial decrease.

Youth drinking has become a general social and health concern in Europe. In fact, concerns about youth drinking have been the main vehicle for expressing concerns about alcohol problems in general at a continental level, such as in the European Union. A flurry of concern about "alcopops" (sweetened alcoholic drinks perceived to be aimed at youth) started in 1995 and brought the first serious attempt at public health-oriented action on alcohol issues within the European union structure (Sutton and Nylander, 1999). In early 2001, European Ministers of Health agreed on a "Declaration on Young People and Alcohol," stating that "the health and well-being of many young people today are being seriously threatened by the use of alcohol and other psychoactive substances," and setting goals, including reducing drinking and high-risk drinking substantially, delaying the onset of drinking among young people, and reducing pressures on young people to drink from alcohol advertising and other promotion (World Health Organization, 2001).

Nevertheless, concern about youth drinking is generally less urgent in Europe than in the United States, and measures and programs to counter it have been generally soft and not particularly effective. The discussion about alcopops in Denmark did result in a law imposing a minimum age limit (of 15) for off-premise purchases of alcohol, which seems to have some effect (Møller, 2002). Countries that have traditionally had fairly restrictive alcohol controls (the Nordic countries other than Denmark, the United Kingdom, and Ireland) in areas such as bar and liquor store closing hours and days have continued to loosen the controls (Karlsson and Österberg, 2001), raising the effective availability for youth and others. In Ireland, which has seen an extraordinary rise in alcohol consumption (46 percent in 11 years), with high rates of drinking among teenagers (see Table 13-4), a Strategic Task Force on Alcohol (2002) has called for increased taxes and other measures. In the United Kingdom, the primary policy focus has been on "drunken yobs" (louts; Hinsliff, 2002) and "alcohol-related crime, disorder and violence" (U.K. Home Office, 2000), including proposals to increase regulation and legislation concerning underage drinking. But the government effort has lacked crucial components such as a scheme to provide "proof of age" documentation, a task that has been left in the hands of an alcohol industry organization (Portman Group, 2000). As in the example from Norway, harm reduction efforts are also common in much of Europe. Institutional legal liability for underage drinking is much less likely outside the United States.

Age Limits and Coming of Age Discourse and Choices

Arguments and Issues in the Discourse About Underage Drinking

An interesting study that has not been done would be to read and analyze the discourse in different societies about the minimum legal age for drinking and for other behaviors. Clearly, there is influence between polities on these matters: for example, the age of majority was lowered from 21 in many places in the 1970s, while there is currently a strong tendency to push up the minimum age for purchasing cigarettes. Turkey's legal age of marriage is being raised from 17 for men and 15 for women to 18 for both genders, as part of a modernization of the civil code pushed forward in the process of applying for membership in the European Union. The code which is being replaced was based on Swiss family law in 1926, adopted as "the most modern code of its time" (Fraser, 2001). The lines of influence probably flow mostly from the center to the periphery, so that the discourse in the United States is not strongly influenced these days by provisions and arguments from elsewhere.

One potential consideration in discussions about the minimum legal age for drinking would be the effect of alcohol on the physically developing body. This was a consideration in the recent proposal by a Canadian Senate committee for a minimum age of 16 for a legalized marijuana regime (Senate Special Committee, on Illegal Drugs 2002, pp. I, 166). Other potential considerations are the various ages at which understanding and judgment in different circumstances are considered mature, and how drinking and intoxication may interplay with these factors. Intoxication often enters into legal considerations about consent to sexual intercourse and about intent to perform criminal acts; for both of these issues, there is a minimum age at which a teenager's self-governance is recognized. If a teenager is too young to be held legally accountable for the results of drinking, maybe he or she is too young to be drinking.

In the United States, arguments defending a drinking age of 21 emphasize the higher probabilities of later drinking problems for those who start drinking earlier (e.g., National Advisory Council on Alcohol Abuse and Alcoholism, 2002, p. 51), although there is room for questioning the causal significance and relevance to the minimum drinking age of the relationships used in these arguments. Issues of the relation of the drinking age to other normative ages can also come into the discussion. For example, a consideration in raising the minimum drinking age from 18 to 19 in Ontario in 1979 was to move legal drinking out of the ages of high school attendance. As we have noted, the relation of minimum drinking age to minimum driving age and driving customs is particularly relevant in the United States; one argument that has been given for discounting European experience is

that "youth drive less frequently in Europe than in the U.S." (National Advisory Council on Alcohol Abuse and Alcoholism, 2002:52).

An important consideration with respect to minimum drinking age is the issue of how and in what circumstances drinking is to be initiated. A position paper of the National Youth Rights Association (n.d.) summarizes the main line of argument on this issue that has been used in the United States:

> "Drinking age laws discourage rather than encourage a transition period between youthful abstinence and adult use of alcoholic beverages," writes journalist and sociologist Mike A. Males (1996:207).
>
> Under such laws, many young people learn drinking in unsafe environments, like basement keg parties. They use alcohol with the intention of getting drunk rather than as an accompaniment to food. Researchers say American young people engage in dangerous "binge drinking" far too often and far more often than some of their European counterparts, who learn to drink in the open. The United States should take lessons from cultures like those of Jews, Italians and Greeks, who traditionally focus on misuse of alcohol, rather than simple use of alcohol, as the source of problems. "Educational efforts should encourage moderate use of alcohol among those who choose to drink," explains sociologist David J. Hanson (1996:45).

There are several empirical problems with the line of argument as it is stated. The first is that, as Table 13-4 indicates, European teenagers are at least as likely as Americans to initiate drinking before the local legal age. Table 13-4 also suggests that the United States is about in the middle of the range of European countries when it comes to the proportion of teenagers engaged in drinking that—in U.S. terminology—is often called binge drinking. Furthermore, there is no clear relationship, viewed cross-nationally in the table, between the minimum drinking age and the proportion of binge occasions among teenage drinking occasions. As we have seen, there is also some evidence of a generational shift in teenage drinking patterns in southern Europe, moving toward more binge drinking.

Perhaps most importantly, the evidence that a solution of "educational efforts" would have much success is not compelling at the level of the individual educational program (Paglia and Room, 1999), let alone at the level of the society. Examples of societies that have successfully changed their patterns on hazardous drinking and drunken comportment are hard to find (Room, 1992). Considering the development of amounts and patterns of drinking in western Europe in the past 50 years, Simpura (2001:11) concludes that changes in "qualitative features of drinking" may

> take decades and even longer to become visible. Some traditional qualitative features of drinking seem very persistent to change, even in the midst

> of major quantitative changes in consumption levels etc. Therefore, the analysis of this report suggests that the natural time frame for changes in drinking patterns is a generation, rather than a decade or any shorter period. If this is accepted, it implies that efforts to prevent alcohol-related harm by measures targeted at drinking patterns will produce gains only in the very long run, if ever.

On the other side of the argument, it must be acknowledged that there has been one substantial change already in drinking patterns in the United States over a period of about a generation—the shift away from drinking before driving. Given the U.S. culture's dependence on the automobile, this has been a significant change, even if an incomplete one. But an effort to reduce rates of drinking before age 21 to insignificance seems to be taking on a much more difficult task, particularly in a cultural environment saturated in promotion of drinking in youth-oriented media, and in a legal environment where restrictions on alcohol advertising and promotion are increasingly suspect from a constitutional perspective (Hudson, 2002).

Underage Drinking Can Be Reduced—But What Then?

There is little question, from data predominantly from the United States, but also from Canada and Australasia, that changing the drinking age affects levels of alcohol consumption and rates of traffic crashes in the applicable ages and to some extent at lower ages (Wagenaar and Toomey, 2002). However, the effects on other health and social problems are less clear. A Danish study has recently found that instituting a minimum age of 15 for purchases for off-premise consumption had an effect on consumption levels (Møller, 2002). In this case, the effect also extended above age 15, which may have reflected a sensitization of Danish parents to watching over their children's drinking as a result of the public debate about the measure.

But stiffer policing of underage drinking presumably has its limits in a situation where alcohol is readily available to those over legal age. Despite much police pressure, marijuana—though not legally available—has not disappeared from the life of young American adults. In the case of alcohol, repression may in the end provoke a rebound, as Prohibition did among American youth in the 1920s and 1930s (Room, 1984). In the context of official repression, drinking—and indeed intoxication—became a symbol of a generational rebellion. As a member of that generation remarked, looking back, "drinking, we proved to ourselves our freedom as individuals and flouted Congress. . . . It was the only period in which a fellow could be smug and slopped concurrently" (Liebling, 1981:667).

Even if there is no rebound, there will still be a substantial residue of drinking under the age of 21 in the United States at any time in the foresee-

able future. This leaves open the following question: What is the best way to handle the discrepancy—which exists in Europe as well as in the United States—between the actual ages at which teenagers start drinking and the age at which the behavior becomes legal? Age-specific prohibition is more likely to reduce the frequency of drinking than the amount drunk on one occasion. In fact, although a rigorous enforcement may result in fewer intoxicated occasions, it may well raise the proportion of drinking occasions that involve intoxication.

Environmental strategies such as high taxes on alcohol and reducing the general availability of alcohol can be brought into play and will have some effect (Toomey and Wagenaar, 2002). But, again, the effect will have its limits.

The general policy choices at that point are by now familiar from the world of illicit drugs, although there are differences in their application in the case of underage drinking. One choice is the "zero tolerance" model. Underage drinking is vigorously pursued, if necessary with urine testing, and those detected are punished, secondarily deterred, or "treated," hopefully back into line. Public attitudes in the United States generally do not support the application of such an approach with anything like the rigor used for illicit drugs, except perhaps in connection with drinking and driving.

A second choice is an institutionalized "patterned evasion" of norms. This is how marijuana smoking is handled these days in much of Europe and parts of the United States. If the young cannabis smoker does not insist on lighting up on the steps of the police station, but keeps the use within private space, he or she is generally left alone. The police, however, retain the possibility of a "drug bust" as a handy lever in the pursuit of their duties, which tends to mean that the strategy results in many arrests and police records, potentially on a discriminatory basis. Institutionalized patterned evasion was the traditional approach of American colleges to underage drinking before the last two decades.

A third choice is a "harm reduction" strategy, which involves acknowledging the reality of youthful drinking in the course of making provision to reduce the harms associated with it. This third strategy is pursued by the Norwegian local police in dealing with *russefeiring* (Sande, 2002). Each year the elected leaders for that year's celebration negotiate in considerable detail with the local authorities about which public rules are available to individual participants to be broken (with the achievement of breaking it marked by a trophy sign on the *russefeiring* costume). The adult world has made various unsuccessful attempts to eliminate *russefeiring*, but given that these have failed, there is no hesitation in falling back on minimizing the harm.

The approach to underage drinking by American colleges traditionally included some elements of harm reduction, along with the patterned evasion strategy. But in the past two decades, a harm reduction strategy has been becoming more difficult for colleges: to acknowledge that illegal behavior is occurring puts the colleges at risk of legal liability for adverse consequences. More generally, American culture seems to be uncomfortable with the uneasy compromises with disapproved behavior which harm reduction strategies often involve. Thus the trend seems to be toward the first choice. This is the policy choice that offers the best target for a potential future generational rebellion. As we have noted, Europe does not seem to be moving in the same direction in terms of policy choices.

Although some young people, particularly in the United States, remain abstainers, drinking and intoxication seem to be involved in the process of growing up for many young people in all societies with European roots. One way or another, the damage from the intoxication to the drinker and to others can be reduced, but it is unlikely to be eliminated in the foreseeable future. Nor is it likely that state actions can succeed in cutting off all drinking below the age of 21. In these circumstances, there is a need to look not only at means of prevention of underage drinking, but also at means of handling it to minimize the adverse consequences. These adverse consequences would include any lasting stigma and its adverse effects on those found to be drinking. There is also a need for a greater understanding of the place of drinking and intoxication in the various subcultures and social worlds of young people. U.S. researchers and policy makers have much to gain from encouraging a greater internationalism in studying these issues.

REFERENCES

Adlaf, E.M., Ivis, F.J., and Smart, R.G. (1997). *Ontario student drug use survey: 1977-1997*. Research Document Series No. 136. Toronto: Addiction Research Foundation.

Anonymous. (1997). Rite of passage. In J. Kagan and S. Gall (Eds.), *Gale encyclopedia of childhood and adolescence*. Farmington Hills, MI: Gale. Available: http://www.findarticles.com/cf_dls/g2602/0004/2602000456/p1/article.jhtml (accessed 20 May 2003).

Aries, P. (1962). *Centuries of childhood: A social history of family life*. New York: Knopf.

Beccaria, F., and Guidoni, O.V. (2002). Young people in a wet culture: The functions and patterns of drinking. *Contemporary Drug Problems*, *29*, 305-334.

Bright, M., and Hinsliff, G. (2002, September). *Heads act on exam chaos*. Available: http://www.observer.co.uk/politics/story/0,6903,792510,00.html (accessed 20 May, 2003).

Cahalan, D., and Room, R. (1974). *Problem drinking among American men*. New Brunswick, NJ: Rutgers Center of Alcohol Studies.

Church of England. (1662). *Book of common prayer*. Oxford: Oxford University Press.

Fraser, S. (2001, October). *Turkey revises male-dominated code*. Available: http://www.fww.org/famnews/turkey.htm (accessed 20 May 2003).

Gusfield, J. (1996) *Contested meanings: The construction of alcohol problems*. Madison: University of Wisconsin Press.

Hanson, D. (1996). *Alcohol education: What we must do*. Westport, CT: Praeger Press.
Hanson, D. (2001). *It's better to teach safe use of alcohol*. Available: http://www2.potsdam.edu/alcohol-info/InMyOpinion/TeachSafeAlcohol.html (accessed 20 May, 2003).
Heath, D.B. (1995). An anthropological view of alcohol and culture in international perspective. In D.B. Heath (Ed.), *International handbook on alcohol and culture* (pp. 328-347). Westport, CT: Greenwood Press.
Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnasson, T., Kokkevi, A., and Morgan, M. (2000). *The 1999 ESPAD report: Alcohol and other drug use among students in 30 countries*. Stockholm: CAN.
Hinsliff, G. (2002, August 11). *Instant fines start for street crimes*. Available: http://www.observer.co.uk/politics/story/0,6903,772648,00.html (accessed 20 May, 2003).
Hollingshead, A.B. (1961) *Elmtown's youth: The impact of social classes on adolescents*. New York: Science Editions (first published 1949).
Hudson, D.J., Jr. (2002). Alcohol advertising, labeling, score victories in Utah, Colorado. In R.T. Kaplar (Ed.). *The First Amendment and the media 2002* (Section III.J). Washington, DC: The Media Institute.
International Center for Alcohol Policy. (2002, March, revised). *Drinking age limits. ICAP reports 4*. Available; http://www.icap.org/publications/report4.html (accessed 20 May, 2003).
Johnston, L.D., O'Malley, P.M., and Bachman, J.D. (2000). *Monitoring the future: National survey results on drug use, 1975-1999. Vol. 1, secondary school students*. Available: http://www.monitoringthefuture.org/pubs/monographs/overview1999.pdf (accessed 20 May 2003).
Karlsson, T., and Österberg, E. (2001). A scale of formal alcohol control policy in 15 European countries. *Nordic Studies on Alcohol and Drugs*, *18*(English Suppl.), 117-131.
Kett, J.F. (1977). *Rites of passage: Adolescence in America, 1790 to the present*. New York: Basic Books.
Liebling, A.J. (1981). *Liebling abroad*. New York: Wideview Books (reprinted from *Between meals: An appetite for Paris*, 1962).
MacAndrew, C., and Edgerton, R. (1969). *Drunken comportment: A social explanation*. Chicago: Aldine.
Mäkelä, K. (1983). The uses of alcohol and their cultural regulation. *Acta Sociologica*, *26*, 21-31.
Males, M. (1996). *The scapegoat generation*. Monroe, ME: Common Courage Press.
Ministry of Children and Family Affairs. (2001). *Action plan against forced marriages*. Oslo: Author.
Møller, L. (2002). Legal restrictions resulted in a reduction of alcohol consumption among young people in Denmark. In R. Room (Ed.), *The effects of Nordic alcohol policies: What happens to drinking and harm when controls change* (pp. 155-166). Helsinki: Nordic Council for Alcohol and Drug Research.
Mosher, J.F. (1980). The history of youthful drinking laws: Implications for current policy. In H. Wechsler (Ed.), *Minimum-drinking-age laws* (pp. 11-38). Lexington, MA.: Lexington Books.
National Advisory Council on Alcohol Abuse and Alcoholism. (2002). *How to reduce high-risk college drinking: Use proven strategies, fill research gaps*. Rockville, MD: National Institute on Drug Abuse and Alcoholism.
National Youth Rights Association. (n.d.). *NYRA position paper: The drinking age*. Adopted by the NYRA Board of Directors. Available: http://nyra.ecg.net/docs/nyraissues_drinkingage.pdf (accessed 20 May, 2003)
Neugarten, B.L., Moore, J.W., and Lowe, J.C. (1965). Age norms, age constraints, and adult socialization. *American Journal of Sociology*, *40*, 710-717.

Opie, I. and Opie, P. (2001). *The lore and language of schoolchildren*. New York: New York Review of Books (first published 1959).

Paglia, A., and Room, R. (1998). How unthinkable and at what age? Adult opinions about the "social clock" for contested behaviour by teenagers. *Journal of Youth Studies*, *1*, 295-314.

Paglia, A., and Room, R. (1999). Preventing substance use problems among youth: A literature review and recommendations. *Journal of Primary Prevention*, *20*, 3-50.

Partanen, J. (1991). *Sociability and intoxication: Alcohol and drinking in Kenya, Africa, and the modern world* (Vol. 39). Helsinki: Finnish Foundation for Alcohol Studies.

Polhemus, T. (1995). *Street style: From sidewalk to catwalk*. London: Thames & Hudson.

Portman Group. (2000, January 17). *Drinks industry scheme continues to plug the proof of age gap*. Available: http://www.portman-group.org.uk/newsdesk/66.asp?coid=155&recordcount=5 (accessed 20 May 2003).

Pyorälä, E. (1995). Comparing drinking cultures: Finnish and Spanish drinking stories in interviews with young adults. *Acta Sociologica*, *38*, 217-229.

Rehm, G., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., Sempos, C.T., Frick, U., and Jernigan, D. (in press). Alcohol. In *Comparative quantification of health risks: global and regional burden of disease due to selected major risk factors*. Geneva: World Health Organization.

Rehm, J., Monteiro, M.G., Room, R., Gmel, G., Jernigan, D., Frick, U., and Graham, K. (2001). Steps towards constructing a global comparative risk analysis for alcohol consumption: Determining indicators and empirical weights for patterns of drinking, deciding about theoretical minimum, and dealing with different consequences. *European Addiction Research*, *7*, 138-147.

Room, R. (1982). Region and urbanization as factors in drinking practices and problems. In B. Kissin and H. Begleiter (Eds.). *The pathogenesis of alcoholism: Psychosocial factors; The biology of alcoholism* (Vol. 6) (pp. 555-604). New York and London: Plenum Press.

Room, R. (1984). A "reverence for strong drink": The Lost Generation and the elevation of alcohol in American culture. *Journal of Studies on Alcohol*, *45*, 540-546.

Room, R. (1992). The impossible dream? Routes to reducing alcohol problems in a temperance culture. *Journal of Substance Abuse*, *4*, 91-106.

Room, R. (2001). Intoxication and bad behaviour: Understanding cultural differences in the link. *Social Science and Medicine*, *53*, 189-198.

Room, R., and Bullock, S. (2002). Can alcohol expectancies and attributions explain Western Europe's north-south gradient in alcohol's role in violence? *Contemporary Drug Problems*, *29*, 619-648.

Room, R., and Paglia, A. (2001). "At what age do you think it's OK?": The social clock for drinking and drug use among Ontario teenagers. Presented at an international research conference, Youth Cultures and Subcultures: Functions and Patterns of Drinking and Drug Use, Skarpö, Sweden, April 23-26.

Rossow, I. (2001). Alcohol and homicide: a cross-cultural comparison of the relationship in 14 European countries. *Addiction*, *96*(Suppl. 1), S77-S92.

Sande, A. (2002). Intoxication and rite of passage to adulthood in Norway. *Contemporary Drug Problems*, *29*, 277-303.

Sarmela, M. (1969). *Reciprocity systems of the rural society in the Finnish-Karelian culture area: With special reference to social intercourse of the youth*. Helsinki: Suomalainen Tiedeakatemia.

Senate Special Committee on Illegal Drugs, Canadian Senate. (2002). *Cannabis: Our position for a Canadian public policy*. Available: http://www.parl.gc.ca/common/Committee_SenRep.asp?Language=E&Parl=37&Ses=1&comm_id=85 (accessed 20 May 2003).

Simpura, J. (2001). Trends in alcohol consumption and drinking patterns: Sociological and economic explanations and alcohol policies. *Nordisk Alkohol- and Norkotikatidskrift*, *18*(English Suppl.), 3-13.

Steele, C.M., and Josephs, R.A. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist*, *45*, 921-933.

Strategic Task Force on Alcohol. (2002). *Interim report*. Available: http://www.doh.ie/pdfdocs/stfa.pdf (accessed 20 May 2003).

Sutton, C., and Nylander, J. (1999). Alcohol policy strategies and public health policy at an EU-level:. The case of alcopops. *Nordic Studies on Alcohol and Drugs*, *16*(English Suppl.), 74-91.

Thornton, S. (1995). *Club cultures: Music, media and subcultural capital*. Cambridge, UK: Polity Press.

Toomey, T.L., and Wagenaar, A.C. (2002). Environmental policies to reduce college drinking: Options and research findings. *Journal of Studies on Alcohol*, (Suppl. 14), 193-205.

Tremlett, G. (2002, February 9). *Mayor starts party purge of night-time madness in Madrid*. Available: http://www.guardian.co.uk/international/story/0,3604,647436,00.html (accessed 20 May 2003).

U.K. Home Office. (2000). *Tackling alcohol related crime, disorder and nuisance: Action plan*. Available: http://www.homeoffice.gov.uk/crimpol/crimreduc/alcohol/index.html (accessed 20 May 2003).

van Gennep, A. (1960). *The rites of passage*. Translated by M.B. Vizedom and G.L. Caffe. London: Routledge and Kegan Paul (first published 1908).

