Drinking, Conduct Disorder, and Social Change: Navajo Experiences

Stephen J. Kunitz

Jerrold E. Levy

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PREFACE

This book marks the culmination of more than 30 years of collaborative research aimed at understanding the origins, trajectory, and consequences of alcohol use among the Navajo Indians of Arizona and New Mexico. The study on which the book is based, however, had its origins in a chance observation in an earlier study (Kunitz and Levy 1994). That was a 25-year follow-up study in 1990 of several groups of Navajo Indians who had first been interviewed about their histories of alcohol use in the mid-1960s (Levy and Kunitz 1974). One of the groups was made up of people, mostly men, who had been admitted to hospital for treatment of alcoholism. Some of them died within 10 years of the first interview. If they survived the 10 years, the chances were extremely good that they would survive the full 25 years.

Two attributes distinguished the people in the treatment program who died from those who survived: Those who died were substantially younger at the time of the initial interview, and they had had trouble with the police at younger ages. The numbers were too small and the data too incomplete for us to be certain, but we wondered if they represented a segment of the population who would have met the criteria for conduct disorder before age 15 years and for antisocial personality disorder thereafter. In contrast, the people in the treatment program who survived the 25 years were similar to the community samples both at the time of first interview and at the time of follow-up.

The present study was designed to examine the possibility that conduct disorder before age 15 years is not only a risk factor for alcohol dependence in adulthood but also a risk factor for more severe alcohol dependence than is found among alcoholics without a history of conduct disorder. We also have been able to examine the proportions of men and women in the population who at some point in their lives have been or are currently alcohol dependent (called *lifetime prevalence*), as well as to calculate the proportion of alcohol dependence attributable to conduct disorder. This in turn has allowed us to consider questions having to do with the appropriateness of different modes of prevention. These issues are all considered in more detail in Chapter 1.

In Chapter 2, we describe the areas on the eastern and western ends of the Navajo Reservation where the study was carried out, and, in Chapter 3, we describe the history of alcohol use on the reservation. In the past, the western end has been more isolated and more "traditional" than the eastern end, but, as the isolation of the western reservation has decreased, so the differences between east and west have lessened to the point that it has not been necessary to consider each area separately. As regional differences have lessened, however, differences among types of community have increased, especially with respect to drinking patterns but also in the areas of education and economic well-being. The magnitude of change since the 1960s adds emphasis to the great variability among and within tribes that we noted in our earlier work. The implications of these findings for research in the area of the drinking patterns of Native Americans are discussed in the concluding chapter.

Chapter 4 addresses the question of whether conduct disorder is a risk factor, for alcohol dependence as well as the proportion of alcohol dependence attributable to it. A number of other potential risk factors are also examined at this juncture. Several that have been said to cause alcohol dependence, such as type of school attended and the experience of relocation and migration, are shown not to be associated. On the other hand, some significant risk factors have been identified, among them conduct disorder and physical abuse before age 15 years. The results also support the suggestion that alcohol dependence is a somewhat different phenomenon for most men than for most women. For men, the more pervasive drinking is in the environment, the greater the risk of becoming alcohol dependent. For women, the risk factors seem to be associated primarily with family dynamics.

Chapter 5 considers the question of whether behavioral manifestations of alcoholism can be used to define meaningful types of alcoholics similar to those described in other populations. Our results indicate that two distinct types of alcoholics that have been described in other populations cannot be differentiated among Navajos and that the variables that are said to comprise each type are not more highly correlated with each other than they are with the variables that are

said to comprise the other type. Behavioral measures of problems with alcohol are cumulative as a measure of severity, but they do not form clusters of discrete syndromes.

Chapter 6 examines some of the risk factors for conduct disorder itself and attempts to answer the question of whether conduct disorder has become increasingly common. Despite some confounding age-related effects, there is suggestive evidence of a small but real increase in conduct disorder due, in all probability, to changes in social structure similar to those found in other populations.

Chapter 7 explores the association between the experience of abuse in childhood, conduct disorder, alcohol dependence, and the commission of violence in adulthood. We find that involvement in domestic violence is the result of the historical legacy of tension between the sexes exacerbated by parental drinking and physical abuse in childhood. On the other hand, conduct disorder is not a risk factor for family violence but it is for non-family drunken violence.

Chapter 8 describes pathways into alcohol treatment and compares the remission rates of those who have used formal treatment programs with those who were never in treatment. Although the severity of alcohol-related problems is a powerful determinant of what happens to alcohol-dependent people, disentangling the importance of severity from other associated circumstances has not proved easy. The very high prevalence of alcohol dependence has resulted in a very large treatment industry on and adjacent to the reservation. Evidence presented in Chapter 8, however, suggests that people who have been in treatment programs are no more likely to be in remission than those who have not, even adjusting for severity of alcohol dependence. Moreover, the presence of conduct disorder before age 15 years is unassociated with remission, whether in or out of treatment. That Navajo remission rates are not very different from those reported by the Epidemiologic Catchment Area Study suggests that what is labeled "alcohol dependence" is the same phenomenon in the Navajo as in the larger national population.

In Chapter 9, we return to the issue of women's drinking and examine it in more detail. Drinking by Navajo women and the lifetime history of domestic violence have increased in recent decades, and the data suggest that there is a casual relation between them. As drinking by women has become more common, so have alcohol abuse and dependence and family violence.

After summarizing our findings, we conclude Chapter 10 with a reconsideration of some of the implications of our results for the cross-cultural study of alcohol use; for prevention; for the question of whether alcohol dependence is one condition or many; and for understanding the impact of social change on alcohol use and abuse. Among the most important implications is the policy dilemma our work raises. The evidence suggests that alcohol dependence is indeed heterogeneous and that certain individuals at especially high risk can be identified early in

life. The dilemma is that because such individuals account for only a very small proportion of alcohol dependence in the population, expending resources on case finding and prevention in this high-risk group may be good for them and their families but will have little discernible impact at the population level. What then should be the focus of prevention? And how should limited resources be most effectively used?

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1

Conduct Disorder, Drinking, and the Problem of Prevention

Stephen J. Kunitz
Jerrold E. Levy

Heavy alcohol use has been a problem for Native Americans for generations, so much so that it has been called their number one health problem. Indeed, the costs in blighted lives, premature deaths, and social disruption have been documented endlessly. For instance, at present, death rates among aboriginal Americans from alcohol-related conditions are five to seven times those of the general population. It is useful to point out, however, that the general story of widespread abuse masks differences among and within Native-American populations that deserve attention. As we point out later in this chapter, there are great regional differences in aboriginal American alcohol-related mortality rates that are associated with variations in income levels. There are also differences, however, that seem to be better explained by patterns of social organization, for example, whether populations were sedentary village-dwelling agriculturalists or band-level hunter-gatherers. Moreover, evidence from several Native-American populations indicates that while abusive drinking is common, especially by men, a very high proportion give up drinking entirely or markedly reduce their levels of consumption in middle age (May, 1996).

Although remission of abusive drinking is common, much unnecessary suffering and many deaths occur before that. Indeed, it was just such an observation that lead to the present study, for we wondered whether there were attributes of individuals that put them at increased risk of premature death. That is to say, in-

stead of considering all Native-American alcohol abusers as essentially the same, we thought that there might be different types of drinkers who abused alcohol for different reasons. If there were, then perhaps early identification and intervention could make a contribution to a reduction in the most severe forms of alcohol abuse.

We focussed on conduct disorder before age 15 years because other research and our own previous work (Kunitz and Levy, 1994) have suggested that people who met the criteria for this condition might very well be at substantially greater risk for early and severe alcohol-related problems. Conduct disorder before age 15 years includes a variety of antisocial and aggressive behaviors, such as physical cruelty to people and animals, frequent truancy, deliberate destruction of the property of others, and so on. The criteria are given in full in Appendix 1. According to the revised third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-lll-R) of the American Psychiatric Association (1987), conduct disorder before age 15 is a necessary but not sufficient condition for antisocial personality disorder (ASPD) in adulthood. Only about 25% of young people with conduct disorder go on to develop ASPD, but ASPD is not diagnosed in the absence of a history of conduct disorder before age 15.

The role of conduct disorder and ASPD in alcoholism is important because, as described in Chapter 4, people with ASPD are disproportionately found among alcoholics and because there has been debate about whether alcoholism is one condition or several. If it is one condition with varying degrees of severity, the implications for prevention and treatment are different from those if it is several conditions that have in common the fact that people drink too much. As we point out in Chapter 5, a similar debate occurred in the nineteenth century concerning the nature of fever: Were all fevers the same, or were there differences among them that had implications for prevention and therapy?

If alcoholism is two or more conditions, one of which is the result of conduct disorder and/or ASPD, preventive approaches that work for some may not work for others. Thus, if people with conduct disorder before age 15 could be shown to be at especially high risk for the most severe forms of alcoholism, then it might be worth considering special preventive measures to deal with them. This may be called the *high-risk approach.*

If, on the other hand, alcoholism is one condition with varying degrees of severity, then prevention might be concerned with, for instance, the entire drinking population including light and moderate drinkers as opposed to dealing only with the most serious drinkers. This may be called the *population approach.*

These are examples of the different modes of prevention described by Geoffrey Rose, who pointed out that there are strengths and weaknesses involved in each (Rose, 1992:46–52). The strengths of the focus on high-risk individuals are

1. The intervention is appropriate to the individual.
2. It avoids interference with those who are not at special risk.
3. It is readily accommodated within the ethos and organization of medical care.
4. It offers a cost-effective use of resources.
5. Selectivity improves the benefit to risk ratio.

Some of the weaknesses of the high-risk strategy are

1. Prevention becomes medicalized.
2. Success is only palliative and temporary.
3. The strategy is behaviorally inadequate because it is concerned with changing individuals while ignoring the social and cultural environment that may shape the individual's behavior.
4. It is limited by a poor ability to predict the future of individuals.
5. The contribution to overall control of a disease may be disappointingly small.