Wagenaar, A.C., and Toomey, T.L. (2002). Effects of minimum drinking age laws: Review and analyses of the literature from 1960 to 2000. *Journal of Studies on Alcohol*, (Suppl. 14), 206-225.

Williams, R.M. (1960). *American society: A sociological interpretation*. New York: Knopf.

World Health Organization. (2001, January). *Declaration on young people and alcohol*. Adopted at a Ministerial meeting in Stockholm, January. Copenhagen: World Health Organization, Regional Office for Europe. Available: http://www.who.dk/AboutWHO/Policy/20030202_1 (accessed 20 May 2003).

World Health Organization. (1999). *Global status report on alcohol*. Geneva: Author.

14

Preventing Underage Drinking in American Indian and Alaska Native Communities: Contexts, Epidemiology, and Culture

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The use and abuse of alcohol among American Indian and Alaska Native (AI/AN) adolescents is a major public health concern (Beauvais, 1996; U.S. Congress Office of Technology Assessment, 1990). Compared to their non-AI counterparts, AI youth are more likely to use alcohol regularly (Beauvais, 1992b; Beauvais, 1996), more likely to become problem drinkers (Beauvais, 1996), more likely to meet diagnostic criteria for alcohol abuse and dependence (Beals et al., 1997; Costello, Farmer, Angold, Burns, and Erkanli, 1997), more likely to use alcohol in combination with drugs (Beauvais, 1992a; Novins, Beals, and Mitchell, 2001a), and more likely to have both an alcohol use disorder and a psychiatric disorder (Beals, Novins, Mitchell, Shore, and Manson, 2002; Beals et al., 1997; Costello et al., 1997). From service system data and vital statistics, we

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know that AIs generally are more likely to develop a variety of physical health conditions related to alcohol use (Hisnanick, 1992; Indian Health Service, 1999; Sugarman and Smith, 1992) and to die from alcohol-related causes (Campos-Outcalt, Prybylski, Watkins, Rothfus, and Dellapenna, 1997; Gilliland, Becker, Samet, and Key, 1995; Indian Health Service, 1999; May, 1996; May and Van Winkle, 1994; Singh and Hoyert, 2000). Research to date also suggests that rates of alcohol use and related problems vary substantially across AI/AN tribes (Indian Health Service, 1999; May, 1996; Novins, Beals, Roberts, and Manson, 1999).

Prevention of underage drinking in AI/ANs requires an appreciation of the historical, cultural, and sociodemographic contexts of alcohol use and related problems as well as an understanding of its epidemiology and theoretical relationships to key cultural contexts. Several promising prevention efforts have either been transferred successfully to AI/AN communities or emerged from these communities themselves. Although these efforts demonstrate community-level impacts, research suggests that efforts through the mid-1990s had failed to reduce high-risk substance use among AI/ANs overall (Beauvais, 1996).

The goal of this paper is to review our current knowledge regarding the prevention of underage drinking in AI/AN communities. We will include descriptions of the key contexts and epidemiology of underage drinking among AI/ANs, prevention efforts to date, and the role of cultural constructs in understanding and preventing underage drinking and related problems.

KEY CONTEXTS

Sociodemographics

AI/ANs are a diverse and heterogeneous population. There are more than 500 federally recognized tribes with a population of 4.1 million as of 2000 (U.S. Census Bureau, 2001). These tribes differ substantially in terms of language, customs, family structures, religions, and social relationships (U.S. Department of Health and Human Services, 2001). Most AIs live in western states, including California, Arizona, New Mexico, South Dakota, Alaska, and Montana, with 42 percent residing in rural areas, compared to 23 percent of whites (Rural Policy Research Institute, 1999). They are also relatively young, with a birth rate 1.6 times that of the U.S. all-races rate (U.S. Department of Health and Human Services, 1998). The Indian Health Service (IHS) reported that 65.3 perecnt of the AI/AN population living in reservation states have completed high school and 8.9 percent have completed 4 years of college—much lower than the 75.2 percent and 20.3 percent, respectively, for the U.S. as a whole (U.S. Department of Health and

Human Services, 1998). Furthermore, unemployment is generally higher among AI/ANs (16.2 percent versus 6.4 percent nationally). Not surprisingly, poverty is often quite severe in AI/AN communities. In 2000, the median family income was $33,144 compared to $49,628 for the general population (U.S. Census Bureau, 2002). Thus, the AI/AN population is younger, is less educated, and has fewer economic resources than the rest of the U.S. population (U.S. Department of Health and Human Services, 1998). However, it is important to recognize that there is considerable variability across tribes and regions of the country (U.S. Department of Health and Human Services and Indian Health Service, 1997).

History

Although there was some exposure to alcohol among AI/ANs prior to European contact, it was confined mostly to agricultural peoples of the Southwest (Waddell, 1980). The majority of tribes gained their first experience with alcohol from frontiersmen, trappers, and traders—often under exploitative circumstances. Given the relatively rapid nature of this introduction and a lack of indigenous mechanisms to control alcohol use, problems with alcohol developed in many, but by no means all, AI/AN cultures (Abbott, 1998; Levy and Kunitz, 1974; MacAndrew and Edgerton, 1969; Mancall, 1995). Stereotypes of the "drunken Indian" soon abounded and tribal leaders—and then the federal government—attempted to control the use of alcohol (Mancall, 1995). Although AIs became U.S. citizens in 1924, federal laws prohibiting their use of alcohol remained in effect until 1953. Interestingly, up to 50 percent of tribes still limit access to alcohol within their reservation borders (Abbott, 1998).

Institutions

Educational, human, and health services in AI/AN communities have undergone radical changes in recent years. These are largely the result of the Indian Self-Determination and Educational Assistance Act (Public Law 93-638), which has given AI/AN tribes greater flexibility and autonomy to restructure human services. These changes are well illustrated by changes in health services delivery for AI/ANs. Since 1965, IHS has developed a system of ambulatory mental health services for Indian communities at no cost to those eligible. Hospitals and clinics are operated either by IHS or by tribes. Three distinct funding and provider models have evolved in AI/AN communities. In the first and original model, commonly referred to as direct service, federal agencies such as IHS function as both funders and providers of services. In the second model, federal agencies provide funding and tribes are the contracted providers (i.e., the federal agencies oversee the types and

quality of services offered). In the third model, federal agencies provide funding and tribes serve as "compacted" providers (i.e., federal funds are transferred directly to the tribes, who then determine the types of services they will offer; Dixon, 2001; Dixon, Bush, and Iron, 1997).

This movement to local control of services has not been uniform. While some tribes have embraced this process, others have raised concerns that the contracting and compacting of educational, health, and human services to tribes allow the federal government to avoid meeting its treaty obligations (Dixon et al., 1997; Sternberg, 1997). Small tribes are in a particularly poor position to take advantage of this process because their shares of federal funds under current compacting schemes are small and they are less able to draw on other resources than are larger tribes (Dixon et al., 1997). In some communities, a loose network of IHS, Bureau of Indian Affairs, state, private, tribally operated, and traditional services has emerged that creates substantial administrative barriers to the coordination of services. These problems are even more complex in urban areas. In the area of health service delivery, Urban Indian Health boards, which were chartered by the IHS, receive very limited funding (about 1 percent of the IHS budget), even though half of all Indian people live in urban and suburban areas (Kauffman, Johnson, and Jacobs, 1997; Sternberg, 1997; U.S. Congress Office of Technology Assessment, 1990). Overall, health, education, and human services systems serving AI/ANs are complex, often fragmented, and chronically underfunded (Dixon, 2001; Dixon et al., 1997; Kauffman et al., 1997; Nelson, McCoy, Stetter, and Vanderwagen, 1992; Novins, LeMaster, Sharma, and Manson, 2001b; Sternberg, 1997). This situation creates significant institutional barriers to the development of effective prevention programs in AI/AN communities.

NATURE AND EXTENT OF UNDERAGE DRINKING IN AMERICAN INDIAN AND ALASKA NATIVE COMMUNITIES

A series of community-based studies provides critical information regarding the prevalence and correlates of underage drinking. Beauvais and colleagues have conducted an ongoing annual survey of AI 7th to 12th graders that has been a key resource for monitoring the prevalence and patterns of alcohol and drug use among rural reservation AI adolescents since 1975. Five to seven tribes are chosen each year (albeit in a way that does not allow for tribal comparisons) and a companion effort has allowed correction of their rates to account for school dropouts (Beauvais, 1992a, 1992c; Beauvais, 1996; Beauvais, Oetting, Wolf, and Edwards, 1989; Swaim, Beauvais, Chavez, and Oetting, 1997). When compared to studies of non-AI adolescents such as Monitoring the Future and the National Household Survey on Drug Abuse, Beauvais and colleagues have consis-

tently shown that AI youth are as likely to drink as other youth, more likely to start drinking at a younger age, more likely to drink heavily, more likely to use drugs, and more likely to suffer more alcohol- and drug-related negative consequences than their non-AI counterparts (Beauvais, 1992a; Beauvais, 1996; Beauvais, 1998; Beauvais et al., 1989). Correlates of alcohol and drug use include living on a reservation (Beauvais, 1992a), having dropped out of school, legal problems, antisocial behavior (Beauvais, 1996), and associating with alcohol- and drug-using peers (Beauvais, 1992a).

The Indian Adolescent Health Survey questioned 13,454 AI middle and high school students from across the United States in 1989 and compared them to a sample of white students in rural Minnesota (Blum, Harmon, Harris, Bergeisen, and Resnick, 1992). This study focused on risk behaviors and self-reported health status. The prevalence of weekly alcohol use increased by age for both AI females and males, although males were more likely to use alcohol in all age groups. When compared to their non-AI counterparts, AI adolescents were less likely to use alcohol weekly (17.1 percent versus 14.1 percent, respectively for males; 15.8 percent versus 10.2 percent for females). The major exception to this was AI males in 12th grade, who were more likely to use alcohol weekly than their white counterparts. AI youth had consistently higher rates of drug use and history of suicide attempts, and were more likely to report being a victim of physical abuse (Blum et al., 1992). AI adolescents were more likely to report driving after drinking and riding in a car with a driver who had been drinking or using drugs. Regular alcohol consumption was associated with having attempted suicide for both male and female AI students, even after controlling for other variables such as having a family member or friend attempt or complete suicide or reporting poor emotional health (Borowsky, Resnick, Ireland, and Blum, 1999).

The Great Smoky Mountains Study, a longitudinal study of 9- to 15-year-olds residing in rural Appalachia, included 431 AI children from the Eastern Band Cherokee Tribe. This study generated *Diagnostic and Statistical Manual of Mental Disorders*-based diagnoses (American Psychiatric Association, 1994) of alcohol and drug abuse/dependence as well as a number of psychiatric disorders (e.g., major depression). Although lifetime and 3-month prevalences of alcohol use were comparable for the AI and white participants (Federman, Costello, Angold, Farmer, and Erkanli, 1997), AI participants were more likely to have an alcohol or drug disorder. Consistent with Kandel's Stage Theory (Kandel and Yamaguchi, 1993), alcohol use usually preceded drug use (Federman et al., 1997). Although those using substances were at greater risk for the development of later psychiatric disorders in both samples (Federman et al., 1997), such comorbidity was more common in the AI sample (2.5 percent versus 0.9 percent; Costello et al., 1997).

The Voices of Indian Teens Study (VOICES) was a longitudinal study of more than 2,000 AI adolescents from 4 AI communities conducted by our research group. This study led to a number of key findings. In a comparison to regionally matched non-AIs from the Monitoring the Future Study, AI youth had comparable rates of lifetime alcohol use, but were more likely to report past-month use (Plunkett and Mitchell, 2000). Novins et al. (1999) found that AI alcohol use was associated with suicidal ideation in two of three VOICES communities studied. Another study by Novins et al. (2001a) found that most AI adolescents who used alcohol also used another substance (79.2 percent). Many of these youth reported a pattern of substance use progression that was inconsistent with Kandel's Stage Theory, in contrast to findings from the Great Smoky Mountains Study (Novins et al., 2001a). The patterns of substance use progression varied by community, with marijuana more likely to serve as an initiating substance in communities in which alcohol possession and consumption are illegal for adults (Novins et al., 2001a).

Other studies amplify these findings. Analyses of data from Monitoring the Future have shown that AI adolescents exhibit comparable 12-month and 30-day prevalences of alcohol use, but are more likely to report daily use of alcohol (Bachman et al., 1991). King and Thayer (1993) found that having alcohol-using peers was associated with alcohol use among AI adolescents attending a boarding school. Beals et al. (1997) reported a higher prevalence of alcohol abuse/dependence in a sample of 109 Northern Plains high school students (11.6 percent) compared to a sample of white adolescents from Oregon (4.6 percent). In this study, 15 percent of those youth with a substance use disorder (60 percent of whom had alcohol abuse or dependence) had a comorbid depressive disorder; 10 percent had a comorbid anxiety disorder and 40 percent had a comorbid disruptive behavior disorder (the latter being more common than the comparison sample of white adolescents, who had a prevalence of 25 percent). In a companion study to Beals et al., Duclos and colleagues (1998) found that 150 AI adolescents admitted to a juvenile detention center in a Northern Plains community had a much higher prevalence of alcohol abuse and dependence (34.0 percent) than did Beals et al.'s (1997) high school sample (11.6 percent), suggesting an association between legal problems and alcohol use disorders. The relationships of alcohol use to drug use and nonsubstance use psychiatric disorders are amplified by our recent study of 89 AI adolescents admitted to a residential substance abuse treatment facility (Novins, Fickenscher, and Manson, 2002a). Ninety-five percent of these adolescents had an alcohol use disorder, 90 percent had at least one drug use disorder, and 85 percent had at least one comorbid psychiatric disorder. In addition, this study shows that adolescents admitted to this residential substance abuse treatment program bring with them problems in a number of do-

mains, including family (only 25.3 percent came from a family with both biological parents present; 73 percent had been a victim of physical or sexual abuse), educational (22.9 percent were not in school prior to their admission to this program), and legal (32.3 percent were referred by the legal system) problems (Novins et al., 2002a; Novins, Fickenscher, and Manson, 2002b).

In summary, these studies suggest that although AI adolescents are as likely as non-AI youth to use alcohol, they use alcohol more frequently, drink more heavily when they do use alcohol, and are more likely to meet criteria for alcohol abuse/dependence than many other American youth. AI youth often use alcohol in combination with drugs, and have a high prevalence of comorbid psychiatric disorders and emotional problems (e.g., suicidal ideation and attempts). Correlates of alcohol use appear to be similar to those of non-AIs, although the patterns of substance use progression may deviate substantially from non-AIs in some AI communities.

KEY CULTURAL CONSIDERATIONS IN UNDERSTANDING UNDERAGE DRINKING IN AMERICAN INDIAN AND ALASKA NATIVE COMMUNITIES

Designing and implementing prevention programs in a way that is consonant with the culture of the participating community is critical (Institute of Medicine, 1994). This is certainly true for AI/AN communities (Fleming, 1992). Indeed, researchers and AI/AN communities have had a keen interest in the relationship of a number of cultural constructs to underage drinking and related problems. Aboriginal social organization, societal disruption, ethnic identity, and historical trauma are the most commonly mentioned cultural constructs that may be related to underage drinking and related problems, although researchers have had difficulty identifying relationships between their operationalizations of these constructs and underage drinking and related problems. We will consider each of these constructs in turn.

Social Organization and Societal Disruption

Researchers have had a long-standing interest in the relationship of culture and societal disruption and alcohol use in AI/AN communities. In terms of culture, much of this research has focused on a theory developed by Field (1962) that builds on the well-established anthropological observation that societies differ in the degree of control they exert, or seek to exert, over individual behavior. Using ethnographic data from 56 tribes and rating scales intended to capture salient aspects of social organization and degrees of drunkenness at a societal level, Field found higher levels of

drunkenness in societies with a more personal (informal) organization than in those with a more corporate (formal) organization. Among the most robust predictors of relative sobriety in Field's study were the presence of corporate kin groups, patrilocal residence (i.e., postmarital residence in the husband's community), the institution of bridewealth (i.e., the transfer of goods from the husband's family to the wife's family in the context of marriage), and a village settlement pattern (Field, 1962).

Field's theory was soon applied to AI/AN drinking by Levy and Kunitz (1974) in their classic study of AI drinking in the southwestern United States, where it informed the interpretation of different drinking styles of the Hopi and the Navajo: The Hopi fell closer to the corporate (formal) and the Navajo closer to the personal (informal) end of Field's continuum of aboriginal social organization. Both Navajo and Hopi societies are matrilineal and organized on the basis of clans, so this was perhaps not the best empirical test of Field's hypothesis in North America, but the theory did appear to make sense of the fact that the Navajo drinking style was more public than that found among the Hopi. Subsequent research among diverse tribes in Oklahoma, conducted by Stratton and his colleagues using administrative data sets on arrests and mortality, also confirmed Field's hypothesis, in that the former hunting and gathering societies of western Oklahoma evidenced higher rates of alcohol-related arrest and death than did the formerly agricultural tribes of eastern Oklahoma (Stratton, Zeiner, and Paredes, 1978).

The application of Field's theory to North America was subsequently systematized by May (1982), who suggested that the more general principle at work in these findings was the degree of social integration in a society. In addition to drawing on Levy and Kunitz's use of Field's theory, May suggested that societies will also vary in their level of integration as a function of what he called "acculturative stress." Thus, the level of integration in an American Indian society was seen as a function of (1) the degree of control exerted over individual members in aboriginal social organization, and (2) the degree of disruption that a society has experienced under European colonization and control. The integration of these two separate dimensions by May (1982) generated a 2×3 typology in which societies could have high, medium, or low levels of integration in their aboriginal social organization as well as higher or lower levels of acculturative stress because of their subsequent historical experiences (May, 1982).

Illustrating his typology, May suggested that many Pueblo tribes as well as those of Eastern Oklahoma evidenced high levels of integration in their aboriginal social organization, while hunting and gathering tribes of the Plains and the Southwest had low levels. Intermediate between these two extremes were agricultural and pastoral peoples of the Southwest, as well as many tribes from the Northwest coast. In terms of the second

dimension of his typology, "acculturative stress," May argued that the tribes of eastern Oklahoma such as the Cherokee and Choctaw had experienced higher levels of these stressors than had some of the more isolated Pueblos of the Southwest. At the other end of his continuum of aboriginal social organization, he placed many of the Plains tribes of the United States that he argued had been subjected to more intense pressures than had more isolated Canadian Plains communities.

Thus, the insights derived from Field's and May's work have continued to shape our thinking about the American Indian experience with alcohol in important ways. But despite the dominance of this view, our ability to adequately test the claims in new data on alcohol use has been severely constrained by the fact that limited work has been conducted simultaneously in more than two different American Indian tribal communities. In our analysis of data from the Voices of Indian Teens Study, we examined explicitly the relationship between May's 2×3 typology of aboriginal social organization and social disruption described above with alcohol use among 1,923 youth from four culturally distinct AI tribes. In addition, we examined whether tribal differences could be explained by other variables such as gender, age, parental alcohol use, stressful life events, and association with alcohol-using peers (Spicer, Novins, Mitchell, and Beals, 2003). Our findings indicated that the prevalence of alcohol use as well as the quantity/frequency and negative consequences of such use did vary across the four AI tribes, but the patterns did not fit those predicted by Field or May. Furthermore, these cultural differences were fully accounted for by the sociodemographic, familial, stress, and peer association measures noted earlier. Among these variables, peer association made the greatest contribution to regressions modeling the quantity/frequency and negative consequences of alcohol use.

Thus, in these analyses, cultural group and, by implication, the kind of social organization found in these societies aboriginally was of limited utility in understanding the patterning of contemporary young people's experiences with alcohol. However, this does not suggest that social and cultural factors are irrelevant. The paramount importance of peers in our final model indicates quite clearly the extent to which adolescent drinking in these AI communities is patterned in social, and probably cultural, ways. But the fact that the drinking of these adolescents does not follow the predictions of Field's (1962) and May's (1982) theories, combined with our finding that the cultural differences that do exist are explained by peer dynamics, makes clear that new conceptualizations of social and cultural influences on drinking will be required if we are to advance theory and research in this area.

Ethnic Identity

Another cultural construct that has received considerable attention in relationship to underage drinking and related problems among AI/ANs is ethnic identity. The theoretical work of Oetting and Beauvais (Oetting, 1993; Oetting and Beauvais, 1990-91) has been particularly influential. Their theory states that identification with Native and majority culture are independent of one another or orthogonal—individuals may view themselves as a part of Indian or white culture, neither culture, or both cultures. Furthermore, Oetting and Beauvais (1990-1991) argued that AI youth with a bicultural identification would be less likely to use substances, particularly when compared to youth lacking identification with either culture.

However, research on the relationship of ethnic identity and alcohol use and other problems among AI youth has been mixed at best. For example, Oetting and Beauvais conducted two studies on this issue. In one, AI youth with bicultural ethnic identity were less likely to use drugs, but they were unable to identify such a relationship in a second study (Oetting and Beauvais, 1990-1991). Bates, Beauvais, and Trimble (1997) were also unable to identify a relationship between ethnic identity and alcohol use. In our own analyses of data from the Voices of Indian Teens study, while we did identify relationships between bicultural ethnic identity and self-perceived social competencies, personal mastery, self-esteem, and social support (Moran, Fleming, Sommervell, and Manson, 1999), we were unable to find a relationship between ethnic identity and marijuana use or suicidal ideation (Novins et al., 1999; Novins and Mitchell, 1998).

Historical Trauma

The fourth cultural construct that has been put forth as an explanation for drinking patterns among AI/ANs is historical trauma. Although similar to May's construct of acculturative stress, the concept of historical trauma (Berlin, 1987; Duran and Duran, 1995; Gray, 1998) focuses more specifically on the present impacts of past traumatic events on a community. For AI/AN communities, these historical traumas include genocidal experiences such as war, massacres, seizure of tribal lands, forced migration to reservations, forced attendance at boarding schools, laws outlawing traditional practices, racism, and induced migration from reservations to urban areas (Gray, 1998; Novins et al., 2001b). Historical trauma has been conceptualized as an intergenerational, communitywide version of post-traumatic stress disorder (PTSD; American Psychiatric Association, 1994). While PTSD describes a set of symptoms that occurs in reaction to a traumatic event experienced or witnessed by an individual, historical trauma refers to community-level consequences of these historical events, which are trans-

mitted from generation to generation. The community-level impacts of historical trauma include poverty, domestic violence, school failure, low self-esteem, cultural confusion, mental health problems, and the use and abuse of alcohol and drugs (Berlin, 1987; Duran and Duran, 1995; Gray, 1998; Novins et al., 2001b).