The population approach is based on the observation that there is a very strong association between the population average of a phenomenon (e.g., blood pressure) and the prevalence of a particular form of deviance (e.g., hypertension) (Rose, 1992:64). That is, the higher the average blood pressure in a population, the higher the prevalence of hypertension. If the entire distribution of blood pressure can be shifted downward, the prevalence of hypertension will fall as well. Thus, "a preventive policy which focuses on high risk individuals may offer substantial benefits for those individuals, but its potential impact on the total burden of disease in the population is often disappointing . . . [because] most of the cases may arise among the many at lower risk rather than among the few who are at high risk, and it can be difficult to change the habits or environment of individuals if this requires them to be different from their society" (Rose, 1992:73).

We return to a further discussion of these issues in the concluding chapter. For the moment, it is sufficient to note that the question of whether alcoholism is one condition or several is significant because it encourages us to consider the possibility that a population approach may, or may not, be appropriate.

The same might be true for therapeutic interventions if it could be shown that people with a history of conduct disorder and/or a current diagnosis of ASPD respond differently to different treatment regimes than other alcoholics. This is especially important because people with ASPD represent a small proportion of the total population but a large proportion of people in treatment programs. Although our study was not designed to test the results of different treatment modalities, we are able to say something about recovery and remission of people

with and without a history of conduct disorder and their association, or lack of association, with formal and informal treatment. We find that the presence or absence of conduct disorder before age 15 years is unassociated with remission, whether in formal treatment or not. It should be noted, however, that even if there is more than one form of alcoholism, different treatments might not be appropriate for each of them. Different therapeutic modalities may or may not be appropriate depending on the stage of the condition. Thus individuals with far advanced arthritis of different types may be equally limited in their activities of daily living, but rehabilitation activities may be the same for all of them, whereas earlier in the course of the disease, different interventions may be appropriate. These issues have to do with the differences between primary, secondary, and tertiary prevention, to which we return in the concluding chapter.

In the Navajo context, the problems of conduct disorder and of prevention and treatment assume particular significance, for it has been suggested that in "modernizing" populations, conduct disorder occurs with increasing frequency (Moffitt, 1993). The argument is that modernization results in the emergence of youth cultures no longer integrated into the larger cross-generation social fabric. This happens as a result of both urbanization and universal education, which remove young people from the supervision and socializing influence of their families for long periods.

In our earliest work, we showed that heavy alcohol use had been common among Navajo men for over a century but that it became more problematic beginning in the 1930s and 1940s as alcohol became more accessible. Increasing accessibility was the result of the creation of a cash economy, the improvement of roads, the greater availability of motor vehicles, and the movement of people from remote rural areas into reservation towns where bootleggers were common. Implicitly we assumed that nothing had changed but the frequency and severity of alcohol abuse. Subsequently, we showed that the norms that had restrained alcohol abuse in earlier times seemed to be eroding in these reservation towns. In this study, we go further and ask whether modernization has made possible the emergence of a youth culture and an increase in delinquency. If the answer is affirmative, the implications for alcohol and substance abuse in general must be considered.

The same social changes that have been said to cause an increase in conduct disorder have also been said to result in increased child abuse. Moreover, the experience of abuse in childhood has been found to be a risk factor for both alcohol misuse and the commission of violence, especially domestic violence, in adulthood. Because child abuse and conduct disorder are thought to have common sources as well as common consequences with respect to both alcohol misuse and the commission of violence, we have explored these associations as well. This is a difficult problem because, as we have shown elsewhere, domestic vio-

lence in Navajo families has been observed for well over a century (Levy et al., 1969). Until the 1970s, for example, Navajo homicide victims were as likely to be female as male, in contrast to what was found in the nation at large where males comprise the larger proportion of victims. Moreover, the female Navajo victim was far more likely to have been the wife or girlfriend of the perpetrator. Since the 1970s, the balance has shifted radically from a ratio of one male to one female to the current four males to each female (Kunitz and Levy, 1994). Nonetheless, female homicide continues to be common, and the question remains whether domestic violence has been exacerbated by changes in conduct disorder, abuse in childhood, and alcohol misuse.

In addition to answering the new questions raised by our observations concerning premature death and its possible association with conduct disorder before age 15 years, the present study provided us with the opportunity to reconsider questions that had emerged from our previous work. In our earlier research we found that a large proportion of the Navajo men we studied scored in the "alcoholic" range of the various scales we used to identify problem drinkers but that a seemingly high proportion of these "alcoholics" either became abstinent or curtailed their drinking severely on reaching middle age. These findings, in turn, raised several questions. Of practical concern was that it would be impossible to provide adequate treatment for all the young men who would be labeled "alcoholic" if the criteria used in the general population were also used among the Navajos. We also questioned whether these measures actually identified those drinkers who were the least likely to attain abstinence and hence to be at most risk of premature death and other untoward consequences of alcohol abuse.

Yet another question that attracted our attention concerned the reason Navajos appeared to drink excessively: Was their "alcoholism" the same as that found in other populations, and, if so, what was the reason for it? With respect to the etiology of alcohol abuse among Native Americans, several broad explanations, which are not necessarily mutually exclusive, have been proposed. One is that Indians are somehow biologically more susceptible to the effects of alcohol than non-Indians. This is, of course, a necessary cause argument and is contentious even in populations in which sophisticated family and adoption studies have been carried out. We are unaware of any such studies among Indians, and the studies that have been done searching for biological differences between Indians and non-Indians have not provided significant results (see May, 1989:100–101).

A second explanation of the high rates of alcohol abuse among Native Americans is that stress, acculturation, and social disruption are the causes. A third is that different Native-American societies use alcohol differently depending on their own cultural values, patterns of social organization, and historical experience.

Depending on which aboriginal-American populations or segments of such

populations one examines, the latter two find more or less support. They are both based on the idea of risk factors: that being acculturated or being a member of a particular Native-American society increases or decreases the risk of alcohol abuse. Our own early work indicated that there were significant differences in drinking behavior and alcohol-related pathologies among a variety of tribes with different aboriginal patterns of social organization and ecological adaptation. Sedentary agriculturists tended to drink in a much more covert and restrained fashion than people who had been hunter-gatherers, for instance. Studies among Oklahoma Indian populations have reached similar conclusions (Stratton, et al., 1978).

The intertribal comparisons we began in the 1960s were based primarily on sources such as the reports of the Commissioner of Indian Affairs of homicides among various tribes in the late nineteenth century and the records of Indian deaths from the Indian Health Service, state health departments, and the Navajo and Hopi Police in more recent decades. Those comparative studies of deaths from homicide, suicide, and alcoholic cirrhosis convinced us that there were very different patterns prevalent among different tribes, which seemed to be best explained by differences in social organization and culture. For example, the low homicide rates of Pueblo Indians in the nineteenth century and the very high rates among many Apache groups at the same time were best explained by the fact that the former were sedentary village-dwelling agriculturists who valued subordination of the individual to the needs of the community, whereas the latter were hunters and horsemen who valued individuality, independence, and self-expression. Navajos, pastoral herders and part-time agriculturists, were closer to the Puebloan end of the spectrum, although Athabaskan speakers like the Apaches. Not surprisingly, contemporary rates of homicide and suicide were found to lie along the same spectrum (Levy and Kunitz, 1971, 1974:99–100), as were death rates from accidents of all types (Kunitz, 1976).

By far the most prevalent view has been that acculturation, stress, and deprivation have primarily been responsible for the high rates of alcohol abuse observed in many tribes. This view has much to recommend it, for in aggregate aboringinal Americans are indeed poor and do experience high rates of alcohol abuse and its untoward consequences. For instance, across nine Indian Health Service Areas[1] for which data were considered adequate, there were significant positive correlations between male and female unemployment rates and homicide, suicide, and alcohol-related death rates: The higher the unemployment rates, the higher the death rates. There were also significant negative associations across eight of the areas between the same causes of death and median family income (the Alaska Area is anomalous, having very high incomes as well as unusually high death rates). Clearly, poverty and deaths from alcohol-related causes are related.

Moreover, Indians are not isolated from the non-Indian neighbors that surround them. Indeed, one of the arguments we shall make is that in many ways Navajos are becoming similar to their neighbors. Nonetheless, when Navajo rates of mortality are compared with those of all 46 counties in New Mexico and Arizona, they tend to be at the upper level of the range, as Table 1-1 indicates. Age-adjusted death rates from alcohol dependence syndrome, alcoholic cirrhosis, homicide, and motor vehicle accidents tend to be higher than those of their neighbors, whereas suicide is not.[2]

The difficulty is that both the persistence and the acculturation explanations are at the ecological level: entire tribes, the entire Native-American population, and county populations. A useful step beyond these explanations is to consider the heterogeneity of drinking styles that exists within Native-American populations to determine whether the most acculturated or poverty-stricken individuals within a given tribe are the most likely to abuse alcohol.

Martin Topper (1985; See also Topper and Curtis, 1987) has argued that as the Navajo population has grown and diversified, so have drinking styles proliferated. He identifies at least five different drinking styles, several of which overlap with those we described in our first study and are regarded as "traditionally" Navajo. The first type is "the house party," which occurred at home in the evening and involved the sharing of alcoholic beverages by all adults present. The second type traditionally involved drinking by groups of older men, usually when traditional ceremonies were taking place but at a place somewhat removed

Table 1-1. Age-Adjusted Mortality Rates per 100,00 Population, Navajos 1990–1992, and All New Mexico and Arizona Counties, 1979–1985

CAUSE OF DEATH	ALL AZ AND NM COUNTIES (RANGE OF AVERAGE ANNUAL RATES)	NAVAJOS (AVERAGE ANNUAL RATES)
Alcohol dependence	0–24	21.2
Alcoholic cirrhosis	0–29	22.0
Motor vehicle accident	0–96.8	89.3
Homicide	0–25.1	19.3
Suicide	2.7–44.7	18.2

Sources: County data are from *County Alcohol Problem Indicators 1979–1985.* U.S. Alcohol Epidemiologic Data Reference Manual, Vol. 3, Third edition. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, 1991. Navajo data are from *Regional Differences in Indian Health 1995.* Rockville, MD: U.S. Department of health and Human Services, Public Health Service, Indian Health Services, Office of Planning, Evaluation, and Legislation, Division of Program Statistics, 1995. Both sources age adjust the death rates to the age structure of the 1940 U.S. population. They are therefore comparable and not distorted due to age differences.

from the ceremony itself. The third type was similar to the second but involved younger men. The fourth type was alcoholic drinking, which for men usually meant isolated drinking. "The reason that this drinking was so heavily stigmatized was that it took the individual away from the economic tasks that he or she was obligated to perform and it did not involve any sharing of 'drinks' among kinsmen." On the other hand, "The traditional female alcoholic was a person who drank in the company of men when they drank in groups in the desert or who hung around the bootlegger's house or in the trading post and traded sexual favors for liquor" (Topper, 1985:232–235) We have shown in previous studies that such women were rare and that most women were abstainers or drank only limited amounts.

Beside these older forms of drinking have grown up new forms. "Drinking no longer occurs more or less exclusively among kinsmen or affines. The drinking cohort often forms more or less spontaneously at various events and places." That they are not drinking with relatives and affines is disruptive, Topper argues, because the socialization function of the drinking group has vanished and because many Navajos are suspicious of non-relatives. This difficulty relating to strangers has been exacerbated by the boarding school experience, he writes, as well as by wage work, both of which are alienating and fail to meet deeply felt emotional needs.

> The net impact of acculturation appears to be that only the escape or narcotizing function of alcohol remains for many young Navajos who drink in non-traditional environments. Given the fact that these people are an ever-increasing segment of the Navajo population, a major trend toward a new and dangerous form of drinking is underway. Those who drink for escape in non-traditional environments find themselves using a disinhibiting, depressant drug among strangers about whom they feel ambivalent. Furthermore, they drink in environments in which traditional Navajo rules for social control of drinking do not apply, and for which, there has not been the development of non-traditional social controls. Finally they frequently bring with them considerable anger and frustration concerning their economic and perhaps social condition. (Topper, 1985:238–239).

This quotation reflects the widespread consensus that drinking among many young Navajos is a different phenomenon now than it was in the past and that it is caused by growing up in disrupted families with parents who abuse alcohol and who were themselves sent at an early age to boarding schools where they did not learn parenting skills. Children from such families are often sent to boarding schools both because the parents do not feel competent to care for them and because social agencies encourage it. The assumption is that the diminishing proportion of Navajo children who do attend boarding schools increasingly come from dysfunctional families and form a stratum of the population at high risk for

developing depressive and antisocial personality disorders and for becoming substance abusers.

These observations suggest that Native-American alcohol abusers in general and Navajos in particular are heterogeneous and that among the highest risk drinkers seem to be young adults who are impulsive and have been educated in boarding schools or otherwise have had difficult childhoods. They may be similar in many respects to the impulsive type of drinker described by Cloninger (1987) and to the antisocial personality drinkers described by Hesselbrock (1986), McCord and McCord (1962), and Robins et al. (1962), among others. It is, however, far from clear that this type of drinker is the same as those described in other populations, that their personal and family histories (i.e., risk factors) are similar, and that the type is homogeneous in course. Our current research was designed to answer these questions.

To do so, we used what is called a *case–control design.* In this type of study, people with the condition the cause(s) of which are to be investigated are compared with people who are similar to them in most respects except that they do not have the condition of interest. The people with the condition are the cases. The people without the condition are the controls. In this study as originally designed, the cases were to be people who were in treatment for alcohol dependence; the controls were to be people of the same age, sex, and community of residence who were not alcohol dependent.

Investigators generally have a causal hypothesis they wish to examine. In our case, the hypothesis was that conduct disorder before age 15 years is a risk factor for (a cause of) alcohol dependence in adulthood. The hypothesis would be accepted if the cases (alcohol-dependent respondents) were significantly more likely than the controls to have reported behavior consistent with conduct disorder before they were 15 years old. (More details of study design are provided in Appendix 1.)

An unexpected circumstance occurred in the course of the study, however, that allowed us to go much further than we had originally planned. As noted, the original design required that we interview alcohol-dependent cases (abbreviated as CAS in the following chapters) in treatment and then find matched non-alcohol–dependent controls (abbreviated as NADC) with which to compare them. They were all to come from either the eastern or the western end of the reservation, from two Indian Health Service administrative units: the Shiprock Service Unit and the Tuba City Service Unit (Fig. 1-1). The controls were matched according to age (within 5 years), sex, and community of residence, called the *stratification variables.* The way we did this was to interview potential controls in the community until we found one who was not alcohol dependent. To discover whether a potential control was alcohol dependent or not, we conducted the same complete interview as we had done with the cases. As a result, at the end of the study we had accumulated a group of people who had been inter-

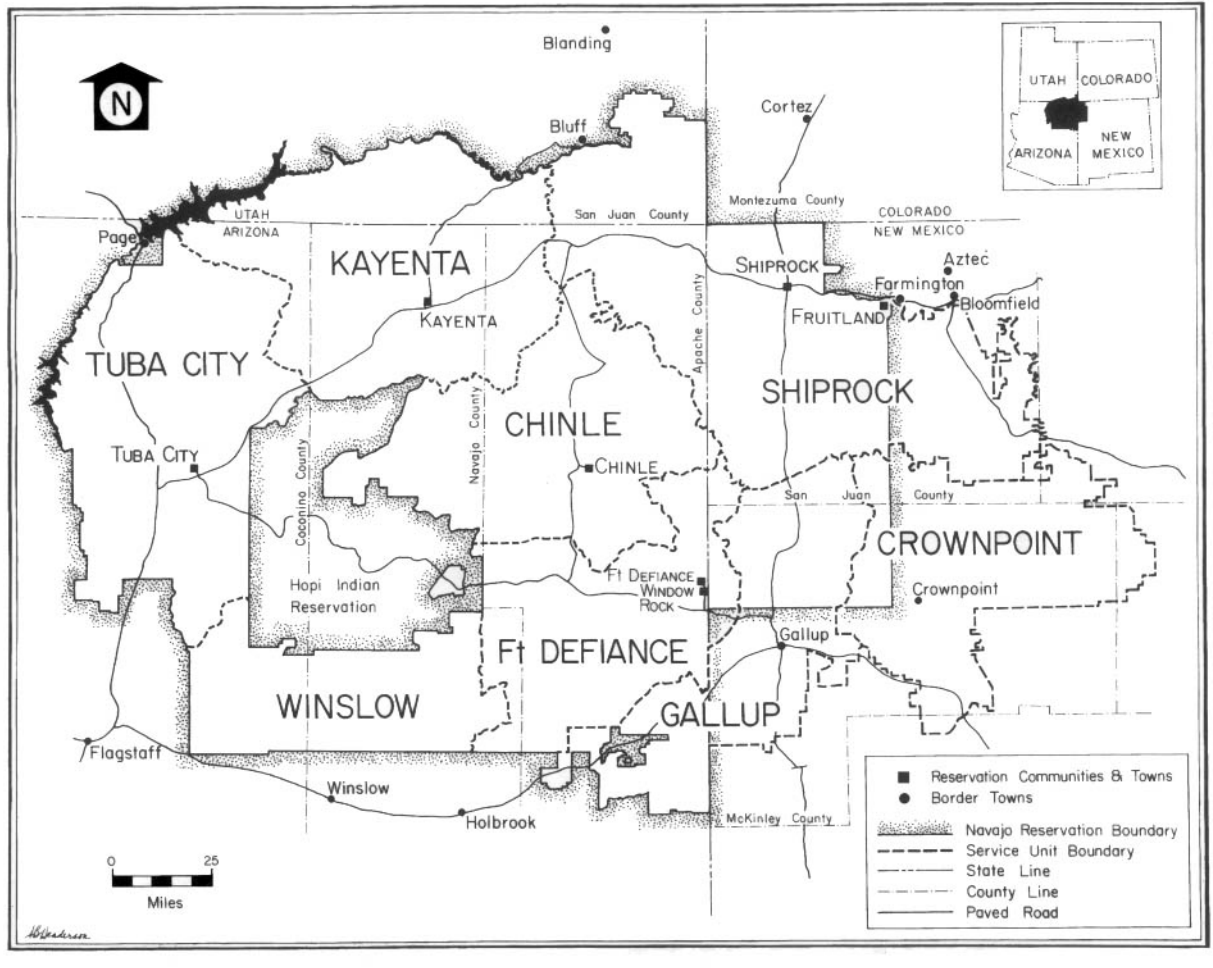

Figure 1-1. Map of the Navajo Reservation.

viewed as potential non-alcohol–dependent controls but had turned out to have been alcohol dependent at some point in their lives or who were still actively alcohol dependent. We called them alcohol-dependent controls (abbreviated as DEP). As discussed in Appendix 1, the two control groups, non-alcohol dependent and alcohol dependent, when combined and adjusted for age, sex, and community of residence (the stratification variables), comprise a reasonable random sample of the adult Navajo population.

Our definition of alcohol dependence is that provided by the American Psychiatric Association (1987) in DSM-III-R, and the questions came from the Diagnostic Interview Schedule of the Epidemiologic Catchment Area Study (Robins and Regier, 1991). (See Appendix 1 for details of sampling, data analysis, and questionnaire design.) Lifetime prevalence rates of alcohol dependence among the controls in this study are remarkably high and consistent with our earlier findings (Levy and Kunitz, 1974:138–139). About 70% of men and 30% of women have such a history.[3] These rates are considerably higher than those reported by the Epidemiological Catchment Area Study for men and women in the general population, 15.1% and 3.5% respectively, but they are consistent with rates found in two other tribes using similar methods as those we used (Leung et al., 1993; Robin, et al., 1998).

Two of the central variables in the study are alcohol dependence and conduct disorder. Each may be treated as discrete or continuous. A discrete variable is one whose possible values have clear, categorical differences: for example, a response of yes or no, or present or absent. One either has or does not have a history of conduct disorder; one either is or is not alcohol dependent. Treating these conditions as discrete entities is useful because it allows us to use such concepts as prevalence as in the preceeding paragraph.