The concept of historical trauma resonates strongly with many AI/AN people (Novins et al., 2001b), but has been problematic for researchers to operationalize. While several research groups, including our own, have developed measures that inquire about an individual's awareness of these historical traumas and whether he or she connects these traumatic events to any personal and community-level difficulties, the utility of these measures is limited because an individual in a community does not necessarily need to be aware of these traumas to be impacted by them. Although ethnographic inquiries have also pointed to this construct (O'Nell, 1996), the evidence supporting the assertions of the existence of historical trauma remains elusive.

PREVENTION EFFORTS IN AMERICAN INDIAN/ALASKA NATIVE COMMUNITIES

A variety of prevention efforts have been pursued in AI/AN communities, many of which have included a focus, but rarely an exclusive one, on underage drinking. For the purposes of this discussion, we will divide them into two groups: policy focused and population focused.

Policy-Focused Prevention Efforts

As we noted previously, alcohol use was not a part of the vast majority of aboriginal AI/AN cultures, and many AI/AN tribes were introduced to drinking under exploitative circumstances absent indigenous mechanisms to control alcohol use (Abbott, 1998; Levy and Kunitz, 1974; MacAndrew and Edgerton, 1969; Mancall, 1995). The federal government subsequently prohibited alcohol use by AI/ANs, a policy that remained in effect until 1953 (Abbott, 1998). Approximately 50 percent of tribes have, in effect, continued this policy by prohibiting access to alcohol within their reservation borders. Research to date suggests that these policies impact AI communities differently from AN communities. In the lower 48 states, results from the Voices of Indian Teens Study reveal that while communities that prohibit the possession of alcohol do have lower prevalences of underage drinking than those communities that permit alcohol possession, they may not reduce the overall prevalence of substance use. Indeed, adolescents from "dry" communities were more likely to use other drugs, particularly marijuana, than adolescents from "wet" communities (Novins et al.,

2001a). We have theorized that these policies limit the easy availability of alcohol, and youth who want to use substances turn to nonalcohol alternatives. In Alaska, changes in state policy, known as "local option," have allowed AN villages to choose whether to allow or prohibit the possession of alcohol in their communities (Berman, Hull, and May, 2000). Results of studies of this policy change have shown that AN villages that moved from "wet" to "dry" status significantly reduced their injury death rates, particularly in terms of homicides and accidents (Berman et al., 2000). Similar results were reported for alcohol-related hospital visits (Chiu, Perez, and Parker, 1997). These policies are likely to have had similar impacts on underage drinking, although no data specific to this outcome are available. Researchers have hypothesized that these impacts are likely the result of the extreme isolation of AN villages, many of which have no roads connecting them to other communities, making such policies far more effective than in less isolated AI reservations.

Population-Focused Prevention Efforts

A number of population-focused prevention efforts have been pursued in AI/AN communities. These have included programs that are aimed at developing skills at the individual, family, and community levels that should reduce problem behaviors such as underage drinking. Other programs have focused more specifically on using traditional AI/AN culture as a solution to a variety of problems, including underage drinking. Examples of the former types of programs include "D.A.R.E. to be you" (Miller-Heyl, MacPhee, and Fritz, 1998), which was originally developed with an AI pilot site and has been disseminated to other AI communities and "Communities that Care" (Hawkins, Catalano, and Arthur, 2002; Lonczak, Abbott, Hawkins, Kosterman, and Catalano, 2002; O'Donnell, Hawkins, Catalano, Abbott, and Day, 1995), which has been piloted with a multiethnic sample that included a substantial number of AIs living in an urban area. Results to date suggest both are effective in developing targeted skills and reducing problem behaviors (Hawkins et al., 2002; Miller-Heyl et al., 1998).

Although both of these programs are designed to allow customization for use in a variety of communities, and thus permit the incorporation of cultural elements specific to the target community, they may not reflect the critical grassroots understandings of the risk and protective factors surrounding alcohol use by youth in these communities. In contrast, the demonstration projects from the Robert Wood Johnson Foundation's Healthy Nations' Initiative supported model prevention programs developed by AI/AN communities themselves, drawn substantially from local cultures and beliefs. Although originally conceived as an extension of the Robert Wood Johnson Foundation's Fighting Back Program (Brodeur, 2002), which

would have made it similar to the two programs just noted, the Healthy Nations' Initiative departed from this approach by encouraging participant communities to use local knowledge of their strengths and traditions to design their respective prevention programs.

Healthy Nations grantees developed and successfully implemented a broad range of creative and interesting community-based activities. For example, the Seattle Indian Health Board developed technology-focused youth mentoring projects with the Boeing Corporation, Microsoft, and the American Indian Science and Engineering Society. The Cherokee Nation of Oklahoma actively engaged up to 1,000 members in increasing physical activity and healthy lifestyles and instituted a school-based health promotion curriculum, smoking cessation classes, and cultural heritage projects. Norton Sound Health Corporation, based in Nome, Alaska, instituted a Village-Based Counselor program to provide much needed behavioral health services to its 17 remote villages. Most of the grantees incorporated traditional healing practices such as sweat lodges and talking circles into their community's treatment and aftercare options. In addition, many of the grantee communities used traditional language and arts and crafts projects as aftercare activities (Noe, Fleming, and Manson, 2003). Although data regarding the effectiveness of these programs are not yet available, analyses of Healthy Nations' Initiative suggests that these programs show evidence of substantial community change (using a hierarchy of results that are strongly related to this phenomenon, such as generating interest, engagement, community capacity enhancement, and policy as well as institutional changes; Capra and Steindl-Rast, 1991; Cohen and Kibel, 1993; Noe et al., 2003).

CONCLUSIONS AND RECOMMENDATIONS

Research to date suggests that underage drinking is a substantial public health problem in AI/AN communities. Underage drinking in these communities is highly comorbid with the use of other substances and nonsubstance use psychiatric disorders as well as school, legal, and family problems. Key institutions, including education, health, and human services, are chronically underfunded and fragmented, creating substantial barriers to the adoption of community-based prevention efforts. Although a few programs have demonstrated effectiveness and others appear promising for reducing underage drinking and related problems in AI/AN communities, research suggests that efforts through the mid-1990s failed to reduce high-risk substance use among AI/ANs overall (Beauvais, 1996).

Though scientists and AI/AN community members have suggested that underage drinking and related problems are associated with a variety of cultural constructs (e.g., aboriginal social organization, social disruption,

ethnic identity, and historical trauma), empirical research to date has failed to demonstrate strong relationships in this regard. Indeed, results from studies of AI adolescents suggest that underage drinking and related problems are strongly correlated with many of the same factors that are found among non-AIs, including stress, parental alcohol use, and association with alcohol-using peers. However, because of the complexities in operationalizing these cultural constructs (particularly historical trauma, which does not require conscious awareness to have an impact), it is not possible to completely dismiss them as potential contributors to these problems. This is further complicated by the extraordinary diversity of AI/AN communities, making it difficult to draw firm conclusions about these issues from even the largest of these studies. In fact, research to date demonstrates substantial variation in the prevalence of underage drinking and related behaviors across AI/AN communities. While these differences can be explained largely by purportedly noncultural factors such as association with alcohol-using peers, "neighborhood" factors (National Research Council and Institute of Medicine, 2000)—including cultural factors—likely play a role in the relative prevalence of these correlates across AI/AN communities.

Dismissing these cultural factors as unimportant in understanding these problems—and preventing them—is even more difficult simply because of the significance many AI/AN communities attach to them (Novins et al., 2001b). Indeed, notable prevention efforts in AI/AN communities have either incorporated cultural elements into a western conceptualization of prevention, or built directly on communities' knowledge, beliefs, and practices. Even prohibition can be viewed as a culturally based prevention effort because alcohol was not present in the vast majority of AI/AN communities prior to European contact. However, this policy-level approach appears to be effective only in highly isolated AN villages.

Because of the diversity of AI/AN communities, a variety of approaches probably should and will be used to prevent underage drinking and related problems. The vast majority will draw on cultural approaches, either as their core component or as an adjunct to a more western-based approach. These components may be critical not only to the effectiveness of these interventions, but also to their acceptance and maintenance by AI/AN communities (Kumpfer, Alvarado, Smith, and Bellamy, 2002).

Another aspect of AI/AN culture that is critical for prevention efforts is the widespread belief across AI/AN communities that all things are interconnected, and that it is not possible, or appropriate, to separate an issue such as underage drinking from both its comorbidity with other substance use and emotional, behavioral, familial, and social problems (Fleming, 1992; Novins et al., 2001b). Indeed, this is one area in which research findings resonate strongly with the beliefs of AI/ANs, which demonstrate strong interconnections of these problems. Thus, prevention efforts that focus

exclusively on preventing underage drinking face the danger of failure because they are both too narrow from a scientific perspective to be effective, and also fail to resonate with the beliefs of AI/AN communities that are most critical for their adoption.

REFERENCES

Abbott, P.J. (1998). Traditional and western healing practices for alcoholism in American Indians and Alaska Natives. *Substance Use and Misuse*, *33*(13), 2605-2646.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, fourth edition (DSM-IV)*. Washington, DC: Author.

Bachman, J.G., Wallace, J.M., Jr., O'Malley, P.M., Johnston, L.D., Kurth, C.L., and Neighbors, H.W. (1991). Racial/ethnic differences in smoking, drinking, and illicit drug use among American high school seniors, 1976-89. *American Journal of Public Health*, *8*, 372-377.

Bates, S.C., Beauvais, F., and Trimble, J.E. (1997). American Indian adolescent alcohol involvement and ethnic identification. *Substance Use and Misuse*, *32*, 2013-2031.

Beals, J., Novins, D., Mitchell, C., Shore, J., and Manson, S. (2002). Comorbidity between alcohol abuse/dependence and psychiatric disorders: Prevalence, treatment implications, and new directions for research among American Indian populations. *NIAAA Research Monograph Series*, *37*, 371-410.

Beals, J., Piasecki, J., Nelson, S., Jones, M., Keane, E., Dauphinais, P., Red Shirt, R., Sack, W., and Manson, S. M. (1997). Psychiatric disorder among American Indian adolescents: Prevalence in Northern Plains youth. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*(9), 1252-1259.

Beauvais, F. (1992a). Characteristics of Indian youth and drug use. *American Indian and Alaska Native Mental Health Research*, *5*, 50-67.

Beauvais, F. (1992b). Comparison of drug use rates for reservation Indian, non-reservation Indian and Anglo youth. *American Indian and Alaska Native Mental Health Research*, *5*, 13-31.

Beauvais, F. (1992c). Trends in Indian adolescent drug and alcohol use. *American Indian and Alaska Native Mental Health Research*, *5*, 1-12.

Beauvais, F. (1996). Trends in drug use among American Indian students and dropouts, 1975 to 1994. *American Journal of Public Health*, *86*, 1594-1599.

Beauvais, F. (1998). Cultural identification and substance use in North America: An annotated bibliography. *Substance Use and Misuse*, *33*, 1315-1336.

Beauvais, F., Oetting, E.R., Wolf, W., and Edwards, R. (1989). American Indian youth and drugs, 1976-87: A continuing problem. *American Journal of Public Health*, *79*, 634-636.

Berlin, I.N. (1987). Effects of changing Native American cultures on child development. *Journal of Community Psychology*, *15*, 299-306.

Berman, M., Hull, T., and May, P. (2000). Alcohol control and injury death in Alaska Native communities: Wet, damp and dry under Alaska's local option law. *Journal on the Studies of Alcohol*, *61*(2), 311-319.

Blum, R.W., Harmon, B., Harris, L., Bergeisen, L., and Resnick, M.D. (1992). American Indian-Alaska Native youth health. *Journal of the American Medical Association*, *267*, 1637-1644.

Borowsky, I.W., Resnick, M.D., Ireland, M., and Blum, R.W. (1999). Suicide attempts among American Indian and Alaska Native youth: Risk and protective factors. *Archives of Pediatric and Adolescent Medicine*, *153*, 573-580.

Brodeur, P. (2002). Programs to improve the health of Native Americans. In S. Issacs and J. Knickman (Eds.), *To improve health and health care* (pp. 53-74). San Francisco: Jossey-Bass.

Campos-Outcalt, D., Prybylski, D., Watkins, A.J., Rothfus, G., and Dellapenna, A. (1997). Motor-vehicle crash fatalities among American Indians and non-Indians in Arizona, 1979 through 1988. *American Journal of Public Health*, *87*(2), 282-285.

Capra, F., and Steindl-Rast, D. (1991). *Belonging to the universe.* New York: HarperCollins.

Chiu, A.Y., Perez, P.E., and Parker, R.N. (1997). Impact of banning alcohol on outpatient visits in Barrow, Alaska. *Journal of the American Medical Association*, *278*(21), 1775-1777.

Cohen, A.Y., and Kibel, B.M. (1993). *The basics of open-systems evaluation.* Rockville, MD: Center for Substance Abuse Prevention.

Costello, E.J., Farmer, E.M., Angold, A., Burns, B J., and Erkanli, A. (1997). Psychiatric disorders among American Indian and white youth in Appalachia: The Great Smoky Mountains Study. *American Journal of Public Health*, *87*, 827-832.

Dixon, M. (2001). Access to health care for Native American consumers. In M. Dixon and Y. Roubideaux (Eds.), *Promises to keep: Public health policy for American Indians and Alaska Natives in the 21st century* (pp. 61-88). Washington, DC: American Public Health Association.

Dixon, M., Bush, J.K., and Iron, P.E. (1997). Factors affecting tribal choice of health care organizations. In *A forum on the implications of changes in the health care environment for Native American health care* (pp. 53-88). Menlo Park, CA: Henry J. Kaiser Foundation.

Duclos, C.W., Beals, J., Novins, D.K., Martin, C., Jewett, C.S., and Manson, S.M. (1998). Prevalence of common psychiatric disorders among American Indian adolescent detainees. *Journal of the American Academy of Child and Adolescent Psychiatry*, *37*(8), 866-873.

Duran, E., and Duran, B. (1995). *Native American postcolonial psychology.* Albany: State University of New York Press.

Federman, E.B., Costello, E.J., Angold, A., Farmer, E.M., and Erkanli, A. (1997). Development of substance use and psychiatric comorbidity in an epidemiologic study of white and American Indian young adolescents in the Great Smoky Mountains Study. *Drug and Alcohol Dependence*, *44*, 69-78.

Field, P.B. (1962). A new cross-cultural study of drunkenness. In C. Snyder (Ed.), *Society, culture, and drinking patterns* (pp. 32-61). New York: John Wiley and Sons.

Fleming, C.M. (1992). American Indians and Alaska Natives: Changing societies past and present. In M.A. Orlandi (Ed.), *Cultural competence for evaluators: A guide for alcohol and other drug abuse prevention practitioners working with ethnic/racial communities* (Vol. 1). Rockville, MD: Alcohol, Drug Abuse, and Mental Health Administration, Office for Substance Abuse Prevention.

Gilliland, F.D., Becker, T.M., Samet, J.M., and Key, C.R. (1995). Trends in alcohol-related mortality among New Mexico's American Indians, Hispanics, and non-Hispanic whites. *Alcoholism: Clinical & Experimental Research*, *19*(6), 1572-1577.

Gray, N. (1998). Addressing trauma in substance abuse treatment with American Indian adolescents. *Journal of Substance Abuse Treatment*, *15*, 393-399.

Hawkins, J.D., Catalano, R.F., and Arthur, M.W. (2002). Promoting science-based prevention in communities. *Addictive Behaviors*, *27*(6), 951-976.

Hisnanick, J.J. (1992). The prevalence of alcohol abuse among American Indians and Alaska Natives. *Journal of Health Behavior, Education, & Promotion*, *16*(5), 32-37.

Indian Health Service. (1999). *Brief summary of major changes proposed to the Indian Health Care Improvement Act by the National 437 Steering Committee.* Rockville, MD: Authors.

Institute of Medicine. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. Washington, DC: National Academy Press.

Kandel, D., and Yamaguchi, K. (1993). From beer to crack: Developmental patterns of drug involvement. *American Journal of Public Health*, *83*, 851-855.

Kauffman, J.A., Johnson, E., and Jacobs, J. (1997). Overview: Current and evolving realities of health care to reservation and urban American Indians. In *A forum on the implications of changes in the health care environment for Native American health care* (pp. 25-52). Menlo Park, CA: Henry J. Kaiser Foundation.

King, J., and Thayer, J.F. (1993). Examining conceptual models for understanding drug use behavior among American Indian youth. In M.R. De La Rosa and J.L.R. Adrados (Eds.), *Drug abuse among minority youth: Advances in research methodology* (pp. 129-143). Rockville, MD: National Institute on Drug Abuse.

Kumpfer, K.L., Alvarado, R., Smith, P., and Bellamy, N. (2002). Cultural sensitivity and adaptation in family-based prevention interventions. *Prevention Science*, *3*(3), 241-246.

Levy, J.E., and Kunitz, S.J. (1974). *Indian drinking: Navajo practices and Anglo-American theories*. New York: John Wiley and Sons.

Lonczak, H.S., Abbott, R.D., Hawkins, J.D., Kosterman, R., and Catalano, R.F. (2002). Effects of the Seattle social development project on sexual behavior, pregnancy, birth, and sexually transmitted disease outcomes by age 21 years. *Archives of Pediatric and Adolescent Medicine*, *156*(5), 438-447.

MacAndrew, C., and Edgerton, R.B. (1969). *Drunken comportment*. Chicago: Aldine.

Mancall, P.C. (1995). *Deadly medicine: Indians and alcohol in early America*. Ithaca, NY: Cornell University Press.

May, P.A. (1982). Substance abuse and American Indians: Prevalence and susceptibility. *The International Journal of the Addictions*, *17*, 1185-1209.

May, P.A. (1996). Overview of alcohol abuse epidemiology for American Indian populations. In G.D. Sandefur, R.R. Rindfuss, and B. Cohen (Eds.), *Changing numbers, changing needs: American Indian demography and health* (pp. 235-261). Washington, DC: National Academy Press.

May, P.A., and Van Winkle, N. (1994). Indian adolescent suicide: The epidemiologic picture in New Mexico. In C.W. Duclos and S.M. Manson (Eds.), *Calling from the rim: Suicide behavior among American Indian and Alaska Native adolescents* (Vol. 4). Boulder: University of Colorado Press.

Miller-Heyl, J., MacPhee, D., and Fritz, J (1998). DARE to be you: A family-support, early prevention program. *Journal of Primary Prevention*, *18*, 257-285.

Moran, J., Fleming, C.M., Sommervell, P., and Manson, S.M. (1999). Measuring bicultural ethnic identity among American Indian adolescents: A factor analytic study. *Journal of Adolescent Research*, *14*, 405-426.

National Research Council and Institute of Medicine. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.

Nelson, S.H., McCoy, G.F., Stetter, M., and Vanderwagen, W.C. (1992). An overview of mental health services for American Indians and Alaska Natives in the 1990s. *Hospital and Community Psychiatry*, *43*, 257-261.

Noe, T., Fleming, C., and Manson, S.M. (2003). Healthy nations: Reducing substance abuse in American Indian and Alaska Native communities. *Journal of Psychoactive Drugs*, *35*, 15-26.

Novins, D.K., and Mitchell, C.M. (1998) Factors associated with marijuana use among American Indian adolescents. *Addiction*, *93*, 1693-1702.

Novins, D., Beals, J., Roberts, R., and Manson, S. (1999). Factors associated with suicide ideation among American Indian adolescents: Does culture matter? *Suicide and Life-Threatening Behavior*, *29*, 332-346.

Novins, D.K., Beals, J., and Mitchell, C.M. (2001a). Sequences of substance use among American Indian adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*, 1168-1174.

Novins, D.K., LeMaster, P.L., Sharma, V.R., and Manson, S.M. (2001b). *Circles of care: The final report for the first cycle of grantees from the National Evaluation Technical Assistance Center*. Denver: University of Colorado Health Sciences Center, American Indian and Alaska Native Programs, Circles of Care Evaluation Technical Assistance Center.

Novins, D.K., Fickenscher, A., and Manson, S.M. (2002a, October). *American Indian adolescents in substance abuse treatment: Psychiatric diagnostic status*. Paper presented at the Annual Meeting, American Academy of Child and Adolescent Psychiatry, San Francisco.

Novins, D.K., Fickenscher, A., and Manson, S.M. (2002b, April). *Psychiatric and psychosocial characteristics of American Indian adolescents entering substance abuse treatment: What evidence do we need?* Paper presented at the meeting entitled Evidence in Mental Health Services Research-What Types, How Much, and Then What?, Washington, DC.

O'Donnell, J., Hawkins, J.D., Catalano, R.F., Abbott, R.D., and Day, L.E. (1995). Preventing school failure, drug use, and delinquency among low-income children: Long-term intervention in elementary schools. *American Journal of Orthopsychiatry*, *65*(1), 87-100.

Oetting, E.R. (1993). Orthogonal cultural identification: Theoretical links between cultural identification and substance use. In M.R. De La Rosa and J.L.R. Adrados (Eds.), *Drug abuse among minority youth: Advances in research and methodology* (pp. 32-56). Rockville, MD: National Institute on Drug Abuse.

Oetting, E.R., and Beauvais, F. (1990-91). Orthogonal cultural identification theory: The cultural identification of minority adolescents. *The International Journal of the Addictions*, *25*, 655-685.

O'Nell, T.D. (1996). *Disciplined hearts: History, identity and depression in an American Indian community*. Berkeley: University of California Press.

Plunkett, M., and Mitchell, C.M. (2000). Substance use rates among American Indian adolescents: Regional comparisons with Monitoring the Future high school seniors. *Journal of Drug Issues*, *30*, 593-620.

Rural Policy Research Institute. (1999). *Rural by the numbers: Information about rural America*. Available: http://www.rupri.org/policyres/rnumbers/demopop/demo.html [December 20, 2002].