A continuous variable, on the other hand, is one that is graded, for example, from nonexistent to severe, with no distinct breaks between normal and abnormal. Both conduct disorder and alcohol dependence may be regarded as continuous as well as discrete. Respondents can manifest all degrees of conduct disorder from nonexistent to severe, and where "normal" becomes "abnormal" is often an arbitrary decision. We describe these variables in more detail in Appendix 1 and Chapter 4. It suffices to say here that we have treated conduct disorder and alcohol dependence in both ways: as discrete and as continuous variables. To simplify the writing and the tables, when alcohol dependence is treated as a continuous variable, usually as a measure of severity, it is labeled ALCSUMAB. When treated as a discrete variable, the term alcohol dependence is used. Similarly, when conduct disorder is treated as a continuous variable, it is called logASYES (because a log transformation was used; see Appendix 1). When treated as a discrete variable, the term conduct disorder is used. The abbreviations are not euphonious, but we hope that they are as convenient for the reader as they have

been for us. At various places throughout the text, we remind the reader of their meaning. The data analysis relies heavily on regression analyses, of which there are several types. Most of these analyses are to be found in the appendices. Some are included in the body of chapters, particularly Chapter 4, which in many ways is the heart of the study.

Notes

1. The Indian Health Service of the U.S. Public Health Service is organized for administrative purposes in 12 Area Offices. For three of them, California, Oklahoma, and Portland, reporting is regarded as incomplete. The analyses reported in this paragraph are from the nine in which reporting is regarded as more nearly complete. The source is *Regional Differences in Indian Health 1995.* Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Indian Health Service, Office of Planning, Evaluation, and Legislation, Division of Program Statistics, 1995.

2. Of course, Navajos (and other Native Americans) are included in the rates of the counties where they reside, and the county rates are often high where Native Americans make up a large proportion of the population. To explore these relationships further, we did a series of analyses of county rates of different causes of death. These show that counties with a high proportion of Native Americans have high motor vehicle accident death rates and high death rates from alcohol-dependence syndrome. On the other hand, the proportion of the county populations that is Native American is unassociated with death rates from alcoholic cirrhosis, homicide, and suicide. Cirrhosis and homicide are inversely associated with per capita income. Suicide is inversely associated with percent urban.

The analyses are multiple regression with different causes of death as the dependent variables and the following independent variables: (1) proportion of the county population that is urban; (2) proportion of the county population that is Native American; and (3) per capita income in the county. The source of the dependent variables was the *County Alcohol Problem Indicators 1979–85* listed in Table 1-1. The source of the independent variables was *County and City Data Book 1983,* Tenth edition. U.S. Department of Commerce, Bureau of the Census, Washington, DC: U.S. Government Printing Office, 1983.

The multiple regressions are as follows.

	ESTIMATE	STANDARD ERROR	T RATIO	*P* VALUE
Alcohol dependence rates regressed onto				
Percent urban	0.03	0.03	1.01	0.3176
Percent Native American	0.14	0.04	3.32	0.0019
Per capita income	–0.001	0.0007	–2.58	0.0134
Homicide rates regressed onto				
Percent urban	–0.008	0.03	–0.24	0.8147
Percent Native American	0.005	0.05	0.12	0.9067
Per capita income	–0.002	0.0008	–2.09	0.0422
Cirrhosis rates regressed onto				
Percent urban	0.03	0.03	0.92	0.3640
Percent Native American	0.09	0.05	1.85	0.0714
Per capita income	–0.002	0.0009	–2.20	0.0336

Motor vehicle accident rates regressed onto				
Percent urban	–0.303	0.108	–2.80	0.0076
Percent Native American	0.561	0.14	3.83	0.0004
Per capita income	–0.0006	0.002	–0.23	0.8161
Suicide rates regressed onto				
Percent urban	–0.102	0.052	–1.95	0.0577
Percent Indian	–0.068	0.071	–0.96	0.3405
Per capita income	–0.0002	0.001	–0.17	0.8651

3. For men in the earlier study, rates ranged from 76% to 82% in each of two populations. For women, the corresponding rates ranged from 20% to 50%

2

HISTORICAL BACKGROUND: TUBA CITY AND SHIPROCK

Eric Henderson

The western part of the Navajo Reservation is generally thought to be more "traditional" and isolated than the eastern part, which is closer to off-reservation towns and sources of wage work. It was in order to take these regional differences into account that we chose to study the Tuba City area in the west and the area around Shiprock in the east. Until the 1950s, regional variation increased while the traditional system of social stratification was truncated. Since the 1950s, however, regional variation has diminished while social stratification based largely on education and occupation has become more complex, and a variety of community types have emerged. Migration into agency towns and universal education have also created what may be called a youth culture that is similar in important ways to what has been observed elsewhere in the nation. This, in turn, has had an important affect on alcohol use and deviant behavior in general.

The United States took control of the American Southwest in 1848, following the Mexican-American War. The Navajos, however, continued to raid New Mexican settlements as they had when Spain and, later, Mexico controlled the region. In 1863, the U.S. Army undertook retaliatory raids that included a "scorched earth" policy designed to destroy the Navajos' ability to resist. Most Navajos surrendered and were incarcerated on a small reservation at Ft. Sumner on the Pecos River. Conditions were deplorable, but, after signing the Treaty of

1868, the Navajos were allowed to return to a portion of their homeland that straddled what is now the Arizona–New Mexico border. The reservation comprised about 4 million acres. The government issued rations for several years but also distributed sheep to Navajo families in an effort to promote self-sufficiency.

This reservation was too small for all Navajo families to successfully build and maintain large flocks of sheep. Many, therefore, sought water and pasture beyond the boundaries of the 1868 reservation. Westward expansion toward the Colorado River and to the Kaibeto Plateau displaced many Paiutes who occupied the area. Northward expansion into the Shiprock area put pressure on the Southern Utes, and Navajo expansion elsewhere restricted Hopi and Zuni use of lands surrounding their villages. At the same time, the Utah Mormons were settling in the San Juan and Little Colorado River valleys, and other "Anglos" were entering the San Juan Basin from Colorado and New Mexico (McPherson, 1988). The ensuing competition for resources created tensions that occasionally led to violence. Nonetheless, the pre-reservation social stratification system, based primarily on differences in livestock holdings, persisted.

Federal authority was relatively weak in such areas as the Little Colorado and San Juan River valleys, which were distant from the Agency at Ft. Defiance, although at times troops stationed at Fort Lewis, Colorado, or Fort Wingate, New Mexico, would enter the area. After 1882, the railroad built along the southern edge of Navajo Country had a large impact, but a railroad did not reach Farmington in northwestern New Mexico until 1905 (Kelley and Whiteley 1989:65). At least a few young men from northern Navajo Country worked briefly on the railroad in the 1880s (Henderson, 1985), but wage work was an insignificant economic activity in these areas. Differences in land and water resources allowed a greater involvement in farming in the area near Shiprock than in the Tuba City area, where pastoralism predominated. Cooperative networks of kin linked extended families (ideally matrilocal) in these enterprises, and all members of the family had important roles in production.

REGIONAL DIVERGENCE, 1900–1950

During the first third of the twentieth century, the Navajos continued to be somewhat more insulated from the assimilationist policies of the federal government than were most other tribes. The pastoral economy on an expanding, isolated land base buffered a large number of families from the creeping incursion of a market economy. At the same time, Navajos increasingly produced a surplus of wool, mutton, and craft products for that market. Navajo society generally adjusted slowly as the United States continued its own transformation from an agrarian economy to industrial capitalism.

Between 1901 and 1908, five independent Agencies were created to administer governmental programs. A sixth agency administered the 1882 Executive Order Reservation created for the Hopis (Kelly, 1968:27). Each Agency had an administrative headquarters, and "agency towns" slowly developed at these locations. As on other reservations:

> The agency town in each case was the seat of governmental buildings and activities, whether hospital, school, or administrative office, or some combination of these. As the place through which federal money flowed for expenditure and as the seat of administrative authority and operations they were sources of jobs for Indians. Consequently they attracted Indians who built houses at the edges of the areas where governmental buildings were placed (Spicer, 1962:468)

The agency towns of Shiprock and Tuba City were established at the turn of the twentieth century, and from the beginning there were differences between them. Mormons settled Tuba City during the 1870s and established relatively close relations with the local Paiutes and Hopis. Their presence probably made it possible for the Third Mesa Hopis to maintain a large and permanent village at Moencopi, a prime farming area about 1 mile from Tuba City. On the other hand, Mormon relations with most of the larger Navajo population surrounding Tuba City and Moencopi were fraught with problems. One dispute over water and pasture resulted in the killing of a Mormon settler by a Navajo (Shepardson and Hammond, 1970:33).

In 1900, an Executive Order placed Tuba City and its environs within the Navajo Reservation, and 3 years later the federal government purchased the Mormon improvements and ordered the Mormons to leave. With the eviction of the Mormons, the Navajos of the area were even more insulated from close contact with non-Indians than they had been during the previous quarter century. On the other hand, the establishment of the Agency expanded the influence of the federal government and its agents in the area.

The situation was different in Shiprock, where, in 1903, the San Juan School and Agency were established on the San Juan River about 10 miles from the reservation boundary. As at Tuba City, the Agency allowed greater federal influence in local affairs, but, unlike the situation at Tuba City, the local non-Indian settlers were not displaced. Indeed, some of the Mormon families evicted from Tuba City settled along the San Juan River between Shiprock and Farmington, New Mexico. Moreover, Navajo settlement in the region was already dense, and many Navajo families were already heavily reliant on farming at the time the Shiprock Agency was founded. The first Agency Superintendent, William Shelton, reported that there were 275 Navajo farms in the area and that there were 25 irrigation ditches between Farmington and the new Agency, a system that he expanded (McNitt,

1962:140–141). By 1910, Shiprock, like Tuba City, was a small agency town with a school, hospital, and trading post. The growth of each was slow over the next couple of decades as most of the inhabitants were non-Navajos who had came to work for the government and, especially in Shiprock, as missionaries (Bailey and Bailey, 1986:171–172). The relatively few Navajos who had come to take jobs at the agency were most often from other parts of the reservation

It is probable that population growth in rural areas was greater than in agency towns. Navajo settlement patterns remained dispersed as families moved seasonally between summer and winter sheep pastures. With less land being added to the reservation, however, not all families could derive their subsistence from livestock alone (Aberle, 1966:32). Among those with little or no livestock, farming became an increasingly important pursuit in those areas most suited for agriculture, as in the San Juan Valley near Shiprock. Many families turned to other activities to supplement subsistence herding and farming. Seasonal wage work on the railroad and for farmers and ranchers near the reservation enabled many families to supplement subsistence herding and farming (Henderson, 1985). Many also began to move to agency towns because most employment opportunities tended to be in government service or dependent on the government.

Energy resource development

Because different areas had different types of resources, development promoted regionalism across the reservation. Indeed, local control of revenue from subsurface resources emerged as the central focus of Navajo politics in the 1920s, and much controversy involved the Shiprock area where Midwest Oil, a subsidiary of Standard Oil Company of Indiana, sought oil and gas exploration rights in the early 1920s. An ad hoc "council" of about 75 Navajo men, convened in Shiprock by Superintendent Evan Estep in 1922, voted to reject the proposed lease. The government, however, arranged a second "council" that approved a lease to Midwest Oil 3 months later (Kelly, 1968:50–51). The government then created a tribal-wide council that out voted the Shiprock delegates because oil revenues were to go to the tribal council rather than to the Shiprock area. Thus, while the need to deal with corporate exploiters of natural resources spurred the development of a tribal-wide governing body, it also contributed to political controversy that set some leaders in the Shiprock area against other members of the tribal council (Bailey and Bailey, 1986:111, 120; Kelly, 1968:66–70.

Livestock reduction

In 1932, the reservation was consolidated into a single Agency headquartered at Window Rock with 25 administrative subunits. Then, in 1937, an enlarged coun-

cil of 70 members was created, with each member representing a new voting district. Most significantly, however, programs designed to improve the overgrazed Navajo range lands, including the disastrous Livestock Reduction Program, were accelerated.

At the time, probably more than 70% of Navajo income was derived from livestock, farming, and crafts (Kluckhohn and Leighton, 1974:55). Livestock reduction was designed to halve the number of productive livestock and, when implemented, devastated the economic underpinnings of numerous Navajo families. Because livestock were unequally distributed across the reservation, as well as among families within any given locality, the effects of reduction were varied.

In the 1930s, the Bureau of Indian Affairs and the Soil Conservation Service divided the reservation into 18 Land Management Units, or Grazing Districts, to facilitate the management of range lands, and the Soil Conservation Service conducted "Human Dependency Surveys" in each district. There were distinct differences among the six districts that currently comprise the Shiprock and Tuba City Service Units. The Shiprock area was more densely settled by smaller family groups that were slightly better off than those in the Tuba City area. There was more reliance on farming around Shiprock, and Tuba City families had, on average, much larger flocks.

Per capita income was highest in District 13, which included the farming areas of the San Juan Basin between Shiprock and Farmington. The districts that included agency towns had the next highest incomes, and the two most rural districts (one in each area) had the lowest per capita incomes. In these two rural districts, more than half of the income came from livestock, while in the other districts only about one-third came from livestock. District 1 had the highest level of per capita livestock holdings on the reservation. Nevertheless, the income from livestock was no greater than in the two districts containing the agency towns and was below the level of Districts 9 and 13.

According to Kunitz (1983:35–36), "The population density of the eastern side of the reservation was higher than that in the west, and the people were more involved in the wage economy and in commercial livestock and agricultural pursuits. In the west, the dominant economic activity was subsistence livestock raising." These differences, he asserted, stemmed largely from east–west differences in the natural resources and from the histories of contact with Anglo-Americans.

Our data support the idea that wage work was more prevalent in the San Juan Basin. We obtained information on the occupations of the parents of 348 controls born in the Shiprock or Tuba City Service Units whose fathers were born before 1940. Fathers born before 1910 reached maturity before livestock reduction. In the Tuba City area, 45% of informants reported that parents of this generation were engaged exclusively in "traditional" occupations, that is, livestock raising and craft production. In the Shiprock area, however, 80% of informants

noted that, in addition to traditional pursuits, at least one parent was engaged in some form of wage work. Among fathers born between 1910 and 1927, who came of age during the dislocations of livestock reduction and World War II, however, differences between the two areas in parental occupation are statistically insignificant.

The livestock reduction program thus had two immediate and far-reaching consequences for settlement patterns and economic adaptations. First, the extent of loss varied from one district to another. In three districts fewer than 10% of livestock owners were required to reduce their flocks. In two other districts, over 50% of owners were directly affected (Henderson, 1989:394). Second, the wealth hierarchy based on livestock was truncated throughout the reservation. That is, after livestock reduction there were no longer any Navajo "ricos." In only two districts was the maximum flock size as great as 280 sheep units. A flock of that size was, at best, marginally adequate for subsistence.

Both of these developments deeply affected the structure of rural Navajo communities, and both promoted "localism." Before livestock reduction, many Navajo families, especially wealthy livestock owners and associated poorer "client" families, moved seasonally over long distances. The composition of the co-residential kin groups often varied according to the season as different kin apparently had different sorts of claims on different portions of the range (Henderson, 1985). Thus, seasonal moves helped to integrate an extended family over a wide area and also promoted cooperation among different kin groups in a number of distinct areas. Reduced flocks rendered long moves unnecessary, and grazing regulations often restricted movement across Land Management Unit boundaries. Thus, smaller flocks, coupled with restricted seasonal moves, diminished the extent of cooperation within and between kin groups.

The restriction of seasonal moves also contributed to greater economic dependency on a single trading post. When the livestock economy was still important, the pattern of seasonal movement took Navajo families and their possessions near several different trading posts during a year, making it both convenient and common for families in many areas to trade at different posts. It is likely that with the destruction of large flocks Navajos became not only more dependent on traders but also more dependent on one or two particular trading posts. This both created a trader's monopoly and, again, reinforced a more local economic focus among people in the rural area around the post.

Livestock reduction fundamentally altered social and ceremonial relations among Navajos living in localities that were increasingly becoming more restricted geographically, socially, and economically. In the livestock economy, "ricos" not only had high status based on their livestock holdings, but they used their resources to provide some jobs—as herders and masons, for example—to organize trade, and to sponsor large ceremonies. With the loss of most of their live-

stock, they were in no position to provide patronage or to sponsor large-scale social and ceremonial gatherings. Following livestock reduction there was still inequality in livestock holdings, but the former "ricos" were only slightly less poor than their neighbors. The decline in the importance of livestock led to enhanced recognition of bases of social status other than livestock wealth and ceremonial knowledge. The new positions of status and authority were generally linked to employment in the federal bureaucracy and were primarily available in agency towns. Nevertheless, livestock holdings continued to be a source of status, despite the emergence of new avenues to social standing described by Young (1961:217):

> Within the span of one generation, that stratum in the traditional society once distinguished as the large stock owning class—the "ricos" of old—has declined to the vanishing point and their place has been taken by a new upper stratum, composed of people with steady employment by the Federal Government, the Navajo Tribe, the public schools or private industry operating in the Reservation area.

Other forms of wage work available to Navajos predominately required no skills and, while providing necessary income, conferred little status. Although such New Deal programs as the Work Projects Administration and Civilian Conservation Corps expanded job opportunities and benefited poor families, they hardly compensated for the loss of livestock sustained by the middle and upper ranks of livestock owners.

By the early 1950s, livestock reduction had contracted the field of social relations, irrigation projects had led to the creation of new communities, especially along the San Juan River, and regional differences across Navajo Country were greater than at any time since the establishment of the reservation. Regional and community differences were further promoted by the new council system, which made delegates responsible to local constituencies. Navajos were generally impoverished, resided in sparsely settled rural areas, lacked formal education and wage employment, and had little access to adequate health care. Although a few men had relatively steady and secure government employment in agency towns, elsewhere on the reservation employment was less secure and provided low wages. Public works projects tended to be temporary, as were many jobs at trading posts. In the Carrizzo Mountains and at Sanostee, Lukachukai, Monument Valley, and near Tuba City, uranium mines provided jobs that required low skills for little pay and considerable danger. Off-reservation employment opportunities were more extensive, but, again, Navajos primarily obtained low paying and seasonal jobs in agriculture (Uchendu, 1966), construction and mining (Leubben, 1962), on the railroad (Young, 1961), and sometimes as domestic servants. In 1950, few Navajos resided in border towns, and those who did were often short-term residents (McPhee, 1958; Henderson and Levy, 1975).

REGIONAL CONVERGENCE, 1950–1990

Federal Indian policy changed radically in the 1950s, turning away from the New Deal policy of encouraging self-government to a policy of termination and assimilation. The size and isolation of the Navajo Reservation, however, prompted Congress to authorize improvements in the reservation infrastructure without significantly diminishing tribal sovereignty. The Navajo–Hopi Long Range Rehabilitation Act of 1950 provided federal funding for these improvements, especially education and road systems. Improved roads made it possible to bus many children to school, made it easier for relatives to visit over greater distances, and provided many rural residents with convenient access to agency and border towns. In combination, these developments led to significant changes in the nature of the Navajo population that, in turn, affected levels of alcohol consumption and styles of drinking.

The educational system on the Navajo Reservation was perhaps the least extensively developed of any tribe's in 1950. By the end of World War II, only 32% of Navajo children were enrolled (Johnston, 1966:50). The federal government responded in 1946 with a unique 5 year off-reservation boarding school program, the Navajo Special Education Program, designed to provide Navajo adolescents between the ages of 12 and 18 years with "a salable skill, sufficient fluency in English to get and hold a job, and as much academic education as each individual could acquire in the years left to him for formal education" (Thompson, 1975: 90). After passage of the Long Range Rehabilitation Act, enrollment of school-aged children rose to 57% in 1954 and to 89% in 1958 (Johnston, 1966:51; Thompson, 1975:137).