Singh, G.K., and Hoyert, D.L. (2000). Social epidemiology of chronic liver disease and cirrhosis mortality in the United States, 1935-1997: Trends and differentials by ethnicity, socioeconomic status, and alcohol consumption. *Human Biology*, *72*(5), 801-820.

Spicer, P., Novins, D.K., Mitchell, C.M., and Beals, J. (2003). Aboriginal social organization, contemporary experience, and American Indian adolescent alcohol use. *Journal on the Studies of Alcohol*, *64*, 450-457.

Sternberg, S. (1997). Summary of forum proceedings. In *A forum on the implications of changes in the health care environment for Native American health care* (pp. 1-22). Menlo Park, CA: Henry J. Kaiser Foundation.

Stratton, R., Zeiner, A.R., and Paredes, A. (1978). Tribal affiliation and prevalence of alcohol problems. *Journal on the Studies of Alcohol*, *39*(7), 1166-1177.

Sugarman, J., and Smith, E. (1992). Alcohol-related hospitalizations-Indian Health Service and tribal hospitals, United States, May 1992. *Morbidity and Mortality Weekly Report*, *41*(41), 757-760.

Swaim, R.C., Beauvais, F., Chavez, E.L., and Oetting, E.R. (1997). The effect of school dropout rates on estimates of adolescent substance use among three racial/ethnic groups. *American Journal of Public Health*, *87*(1), 51-55.

U.S. Census Bureau. (2001). *Overview of race and Hispanic origin (Census 2000 Brief No. C2KBR/01–1)*. Washington, DC: Author.

U.S. Census Bureau. (2002). *United States Census 2000*. Available: http://www.census.gov/main/www/cen2000.html [December 30, 2002].

U.S. Congress Office of Technology Assessment. (1990). *Indian adolescent mental health*. Washington, DC: Author.

U.S. Department of Health and Human Services. (1998). *Trends in Indian health*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Indian Health Service.

U.S. Department of Health and Human Services. (2001). *Mental health: Culture, race, and ethnicity—a supplement to mental health: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.

U.S. Department of Health and Human Services and Indian Health Service. (1997). *Regional differences in Indian health*. Washington, DC: Author.

Waddell, J.O. (1980). The use of intoxicating beverages among native peoples of the aboriginal greater southwest. In J.O. Waddell and M.W. Everett (Eds.), *Drinking behavior among southwestern Indians* (pp. 1-32). Tucson: University of Arizona Press.

15

Teen Treatment: Addressing Alcohol Problems Among Adolescents

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Alcohol abuse and dependence are often linked with drug abuse and dependence among teenagers. The social costs of alcohol and other drug use disorders—including costs for lost productivity, health care, criminal justice, and social welfare—are staggering. In 1998 these costs were estimated at $185 billion for alcohol abuse and dependence (National Clearinghouse for Alcohol and Drug Information [NCADI], 2002), with an additional $143 billion attributable to illicit drug abuse and dependence (Office of National Drug Control Policy [ONDCP], 2001). Costs were estimated to rise at a rate of approximately 6 percent annually from 1998 to 2000 (ONDCP, 2001). Out of $116.2 billion spent on alcohol in 1999, $22.5 billion was estimated to have come from underage consumers (Foster, Vaughan, Foster, and Califano, 2003). Substance abusers and those who are dependent on alcohol and other drugs are a significant burden to health care and law enforcement systems. The personal costs to teens who are dependent or who have developed problem use include a failure to complete education, establish lasting relationships, and be economically productive members of society. Long-term psychopathology is commonplace.

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THE NEED FOR TEEN TREATMENT

The population of adolescents who need treatment is large. Findings from the 2002 National Household Survey (Substance Abuse and Mental Health Services Administration, 2003) indicate that 11 percent of 12- to 17-year-olds (about 2.6 million) are binge drinkers (five or more drinks on the same occasion at least once in the past 30 days) and 6 percent (1.4 million) are involved in the regular use of illicit drugs excluding marijuana. Many, but not all, need treatment.

Research clearly shows that early treatment is highly cost effective. From cost/benefit research conducted during the past decade, the range of savings realized has been calculated at between $2.50 and $9.60 for every dollar spent on treatment (ONDCP, 2001). Unfortunately, only one person in seven who would qualify for treatment was admitted to treatment in 1999 (National Institute on Drug Abuse [NIDA] Community Epidemiology Work Group, 1999). The potential benefit from increased early treatment is profound.

A large body of literature exists on adolescents and substance use disorders. Epidemiological studies measuring the use of any given drug over the past decade, year, or month are easily found (e.g., Johnston, O'Malley, and Bachman, 2003). Also readily available are studies of best practices in alcohol and drug prevention, and outcome studies of various adolescent treatment programs (e.g., Center for Substance Abuse Treatment [CSAT], 2000a, 2000c; NIDA, 1995). This research informs readers about the prevalence of alcohol and drug use in any given age group, the effects of alcohol and drug use on development, possible methods of treatment, and the results of selected treatment programs. Research continues on why some methods of treatment work better than others and which group responds best to which treatments. Thus, the literature on teen treatment is developing, but does not yet fully define the potential for treatment options with this population.

Effective Teen Treatment

Three reviews of the literature stand as seminal disseminations of what is known about teen treatment: Treatment of Adolescents with Substance Use Disorders (CSAT, 2000b), Screening and Assessing Adolescents with Substance Abuse Disorders (CSAT, 2000b), and Adolescent Drug Abuse: Clinical Assessment and Therapeutic Interventions (NIDA, 1995).

These reviews point to a number of factors that must be considered in selecting appropriate treatment programs for youth. We have also conducted interviews with experts (Drug Strategies, 2003) to help define the key elements of effective teen treatment. From these, the following key

elements of effective treatment were identified: (1) assessment and treatment matching; (2) comprehensive, integrated treatment approach; (3) family involvement in treatment; (4) developmentally appropriate programs; (5) strategies to engage and retain teens in treatment; (6) qualified staff; (7) gender and cultural competence; (8) continuing care; and (9) treatment programs. It is important for treatment programs to conduct ongoing evaluations of their effectiveness. At this point, research has not yet confirmed each of these elements, but they represent our best understanding of what works in teen treatment (CSAT, 2000c; Drug Strategies, 2003).

Assessment and Treatment Matching

Assessment (pretreatment screening) is an important first step to determine need for treatment. Unlike adults who often begin treatment once dependence or life-challenging problems emerge, youth may be referred to treatment primarily because of trouble at school or with the justice system. Understanding the extent to which youth have developed problems is a key to bringing appropriate resources to bear. Matching adolescents to appropriate treatment is based on considerations of age, gender, severity of problem (which is distinct from frequency and quantity of use), financial status, psychiatric comorbidity, cognitive functioning, and legal mandates (Jenson, Howard, and Yaffe, 1995; Brown, Tapert, Granholm, and Delis, 2000; Tarter, 1990; Tapert and Brown, 1999).

Distinguishing between use and abuse among adolescents is often more challenging than among adults. For example, the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria for substance use disorders were developed for adults and have significant limitations when applied to adolescents (Martin and Winters, 1998). Prematurely labeling teens as abusers can be harmful and may actually promote their progression from use to abuse. Those in need of treatment are also likely to have co-occurring psychiatric and psychological conditions.

Assessment is important to determine the type of treatment approach to which an adolescent may respond (Pickens and Fletcher, 1991; Bergmann, Smith, and Hoffman, 1995; Jainchill, Bhattacharyo, and Yagelka, 1995; Werner, 1995). If a program has a family component, there should be a thorough assessment of the family as well as an assessment of the multiple contexts in which the young person lives (e.g., family, peer, school). Treatment services provided to children of alcoholics and other drug users may be distinctly different from treatment services provided to those who do not have a situation in which other family members abuse and are dependent on substances.

Many adolescents experience academic problems and developmental delays as a result of alcohol and drug abuse and dependence. For these

teens, remedial services are crucial. In addition, depending on the extent to which problems associated with alcohol and drug use disorders have interfered with their socialization, some teens may require residential treatment, whereas others may do better when treated on an outpatient basis.

Numerous adolescent screening instruments have been evaluated for reliability and validity, such as the Substance Abuse Subtle Screening Inventory (SASSI) and the Personal Experience Screening Questionnaire (PESQ) (Winters, Latimer, and Stinchfield, 2001). These tools help to identify what the teen needs, the severity of the problem, and whether the parent or other referring adult should contact a different kind of program than the one in which the assessment occurs. A comprehensive assessment provides a road map for developing an effective treatment plan tailored to the adolescent's specific needs. Assessment instruments that have been independently tested and recommended by treatment experts include the Comprehensive Addiction Severity Index for Adolescents (CAS-I) and the Global Assessment of Individual Needs (GAIN) (Drug Strategies, 2003).

Treatment approaches. A variety of therapeutic approaches have been developed. The following therapy strategies have been extensively researched:

The ***Twelve step*** approach, also known as the Minnesota Model and Twelve Step Facilitation, is highly structured and involves detoxification, psychological evaluation, general and individualized treatment planning, group therapy, lectures, and individualized counseling (Winters, 1999). Group counseling is a key therapeutic technique that includes those with alcohol and drug use disorders who are further along in the recovery process; they pass on their knowledge, experience, and values to newer patients. Participants study each of the Twelve Steps and are referred to Alcoholics Anonymous and Narcotics Anonymous meetings as part of their therapy after treatment to prevent relapse (Winters and Schiks, 1989). Many studies have been completed to evaluate the outcomes of the Twelve Step Facilitation method, yet few have been geared specifically to adolescents. One study found that adolescents who are motivated to attend Twelve Step meetings have improved treatment outcomes (Kelly, Myers, and Brown, 2002). However, more research is needed to assess the effectiveness of the Twelve Step approach and how these programs meet the developmental needs of teens (Kassel and Jackson, 2001).

Therapeutic communities (TCs) are a social-psychological form of treatment for addictions and related problems with a focus on resocializing those who attend. To date, TCs have been used in the United States only to treat adolescents with the most severe substance abuse and dependence problems. In the TC model, substance use disorders are viewed as symptoms of broader problems in life. The model uses a holistic treatment approach in a long-term residential setting where peers and professional

staff serve as therapists in the treatment process. A key difference between TC and Twelve Step Facilitation is the TC philosophy that the individuals are responsible for their own addiction or recovery (De Leon, 1997).

A number of modifications are made to the TC model for use with adolescents: (1) stages reflect progress along behavioral, emotional, and developmental dimensions; (2) it is less confrontational; (3) adolescents have less control over management of the program; (4) there is more supervision; (5) neurological disorders are assessed (such as learning disabilities); (6) there is more emphasis on education than daily chores; and (7) there is enhanced family involvement (CSAT, 2000a).

Outcome studies for TC treatment programs have been inconsistent for adolescents (Jainchill et al., 1995; Pompi, 1994). As with all treatment modalities, length of stay is a critical factor for successful abstinence after completion of the program. In the case of TC, longer treatment periods are needed for adolescents than for adults (De Leon, 1985; Hubbard, Cavanaugh, Craddock, and Rachel, 1985; Sells and Simpson, 1979). More research must be carried out in this area in order to truly establish the effectiveness of the TC model with adolescents. Nonetheless, because there is evidence that it works with adults, it might be viewed as a promising therapy.

Cognitive behavioral therapy (CBT) refers to those approaches that focus primarily on an individual's thoughts and behaviors (Liese and Najavits, 1997). CBT has been used to treat many psychological problems, including depression, anxiety, stress, and anger. Since the 1980s, CBT has become widely used as a promising approach for alcohol and substance use (Liese and Najavits, 1997). CBT is also used to prevent relapse. This approach recognizes that there are internal and external cues that prompt an individual to drink. Beliefs ("drinking will help me relax") and urges ("I need to have a drink!") determine how an individual is likely to respond to these cues. Individuals often have facilitating beliefs ("I'll only have one drink"). All of this leads the individual to take action, often taking a drink.

CBT is very structured; for example, an objective is established and each session is used to monitor the mood of the individual, connect treatment from session to session, discuss problems, and provide training in coping strategies and skills to deal with problems. Homework is assigned between sessions. CBT often includes motivational interviewing to engage individuals in the treatment process (Liese and Najavits, 1997). CBT has been extensively researched, particularly as part of the federal Cannabis Youth Treatment study (Dennis et al., in press) and the Adolescent Treatment Model study (Perry et al., 2003). Evaluations suggest this is a very promising approach.

Family therapy takes many forms. Family therapies such as Multidimensional Family Therapy (MDFT) (Liddle et al., 2001) view adolescent

alcohol and drug use as influenced by the community, the family, and peers. Treatment includes individual and family sessions, which can be held at home, at school, in the clinic, or in other areas of the community (CSAT, 2000c; NIDA, 1999). In therapy sessions, treatment of the adolescent focuses on building developmental skills, such as decision making, negotiation, and problem-solving skills (Liddle et al., 2001). Teens learn improved communication with other family members and coping mechanisms for stress. Similar sessions are held with family members, in which parents examine their parenting style and learn to have a positive influence on their child (Schmidt, Liddle, and Dakof, 1996).

Multisystemic therapy **(MST)** is a family-based, short-term intervention that has licensed agencies in 27 states and 12 countries (Henggeler et al., 1996; Henggeler, Melton, Brondino, Scherer, and Henley, 1997). These agencies annually treat more than 7,000 youth and their families. MST has been extensively researched, primarily by the criminal justice system, and has been shown to reduce recidivism and drug use.

Treatment programs often combine a variety of approaches. For example, Drug Strategies (2003) analyzed the most predominant treatment approaches among the 144 programs described in the *Treating Teens* guide. A total of 101 programs (70 percent) offered services based on a combination of treatment approaches. By far, the most widely used approaches were the Twelve Step model (66 percent of all programs) and CBT (58 percent). Four other approaches were featured by more than a dozen of the 144 programs: motivational enhancement therapy (19 percent), MST (19 percent), MDFT (13 percent), and TCs (13 percent).

Treatment settings. Five treatment settings exist for teens (CSAT, 2000c). Generally speaking, treatment settings can be ordered based on intensity. All of these treatment settings were initially designed for adults. A review of the literature reveals that there is little specific information about how these settings have been adjusted to meet adolescents' needs. Nevertheless, they are included here as a summary of treatment settings, beginning with the least intensive.

Brief interventions are often based on CBT. In this setting, interventions are typically delivered by physicians, counselors, or others who do not specialize in drug and alcohol use disorder treatment per se. Brief interventions typically involve single-shot programs that encourage self-help and self-management. They are relatively inexpensive to deliver. Studies by Rollnick, Heather, Gold, and Hall (1992), Miller and Rollnick (1991), and Monti et al. (1999) show that brief interventions can be an effective setting for treatment in a variety of situations, particularly for those who have not yet developed dependence or serious chronic problems associated with use.

Outpatient treatment services provide a broad range of intensity of care levels, but do not offer overnight supervision. The methods of treatment often focus on cognitive behavioral therapy and family therapy. The frequency of contact is adjusted to meet the specific needs of the presenting individual. In less intensive programs, 2 to 3 hours per week are common. More intensive programs can range from 9 to 20 hours per week and may include therapy on weekends.

Day treatment or partial hospitalization programs provide professionally directed evaluation and structured treatment after school, in the evenings, or on weekends. In the most intensive of the outpatient programs, the treatment provided may involve a combination of individual, group, and family therapy.

Inpatient treatment offers a range of intensity of care levels. Each type of inpatient treatment requires the patient to live temporarily in a safe and controlled treatment facility. The most intensive form of inpatient treatment involves 24-hour supervision by professional staff. Group home living, such as halfway houses, is the least intensive inpatient treatment setting. Intensity may be graduated with a short and intensive residential stay in a professional treatment facility, followed by a much longer adjustment period in "sober living" arrangements. The goal of inpatient treatment is to provide sufficient structure to allow the patient to make major life changes, while strictly limiting access to alcohol and drugs.

Detoxification settings are often included as part of a 28-day intensive inpatient treatment. Detoxification generally refers to a 3- to 5-day period of intensive medical monitoring and management of withdrawal symptoms. Physical withdrawal is uncommon for adolescents unless opiates or barbiturates have been the principal substances of abuse and dependence. Detoxification is rarely indicated for adolescents.

Comprehensive, Integrated Treatment Approach

Evidence shows that treatment is more effective if it is fully integrated into all aspects of an adolescent's life—school, home, family, peer group, and workplace. For example, with adolescents it is usually important for the treatment to involve the school. Treatment programs could help students keep up with their schoolwork and feel integrated into the school environment (Personal communication, John Knight, Harvard Medical School, June 1, 2001). Outpatient treatment might take place after school hours so it does not interfere with the positive social and academic aspects of school. Schools can help provide the social support and resocialization that is crucial to successful treatment outcomes (Personal communication, Ken Winters, University of Minnesota, June 1, 2001). In addition, adoles-

cent substance abusers and those who are dependent on alcohol and other drugs are often involved with the criminal justice system. To be effective, treatment needs to be coordinated with decisions that are made by this system (Aarons, Brown, Hough, Garland, and Wood, 2001).

Family Involvement in Treatment

Family involvement is one aspect of a comprehensive, integrated approach to substance use disorder treatment, but deserves attention in its own right. Relationships are critically important in reducing teen drug use, and parents have a powerful influence on adolescent development throughout the teen years (Liddle et al., 2001). Research clearly supports the need for including families in therapy (Liddle et al., 2001). Family involvement usually includes education about treatment and how families can support the treatment process. Sometimes it involves having family sessions at the agency or even in the home that address family environment or structure.

Developmentally Appropriate Programs

Because of the rapid changes they are experiencing, adolescents are at risk for developing substance use disorders more quickly than adults (Dusenbury and Botvin, 1990; Sernlitz and Gold, 1986). Treatment for adolescent substance abuse and dependence must be grounded in an understanding of adolescent development (Liddle et al., 2001; Wagner, Brown, Monti, Myers, and Waldron, 1999). Treatment programs need to be sensitive to the multiple developmental issues that adolescents face (CSAT, 2000b). In contrast to adult treatment, adolescent treatment often needs to emphasize maturational issues, psychological issues, and emotional and sexual issues (Hird, Khuri, Dusenbury, and Millman, 1997; White, Dennis, and Tims, 2002). Treatment programs should be tailored to the different needs of older (16- to 18-year-old) and younger (12- to 15-year-old) adolescents (Personal communication, John Knight, Harvard Medical School, June 1, 2002), as well as to thinking styles of more concrete versus abstract thinkers.

Developmental and cognitive impairments are common, and providers need to be flexible in their use of activities (Wagner et al., 1999). The teenage years are the period during which young people gain autonomy. Adolescents in treatment are often not granted autonomy; this creates tension and frustration between the therapist and the teen (Personal communication, Nancy Jainchill, Center for Therapeutic Community Research, June 1, 2001).

Most programs in use were originally designed for adults (White et al., 2002; Dennis, 2002), and it is rare to find standalone programs for adolescents. Program models specifically designed for adolescents are more effec-

tive than programs based on adult regimens (Personal communication, Randolph Muck, Center for Substance Abuse Treatment, June 1, 2001).

In addition, programs need to use creative, hands-on techniques to make activities relevant to adolescents' concerns and developmental stages. For example, some programs give teen clients disposable cameras to take photos of friends and families, which then become a basis for generating group discussion. Some Twelve Step programs have tailored the individual steps to adolescent experiences. For example, to explain the step of powerlessness, the therapist reviews everyday occurrences to explore what adolescents can control and what they cannot.

Strategies to Engage and Retain Teens in Treatment

Effective programs are designed to engage and retain young people. Simply put, treatment cannot be effective if young people do not participate. At times, motivation to participate is a major barrier for adolescents, who often have other priorities. Motivational enhancement techniques and motivational interviewing are important and clearly have to be a part of engagement (Barnett, Monti, and Wood, 2001; Winters, 1999). The use of positive reinforcement helps with retention. Vouchers to promote attendance and the completion of activities allow program providers to reinforce positive behavior (Drug Strategies, 2003). Developing a therapeutic alliance—a climate of trust that facilitates behavior change—between the client and the counseling staff is an important way to retain teens in treatment. The therapeutic alliance is increased when a therapist helps the teen find things that are concrete, tangible, and relevant to him or her (Liddle et al., 2001). Addressing specific problems with family, school, or the juvenile justice system will help an adolescent stay engaged. Research shows that involving parents in therapy produces better engagement rates for adolescents, which may result in better treatment outcomes (Dakof, Tejeda, and Liddle, 2001).

It is also important to include good case management in treatment to ensure that young people participate and remember appointments (Personal communication, Michael Dennis, Chestnut Health Systems, June 1, 2001).

Qualified Staff

Staff should be trained to understand adolescent development, to recognize psychiatric problems, and to work effectively with families (Liddle et al., 2001). They need to have training and experience in diverse areas to meet the many needs of adolescents with substance use disorders, including problems with delinquency and learning disabilities. Although professional

training and credentials are vitally important, positive, caring staff attitudes are also important in connecting adolescent clients to the treatment process (Drug Strategies, 2003).

Gender and Cultural Competence

Good programs are based on an understanding of gender socialization and the cultural background of the patient. For example, there is a high correlation between childhood trauma and substance use disorders for girls and women. Often female substance abusers and those who are dependent on alcohol and other drugs have been sexually abused. A study comparing the incidence of trauma in adolescents with alcohol abuse and dependence to a control group found that adolescents with alcohol abuse or dependence were 18 to 21 times more likely to have a sexual abuse history. Of those adolescents who reported having both a sexual abuse history and alcohol abuse or dependence, 68 percent were females (Clark, Lesnick, and Hegedus, 1997). A study of women addicts found that not only was abuse (sexual, physical, and emotional) more frequent, but it occurred for longer periods of time and by more perpetrators than those in the control group (Covington and Surrey, 1997). In dealing with their emerging sexuality, girls may adopt a pattern of interaction in which they try to be pleasing to and subordinate to men. For these reasons, putting girls in a coed setting for treatment may be contraindicated. Furthermore, while boys and girls are both at risk for sexual abuse in interpersonal relationships as children, boys move out of risk in adolescence but girls continue to be at risk for sexual abuse (Covington and Surrey, 1997).