Throughout the 1950s, most Navajo students attended boarding schools with only a very small percentage attending local schools on the reservation. The largest number of boarding students attended federal schools on the reservation. A few students could even see their family homes from the campus, but most were drawn from a plethora of distant communities. Many other students, especially older students and those in the 5-year program, were enrolled in one of about a dozen large off-reservation Bureau of Indian Affairs schools located in the Mountain West and Oklahoma. In some of these schools, Navajos constituted the majority of the student body. By the end of the decade, the Bureau of Indian Affairs operated a number of "border dorms" in areas adjacent to the reservation. Students lived in these dormitories but attended local off-reservation public schools.[1]

During the 1950s, "as public schools were established near them, some missions reduced or terminated their school operations" (Thompson, 1975:146), and enrollments at mission schools decreased from 8% of all Navajo enrollments in 1951 to 4% in 1960 (Young, 1961:65). Mission schooling was more prevalent in

the eastern area than in the west. In addition, because Christian sects had missionized more actively in the Shiprock area than in the Tuba City area, more Shiprock area students were enrolled as boarding students in denominational schools in border towns.

The boarding experience brought together Navajo students from different communities. Friendships and romances between individuals from widely separated reservation communities were common and often lasted through adulthood. In addition, boarding schools removed children and adolescents from the supervision of parents and the extended family. Many former students report that they were heavily supervised at boarding schools. Most, however, indicate that peer influences were as least as important as the rules enforced by school authorities.

The expansion of the educational system and the improved network of roads on the reservation made it possible for younger, better educated Navajos to seek employment off the reservation as well as in agency towns. It was also during the 1950s that the national economy grew rapidly, and the populations of the states surrounding the reservation began a period of growth that has continued to the present. Navajo migration to agency towns and off-reservation areas resulted in a far less homogeneous population than ever before. No longer could the Navajos be thought of as rural pastoralists isolated from the national culture. Rather, three relatively distinct types of Navajo community can be distinguished, the rural, the agency town, and the border town, each with its characteristic demographic and occupational profiles.

In many ways, Tuba City and Shiprock are similar and support a social milieu quite distinct from the surrounding rural areas. Rural communities in the Tuba City Service Unit are also similar in many ways to the rural communities of the Shiprock Service Unit. The farming communities of the Shiprock Service Unit are unique in that they are densely settled and located near border towns. For most analyses, we have grouped these communities with Shiprock.

Although the U.S. censuses of the Navajo population have well-documented shortcomings (Johnston, 1966; Kunitz, 1983:14, 190), they provide a useful basis for examining the broad parameters of demographic change in Navajo Country and for comparing the two Service Units. Coconino County, Arizona, includes almost all of the Tuba City Service Unit, and San Juan County, New Mexico, includes all of the New Mexico portion of the Shiprock Service Unit. These data provide a framework for interpreting the changes that have occurred in the areas where we worked.

Between 1930 and 1990, both Coconino and San Juan counties experienced population growth, with the non-Indian population increasing more rapidly than the Indian population. Somewhat different processes have generated these similarities in the basic growth profiles of the two counties. San Juan County's economy has been more strongly influenced by the activities of the energy

resource industries. Coconino County's past half century of growth, however, has been primarily related to the emergence of Flagstaff, Arizona, as a secondary commercial, service, and educational center in the Southwest (Meinig, 1971:117) and to the expansion of recreational tourism.

The census data also show a convergence in the employment patterns of the two counties. Since 1970, employment in the professional services and retail trade have ranked first and second, respectively, in both counties. In the past four decades, the major difference is that employment in mining is high (over 10%) in San Juan County but negligible in Coconino County.

Many changes in the San Juan Basin appear to be associated with cycles in the energy industry, whose drilling activities "have fluctuated wildly depending on momentary market conditions" (Baars, 1995:167). Exploitation of other energy resources has also been affected by market conditions. The uneven development of energy resources seems to have had a greater effect on fluctuations in non-Indian than Indian population growth, however.

Between 1980 and 1990, population growth was greatest in the border towns, where the Native-American population nearly doubled during the decade. Of the two agency towns, Tuba City grew much more than Shiprock–59% and 11% respectively. There was considerable variation among individual rural chapters. Overall, population increased in the western rural areas by 17% but decreased by 13% in the east.

In 1960, 5% or less of the Native-American population in each county lived in border towns. By 1990, over 20% of the Native-American population in each county lived in border towns. In sum, the two counties are similar in the overall growth curves for the Native-American populations and the proportion of Native Americans residing in border towns and agency centers.

The growth in agency towns and particularly in the off-reservation population was a result of migration from rural reservation communities by younger, better educated, and more skilled Navajos. In 1990, border towns had a higher proportion of young and middle-aged adults and a lower proportion of older adults than either agency towns or rural reservation communities. Rural communities, however, had the highest proportion of people aged 50 years and above. This pattern is not unlike that in the rest of rural America, from which young people depart for cities, leaving behind an aging population.

The 1990 census reported that the average per capita income for Native Americans living on the reservation was $3,719, with the rural areas of both counties lower than the average. The two agency towns and the farming communities averaged incomes between $4,400 and $5,500. Border towns, in contrast, ranged from $5,477 to $7,783.

We did not ask respondents about their incomes, but we did obtain information about education and employment. Educational attainment and employment

form a continuum, with the highest levels found among the residents of border towns and rural residents, the lowest.[2]

Over one third of the controls in our study had immigrated to the communities in which they were living at the time of the interview. The border towns of the Shiprock area had the largest proportion of immigration, 77% followed by Shiprock and Tuba City. In contrast, residents of the rural areas tended to have been born there (Tuba City, 79%; Shiprock, 66%). Migrants to agency towns are usually from nearby communities, and half of the border town residents in San Juan County had moved from other communities in the Shiprock Service Unit. In the 1960s, most Navajos migrating to Flagstaff were from neighboring western reservation areas (Levy and Kunitz, 1974:54).

Younger interviewees have about twice the rate of high school completion of older interviewees. Those residing in agency towns are about 2.5 times as likely to be high school graduates as those residing in rural communities. Border town residents are twice as likely as agency town residents and five times as likely as rural residents to have graduated from high school. For those who were reared in agency or border towns, however, the odds of being a high school graduate are only about twice the odds for people from rural communities.

Seventy-five percent of men residing in the Shiprock Service Unit border towns have worked steadily throughout their lives, but half of the border town women have rarely worked in wage jobs. In the nearby agency town of Shiprock and in the neighboring farming communities, nearly half of the men and one forth of the women had careers of steady employment. In Tuba City, on the other hand, the pattern is nearly the reverse; half of the women but only one third of the men had careers of steady wage labor. The eastern and western rural communities also contrast. In the rural Shiprock Service Unit communities, a majority of both men and women have histories of seasonal or steady wage work. Men living in rural Tuba City Service Unit communities tend to follow this pattern but with lower levels of steady employment and higher levels of seasonal work. Most women (60%) in the rural communities of this area have worked for wages less than half of their lives. These women remain in the community and operate in the domain of the nonmarket economy. With respect to occupation, the only statistically significant difference across community types is among older men. Older men in rural communities most often had unskilled jobs. In contrast, half or more of the men residing in agency and border towns had worked in skilled blue-collar trades.

Districts in the western part of the reservation that had been most dependent on livestock in the 1930s were most dependent on welfare in the 1970s, and districts, mainly in the east, that had been most dependent on wage income in the 1930s were still most involved in wage work in the 1970s (Kunitz, 1983:37, 52; Kunitz and Levy, 1994: 151–52). Thus, while there has been increasing homoge-

nization across the reservation with respect to education and migration patterns, some important differences persist.

Despite persisting differences between local economies, however, all areas have seen the stagnation of rural populations and the rapid growth of agency and border town populations. This pattern of urban growth, coupled with near universal primary and secondary school attendance on the reservation and in border towns rather than in distant boarding schools, has worked a major transformation in Navajo life over the past two generations. It is to some of the consequences of that transformation that we now turn.

THE EMERGENCE OF A "YOUTH CULTURE"

Many Navajos have recently expressed concerns over the presence of male youth gangs and what is perceived as growing levels of violence in reservation communities (Donovan, 1997; Linthicum, 1996; Sowers, 1995). The Navajo Tribe estimates that there are now about 60 such gangs (Avery, 1997). News accounts stress both the recentness of Navajo gangs and the gulf between the gangs and the experiences of youths in earlier times.

For understanding the life chances of young Navajo males, several factors seem to be of central significance: (1) the waning of the livestock-based economy and increased participation in the formal educational system, (2) the rapid growth of agency towns and the Navajo population of border towns, and (3) the increasing connections between reservation Navajos and urban areas (both border towns and distant cities). Changes in economic strategies, settlement patterns, and extended family residence arrangements over the past four decades have affected the extent and nature of kinship obligations—with whom individuals cooperate, how they behave toward different categories of kin, and how they conceive of and label these kin. For younger males, cooperation across generations declined with the waning of the livestock economy and with greater participation in the school system. In densely settled areas, there was daily contact with a greater number of peers. Such shifts typically diminish the opportunity for adolescents to share the daily lives of older relatives (Moffitt, 1993:691).

During the 1950s, when nearly all Navajos still lived in scattered rural "camps," young males often gathered together at ceremonies to gamble and drink. Such groups were ephemeral, however, dissolving with the termination of the ceremony. Young men spent most of their days with the extended families of their mother or in-laws. As the livestock economy waned, Navajo children were rapidly enrolled in boarding schools where they were under the nearly constant supervision of school personnel. Men who attended these institutions generally recall the experience as regimented and disciplined. Sometimes, however, there

were fights between Navajo students and students from other tribes. The boarding school experience and the resulting rivalry with other tribes (and, on the reservation, with Navajos from other communities) may have generated greater group cohesion. Moreover, some informants report that when young males returned home for the summer, they felt less obligated to aid kin, and, because of the decline in livestock pursuits, there was less need to do so. They could, and did, stay with relatives in agency or border towns, visit relatives in distant rural communities, or go with school friends to attend rodeos and ceremonies or simply to "party in the boonies." A youthful male drinking "cohort" (sometimes with a common boarding school experience or ties of kinship) could form "more or less spontaneously at various events and places" especially in agency and border towns (Topper, 1985:236).

Increasingly since the 1960s, Navajo students have been enrolled in day schools on or near the reservation, most commonly in agency towns. These towns provide a striking contrast to both the rural dispersed settlement patterns and lifestyles associated with the livestock economy as well as to the off-reservation boarding schools. In the rural areas, youths had only sporadic contact with more than a handful of age-mates and often spent long hours alone herding sheep. Town families do not care for large flocks of sheep, and youths do not spend most of their time isolated from others of the same age. They are in frequent contact with one another both at school and in other daily activities. In contrast to the boarding school environment, adult contact and supervision is intermittent. It is largely in this context that a "youth culture" has emerged.

Most respondents who had spent their high school years in agency towns reported having partied in informal groups during the 1960s and 1970s. By the 1970s, these youths were often enmeshed in networks of vaguely defined kin and unrelated schoolmates. They emphasized connections with peers rather than with their place in multigeneration kin groups. The invention of a new kin term, "cousin-brother," is a marker of this change.[3]

It was in this context that gangs first appeared during the 1970s. They coalesced around members who came from families that were marginal to the agency towns to which they returned after living off the reservation or in distant reservation communities. Some of these "marginalized" Navajo youths who formed the core of gangs, had histories of childhood delinquency that were extreme compared with the more peripheral gang members and nonmembers.[4] The larger set of peripheral members, who seem to have modeled their behavior on that of the core members, had weaker identification with gang life. Most apparently "matured out" of the gang, going from "hell raiser" to "family man" (Hill, 1974). A few, especially core members, graduated to serious crime, including homicide, for which they have spent considerable time in prison.

There is reason to think that, since the 1970s, gangs have become more

common, more institutionalized, and more closely connected with non-Indian gangs off the reservation as agency towns have continued to grow and migration to off-reservation locales has increased (Armstrong and Mendenhall, 1997). Indeed, it is possible that the change in rates and patterns of homicide since the 1960s may be explained, in part at least, by the emergence and growth of gang activity. It is still the case, however, that most young people are not members of self-identified gangs (Henderson *et al,* 1999).

CONCLUSION

Although most Navajos still live in dispersed rural reservation communities, the total number of people living in agency and border towns is now almost equal to the number of rural residents. As important, perhaps, is the fact that the conditions of rural life are far different today from what they were even a generation ago. Improved roads ease travel, satellite dishes import images of popular national culture, and all children attend school. Moreover, because the Navajo populations of agency and border towns are large, many, perhaps most, rural residents have close kin in those towns. Frequent visiting between relatives living in different communities familiarizes rural residents with many aspects of town life. Conversely, many town residents participate in aspects of the routines of their rural kin.

Nonetheless, each type of community has a distinctive demographic and socioeconomic profile, and, in consequence, the life experiences of individuals differ depending on the type of community within which they are reared. Navajo households articulate with the wider political economy in slightly different fashions depending on such attributes as place of residence and nature of involvement in the work force. We have illustrated the process here by focusing on the emergence of a "youth culture" or "subculture" among Navajo males because one of our major concerns in this study is the importance of conduct disorder as a risk factor for subsequent alcohol dependence. For this reason, it has been important to sketch the historical context in which this sort of delinquent behavior has become increasingly prominent.

Notes

1. By the end of the decade, the Bureau of Indian Affairs had established 15 detached dormitory facilities. Five of these dormitories were within Navajo Country, and two were on neighboring reservations, the Southern Ute and the Jicarilla. Of the remainder, designated as "peripheral dormitories" or "border town dormitories," six were in border towns and two at more distant locations (in Albuquerque, New Mexico, and Richfield,

Utah). In these dormitories, Navajo students from different communities were housed together.

2. The proportions of controls who graduated from high school was 82% in border towns, 70% in agency towns, and between 44% and 48% in rural areas.

3. Navajo cousin terms are *Iroquoian,* that is, parallel cousins and siblings are referred to by the same term and cross cousins by another term. Today, the term *cousin-brother* has widespread currency among both young adults and teenagers. The term, of course, makes sense as an attempt to reconcile an Iroquoian with an Eskimoan terminology such as that used by American English speakers. The kin covered by the rubric *cousin-brother* vary depending on the individual using the term. Some young men include all male cousins and siblings. Others, consistent with Iroquoian terminology, limit it to siblings and parallel cousins of the first degree. Still others extend the term to members of the same clan of approximately the same age, anyone of the same age and "somehow" related. The rapid diffusion of the English term *cousin-brother* since 1980 appears to be the result of complex changes in education, residential arrangements, and networks of cooperating kin. It is something of an informal "age-grade" marker expressed in the kinship idiom. For most of those who use the term, there is no specific reference to a Navajo category of kin. Rather, it expresses the solidarity of age-mates and as such has become central to the way Navajos in juvenile groups conceive of their relationship to one another. Members of one's gang are frequently referred to as *cousin-brothers,* and less frequently simply as *bros* (brothers).

4. This process provides a striking parallel to the importance of "choloization" and "marginalization" in discussions of Chicano gangs in southern California (Vigil and Long, 1990:56; Vigil, 1990:121). Southern California parallels are especially interesting because it appears that the founding members of one Navajo gang had lived in southern California before their teenage years and were familiar with Chicano gangs.

3

PATTERNS OF ALCOHOL USE

Eric Henderson

Navajo use of alcohol over the past century has been shaped by a number of factors, including cultural values, federal policies, the drinking styles of neighboring populations, socioeconomic differences within the Navajo population, and the availability of alcohol. These factors produced several "typical" styles of Navajo drinking that have changed somewhat over time as new patterns have emerged since the 1970s.

LEARNING MODELS AND CONTEXTS

During the early colonial period, Europeans provided liquor to Indians "in much the same way they offered it to other colonists" (Mancall, 1995:43). Subsequent restrictions on the Indian liquor trade, however, indicate an increasing concern with Indian drinking. By the early eighteenth century, traders controlled the liquor trade and frequently drank with their "clients" (Mancall, 1995:50–51). Colonial liquor policies varied from one area to another, and patterns of alcohol use varied among colonies as well as among Indian tribes. Not only did the colonists drink heavily by modern standards, but beverage preferences and drinking settings also differed appreciably.

In the late eighteenth and early nineteenth centuries the federal government

attempted to regulate and then prohibit the liquor trade with Indians through the Trade and Intercourse Act. The liquor trade had a far greater impact on some tribes, such as the eighteenth century Choctaw, than on others, such as the mid-nineteenth century Pawnee (White, 1983:82–89, 94, 191–192).

During the early nineteenth century, Americans in general "drank great quantities of alcohol primarily spirits, and 'every social event demanded a drink'" (Rorabaugh, 1979:7, 19). Whiskey was imbibed during communal activities such as barn raisings and harvests as well as during elections and frequently accompanied commercial transactions (Rorabaugh, 1979:19–20; Mancall, 1995:72). More potent liquors, cider and whiskey, were far more popular than wine or beer (Rorabaugh, 1979:112, 117). There were regional differences in the types and amounts of liquor consumed. Western pioneers drank heavily and favored whiskey (Rorabaugh, 1979:126–127). Rorabaugh (1979:125) concludes that "groups more severely affected by change were also the groups most given to heavy drinking." Many tribes learned to drink from fur traders, explorers, or fishing crews, all of whom drank hard and frequently.

Navajos did not use alcohol before European contact, and the trade in liquor was apparently quite limited during the Spanish period. During the 1820s, distilled spirits became more available as the Republic of Mexico relaxed trade barriers and Anglo-American fur traders entered the area. Initial U.S. control of the area in the 1840s prompted little change in the liquor trade. By the 1880s, the availability of liquor increased again with the construction of the railroad along the southern edge of Navajo Country and with increasing settlement in the San Juan River drainage and towns of southern Colorado (Kunitz and Levy, 1994:17–18; McPherson, 1988:69–70). Some styles of early Navajo drinking conformed to the patterns of the soldiers, railroad workers, and other non-Indians with whom the Navajo had the most extensive contacts (Kunitz and Levy, 1994:23; Levy and Kunitz, 1974:69–71).

By the 1880s, drunken Navajos were present in the railroad towns, bootlegging on the reservation was widespread, and prominent bootleggers were often wealthy Navajos. The distinguished headman, Manuelito, was drinking as early as 1873 and reportedly engaged in frequent drunken sprees by the 1880s (Underhill, 1956:162–163). Old Mexican, a Navajo autobiographer, reported that many "drunken men" were at "Squaw Dances" (Enemyway ceremonies) held along the San Juan River in the early 1890s (Dyk, 1966:19, 45). Drinking increased during the twentieth century, initially more in the eastern than in the western parts of the reservation. National prohibition did not counter the trend toward greater use of alcohol. In fact, the livestock reduction of the 1930s seems to have stimulated even greater consumption of alcohol (Kunitz and Levy, 1994:19).

Many of our respondents provided information consistent with the history of Navajo alcohol use sketched here. Some Navajos certainly observed non-

Indian drinking and even drank with non-Indians. One respondent told of a direct ancestor, Blue Eyes, who had been a scout for the U.S. cavalry in the late nineteenth century and who would use a dipper to drink whiskey from a 42 gallon wooden barrel, just "like any other trooper." Blue Eyes was a silversmith and a Blessingway singer. He would travel by horse to Dibenitsaa (Mt. Hesperus), the sacred mountain of the north, each spring for sacred purposes. He sometimes returned through the Southern Ute Agency at Ignacio where he had Ute friends and where he would purchase jugs of whiskey made by "Mexicans" in Ignacio. Often, he would drink some of the whiskey before a ceremony. One of Blue Eyes' sons preferred whiskey and never drank wine. He "had his own measuring cup" and would drink a small amount before going to work. The whiskey had no discernible effect and never became a problem.