The context of drug use also differs for boys and girls. For example, girls often initiate alcohol or drug use in dating or in conjunction with their first sexual experience. In contrast, boys typically first use with other boys. For a girl it is not unusual for the first supplier to be the boy with whom she is involved (Dakof, 2000). Another difference that may affect treatment has to do with teens' responses to anger. Girls are more likely to turn anger inward, while boys direct their anger toward others. Girls often use alcohol and drugs in part to self-medicate (Dakof, 2000), whereas boys often use drugs as a means to enhance pleasure and excitement and as a rite of passage. When a boy gets into trouble and can no longer use, he may struggle with issues of how he can still feel like a man (Personal communication, Stephanie Covington, Institute of Relational Development, June 1, 2001).

Continuing Care

Alcohol abuse and dependence, like most medical or psychological disorders, tend to be chronic. Many adolescents will go back to using

alcohol after they complete treatment (Bukstein, 2000). One-third of those who relapse do so in the first month after treatment, and two-thirds do so in the first 6 months. In contrast to adults, who tend to relapse because of negative affect or personal distress, adolescents appear to relapse more often as a result of peer pressure; it is also more difficult to successfully treat teens who believe that drinking alcohol will help with social interaction (Brown, 1990).

Continuing care is crucial to achieving long-term outcomes. Programs vary tremendously on whether and how much continuing care they provide; many outpatient programs do not include continuing care (Personal communication, Ken Winters, University of Minnesoata, June 1, 2001; Kaminer, 2001), yet good continuing care is increasingly viewed as critical (Godley, Godley, and Dennis, 2001). Teens who require intense treatment will also require intense continuing care (Fertman, 1991). If adolescents leave their home community to receive treatment, continuing care must be activated as soon as the young person returns to the community (Godley et al., 2001).

Treatment Outcomes

It is important to understand the potential of a program to produce results. Most treatment programs keep track of outcome data and are able to provide statistics, which suggest the effectiveness of the treatment and recovery strategies (Pickens and Fletcher, 1991; Bergmann et al., 1995; Jainchill et al., 1995; Werner, 1995). Evaluation is costly and difficult (Drug Strategies, 2003; Milby, 1981). However, evaluation not only validates effective approaches, it also provides information that is essential for improving or enhancing treatment strategies (Muck et al., 2001).

A number of evaluation studies of adolescent treatment programs have been conducted. Many of these studies have multiple methodological problems, including small sample sizes and no control group, as well as variation in operational definitions, terminology, and measures of outcome effectiveness (Williams, Chang, and Addiction Centre Adolescent Research Group, 2000; Kaminer, 2001), making it difficult to draw clear conclusions. Given data that were available a decade ago, reviews were able to make only the most basic conclusion: Any treatment is better than no treatment (U.S. Congress, Office of Technology Assessment, 1991). The best predictor of treatment outcome consistently has been the amount of time spent in treatment (Polich, Ellickson, Reuter, and Kahan, 1984). Success also appears more likely when skills training is part of the treatment and when families participate (U.S. Congress, Office of Technology Assessment, 1991). Attending continuing care activities, including self-help and support groups, also favorably influences outcomes (Bergmann et al., 1995).

Studies of treatment efficacy often focus on the characteristics of the individual who does well in treatment (Kaminer, 2001; Williams, Chang, and Addiction Centre Adolescent Research Group, 2000). There is an extensive literature that documents which adolescents have the best prognosis for success in treatment. Factors that predict success include having a higher socioeconomic status, attending school or other educational programs, and being older when substance use began. Adolescents who are not involved in opiate or multiple substance use or criminal behavior and who have fewer problems initially are more likely to have positive outcomes (U.S. Congress, Office of Technology Assessment, 1991; Sernlitz and Gold, 1986; Cambor and Millman, 1991).

Different approaches appear to be better suited to youth who have several definable characteristics. For example, the highly structured TC environment may work best for delinquent or antisocial youth. On the other hand, outpatient programs appear to be better suited to those who have been productive at some point in the past—including those who are pursuing an education (Polich et al., 1984).

Pragmatic Considerations

Proximity and cost are issues for most families facing the crisis of adolescent substance use disorders. In many communities treatment options may be very limited. Even for families that do have extensive resources, there is a question about whether they should be encouraged to "think national" when selecting a teen treatment program (Personal communication, Stephanie Covington, Institute of Relational Development, June 1, 2001; Personal communication, Elizabeth Rahdert, NOVA Research Company, June 1, 2001; Personal communication, John Knight, Harvard Medical School, June 1, 2001). The answer may depend partly on the severity of the problem. But the importance of family involvement in treatment presents a dilemma to families who might think about sending a child away for treatment: Even if resources are unlimited, it might be preferable to provide average-quality treatment that allows family participation (Personal communication, Stephanie Covington, Institute of Relational Development, June 1, 2001; Personal communication, Winters, 2001).

Although it is crucial for adolescent treatment programs to be developmentally appropriate according to the specific needs of youth, few states require in their certification standards that counselors have any specific knowledge or experience in treating adolescents. Staff qualifications vary widely, from high school to graduate degrees, and there is often a lack of adequate training in co-occurring disorders. In addition, many programs do not address all of the numerous factors that affect the adolescent's environment, including peer groups, the juvenile justice system, and the commu-

nity. This can create further problems when attempting to reintegrate adolescents into their family, school, and community settings (Drug Strategies, 2003).

RECOMMENDATIONS

From the research about treatment and counseling, there are several important lessons about what key elements are important for treating alcohol abuse and dependence among adolescents (see Box 15-1 for summary).

Prior to Treatment Assessment and Treatment Matching Should be Done

An important conclusion from the literature is that assessment (pretreatment screening) is critical to determine need for treatment. Furthermore, matching adolescents to an appropriate treatment modality is based

BOX 15-1 Summary of Key Recommendations for Treating Substance Use Disorders Among Adolescents

Prior to Treatment, Assessment and Treatment Matching Should Be Done
- Proper assessment and matching are critical to determine the need for treatment and the type of approach to which an adolescent may respond. These pretreatment steps maximize the likelihood that treatment will be effective.

Programs Should Be Comprehensive and Offer an Integrated Treatment Approach
- A comprehensive, integrated treatment approach ensures that the program addresses all of an individual teen's treatment needs and connects adolescents and their families with an array of community services.

Treatment Should Be Developmentally Appropriate
- Adolescents face multiple developmental, gender, and cultural issues that require a well-trained program staff because program models specifically designed for adolescents are more effective than programs based on adult regimens.

Treatment Programs Should Actively Work to Retain Teens
- Motivation and building a therapeutic relationship are important to successful treatment outcomes, in part because most adolescents enter treatment through the criminal justice and education systems.

Treatment Needs to Include Continuing Care
- Continuing care is crucial to achieving long-term outcomes because substance use disorders tend to be chronic.

Treatment Programs Need to Be Evaluated
- Establishing the effectiveness of treatment programs is crucial so that treatment effectiveness can be determined.

on considerations of age, gender, severity of problem (distinct from frequency and quantity of use), financial status, psychiatric comorbidity, cognitive functioning, and legal mandates (Jenson et al., 1995; Brown et al., 2000; Tarter, 1990; Tapert and Brown, 1999). Assessment is important to determine the type of treatment approach to which an adolescent may respond (Pickens and Fletcher, 1991; Bergmann et al., 1995; Jainchill et al., 1995; Werner, 1995). Four therapeutic approaches are widely used: (1) Twelve Step programs; (2) therapeutic communities; (3) cognitive behavioral therapy; and (4) family therapy. Five treatment settings exist for teens: (1) brief intervention; (2) outpatient treatment; (3) day treatment or partial hospitalization; (4) inpatient treatment; and (5) detoxification (CSAT, 2000c). Identifying the best setting and approach to treatment maximizes the likelihood that treatment will be effective. Drug Strategies (2003) has released a guide to teen treatment that can help agencies, professionals, and parents begin the process of identifying promising treatment facilities to meet the needs of adolescents.

Programs Should Be Comprehensive and Offer an Integrated Treatment Approach

A comprehensive, integrated treatment approach ensures that the program addresses all of an individual teen's treatment needs, which may include addressing mental health problems, family dysfunction, learning disabilities or school failure, and physical health concerns. In addition, this approach should connect adolescents and their families with an array of community services. Treatment providers, often funded by the health care system, should coordinate with all settings in which teens in need of treatment interact—school, home, family, peer group, and where appropriate, the criminal justice system and the workplace. Policies set and services provided by agencies such as the U.S. Department of Education and the U.S. Department of Justice, local school districts, local court agencies, and agencies that receive block grant funding from the Substance Abuse and Mental Health Services Administration should support high-quality, coordinated programming across these settings.

Treatment Should Be Developmentally Appropriate

Research is needed to determine whether and the extent to which treatment programs originally developed for adults are appropriate when used with adolescents. Adolescents should receive treatment separately from adults. Staff should be trained to understand adolescent development and respond appropriately to the challenges that adolescents present. Good

programs are based on an understanding of gender socialization and the cultural background of the patient. National guidelines for staff training to understand the developmental needs of teens should be developed. Nationally recognized guidelines for ensuring the safety of adolescent patients, particularly females, also should be developed.

Treatment Programs Should Actively Work to Retain Teens

Programs should adopt specific strategies for motivating adolescents to participate in treatment that can help with retention. Most adolescents enter treatment through the criminal justice and education systems. When treatment is mandatory, teens' intrinsic motivation to complete treatment is low. Motivation is important to successful treatment outcomes. Elements need to be integrated into programs that provide rewards and incentives that are meaningful to participants. These elements should be considered an essential part of the program and should be fully funded.

New preliminary data from CSAT's Adolescent Treatment Model study (Perry et al., 2003) indicates the importance of the therapeutic relationship in retaining youth in treatment. The therapeutic relationship builds a climate of trust between a therapist and a client that facilitates behavior change. Qualities in therapists that foster this relationship include flexible, intelligent thinking, good interpersonal skills, and genuine empathy. Research efforts on the importance of the therapeutic relationship should continue, and the findings should be disseminated widely to treatment providers.

Treatment Needs to Include Continuing Care

Continuing care is crucial to achieving long-term outcomes. Continuing care is often one of the weakest features of adolescent treatment programs nationwide (Drug Strategies, 2003). Programs should institute a process of continuing care that includes relapse prevention, training, follow-up plans, referrals to community resources, and periodic check-ups after completing treatment in order to help teens avoid recidivism.

Treatment Programs Need to Be Evaluated

Establishing the effectiveness of treatment programs is crucial. Federal agencies should fund the collection and analysis of outcome data so that treatment effectiveness can be determined. A federal research priority should be to determine which treatment approaches are most effective with different types of youth.

REFERENCES

Aarons, G.A., Brown, S.A., Hough, R.L., Garland, A.F., and Wood, P.A. (2001). Prevalence of adolescent substance use disorders across five sectors of care. *Journal of American Academy of Child and Adolescent Psychiatry*, *40*, 4.

Barnett, N.P., Monti, P.M., and Wood, M.D. (2001). Motivational interviewing for alcohol-involved adolescents in the emergency room. In E. Wagner and H. Waldron (Eds.), *Innovations in adolescent substance abuse interventions* (pp.143-168). New York: Elsevier Science.

Bergmann, P.E., Smith, M.B., and Hoffman, N.G. (1995). Adolescent treatment: Implications for assessment, practice guidelines, and outcome management. *Pediatrics Clinical North America*, *42*, 453-472.

Brown, S.A. (1990). Adolescent alcohol expectancies and risk for alcohol abuse. *Addiction and Recovery*, *10*, 16-19.

Brown, S.A., Tapert, S.F., Granholm, E., and Delis, D.C. (2000). Neurocognitive functioning of adolescents: Effects of protracted alcohol use. *Alcoholism: Clinical and Experimental Research*, *24*(2), 107-115.

Bukstein, O.G. (2000). Disruptive behavior disorders and substance use disorders in adolescents. *Journal of Psychoactive Drugs*, *32*(1), 67-79.

Cambor, R., and Millman, R.B. (1991). Alcohol and drug abuse in adolescents. In M. Lewis (Ed.), *Child and adolescent psychiatry: A comprehensive textbook* (pp. 736-755). Baltimore, MD: Williams and Wilkins.

Center for Substance Abuse Treatment. (1999). *Treatment of adolescents with substance use disorders*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Center for Substance Abuse Treatment. (2000a). *Screening and assessing adolescents with substance abuse disorders*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Center for Substance Abuse Treatment. (2000b). *Substance abuse treatment in adult and juvenile correctional facilities: Findings from the uniform facilities data set 1997 survey of correctional facilities*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Center for Substance Abuse Treatment. (2000c). *Treatment of adolescents with substance use disorders*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Clark, D.B., Lesnick, L., and Hegedus, A.M. (1997). Traumas and other adverse life events in adolescents with alcohol abuse and dependence. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*, 1744-1751.

Covington, S., and Surrey, J. (1997). The relational model of women's psychological development: Implications for substance abuse. In S. Wilsnack and R. Wilsnack (Eds.), *Gender and alcohol: Individual and social perspectives* (pp. 335-351). New Brunswick, NJ: Rutgers University Press.

Dakof, G.A. (2000). Understanding gender differences in adolescent drug abuse: Issues of comorbidity and family functioning. *Journal of Psychoactive Drugs*, *32*(1), 25-32.

Dakof, G.A., Tejeda, M., and Liddle, H.A. (2001). Predictor of engagement in adolescent drug abuse treatment. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(3), 274-281.

De Leon, G. (1985). The therapeutic community: Status and evolution. *International Journal of the Addictions*, *20*(6-7), 823-844.

De Leon, G. (Ed.). (1997). *Community as method: Therapeutic communities for special populations and special settings*. Westport, CT: Praeger/Greenwood.

Dennis, M.L. (2002). Treatment research on adolescent drug and alcohol abuse: Despite progress, many challenges remain. *Connection*, *1-2*, 7.

Dennis, M.L., Titus, J., Diamond, G., Babor, T., Donaldson, J., Godley, S.H., Tims, F., and Webb, C. (in press). The cannabis youth treatment (CYT) experiment: A multi-site study of five approaches to outpatient treatment for adolescents. *Journal of Substance Abuse Treatment*.

Drug Strategies. (2003). *Treating teens: A guide to adolescent drug programs*. Washington, DC: Author.

Dusenbury, L., and Botvin, G.J. (1990). Competence enhancement and the prevention of adolescent problem behaviors. In K. Hurrelmann and F. Losel (Eds.), *Health hazards in adolescence* (pp. 459-477). Germany: Aldine/De Gruyter.

Fertman, C.I. (1991). Aftercare for teenagers: Matching services and needs. *Journal of Alcohol and Drug Education*, *36*, 1-11.

Foster, S.E., Vaughan, R.D., Foster, W.H., and Califano, J.A. (2003). Alcohol consumption and expenditures for underage drinking and adult excessive drinking. *Journal of the American Medical Association*, *289*, 989-995.

Godley, S.H., Godley, M.D., and Dennis, M.L. (2001). The assertive aftercare protocol for adolescent substance abusers. In E. Wagner and H. Waldron (Eds.), *Innovations in adolescent substance abuse interventions* (pp. 313-331). New York: Elsevier Science.

Henggeler, S.W., Cunningham, P.B., Pickrel, S.G., Schoenwald, S.K., et al. (1996). Multisystemic therapy: An effective violence prevention approach for serious juvenile offenders. *Journal of Adolescence*, *19*, 47-61.

Henggeler, S.W., Melton, G.B., Brondino, M.J., Scherer, D.G., and Hanley, J.H. (1997). Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting and Clinical Psychology*, *65*, 821-833.

Hird, S., Khuri, E.T., Dusenbury, L., and Millman, R.B. (1997). Adolescents. In J.H. Lowinson, P. Ruiz, R.B. Millman, and J.G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (pp. 683-692). Baltimore, MD: Williams and Wilkins.

Hubbard, R.L., Cavanaugh, E.R., Craddock, S.G., and Rachal, J.V. (1985). Characteristics, behaviors and outcomes for youth in the TOPS. In A.S. Friedman and G.M. Beschner (Eds.), *Treatment services for adolescent substance abusers* (pp. 49-65). Rockville, MD: National Institute on Drug Abuse.

Jainchill, N., Bhattacharya, G., and Yagelka, J. (1995). Therapeutic communities for adolescents. In E. Rahdert and D. Czechowicz (Eds.), *Adolescent drug abuse: Clinical assessment and therapeutic interventions* (pp. 190-217). NIDA Research Monograph Series, Number 156. Rockville, MD: National Institute on Drug Abuse.

Jenson, J.M., Howard, M.O., and Yaffe, J. (1995). Treatment of adolescent substance abusers: Issues for practice and research. *Social Work and Health Care*, *21*, 1-18.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2003). *Monitoring the future: National survey results on drug use, 1975-2002. Volume I: Secondary school students* (NIH Publication No. 03-53757). Bethesda, MD: National Institute on Drug Abuse.

Kaminer, Y. (2001). Adolescent substance abuse treatment: Where do we go from here? *Psychiatric Services*, *52*(2), 147-149.

Kassel, J.D., and Jackson, S.I. (2001). Twelve-step-based interventions. In E. Wagner and H. Waldron (Eds.), *Innovations in adolescent substance abuse interventions* (pp. 333-351). New York: Elsevier Science.

Kelly, J.F., Myers, M.G., and Brown, S.A. (2002). Do adolescents affiliate with 12-step groups? A multivariate process model of effects. *Journal of the Study of Alcohol*, *63*(3), 293-304.

Liddle, H.A., Dakof, G.A., Parker, K., Diamond, G.S., Barrett, K., and Tejeda, M. (2001). Multidimensional family therapy for adolescent drug abuse: Results of a randomized clinical trial. *American Journal of Drug and Alcohol Abuse*, *27*(4), 651-687.

Liese, B.S., and Najavits, L.M. (1997). Cognitive behavioral therapies. In J. Lowinson, P. Ruiz, R. Millman, and J.G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* 3rd ed. (pp. 467-478). Baltimore, MD: Williams and Wilkins.

Martin, C.S., and Winters, K.C. (1998). Diagnosis and assessment of alcohol disorders among adolescents. *Alcohol Health and Research World*, *22*, 95-105.

Milby, J.B. (1981). *Addictive behavior and its treatment*. New York: Springer.

Miller, W.R., and Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford Press.

Monti, P.M., Colby, S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M.G., Woolard, R.H., and Lewander, W.J. (1999). Brief intervention for harm reduction with alcohol and older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*, *67*, 989-994.

Muck, R., Zempolich, K.A., Titus, J.C., Fishman, M., Godley, M.D., and Schwebe, R. (2001). An overview of the effectiveness of adolescent substance abuse treatment models. *Youth and Society*, *33*(2), 143-168.

National Clearinghouse for Alcohol and Drug Information. (2002). *A collection of NIDA notes and articles that address drug abuse treatment*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

National Institute on Drug Abuse. (1995). *Adolescent drug abuse: Clinical assessment and therapeutic interventions* (NIH Publication No, M156). Rockville, MD: National Institutes of Health.

National Institute on Drug Abuse. (1999). *Principles of drug addiction treatment: A research-based guide* (NIH Publication No. 99-4180). Rockville, MD: National Institutes of Health.

National Institute on Drug Abuse Community Epidemiology Work Group. (1999). *Epidemiologic trends in drug abuse* (NIH Publication No. 00-4529) Rockville, MD: National Institutes of Health.

Office of National Drug Control Policy. (2001). *The economic costs of drug abuse in the United States: 1992-1998* (Publication No. NCJ-19-636). Washington, DC: Executive Office of the President.

Perry, P., Hedges, T., Carl, D., Fusco, W., Carlini, K., Schneider, J., and Salerno, N. (2003). Dynamite Youth Center, Incorporated: A multiphase, step-down therapeutic community for adolescents and young adults. In S. J. Stevens and A. Morral (Eds.), *Exemplary models of drug treatment in the United States* (pp. 235-255). Binghamton, NY: Haworth Press.

Pickens, R.W., and Fletcher, W.W. (1991). Overview of treatment issues. *National Institute on Drug Abuse Research Monograph*, *106*, 1-19.

Polich, J.M., Ellickson, P.L., Reuter, P., and Kahan, J.P. (1984). *Strategies for controlling adolescent drug use*. Santa Monica, CA: RAND Corporation.

Pompi, K.F. (1994). Adolescents in therapeutic communities: Retention and posttreatment outcome. In F. Tims, G. DeLeon, and N. Jainchill (Eds.), *Therapeutic community: advances in research and application*. Research Monograph Series, 144, (DHHS Pub. No. [ADM] 94-3633). Rockville, MD: National Institute on Drug Abuse.

Rollnick, S., Heather, N., Gold, R., and Hall, W. (1992). Development of a short "readiness to change" questionnaire for use in brief, opportunistic interventions among excessive drinkers. *British Journal of Addiction*, *87*(5), 743-754.

Schmidt, S.E., Liddle, H.A., and Dakof, G.A. (1996). Changes in parenting practices and adolescent drug abuse during multidimensional family therapy. *Journal of Family Psychology*, *10*(1), 12-27.

Sells, S.B., and Simpson, D.D. (1979). Evaluation of treatment outcome for youths in the drug abuse reporting program (DARP): A follow-up study. In G.M. Beschner and A.S. Friedman (Eds.), *Youth drug abuse: Problems, issues, and treatment* (pp. 571-628). Lexington, MA: DC Heath.

Sernlitz, L., and Gold, M. (1986). Adolescent drug abuse: Diagnosis, treatment and prevention. *Psychiatric Clinics of North America*, *9*, 455-473.

Substance Abuse and Mental Health Services Administration. (2003). *Results from the 2002 National Survey on Drug Abuse and Health: National findings*. Office of Applied Studies, NHSDA Series H-22, DHHS Publication No. SMA 03-3836.

Tapert, S.F., and Brown, S.A. (1999). The role of neurocognitive abilities in coping with adolescent relapse to alcohol and drug use. *Journal of Studies on Alcohol*, *60*(4), 500-508.

Tarter, R.E. (1990). Decision-tree for adolescent assessment and treatment planning. *American Journal of Drug and Alcohol Abuse*, *16*, 1-46.

U.S. Congress, Office of Technology Assessment. (1991). *Adolescent health: Summary and policy options* (No. OTA-H-468). Washington, DC: U.S. Government Printing Office.

Wagner, E.F., Brown, S.A., Monti, P.M., Myers, M.G., and Waldron, H.B. (1999). Innovations in adolescent substance abuse intervention. *Alcoholism: Clinical and Experimental Research*, *23*(2), 236-249.

Werner, M.F. (1995). Principles of brief intervention for adolescent alcohol, tobacco, and other drug use. *Pediatric Clinics of North America*, *42*, 335-349.

White, W.L., Dennis, M., and Tims, F.M. (2002). Adolescent treatment: Its history and current renaissance. *Counselor*, *3*(2), 20-24.

Williams, R.J., Chang, S.Y., and Addiction Centre Adolescent Research Group. (2000). A comprehensive and comparative review of adolescent substance abuse treatment outcome. *Clinical Psychology: Science and Practice*, *7*(2), 138-166.

Winters, K.C. (1999). Treating adolescents with substance abuse disorders: An overview of practice issues and treatment outcome. *Substance Abuse*, *20*(4), 203-225.

Winters, K.C., Latimer, W.W., and Stinchfield, R. (2001). Assessing adolescent substance abuse. In E. Wagner and H. Waldron (Eds.), *Innovations in adolescent substance abuse interventions* (pp. 1-29). New York: Elsevier Science.

Winters, K.C., and Schiks, M. (1989). Assessment and treatment of adolescent chemical dependency. In P. Keller (Ed.), *Innovations in clinical practice: A source book* (pp. 213-228). Sarasota, FL: Professional Resource Exchange.

16

Youth Smoking Prevention Policy: Lessons Learned and Continuing Challenges

Paula M. Lantz

A large body of research shows that very few people in the United States initiate cigarette smoking or become habitual smokers after their teen years. Nearly 9 out of 10 current adult smokers started their tobacco use at or before age 18 (Giovino, 1999). Given the epidemiology of smoking initiation, a great deal of policy and programmatic attention has been directed toward youth smoking prevention (Institute of Medicine [IOM], 1994; Jacobson et al., 2001). Despite this strong policy focus, tobacco use among U.S. adolescents actually rose throughout most of the 1990s, until declining somewhat in the past few years. Given the wide range of interventions and policies that have been implemented—and the plethora of research that has been conducted regarding effectiveness—much can be said about the current state of youth tobacco control policy, and its triumphs and tribulations.

This chapter presents a synthesis of the burgeoning literature regarding efforts to prevent or reduce youth smoking, with an emphasis on policies and intervention strategies that have parallels in efforts to reduce alcohol consumption among minors (i.e., school-based interventions; regulation regarding youth purchase, possession, and use; advertising restrictions; mass media counter-marketing campaigns; community interventions; and comprehensive tobacco control programs). Brief summaries of the policy and evaluation literature regarding strategies aimed at youth smoking control are presented. These summaries are based primarily on other reviews that were recently published (Lantz et al., 2000; Jacobson et al., 2001) and a set of commissioned papers presented at the recent Innovations in Youth To-

bacco Control Conference, held in Santa Fe, New Mexico, in July 2002 (sponsored by the University of Michigan Tobacco Research Network, the Robert Wood Johnson Foundation, and the Ted Klein Youth Tobacco Research Project). This chapter concludes with a discussion of key lessons learned from youth tobacco control efforts that potentially are relevant for youth alcohol policy.

RECENT TRENDS IN SMOKING AMONG YOUTH AND YOUNG ADULTS

Trends in adolescent smoking typically are monitored in regard to ever smoking (also referred to as "initiation" and defined as having ever tried a cigarette), current smoking (defined as having smoked in the past 30 days), and daily smoking. Trend data regarding current smokers suggest that adolescent smoking increased during the 1960s and into the 1970s. In the late 1970s, rates began a slow yet steady decline that persisted until the late 1980s, when rates started to rise again and continued to rise for most of the decade (Jacobson et al., 2001). Data on high school seniors from 1975 to 2001 (see Figure 16-1) show that current smoking rates rose from 19.4 percent in 1990 to a peak of 24.5 percent in 1997, after which time rates

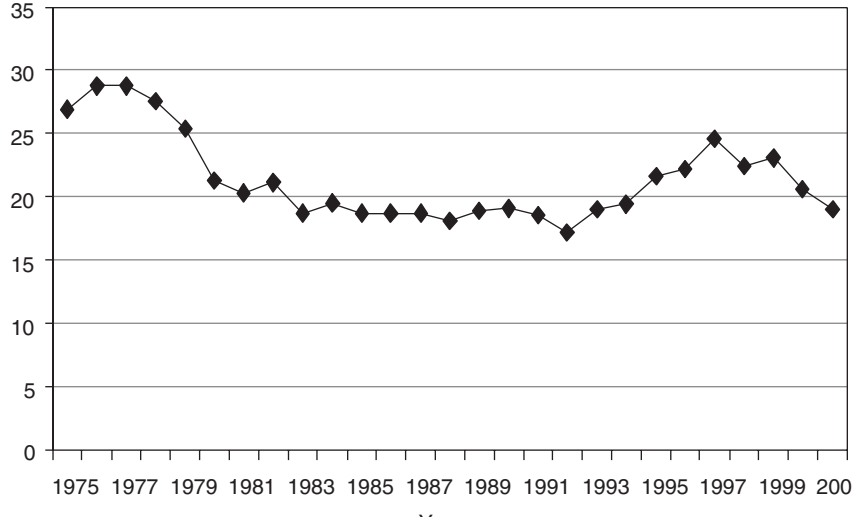

FIGURE 16-1 Prevalence of smoking in the past 30 days among twelfth graders, 1975-2001.
SOURCE: Data from Monitoring the Future (2002).

started to decrease slightly (Monitoring the Future, 2002; Johnston et al., 2001). Youth in all sociodemographic groups experienced increased rates of smoking during the 1990s, although in the past several years, male adolescents have had higher rates of smoking than females, and white and Native American adolescents have had higher rates than other ethnic groups.

The process of becoming a regular or habitual smoker can be considered as a series of transitions through several stages, starting with a first "initiating" puff of a cigarette (Flay, Hu, and Richardson, 1998). A clear finding from research is that smoking initiation or experimenting is a behavior of youth. Among adult smokers, the vast majority tried their first cigarette as an adolescent, and most of these initiators proceeded to the next stages in the transition to habitual smoking before the age of 19 (Giovino, 1999). The most recent estimates (from 2001) suggest that, among eighth graders, 36.6 percent have ever tried a cigarette, 12.2 percent are current smokers, and 5.5 percent are daily smokers. Among twelfth graders, 61 percent have ever smoked, 29.5 percent are current smokers, and 19 percent are daily smokers. Despite the recent declining trend, current rates are similar to what was observed for youth nearly two decades ago in the early 1980s (Monitoring the Future, 2002).

The "social context" of adolescent tobacco use is of critical importance. Socioeconomic status is associated with youth smoking, with youth from families with lower levels of parental education and income more likely to smoke (Jacobson et al., 2001; Giovino, 1999). Also, factors such as the attitudes of parents and friends/peers toward smoking, whether or not friends or peers smoke, and whether or not a parent or other family member smokes are all significantly associated with youth smoking behavior (Jacobson et al., 2001; Richter and Richter, 2001). In addition, tobacco use does tend to cluster with other types of risk behaviors—including alcohol use—among adolescents (Windle and Windle, 1999; Bauman and Phongsavan, 1999). For example, youth who smoke are more likely to engage in binge drinking (Johnson, Boles, Vaughan, and Kleber, 2000).

Smoking rates among young adults (ages 19 to 25) also rose dramatically during the 1990s. Trend data from National Health Interview Surveys suggest that current smoking rates among young adults rose from 22.9 percent in 1991 to a peak of 27.9 percent in 1999 (Lantz, 2002). Several studies suggest that this increase was observed among both college students and young adults not in school (Wechsler, Rigottu, Gledhill-Hoyt, and Lee, 1998; Johnston, O'Malley, and Bachman, 2001; Lantz, 2002). Although smoking rates among young adults also have declined recently, the dramatic increase observed during the 1990s remains alarming. Based on time-series analysis (Lantz, 2002), it does appear that approximately 75 percent of this increase is due to a cohort effect: that is, the observed increase in smoking among young adults reflects in large part the aging of adolescent

cohorts with high rates of tobacco use. However, there is also evidence to suggest that the increase among young adults should not be dismissed totally as a cohort effect. This evidence includes an increase in the rate at which those who have experimented with tobacco become habitual smokers as young adults (especially among males), and concomitant increases in other types of substance use among adolescents and young adults in the 1990s, including binge drinking and use of marijuana and other illicit drugs (Johnston et al., 2001; Lantz, 2002). This suggests that risk-taking behavior regarding substances in general was on the rise among adolescents and young adults during the 1990s.

MAJOR YOUTH TOBACCO CONTROL STRATEGIES AND THEIR EFFECTIVENESS

School-Based Educational Interventions

During the past three decades, a number of school-based tobacco use prevention programs have been implemented, primarily at the elementary school and/or middle school level. The majority of these programs have tended to be based on one of three main approaches: (1) an information deficit or rational model in which the program provides information about the health risks and negative social consequences of tobacco use in an attempt to address "knowledge deficits," most often in a manner intended to provoke fear, concern, or disgust; (2) an affective education model in which the program attempts to influence beliefs, attitudes, intentions, and norms related to tobacco use with a focus on enhancing self-esteem and values clarification; and (3) a social influence resistance model (Bruvold, 1993; Lantz et al., 2000). This last model emphasizes that, in addition to individual factors such as knowledge and attitudes, the social environment is a critical factor in tobacco use. Important aspects of the social environment include peer behavior and attitudes, and certain aspects of environmental, familial, and cultural contexts. Therefore, interventions based on this model focus on building skills needed to resist negative influences, including communication and decision-making skills, assertiveness training, and recognition of industry advertising tactics and peer influences. The results of several individual evaluations and meta-analyses strongly suggest that educational programs based on the social influence resistance model are the most effective of the three approaches (Bruvold, 1993; Jacobson et al., 2001; Botvin, 2000). These types of programs can have a modest but significant impact on both smoking initiation and level of use.

A recent trend in school-based interventions is the use of peer education programs (e.g., Teens Against Tobacco Use) (Black, Tobler, and Sciacca, 1998). In this type of program, older students are trained to deliver inter-

vention components to and become positive role models for middle and elementary school students. However, the long-term impact of this and other types of school-based educational interventions is of general concern because any existing effects appear to generally dissipate over a one- to four-year period (Jacobson et al., 2001). Booster interventions are needed to maintain effects over time (Botvin, 2000). Furthermore, just because an intervention is based on a social influences resistance model does not mean it will be effective. For example, studies regarding the Drug Abuse Resistance Education, or D.A.R.E.®, program (currently implemented in approximately three-fourths of the nation's elementary schools) have been quite mixed, with the majority finding no short- and/or long-term impact on tobacco use (Ahmed, Ahmed, Bennett, and Hinds, 2002; Brown, 2001; Lynan et al., 1999; Ennett et al., 1994).

Based on the wide literature in this area, several sets of guidelines and "best practices" regarding the development, implementation, and evaluation of school-based tobacco prevention programs have been developed (IOM, 1994; Centers for Disease Control and Prevention, 1999b). In addition, however, some studies have actually shown "reverse effects" of educational interventions on youth smoking; that is, youth exposed to the intervention have significantly higher rates of smoking thereafter (Hawthorne, 1996; Ellickson and Bell, 1990). This trend has led some experts to raise concerns about the potentially counter-productive effects of educational interventions, especially those that do not include a focus on the social environment or broader community context (Peterson, Kealy, Mann, Marek, and Sarason, 2000).

Regulation, Restrictions, and Penalties Regarding Youth Access to Tobacco

In the past decade, the issue of youth access to tobacco products has received an explosion of attention. Policy action has been seen in a number of areas, including regulation of sellers, restrictions on the distribution of free products, and regulation of where and how tobacco can be sold, including efforts to restrict sales via vending machines.

Federal Public Law 102-321, enacted in 1991 and commonly referred to as the Synar amendment, stipulates that states must both (1) enforce laws restricting the sale and distribution of tobacco products to minors, and (2) demonstrate success in reducing youth tobacco access or risk not receiving the full complement of block grant funding for substance abuse prevention and treatment. The Synar amendment has led to a number of developments in youth tobacco control, including the passage of age-of-sale legislation with penalties for vendors who sell to minors and the increased use of undercover or "sting" operations (Jacobson and Wasserman, 1997).

However, few jurisdictions appear to enforce laws seriously regarding the sale of tobacco to minors. This lack of enforcement undermines the potential of such policies. Enforcement is a critical component of potential effectiveness; without ongoing enforcement, these types of laws appear to be benign (Jacobson and Wasserman, 1997; Forster and Wolfson, 1998; Stead and Lancaster, 2000). Several controlled community intervention studies have demonstrated that increased enforcement of laws regarding tobacco sales to minors can indeed reduce illegal sales (Rigotti, DiFranza, and Change, 1997; Altman, Wheelis, McFarlane, Lee, and Fortmann, 1999; Biglan et al., 1996).

Unfortunately, the evidence that a reduction in youth purchases of cigarettes actually translates into a reduction in consumption or a change in smoking behavior is limited. The majority of studies conducted in this area only explored the impact of enforcement on youth access or ability to purchase tobacco products rather than the impact on smoking rates. In studies that looked at both sales and smoking behavior, reduced sales typically did not go hand in hand with reduced smoking (Forster and Wolfson, 1998; Lantz et al., 2000). We might expect the enforcement of youth access laws to have an impact on smoking behavior if the primary way in which adolescents obtain their cigarettes is through illegal purchases. However, youth cite a number of "social sources" (such as family, friends, or even strangers) for their cigarettes in addition to illegal purchase. Thus, with the evidence to date, we can conclude that interventions that involve enforcement of state or local laws regarding tobacco sales to minors (i.e., "cracking down" on vendors) can produce reductions in illegal sales, but whether the enforcement also leads to sustained reductions in youth tobacco use remains speculative.

Penalties for Youth Possession, Use, and Purchase

A recent yet controversial response to youth tobacco use is the implementation of state and/or local laws that levy penalties against youth for the possession, use, or purchase of tobacco products. Some tobacco control advocates have stridently protested this approach as an attempt to shift attention and responsibility away from vendors who sell tobacco products to children to the minors themselves. Nonetheless, this shift in focus gained significant momentum during the 1990s. As Wakefield and Giovino (2002) reported, the number of states with legislation restricting possession of cigarettes among minors (those under age 18) grew from 6 in 1988 to 32 in 2001. In 2001, only 6 states and the District of Columbia had no laws mandating some type of penalty on youth possessing, using, or purchasing tobacco products (Wakefield and Giovino, 2002). The penalties associated with these laws vary widely, including receipt of a ticket, a fine, appearance

in court (including special "teen courts"), suspension from school, loss of driving privileges, referral to an educational or smoking cessation program, community service, and/or other court-ordered responses.

A small number of studies have been conducted to assess the impact of teen penalty laws on youth tobacco purchases and use. Wakefield and Giovino (2002) summarized the limited amount of research conducted to date:

> Based on these studies, it is difficult to conclude there are strong positive effects from [possession, use, and purchase] laws. Some of the studies suggest small effects for some subgroups, such as low-risk younger students. However, in assessing the value of [these] laws, it is important to consider the net effects of [these] laws, rather than focusing upon one positive or negative aspect.

These reasons include the low likelihood of detection and thus punishment, the long time delay between detection and punishment, and the rather impersonal or distant relationship between the punisher (the state) and the youth involved.

Furthermore, concerns have been raised that possession, use, and purchase laws could actually undermine or confuse efforts being made by schools (Kropp, 1998) or may intensify parent-child relationships that are already vulnerable or troubled (Woodhouse, Sayre, and Livingood, 2001; Wakefield and Giovino, 2002). This type of regulation also raises concerns that the focus on youth relieves the tobacco industry of responsibility for its marketing tactics, and further reinforces the industry's premise that smoking is a behavior for adults only, a perspective that likely enhances the appeal or allure of smoking for many youth. As with youth access laws, there is little evidence to suggest that this type of regulation has a significant impact on youth smoking behavior. As a result, some tobacco control experts have called for the shifting of research, intervention development, and advocacy resources away from this policy area (Ling, Landman, and Glantz, 2002; Fichtenberg and Glantz, 2002; Glantz, 1996).

Tobacco Advertising Restrictions and Mass Media Counter-Marketing Campaigns

Tobacco Advertising Restrictions

As a consumer product, cigarettes are heavily advertised and marketed. Despite the defensive claims of tobacco industry representatives that they only market to adults, a large and growing body of evidence shows that the industry has indeed developed product lines and large, intense advertising campaigns that target adolescents and even younger children (Jacobson et al., 2001). In a review of industry documents, Perry concluded that there

is significant evidence from the industry itself that: (1) youth smoking has been viewed as critical to economic viability; (2) decreases in youth smoking were perceived as negative and disturbing; and (3) specific products and advertising strategies were aimed specifically at youth, with successful results (Perry, 1999).

There is great concern that tobacco advertising and marketing—including the distribution of promotional products such as clothing, sporting equipment, and outdoor gear—are positively associated with youth smoking. There also is great concern that increased marketing activities aimed at young adults, including promotions on college campuses and at bars, nightclubs, and musical events, are partly responsible for the recent increase in smoking among young adults (Ling and Glantz, 2002; Lantz, 2002).

Estimating the effects of advertising and promotions on smoking initiation or cigarette consumption is technically difficult. Several studies have shown that the most popular cigarette brands among younger smokers are also those that are most heavily advertised (DiFranza et al., 1991; Cummings, Hyland, Pechacek, Orlandi, and Lynn, 1997; Arnett and Terhanian, 1998). Studies have also found that adolescents who are more susceptible to future tobacco or alcohol use have more favorable reactions to product advertising (Unger, Johnson, and Rohrbach, 1995). In addition, a growing amount of research evidence suggests that youth awareness of tobacco marketing campaigns, receipt of free tobacco samples, and receipt of direct mail promotional paraphernalia are associated with smoking susceptibility and initiation (Schooler, Feighery, and Flora, 1996; Gilpin and Pierce, 1997; Feighery, Borzekowski, Schooler, and Flora, 1998). Although some of the evidence to date is compelling, these studies primarily show an association rather than a causal relationship between exposure to tobacco advertising/marketing and youth smoking. Two longitudinal studies do provide evidence that exposure to tobacco industry promotional activities at a young age is associated with subsequent smoking (Pierce, Gilpin, and Choi, 1999; Pucci and Siegal, 1999). In fact, Pierce and colleagues (1999) concluded that nearly one-third of smoking experimentation among California youth between 1993 and 1996 is attributable to tobacco industry marketing and promotional tactics. Nonetheless, the potential effects of restrictions or bans on cigarette advertising on adolescent or young adult smoking behavior remain unclear at this time.

Mass Media Counter-Marketing Campaigns

Mass media strategies have been used for broad-based public education regarding a variety of public health issues, including immunizations, domestic violence, drunk driving, illicit drug use, and tobacco use. In general, mass media efforts are viewed as being especially effective in efforts to

reach youth because they tend to be more interested in and exposed to media messages. Youth have been the primary target of some forceful and sophisticated anti-tobacco media campaigns in a number of communities and states, primarily as a major part of state-funded tobacco control programs but also through the efforts of advocacy or activist groups (Jacobson et al., 2001; Farrelly, Niederdeppe, and Yarsevich, 2002b). Many of these campaigns have focused on efforts to "counter-market" the efforts of the tobacco industry to glamorize smoking and to downplay or deny the addictive, harmful nature of tobacco products (Farrelly et al., 2002b). In fact, both a campaign in Florida and a subsequent national effort launched by the American Legacy Foundation (the independent foundation established as part of the multistate settlement with the tobacco industry) have been labeled "the truth campaign" (Farrelly et al., 2002a). In addition, a number of other thematic approaches and message strategies have been or are currently being employed in campaigns at the state and local levels, including the short- and long-term consequences of smoking and changing social norms about smoking (Farrelly et al., 2002b).

Although it is difficult to evaluate the independent effects of mass media campaigns on smoking behavior, evaluation results from a number of community trials and statewide campaigns provide evidence that such interventions can be effective in reducing youth smoking. Farrelly et al. (2002b), in a recent review, concluded:

> [T]here is growing evidence that aggressive youth prevention campaigns in states have been effective in reducing tobacco use, but it is still unclear to what extent increases in cigarette prices and other concurrent programs contributed to these decline . . . [In addition,] while counter-industry and branding approaches are fashionable, based on the experimental literature and results from recent campaigns, it is not clear if any particular message strategy dominates others (p. 14).

It appears that anti-smoking advertising campaigns aimed at youth have greater potential when reinforced by other community or school-based efforts implemented at the same time (Jacobson et al., 2001; Farrelly, Niederdeppe, and Yarsevich, 2002b). In addition, media campaigns that are theoretically driven and involve essential elements of social marketing stand the best chance of having an impact on attitudes and behaviors regarding tobacco use. The literature at hand suggests that mass media interventions increase their impact if the following conditions are met: (1) the campaign strategies are based on sound social marketing principles; (2) the effort is large and intense enough; (3) target groups are carefully differentiated; (4) messages for specific target groups resonate with "core values" of the group (rather than simply preach about the health risks of tobacco use) and are based on empirical findings regarding the needs and interests

of the group; and (5) the campaign is of sufficient duration, rather than a one-shot, limited effort (Jacobson et al., 2001).

Within the past few years, two large tobacco companies have launched their own media campaigns against youth smoking: (1) Philip Morris' Think. Don't Smoke, and (2) Lorillard's Tobacco is Whacko, if You're a Teen. Although the electronic and print ads that comprise these campaigns take a variety of forms, the core message is that smoking is an adult behavior in which kids should not engage. Based on what is known about youth smoking prevention and social marketing in general, there are many reasons to believe that the approach taken by the tobacco industry will not be effective. In fact, there are some reasons to believe that this message will serve to make smoking—as a forbidden "adult" behavior—even more appealing to youth. Farrelly and colleagues have reported that, in regard to the Philip Morris approach, exposure to the ads—which themselves are not particularly compelling to many teens—is associated with more positive attitudes toward the tobacco industry and with increased intentions regarding future smoking (Farrelly et al., 2002a; Farrelly, Niederdeppe, Yarsevich, 2002b). A developmental psychologist with experience in advertising and marketing wrote: "This [type of phenomenon] is behind the 'don't put peas up your nose' phenomenon in child rearing. I do not recommend giving this command to a preschooler. And while you are at it, maybe you shouldn't tell your teenager not to smoke" (Rust, 1999, p. 87). Thus, a cynic might suggest that the tobacco industry—with a primary interest in increasing industry credibility—knows full well that this approach to youth smoking prevention is at best benign, and may actually have counterproductive effects (Jacobson et al., 2001; Novelli, 1999).

Tobacco Excise Taxes

As a policy strategy, tobacco taxation not only generates revenue for federal, state, and some local governments, it also creates an economic disincentive to use tobacco products. Theoretically, increasing the price of cigarettes through taxation could reduce adolescent consumption through three main mechanisms: (1) serving as an inducement to quit smoking; (2) serving as an inducement to reduce the amount smoked; and (3) preventing some youth from starting to smoke (U.S. Department of Health and Human Services, 1994). The extent to which higher cigarette taxes actually prompt these mechanisms depends on how responsive smokers and potential smokers are to price increases.

A number of economic studies of consumer responsiveness to cigarette pricing (or "price elasticity of demand") have been conducted, although the majority have focused on the adult or overall demand for cigarettes, with

comparatively few focused on youth. The conclusion of numerous studies is that an increase in the price of cigarettes does lead to lower consumption by adults (Chaloupka and Warner, 2000). Although the evidence on the degree to which teenagers are responsive to changes in cigarette prices is a bit more mixed, the general consensus is that higher prices are an effective deterrent to youth smoking (Jacobson et al., 2001; Lantz et al., 2000). In fact, several studies have found an inverse relationship between price sensitivity and age, meaning that youth are *more* sensitive to cigarette prices than are adults (Farrelly and Bray, 1998; Lewit et al., 1997; Dee and Evans, 1998).

Because most excise tax increases in the United States have been relatively small to date, it is difficult to predict the exact impact that a large tax increase (e.g., $1 or more per pack) would have on youth smoking. One might assume that the effects would be proportionately greater than those of a smaller tax increase, but this is not certain. Nonetheless, the evidence to date does suggest that tobacco excise tax increases are an effective policy strategy for reducing youth smoking.

Smoke-Free Space Policies

Policy efforts to restrict smoking in public spaces—including airplanes, public/government buildings, worksites, hospitals, restaurants, bars, and hotels—have proliferated since the 1980s. The primary purpose of these bans is to reduce exposure to environmental tobacco smoke. These types of policies also are believed to impact smoking behavior. Theory suggests that the main reasons smoking bans could affect behavior are because they reduce opportunities for smoking, they provide further incentive to quit for those who are contemplating cessation, and they help to create and reinforce social norms against smoking. Several studies have shown that these types of "clean air" policies do have an impact on adult smoking, and can be implemented without negative economic repercussions (Brownson et al., 1997; Glantz and Charlesworth, 1999; Glantz, 1999).

The impact of smoke-free space policies on youth is less clear. However, a few studies have found evidence that clean indoor air laws do reduce teenage cigarette consumption (Chaloupka and Grossman, 1996; Wasserman, Newhouse, and Winter, 1991). It also appears that youth are positively affected by school-based policies regarding tobacco use (Wakefield et al., 2000; Pinilla et al., 2002; Chaloupka and Grossman, 1996; Pentz et al., 1989a). Schools may have their own smoking policies, responding to violations with a variety of penalties, including fines, smoking education and cessation classes, informing the student's parents, suspension and/or expulsion, and community service assignments. These policies clearly are aimed at youth, but can restrict smoking behavior among adults as well. As

with other types of tobacco-related policies, it appears that school-based policies need to be enforced to be effective. As Moore, Roberts, and Tudor-Smith (2001) documented, the prevalence of smoking among students is associated with the presence of a smoking policy and the strength of its enforcement. There is some evidence to suggest that an increasing number of primary and secondary schools are developing and implementing smoking policies, and are also more actively enforcing these policies (Jacobson et al., 2001). In addition, over the past decade, a number of college and university campuses have implemented full or partial smoking bans. The creation of smoke-free environments on campus (including dormitories and other residence facilities, cafeterias, recreational areas, classrooms, and private offices) is in direct response to concern about the increase in smoking among college students (Wechsler et al., 2001). Chaloupka and Wechsler (1997) found that rates of smoking among college students were lower in the presence of policies restricting smoking on campus and in nearby restaurants. Again, however, these types of policies must be promoted and enforced to be effective.

An emerging area of interest is family or home-based smoking policies. Although few studies have been conducted on this topic to date, early research results suggest that having an articulated set of rules regarding smoking in the home environment has a negative impact on youth smoking behavior (Biglan et al., 1996; Spoth, Redmond, and Shin, 2001).

Smoking Cessation Interventions

In the face of rising smoking rates among adolescents, and with growing empirical evidence regarding the limitations of a number of primary prevention strategies, interest in the efficacy of youth smoking cessation interventions has grown over the past decade. A number of descriptive survey and focus group studies clearly show that many teen smokers are indeed motivated to quit (Jacobson et al., 2001). For example, in a sample of high school seniors, nearly 70 percent of regular smokers had tried to quit at least once, and 60 percent had attempted to quit in the past year (Burt and Peterson, 1998). Success in quit attempts, however, is quite low among adolescents (Mermelstein, 2002). Many youth also apparently believe that quitting is something done all alone and "cold turkey." Most adolescent smokers are unfamiliar with the concept of a smoking cessation program or with methods available to support quit attempts; those who are aware tend to express concern regarding confidentiality and the involvement of parents in their cessation effort (Jacobson et al., 2001).

The psychology and physiology of nicotine dependence in adolescents are not well understood, nor is the impact of smoking cessation interventions in this population (Mermelstein, 2002; Jacobson et al., 2001; Sussman,

2002). None of the pharmacological interventions and nicotine replacement therapies currently on the market have been approved for use under the age of 18. Mermelstein (2002, p. 6) summarized the state of knowledge regarding teen smoking cessation by stating that the "evidence base behind smoking cessation interventions for adolescents is starting to grow, but unfortunately, the studies to date have frequently been plagued by major methodological problems," including lack of control or comparison groups, inappropriate measures of cessation, follow-up periods that are too short, and vague descriptions of interventions.

Based on the evidence at hand, it does appear that some cessation interventions aimed at adolescents have met with some limited success. Sussman (2002) estimated average quit rates across a number of studies, and found that the immediate post-program quit rate for those receiving the intervention was double that for those in the control groups (14 percent versus 7 percent). This average quit rate, however, is much lower than that observed for adults, and is for immediately after the program ended and thus does not speak to either short-term or long-term sustainability. At the present time, many researchers and tobacco policy experts remain speculative or "cautiously optimistic" about the potential of smoking cessation interventions for adolescents. To date, only two studies regarding the nicotine patch have been conducted on minors, and both produced very low cessation rates (Hurt et al., 2000; Smith et al., 1996). Although it is premature to state "best practices" and to make policy recommendations in this area, Mermelstein (2002) did conclude:

> [C]ognitive-behavioral approaches that emphasize skills training and self-management approaches may hold promise, along with perhaps brief motivational interviewing procedures in the context of health care delivery settings there is much promise, though, for "more and better to come" as almost two dozen well-designed trials are currently underway (p. 2).

The Case for Community Interventions and Comprehensive Tobacco Control Programs

In-depth review of the current state of youth tobacco policy suggests that a number of prevention strategies are promising, especially if conducted in a coordinated way to take advantage of potential synergies across interventions (Jacobson et al., 2001). For example, research suggests that mass media interventions are most potent when implemented in conjunction with school-based efforts or community interventions (Farrelly, Niederdeppe, and Yarsevich, 2002b). Research also shows that school-based educational interventions are enhanced when supported by community interventions that target the social environment. In addition, it is clear that secondary prevention efforts (e.g., tobacco use cessation) need to

complement primary prevention strategies because primary prevention fails with a significant number of youth.

The increased understanding of the combined effects of individual factors and social environment conditions on tobacco use has resulted in an emphasis on community interventions. In general, community interventions have multiple components that target a community at a number of different levels, including individuals, institutions, policies, and the broad social environment. Typical or common elements include an emphasis on altering the social environment or social context in which tobacco products are obtained and used, with the shared goal of creating an environment that is supportive of nonsmoking and cessation. Intervention activities can involve families, schools, community organizations, houses of worship, businesses, the media, social service and health agencies, government, and law enforcement, with intervention strategies generally focused on making changes at both the individual and the environmental levels (Jacobson et al., 2001). Some examples of community interventions targeting tobacco use include COMMIT (Community Intervention Trial for Smoking Cessation), Project ASSIST (American Stop Smoking Intervention Study for Cancer Prevention), and the Fighting Back program (Jacobson et al., 2002).

Although a number of communities have implemented multiple-component, community-focused interventions to reduce youth tobacco use, only a handful of published reports exist of evaluations using research designs that employ the use of a control or comparison group. Nonetheless, the research results that are available are encouraging in some cases. For example, a community intervention implemented in 15 communities in the Kansas City area incorporated mass media, school-based education, parent education, community organizing, and policy advocacy, and was found to significantly reduce tobacco, alcohol, and illicit drug use among youth. In specific regard to youth smoking, rates of current smoking were 19 percent in the targeted communities compared to 29 percent in the control communities two years after the intervention (Pentz et al., 1989b, 1989c). Positive evaluation results were also reported from the Class of 1989 Study (which was part of a larger community intervention called the Minnesota Heart Health Program) and an intervention in rural Oregon (Perry et al., 1992; Biglan et al., 1999).

There is a significant difference between "community-focused" or "community-placed" interventions and true "community-based" interventions. Interventions that target a specific community and attempt to reach diverse audiences through multiple channels within that community need to be designed and implemented with a strong community perspective. The best way to achieve this community perspective is to ensure that the intervention and all of its component parts are actually designed and planned by people from the community receiving the intervention, rather than by out-

side "experts" who likely do not fully understand the specific historical, cultural, socioeconomic, and political contexts of the community, or the best ways in which to build on the strengths or assets that already exist within it. The perspectives and principles of "community-based participatory research"—in which members of a community share full power and control in all stages of the design, implementation, and evaluation of an intervention—are critical for community-based efforts in youth tobacco control (Israel et al., 1998; Cornwall and Jewkes, 1995).

In summary, community-based interventions that work through parents/families, schools, the local media, and community-based organizations appear to have a stronger impact when they work in tandem over time rather than as single or separately implemented interventions (Jacobson et al., 2001). However, the results of the few controlled trials of community interventions that are available also suggest that most community interventions likely are insufficient to bring about dramatic and sustained declines in youth tobacco use. To produce significant and long-lasting effects, community interventions need to be combined with taxation, strong advocacy work aimed at policy and social environment change, and strong and sustained mass media strategies.

Increased understanding from community intervention studies, along with the availability of resources in most states from increases in the state tobacco excise taxes and/or from the Master Settlement Agreement, has fueled the development of coordinated state-based efforts in youth tobacco control. Over the past decade, several state health departments have implemented what is referred to as "comprehensive tobacco prevention and control programs." These state programs are comprehensive in that they employ a variety of strategies to reach a number of different audiences; they incorporate multiple types of interventions at the regional, state, and local levels; and they attempt to have a strong policy component (Jacobson et al., 2002; Wakefield and Chaloupka, 2000). "Best practices" for this type of comprehensive tobacco control program have been summarized by the Centers for Disease Control and Prevention (CDC, 1999a). Recommended components of a comprehensive program include the following: (1) a statewide focus; (2) community-based interventions; (3) school-based interventions; (4) counter-marketing media activities; (5) cessation programs; (6) enforcement of existing laws and policies; (7) intervention programs aimed at chronic diseases caused by tobacco use; (8) surveillance and evaluation efforts; and (9) dedicated administration and management.

Although many comprehensive state programs are in the early stages of development and implementation, these comprehensive models—when sufficiently funded and at a significant level of intensity—have great potential for youth tobacco control. CDC developed model components based on the experiences of two states: California and Massachusetts. The California

Tobacco Control Program began in 1989, funded by Proposition 99, which raised the state tax on cigarettes from 10 to 35 cents. The goal of the program is to decrease smoking among both adolescents and adults. The program has multiple components (which have changed somewhat over the years), including a large, hard-hitting mass media campaign with multiple themes and messages; investments in the tobacco control capacity of local and city health departments; school-based interventions; a number of cessation efforts; and other strategies aimed at identified subpopulations through diverse channels. More recent efforts have concentrated on three main goals: (1) to reduce exposure to environmental tobacco smoke, (2) to reduce youth access, and (3) to counter protobacco influences (Pierce et al., 1998; Jacobson et al., 2001).

The Massachusetts Tobacco Control program also was funded through an increase in the state tobacco excise tax, which was passed in November 1992. A key component of the program is a statewide multimedia campaign with a number of themes and strategic messages. Other activities have included a telephone hotline to support cessation, a Tobacco Education Clearinghouse, providing technical support for capacity building in local health agencies and primary care facilities, school-based educational efforts, and activities restricting youth access (Biener, 1999). More recently, Florida was able to increase its youth tobacco control efforts after receiving the first installment of the settlement of the Medicaid litigation with the tobacco industry. The Florida program includes a strong marketing component (including the "truth" campaign described earlier). Other components include funding of community partnerships and community-based activities, youth programs, enforcement of youth access laws, and a strong evaluation effort (Jacobson et al., 2001).

A number of analyses and evaluations of the comprehensive programs implemented in California, Massachusetts, and Florida have been conducted, with a full review of research findings to date outside the scope of this chapter. In summary, however, there is substantial evidence that these programs can have an impact on tobacco use among both youth and adults (Jacobson et al., 2001). The rate of adolescent smoking in California dropped by 12 percent between 1995 and 1997, when smoking was increasing among youth nationally (Independent Evaluation Consortium, 1998; Pierce et al., 1998). During its first 9 years, the California program prevented an estimated 30,000-plus deaths from tobacco-related heart disease (Fichtenberg and Glantz, 2002). Not all evidence, however, points to a significant impact of the comprehensive efforts on youth. Rohrbach and colleagues (2002) recently reported that, in a survey of tenth graders in 84 randomly selected schools, there was no association between exposure to California Tobacco Control Program components and tobacco-related attitudes and behaviors.

Rates of smoking among both adults and adolescents in Massachusetts dropped after the state's comprehensive tobacco control program was implemented. Between 1992 and 1996, per capita consumption dropped 6.1 percent nationally but 19.7 percent in Massachusetts (Centers for Disease Control and Prevention, 1996; Biener, 1999). Florida also has witnessed startling and impressive declines in youth smoking. In a 1-year period (February 1998 to February 1999), the 30-day prevalence of smoking among teens dropped from 25.2 percent to 20.9 percent, with declines observed for both genders and all ethnic groups (Florida Department of Health, 2000). Analyses have shown that combining tax increases with other interventions leads to reductions in both adolescent and adult smoking above and beyond what price increases would do alone (Hu, Sung, and Keeler, 1995; Wakefield and Chaloupka, 2000). Lessons regarding the political nature of these programs also have been documented (Pierce et al., 1998; Balbach and Glantz, 1998; Siegel et al., 1997).

DISCUSSION: LESSONS FOR YOUTH ALCOHOL POLICY

The most obvious conclusion from this review is that adolescent smoking prevention efforts have had mixed results, and that there is no "magic bullet" in terms of youth tobacco control on the horizon (Jacobson et al., 2001). As a result, the position that a significant amount of policy attention and resources should be directed at youth smoking prevention is somewhat controversial. Some policy analysts have suggested that the emphasis on youth may actually have counterproductive effects, making smoking more rather than less attractive to them (Glantz, 1996; Hill, 1999). Others have suggested that because primary prevention strategies have met with only limited success, efforts should be focused on secondary prevention, specifically in interventions aimed at getting teens and young adults who smoke to quit. Still others have suggested that the most fruitful approach to tobacco control is to focus on cessation interventions and smoke-free policy interventions in the adult population (Hill, 1999). Jacobson et al. (2001) suggested that these different policy views are not mutually exclusive, and that multiple approaches—aimed at both adolescents and adults, and focusing on both primary and secondary prevention—can be implemented simultaneously. In addition, many of these interventions have great potential to be cost-effective because even modest intervention effects among youth could lead to significant reductions in tobacco-related morbidity and mortality across the life course. Nonetheless, the relative focus of resources and policy attention on adolescents versus adults and on primary versus secondary prevention remains under debate.

Brief comments on the state of knowledge for several major areas of youth tobacco control and some broad implications for youth alcohol policy

follow. First, it is clear that comprehensive programs involving a number of efforts targeted locally but coordinated at the state level are key. A number of different strategies—aimed at individual, family, institutional, community, and policy levels—need to be implemented simultaneously. As mentioned earlier, CDC recommends several components as critical in a comprehensive youth tobacco control program, all of which have parallels in efforts to reduce underage drinking. These components include implementing effective community-based and school-based interventions in a social context that is being hit with a strong media campaign (aimed at some set of "core values") and with an effort to vigorously enforce existing policies regarding the purchase, possession, and use of the substance. In addition, excise taxes are believed to be very effective in reducing youth smoking, although the exact mechanism(s) by which they work is not known. Nonetheless, increasing the price of cigarettes through an increase in taxes is currently viewed as a cornerstone of youth tobacco control policy. An increase in the tobacco tax can have independent effects above and beyond that of other interventions being implemented simultaneously, and—if the political climate allows—also can be used a source of revenue to fund other tobacco control interventions. Evidence exists to suggest that adolescents are also sensitive to tax increases that raise the price of alcohol (Cook and Moore, 2002).

There is not a "one size fits all" comprehensive tobacco control program. States are currently experimenting with combinations of a number of different strategies at the state and local levels. In regard to school-based interventions, we know that these efforts need to meet several criteria to be effective, including the use of a social resistance model, the recognition of the importance of social context regarding attitudes and policies toward smoking, and program boosters throughout high school. These criteria hold for interventions targeting alcohol and illicit drugs as well. In addition, however, concern has been expressed recently that some school-based interventions are not only benign, but may actually produce reverse or counterproductive effects.

Why these reverse effects might occur is not clear, but a major hypothesis is that youth hear negative things about smoking in school yet often witness people using tobacco in their homes, communities, and the media, creating an aura of hypocrisy around the intervention message. In addition, it is also hypothesized that youth frequently receive the message that they should not smoke because they are kids, a message that casts smoking as an "adult behavior" and likely makes it even more attractive. Similar, and perhaps even heightened, concerns could be raised regarding school-based alcohol prevention efforts that cast drinking as an adult behavior. The "hypocrisy" concern—that the messages youth receive about not drinking occur in a broader social environment in which alcohol use is extremely

prevalent and positively presented—is great, as is concern about the potentially counterproductive effects of the message that drinking is fine for adults but not for anyone under the age of 21.

The evidence regarding youth access regulations, restrictions, and penalties at the state and local levels suggests that such policy efforts do reduce access because—when enforced—they do reduce illegal purchases by minors. As mentioned, enforcement of regulations and policies on the books is considered a critical component of a comprehensive state tobacco control program. However, there is little evidence that reduced access to tobacco through enforcement of purchase, use, or possession laws has a concomitant reduction on adolescent smoking behavior. In fact, there is a growing call in the tobacco control community to abandon this type of policy strategy, and to redirect research and advocacy resources toward avenues that appear to have greater potential for actually reducing tobacco use. The amount of time, energy, and money involved with passing these types of laws and then making sure they are enforced is quite significant, and is viewed by some as an unproductive drain on the limited financial and human resources available for tobacco control. Others, however, believe such interventions should remain a focal point of efforts. These are important issues and debates that should be considered by youth alcohol policy experts as well. Obviously, continual efforts need to be made to enforce laws regarding the purchase of alcohol by minors in stores, bars, and restaurants. The question, however, is what the relative degree of focus on this policy area in a comprehensive alcohol control program should be. In the tobacco control community, a primary concern among some experts is that a disproportionate amount of attention and resources has gone to implementing sting operations and other types of interventions when there is no evidence that reducing illegal sales/purchases actually translates into decreased smoking rates.

Regarding the media, the effects of restrictions on advertising or promotional strategies are not clear at the present time, although there is evidence that industry marketing does have an impact on the attitudes and behaviors of youth regarding smoking. In addition, specific types of countermarketing campaigns are proving to have a significant and important impact on youth smoking. Hard-hitting campaigns that include pointed messages about industry manipulation of information about what is in cigarettes and about the health effects of smoking are viewed as having great potential. The ability of these types of campaigns to have a sustained impact, however, is not clear. Regarding youth alcohol prevention, it is not clear if a similar type of campaign—one that included hard-hitting messages regarding deceptive and manipulative behavior on the part of the alcohol industry—could be waged in a legitimate and successful fashion. Messages

regarding alcohol (including the messages in campaigns launched by the industry) are to drink responsibly as an adult, but to not drink as a minor. It seems within the realm of possibility that campaigns that attempt to reduce alcohol use among youth by emphasizing that drinking is an "adult behavior"—whether implemented by the industry or others—run the same risks as those promoting smoking as an adult choice. The effects, at best, are likely to be benign, but also could be counterproductive.

Another important component of current tobacco control strategies (for both youth and adults) is the promotion of smoke-free spaces through regulation at the state and local levels. An important aspect of these types of policies is that they provide strong social cues or messages about the social acceptance of smoking, thus reinforcing some of the messages youth are getting through school-based and other types of interventions. Both advocacy work and research in this area currently are considered important components of youth tobacco control. The role of this type of policy action in youth alcohol control, however, is less clear. Although smoke-free policies are considered critical because of their impact on social norms and the social environment, they are also politically feasible because they serve to decrease exposure to second-hand smoke (i.e., they help to decrease potential health threats that smokers cause to nonsmokers). The obvious parallel in alcohol use is drinking and driving. Policies that restrict alcohol consumption in order to protect others from the threats posed by drunk drivers are broadly supported and politically acceptable. Yet, given the pervasiveness of alcohol consumption in our society, it is unlikely that many communities would consider total bans on adult alcohol consumption at restaurants and other types of public places (e.g., sports arenas, hotels, airplanes). In terms of families enforcing social norms, alcohol-free homes are not likely to be as pervasive as smoke-free homes. Nonetheless, home-based alcohol policies could convey what is considered to be appropriate and acceptable alcohol usage by all family members both within and outside of the home, and what the consequences are for violating the home policy.

As mentioned earlier, there is some tension in the tobacco control community regarding the relative emphasis that should be placed on primary versus secondary prevention. In the case of youth tobacco control, secondary prevention primarily means clinical interventions regarding cessation. By the time they reach high school, many youth have not only tried smoking but are already either physiologically or psychologically addicted to cigarettes. At this point, tobacco use prevention messages are irrelevant. Given the cost-effectiveness of smoking cessation interventions for adults, and the large number of addicted teenagers, cessation programs tailored to youth are seen as a critical part of a comprehensive tobacco control program. Nonetheless, there is debate on how much emphasis should be placed

on this component relative to others. In addition, the research literature to date does not suggest that there is a number of effective methods for smoking cessation among adolescents.

As with tobacco, there is some tension between primary and secondary prevention in regard to youth alcohol use. Because alcohol is an addictive substance, and youth can come to abuse alcohol early in their drinking careers, secondary prevention should involve clinical interventions for youth with diagnosed drinking problems. However, a greater degree of tension is likely to involve the appropriate relative degree of emphasis on youth who have not initiated drinking (primary prevention) and youth who have already tried alcohol and are considered "current" drinkers (have had some alcohol in the past 30 days). The relative focus on these two areas should be informed by the degree of success seen by primary versus secondary prevention interventions. As mentioned, some people (tobacco control advocates) have expressed a sense of defeat regarding the primary prevention of youth smoking, and thus believe a more effective strategy will be to concentrate on new methods for secondary prevention among adolescents and young adults.

CONCLUSION

Trends in youth smoking paint a frustrating picture for public health. Clearly there have been ups and downs in the fight against adolescent tobacco use. However, at a time when the health hazards of smoking are widely accepted and understood, and when significant resources already have been invested in program and policy responses, youth smoking rates are disturbingly high. The decline in smoking rates in the past few years is indeed encouraging. Nonetheless, many policy makers, tobacco control experts, and public health advocates are taking a serious and critical look at where investments have been made and what these investments have reaped. The result, as described in this chapter, is some degree of consensus on the types of interventions with the greatest potential, yet also some disagreement about how limited human and financial resources are best invested in the future.

The tobacco control community has learned a great deal from efforts made in other areas of substance abuse, including youth alcohol control. Hopefully, some of the knowledge gained by the ongoing and intensive efforts made in youth smoking prevention—knowledge gained from intervention development and evaluation, other types of research, litigation, advocacy work, and political struggles—will be instructive for youth alcohol policy as well.

REFERENCES

Ahmed, N.U., Ahmed, N.S., Bennett, C.R., and Hinds, J.E. (2002). Impact of a Drug Abuse Resistance Education (D.A.R.E.) program in preventing the initiation of cigarette smoking in fifth- and sixth-grade students. *Journal of the National Medical Association*, *94*(4), 249-256.

Altman, D.G., Wheelis, A.Y., McFarlane, M., Lee, H., and Fortmann, S.P. (1999). The relationship between tobacco access and use among adolescents: A four community study. *Social Science and Medicine*, *48*(6), 759-775.

Arnett, J.J., and Terhanian, G. (1998). Adolescents' responses to cigarette advertisements: Links between exposure, liking, and the appeal of smoking. *Tobacco Control*, *7*, 129-133.

Balbach, E.D., and Glantz, S.A. (1998). Tobacco control advocates must demand high-quality media campaigns. *Tobacco Control*, *7*, 397-408.

Bauman, A., and Phongsavan, P. (1999). Epidemiology of substance use in adolescence: Prevalence, trends and policy implications. *Drugs and Alcohol Dependence*, *55*(3), 187-207.

Biener, LW. (1999). *Progress toward reducing smoking in the Commonwealth of Massachusetts from 1993 through FY 1999*. Boston: University of Massachusetts at Boston, Center for Survey Research.

Biglan, A., Ary, D., Yudelson, H., Duncan, T.E., Hood, D., James, L., Koehn, V., Wright, Z., Black, C., Levings, D., Smith, S., and Gaiser, E. (1996). Experimental evaluation of a modular approach to mobilizing anti-tobacco influences of peers and parents. *American Journal of Community Psychology*, *24*(3), 311-339.

Biglan, A., Ary, D.V., Smolkowski, K., Duncan, T., and Black, C. (1999, August). A randomized controlled trial of a community intervention to prevent adolescent tobacco use. Center for Community Interventions on Childrearing, Oregon Research Institute, Eugene, Oregon. Unpublished paper.

Black, D.R., Tobler, N.S., and Sciacca, J.P. (1998). Peer helping/involvement: An efficacious way to meet the challenge of reducing alcohol, tobacco, and other drug use among youth? *Journal of School Health*, *68*(3), 87-93.

Botvin, G.J. (2000). Preventing drug abuse in schools: Social and competence enhancement approaches targeting individual-level etiologic factors. *Addictive Behaviors*, *25*(6), 887-897.

Brown, J.H. (2001). Youth, drugs, and resilience education. *Journal of Drug Education*, *31*(1), 83-122.

Brownson, R.C., Eriksen, M.P., Davis, R.M., and Warner, K.E. (1997). Environmental tobacco smoke: Health effects and policies to reduce exposure. *Annual Review of Public Health*, *18*, 163-185.

Bruvold, W.H. (1993). A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health*, *83*(6), 872-880.

Burt, R.D., and Peterson, A.V. (1998). Smoking cessation among high school seniors. *Preventive Medicine*, *27*, 319-327.

Centers for Disease Control and Prevention. (1996). Youth risk behavior surveillance—United States. *Morbidity and Mortality Weekly Report*, *45*(SS04), 181-184.

Centers for Disease Control and Prevention. (1999a). *Best practices for comprehensive tobacco control programs*. Atlanta: U.S. Department of Health and Human Services, Office on Smoking and Health.

Centers for Disease Control and Prevention. (1999b). *Tobacco use prevention curriculum and evaluation fact sheets*. Available: http://www.cdc.gov/nccdphp/dash/rtc/tob-curric.htm. Accessed October, 2002.

Chaloupka, F.J., and Grossman, M. (1996). *Price, tobacco control policies and youth smoking*. Working Paper No. 5740. New York: National Bureau of Economic Research.

Chaloupka, F.J., and Warner, K.E. (2000). The economics of smoking. In J.P. Newhouse and A. Cuyler (Eds.), *Handbook of health economics*. New York: Elsevier.

Chaloupka, F.J., and Wechsler, H. (1997). Price, tobacco control policies and smoking among young adults. *Journal of Health Economics*, *16*(3), 359-373.

Cook, P.J., and Moore, M.J., (2002). The economics of alcohol abuse and alcohol-control policies: Price levels, including excise taxes, are effective at controlling alcohol consumption. *Health Affairs*, *21*(2), 120-133.

Cornwall, A., and Jewkes, R. (1995). What is participatory research? *Social Science and Medicine*, *41*(12), 1667-1676.

Cummings, K.M., Hyland, A., Pechacek, T.F., Orlandi, M., and Lynn, W.R. (1997). Comparison of recent trends in adolescent and adult cigarette smoking behavior and brand preferences. *Tobacco Control*, *6* (Suppl. 2), S31-S37.

Dee, T.S., and Evans, W.N. (1998). A comment on DeCicca, Kenkel and Mathios. Working Paper, School of Economics, Georgia Institute of Technology.

DiFranza, J.R., Richards, J.W., Paulman, P.M., Wolf-Gillespie, W., Fletcher, C., Jaffe, R.D., and Murray, D. (1991). RJR Nabisco's cartoon camel promotes Camel cigarettes to children. *Journal of the American Medical Association*, *266*, 3149-3153.

Ellickson, P., and Bell, R. (1990). Drug prevention in junior high school: A multi-site longitudinal test. *Science*, *247*, 1299-1305.

Ennett, S.T., Rosenbaum, D.P., Flewelling, R.L., Bieler, G.S., Ringwalt, C.L., and Bailey, S.L. (1994). Long-term evaluation of drug abuse resistance education. *Addictive Behaviors*, *19*, 113-125.

Farrelly, M.C., and Bray, J.W., and Office on Smoking and Health. (1998). Response to increases in cigarette prices by race/ethnicity, income, and age groups—United States, 1976-1993. *Morbidity and Mortality Weekly Report*, *47*(29), 605-609.

Farrelly, M.C., Healton, C.H., Davis, K.C., Messeri, P., Hersey, J.C., and Haviland, M. Lyndon. (2002a). Getting to the truth: Evaluating national tobacco counter-marketing campaigns. *American Journal of Public Health*, *92*(6), 901-907.

Farrelly, M.C., Niederdeppe, J. and Yarsevich, J. (2002b, July). *Future directions in tobacco counter-marketing mass media campaigns*. Unpublished paper presented at the Innovations in Youth Tobacco Control Conference, Santa Fe, NM.

Feighery, E., Borzekowski, D.L., Schooler, C., and Flora, J. (1998). Seeing, wanting, owning: The relationship between receptivity to tobacco marketing and smoking susceptibility in young people. *Tobacco Control*, *7*, 123-128.

Fichtenberg, C.M., and Glantz, S.A. (2002). Youth access interventions do not affect youth smoking. *Pediatrics*, *109*(6), 1088-1092.

Flay, B.R., Hu, F.B., and Richardson, J. (1998). Psychosocial predictors of different stages of cigarette smoking among high school students. *Preventive Medicine*, *27*, A9-A18.

Florida Department of Health, Office of Tobacco Control. (2000, March 17). Report regarding the progress of the Tobacco Pilot Program. Unpublished, In-house.

Forster, J.L., and Wolfson, M. (1998). Youth access to tobacco: Policies and politics. *Annual Review of Public Health*, *19*, 203-235.

Gilpin, E.A., and Pierce, J.P. (1997). Trends in adolescent smoking initiation in the United States: Is tobacco marketing an influence? *Tobacco Control*, *6*(2), 122-127.

Giovino, G.A. (1999). Epidemiology of tobacco use among U.S. adolescents. *Nicotine and Tobacco Research*, *1*(Supp. 1), 40-41.

Glantz, S.A. (1996). Editorial: Preventing tobacco use. The youth access trap. *American Journal of Public Health*, *86*(2), 1156-1158.

Glantz, S.A. (1999). Smoke-free restaurant ordinances do not affect restaurant business. *Journal of Public Health Management and Practice*, *5*(1), vi-ix.

Glantz, S.A., and Charlesworth, A. (1999). Tourism and hotel revenues before and after passage of smoke-free restaurant ordinances. *Journal of the American Medical Association*, *281*(20), 1911-1998.

Hawthorne, G. (1996). The social impact of life education: Estimating drug use prevalence among Victorian primary school students and the statewide effect of the life education programme. *Addiction*, *91*, 1151-1159.

Hill, D. (1999). Why we should tackle adult smoking first. *Tobacco Control*, *8*, 333-335.

Hu, T.W., Sung, H.Y., and Keeler, T.E. (1995). Reducing cigarette consumption in California: Tobacco taxes vs. an anti-smoking media campaign. *American Journal of Public Health*, *85*, 1218-1222.

Hurt, R.D., Croghan, G.A., Beede, S.D., Wolter, T.D., Croghan, I.T., and Patten, C.A. (2000). Nicotine patch therapy in 101 adolescent smokers: Efficacy, withdrawal symptom relief, and carbon monoxide and plasma cotinine levels. *Archives of Pediatrics and Adolescent Medicine*, *154*(1), 31-37.

Independent Evaluation Consortium. (1998). *Final report of the independent evaluation of the California Tobacco Control Prevention and Education Program: Wave 1 data, 1996-1997.* Rockville, MD: Gallup Organization.

Institute of Medicine. (1994). *Growing up tobacco free: Preventing nicotine addiction in children and youth.* Washington DC: National Academy Press.

Israel, B.A., Schulz, A.J., Parker, E.A., and Becker, A.B. (1998). Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health*, *19*, 173-202.

Jacobson, P.D., Lantz, P.M., Warner, K.E., Wasserman, J., Pollack, H.A., and Ahlstrom, A.K. (2001). *Combating teen smoking: Research and policy strategies.* Ann Arbor, MI: University of Michigan Press.

Jacobson, P.D., and Wasserman, J. (1997). *Tobacco control laws: Implementation and enforcement.* Santa Monica, CA: RAND.

Johnson, P.B., Boles, S.M., Vaughan, R., and Kleber, H.D. (2000). The co-occurrence of smoking and binge drinking in adolescents. *Addictive Behaviors*, *25*(5), 779-783.

Johnston, L.D., O'Malley, P.M., and Bachman, J.G. (2001). *Monitoring the Future national survey results on drug use, 1975-2000. Vol. II: College students and adults ages 19-40.* NIH Publication No. 01-4925. Bethesda, MD: National Institute on Drug Abuse.

Kropp, R. (1998, March 27). *Essay against penalizing youth for possession of tobacco products.* GASP of Colorado Education Library. Smoking Control Advocacy Resource Network. Available: http://www.gaspforair.org/gedc/gedcyout.htm.

Lantz, P.M. (2002, July). *Smoking on the rise among young adults: Implications for research and policy.* Unpublished manuscript presented at Innovations in Youth Tobacco Control Conference, Santa Fe, NM.

Lantz, P.M., Jacobson, P.D., Warner, K.E., Wasserman, J., Pollack, H.A., Berson, J., and Ahlstrom, A. (2000, March). Investing in youth tobacco control: A review of smoking prevention and control strategies. *Tobacco Control*, *9*, 47-63.

Lewit, E.M., Hyland, A., Kerrebrock, N., and Cummings, K.M. (1997). Price, public policy, and smoking in young people. *Tobacco Control*, *6*(Suppl. 2), S17-24.

Ling, P.M., and Glantz, S.A. (2002). Using tobacco-industry marketing research to design more effective tobacco-control campaigns. *Journal of the American Medical Association*, *287*(22), 2983-2989.

Ling, P.M., Landman, A., and Glantz, S.A. (2002). It is time to abandon youth access tobacco programmes. *Tobacco Control*, *1*(1), 3-6.

Lynan, D.R., Milich, R., Zimmerman, R., Novak, S.P., Logan, T.K., Martin, C., Leukefeld, C., and Clayton, R. (1999). Project DARE: No effects at 10-year follow-up. *Journal of Consulting and Clinical Psychology*, *67*, 490-593.

Mermelstein, R. (2002, July). *Innovative approaches to youth tobacco control: Teen smoking cessation.* Unpublished manuscript presented at Innovations in Youth Tobacco Control Conference, Santa Fe, NM.

Monitoring the Future website. (2002, August 30). Available: http://monitoringthefuture.org.

Moore, L., Roberts, C., and Tudor-Smith, C. (2001). School smoking policies and smoking prevalence among adolescents: Multilevel analysis of cross-sectional data from Wales. *Tobacco Control*, *10*, 117-123.

Novelli, W.D. (1999). Don't smoke, buy Marlboro. *British Medical Journal*, *318*, 1296.

Pentz, M.A., Brannon, B.R, Charlin, V.L., Barrett, E.J., MacKinnon, D.P., and Flay, B.R. (1989a). The power of policy: The relationship of smoking policy to adolescent smoking. *American Journal of Public Health*, *79*, 857-862.

Pentz, M.A., MacKinnon, D.P., Dwyer, J.H., Wang, E.Y., Hansen, W.B., Flay, B.R., and Johnson, C.A. (1989b). Longitudinal effects of the Midwestern Prevention Project on regular and experimental smoking in adolescents. *Preventive Medicine*, *18*, 304-321.

Pentz, M.A., MacKinnon, D.P., Flay, B.R., Hansen, W.B., Johnson, C.A., and Dwyer J.H. (1989c). Primary prevention of chronic diseases in adolescence: Effects of the Midwestern Prevention Project on tobacco use. *American Journal of Epidemiology*, *130*, 713-724.

Perry, C.L. (1999). The tobacco industry and underage youth smoking: Tobacco industry documents from the Minnesota litigation. *Pediatrics and Adolescent Medicine*, *153*, 935-941.

Perry, C.L., Kelder, S.H., Murray, D.M., and Klepp, K.I. (1992). Community-wide smoking prevention: Long-term outcomes of the Minnesota Heart Health Program and the Class of 1989 study. *American Journal of Public Health*, *82*(9), 1210-1216.

Peterson, A., Kealy, K., Mann, S., Marek, P., and Sarason, I. (2000). Hutchison Smoking Prevention Project: Long-term randomized trial in school-based tobacco use prevention. *Journal of the National Cancer Institute*, *92*, 1979-1991.

Pierce, J.P., Gilpin, E.A., and Choi, W.S. (1999). Sharing the blame: Smoking experimentation and future smoking-attributable mortality due to Joe Camel and Marlboro advertising and promotions. *Tobacco Control*, *8*, 37-44.

Pierce, J.P., Gilpin, E.A., Emery, S.L., White, M.W., Rosbrook, B., and Berry, C.C. (1998). Has the California Tobacco Control Program reduced smoking? *Journal of the American Medical Association*, *280*, 893-899.

Pinilla, J., Gonzalez, B., Barber, P., and Santana, Y. (2002). Smoking in young adolescents: An approach with multilevel discrete choice models. *Journal of Epidemiology and Community Health*, *56*, 227-232.

Pucci, L.G. and Siegel, M. (1999). Features of sales promotion in cigarette magazine advertisements, 1980-1993: an analysis of youth exposure in the United States. *Tobacco Control*, *8*(1), 29-36.

Richter, L., and Richter, D.M. (2001). Exposure to parental tobacco and alcohol use: Effects on children's health and development. *American Journal of Orthopsychiatry*, *71*(2), 182-203.

Rigotti, N.A., DiFranza, J.R., and Change, Y. (1997). The effect of enforcing tobacco-sales laws on adolescents' access to tobacco and smoking behavior. *New England Journal of Medicine*, *337*, 1044-1051.

Rohrbach, L.A., Howard-Pitney, B., Unger, J.B., Dent, C.W., Howard, K.A., Cruz, T. B., Ribisl, K. M., Norman, G. J., Fishbein, H., and Johnson, C.A. (2002). Independent evaluation of the California Tobacco Control Program: Relationships between program exposure and outcomes, 1996-1998. *American Journal of Public Health*, *92*(6), 975-983.

Rust, L. (1999). Tobacco prevention advertising: Lessons from the commercial world. *Nicotine and Tobacco Marketing*, *1*(Suppl.), 1-89.

Saffer, H., and Chaloupka, F. (1999, February). *Tobacco advertising: Economic theory and international evidence*. Working Paper No. 6958. New York: National Bureau of Economic Research.

Schooler, C., Feighery, E., and Flora, J.A. (1996). Seventh graders' self-reported exposure to cigarette marketing and its relationship to their smoking behavior. *American Journal of Public Health*, *86*, 1216-2121.

Siegel, M., Carol, J., Jordan, J., Hobart, R., Schoenmarklinn, S., DuMelle, F., and Fisher, P. (1997, September). Preemption in tobacco control: Review of an emerging public health problem. *Journal of the American Medical Association*, *278*(10), 858-863.

Smith, T.A., House, R.F., Jr., Croghan, I.T., Gauvin, T.R., Colligan, R.C., and Offord, K.P. (1996). Nicotine patch therapy in adolescent smokers. *Pediatrics*, *98*(4 Pt. 1), 659-667.

Spoth, R.L., Redmond, C., and Shin, C. (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*, *69*(4), 627-642.

Stead, L.F., and Lancaster, R. (2000). A systematic review of interventions for preventing tobacco sales to minors. *Tobacco Control*, *9*(2), 169-176.

Sussman, S. (2002). Effects of sixty-six adolescent tobacco use cessation trials and seventeen prospective studies of self-initiated quitting. *Tobacco Induced Disease*, *1*(1), 35-81.

Unger, J.B., Johnson, C.A., and Rohrbach, L.A. (1995). Recognition and liking of tobacco and alcohol advertisements among adolescents: Relationships with susceptibility to substance use. *Preventive Medicine*, *24*(5), 461-466.

U.S. Department of Health and Human Services. (1994). *Preventing tobacco use among young people: A report of the Surgeon General*. Atlanta: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Wakefield, M., and Chaloupka, F. (2000). Effectiveness of comprehensive tobacco control programmes in reducing teenage smoking in the USA. *Tobacco Control*, *9*(2), 177-186.

Wakefield, M.A., Chaloupka, F.J., Kaufman, N.J., Orleans, C.T, Barker, D.C., and Ruel, E. (2000, August). Effect of restrictions on smoking at home, at school, and in public places on teenage smoking: Cross sectional study. *British Medical Journal*, *321*, 333-337.

Wakefield, M., and Giovino, G. (2002, July). *Teen penalties for tobacco possession, use and purchase: Evidence and issues*. Unpublished manuscript presented at Innovations in Youth Tobacco Control Conference, Santa Fe, NM.

Wasserman, J., Manning, W.G., Newhouse, P., and Winkler, J.D. (1991). The effects of excise taxes and regulations on adult and teenage cigarette smoking. *Journal of Health Economics*, *10*, 43-64.

Wechsler, H., Kelley, K., Seibring, M., Kuo, M., and Rigotti, N.A. (2001). College smoking policies and smoking cessation programs: Results of a survey of college health center directors. *Journal of American College of Health*, *49*(5), 1-8.

Wechsler, H., Rigotti, N.A., Gledhill-Hoyt, J., and Lee, H. (1998). Increased levels of cigarette use among college students: A cause for national concern. *Journal of the American Medical Association*, *280*, 1673-1678.

Windle, M., and Windle, R.C. (1999). Adolescent tobacco, alcohol, and drug use: Current findings. *Adolescent Medicine State of the Art Reviews*, *10*(1), 153-163.

Woodhouse, C.D., Sayre, J.J., and Livingood, W.C. (2001). Tobacco policy and the role of law enforcement in prevention: The value of understanding context. *Qualitative Health Research, 11*, 683-692.