Observations of the consequences that excessive drinking could have on non-Navajos have also been incorporated into family folklore. One man's maternal great grandmother warned the children against drinking by telling of a "Spaniard who drank up all his money." This accords well with the view that Navajos do not consider drinking as intrinsically wrong but as causing trouble if done to excess (Kluckhohn and Leighton, 1974:306). Uncontrolled gambling was also disapproved because it was wasteful. It is significant that this respondent was from a relatively wealthy family and took pains to note that his family drank only whiskey, never wine.[1]

The importance of marking ethnic boundaries is illustrated by another respondent, the son of a former tribal chairman, who never saw his father drink because he always kept his drinking away from the family. His father would return home inebriated, sometimes argumentative but never abusive. He could obtain alcohol from the trader because he was a prominent politician. His father sometimes drank with Anglo and Hispanic friends and was occasionally given "white-lightning" (locally distilled liquor) by Navajo friends. The son noted that his father would share a gallon of wine "when drinking with the average Indian person." They would share it in those days, he said, because liquor was scarce and difficult to obtain. The son of another tribal chairman told how his father drank with such "big shots" as "Chee Dodge [who] always had some liquor."

Many nineteenth and early twentieth century Navajo police were former army scouts and, like Blue Eyes, had done some drinking during their service. A number of policemen were stationed at Agencies some distance from their homes and transmitted drinking behaviors and ideologies across Navajo Country. One such policeman was John Daw. In 1905, he was assigned to the new Western Agency at Tuba City, and within a few years his principal residence was about 20 miles away at a farm near Red Lake Trading Post. In addition to his job with the police, he also freighted for the Agency. A stepdaughter recalled that during the 1920s he would return from freighting trips to Flagstaff with a few jugs of

whiskey. These he would hide in his hogan and serve small amounts to important guests. Ricos on the Kaibeto Plateau also used whiskey in this manner (Levy and Kunitz, 1974:77–78). The image of Navajo politicians drinking small amounts of whiskey while discussing matters of state is one that mirrors the behavior of non-Indian politicians during this period immediately before and after national prohibition.

At the opposite end of the status hierarchy, poor Navajos developed somewhat different styles of drinking. One man born in the early 1900s was reared by his unmarried grandmother who had no livestock, and who was raising three children. Some summers they would leave home to do farm work. Other summers she would stay at home and lend the children to someone to herd sheep. Often she would rent a room in Gallup during the school year where she would work as a dishwasher. While doing farm work, she would "gamble all the time," drink wine, and play cards every Saturday night. She never abused her children but would often get mad and fight other women. Her eldest son and eldest surviving daughter, who were in their 20s by this time, were also drinking. The daughter lived and worked in Gallup. She "drank all the time until she got DTs." The son spent much of the time in his mother's home community and was described as "one of the first ones around here who was drinking all the time." This early account of problem drinking in the border towns near the railroad that ran along the southern boundary of the reservation fits descriptions of bacchanalian drinking in the railroad towns at an early date (McNitt, 1962:232–236), and, by the early 1900s, Gallup had a reputation for illicit liquor sales and displays of public drunkenness (Kunitz and Levy, 1994:19).

Informants' accounts of Navajo drinking during and before the 1930s are the basic patterns described as "traditional" by Levy and Kunitz (1974:75–79) and by Topper (1985:232–236). The family and extended kin group party, or "house party," was widespread and seems to have been associated with whiskey drinking among relatively wealthy families. At these parties, adults of both sexes within a co-resident extended family group would drink together. Drinking was most often moderate, although individuals would occasionally drink to excess. Topper asserts that "Serious intoxication was usually prevented by strong cultural values concerning sharing" (Topper 1985:233) as well as by a distaste for excess of any kind.

An equally widespread and even more observable pattern was "male, peer group binge drinking," which Topper (1985:233, 235) subdivides according to age: the group drinking of older men and that of younger men. This style of "drinking often took place during such large ceremonies as the Enemyway and the Mountainway. Always, however, the drinking was done on the periphery of the gathering. Drinking groups reinforced kin relationships through sharing and status by bragging about accomplishments. Older men discussed ceremonial

knowledge, special talents, politics, or economic matters. Younger men usually spoke about their athletic prowess and sexual exploits."

The groups of younger men seem to have been both more visible and more obnoxious when encountered at public gatherings. Kluckhohn and Leighton, (1974:298), examining Navajo society in the waning years of the pastoral economy, proposed that acculturative pressures resulted in deviance and criminality among such groups of younger Navajo males: "Thefts occur chiefly in areas under strongest white influence, especially at 'squaw dances' frequented by ne'er-do-well young men who are souls lost between the two cultures." These groups of young men lacked the continuity of membership found among most groups of older men.

Solitary drinkers were chronic drinkers and, although rare, were considered deviant. Despite often drinking with others, they were considered deviant because they drank frequently and heavily, lost control, and placed a greater value on inebriation than on sharing. That is, they joined groups in order to drink rather than drinking to enhance the solidarity of their group of drinking companions. In recent years, new patterns have emerged. Solitary drinking is no longer the main indicator of excessive drinking, and styles have proliferated to the extent that it is no longer possible to speak of typical Navajo drinking patterns.

HOME BREW AND BOOTLEGGING, 1930–1940

During national prohibition, some Navajos were able to obtain alcohol from off-reservation stills, while others operated their own stills or fermenting operations near their reservation homes. The Franciscan Fathers described the Navajos of the turn of the twentieth century as "very fond of whiskey," adding that "beer, wine and cider are not despised" (Franciscan Fathers, 1910:217). The increasing availability of whiskey led to a decline in the Navajo production of fermented corn "beer" (*tó'łbai*) which, they believed, had been introduced by the Chiracahua Apaches. Navajos used the term "whiskey" to apply to any distilled spirits as is true today. Many of the Navajo heavy drinkers we interviewed mentioned vodka as their favorite type of "whiskey."

Some San Juan Valley Navajos frequented stills on the Southern Ute Reservation. Wealthy Navajos of the Kaibeto Plateau and adjacent Tuba City area could obtain liquor from stills operated by Mormons north of Lee's Ferry and by both Mormons and others in northern Arizona (Kunitz and Levy, 1994:18). Corn-based home brew may have been disappearing by the time of national prohibition, as we obtained only a few clear references to its production by our respondents.

Navajo knowledge of non-Navajo distilling operations was apparently widespread, and by the 1920s, it appears that some Navajos were operating their own

stills. During national prohibition, some Texans in the Ramah area made 'corn liquor' in home-made stills and engaged in an active bootleg business with Navahos (Vogt, 1966:47, 59). From the 1920s through the 1950s, many Navajos produced their own fermented or distilled alcoholic beverages, and families of all social strata engaged in such operations. This was primarily for home consumption but some entrepreneurial individuals brewed for the local market, and their homes seem to have become magnets for more excessive drinking. Dates given for still operations cluster between 1930 and 1955, although a few operated into the 1960s.

There were numerous Navajo stills in the eastern area before the repeal of Indian prohibition. In only two communities did we fail to learn of the presence of stills. We obtained few references to stills in the western part of the reservation, although Adams (1963:76) notes the consumption of "domestic" alcoholic beverages in Shonto during the early 1950s, and Shepardson and Hammond (1970:70) mention the presence of "homebrewed 'grey water'" at Navajo Mountain in the early 1960s. One of the few large areas within Navajo Country in which home brew was reportedly rare, and where stills were rare or nonexistent, was the Kaibeto Plateau. Home brewing persisted in some communities for at least a decade after the repeal of Indian prohibition, especially in those areas remote from off-reservation sources of supply.

Bootlegging from border towns began to supplant home brew during the 1950s, and bootlegged, commercially produced liquor was increasingly available on the reservation. Bootlegging, however, was impeded by poor roads. In 1950, only three paved highways traversed the reservation. Route 66 paralleled the railroad line along the southern periphery; U.S. 89, between Flagstaff and Lee's Ferry, came within 15 miles of Tuba City; and U.S. 666 connected Gallup to Shiprock. Route 666 was apparently used extensively by bootleggers. Vogt (1966:77) observed that "Spanish-Americans have been the main source of supply of liquor to the Indians" in the Ramah area and that, before "the repeal of Indian prohibition in 1953, the bootlegger-customer intercultural role was of crucial importance in the relationships between Spanish-Americans and Indians" (Vogt 1966:66). Aberle (1966:217) has also noted that some Peyote road men, many of whom were members of other tribes, engaged in bootlegging during the early 1950s. Because road men traveled widely and owned trucks, they were in a position to bootleg. It was more common, however, for Navajos to obtain liquor during shopping trips to border towns. By the 1940s, bootlegging was almost totally dependent on motor vehicles and for some individuals seems to have been a major entrepreneurial endeavor.[2]

According to Topper (1985:231), "drinking never quite became a socially approved activity" but was "a rather mild form of bad life." Infrequent, moderate drinking was socially acceptable, although not condoned. Our older respondents,

recalling events across the decades, expressed a view that is consistent with Topper's, although a significant minority expressed at least tacit approval of moderate drinking in certain social settings, particularly the "house party" and the group drinking of older men. Controlled drinking by the wealthy and by older men regardless of social standing was approved by many.

All drinking by Navajos before 1953 was illegal by federal fiat so that there was some risk wherever drinking occurred. Jealous neighbors could inform, and the family life of moderate drinkers might be disrupted. Referring to the 1920s and 1930s, one respondent said that "In those days all they had to do was smell your breath to take you in." Although any drinking could be risky, the police appear to have avoided raiding simple house parties or arresting older men drinking moderately at public events.

By 1950, on the eve of the repeal of Indian prohibition, alcohol use was prevalent on the reservation. Home brewing had declined as bootlegging increased. During and after World War II, many Navajos had the opportunity to observe and participate in a wide range of drinking styles. Although Navajos drank in border towns before this period, there seems to have been some increase in border town drinking that became highly visible. Most Navajo drinking, however, continued to take place on the reservation, where it was most often not observed by persons outside the family, much less by non-Navajos. At ceremonies and in border towns, drinking was more public, and non-Navajos as well as Navajos could witness the highly intoxicated behaviors of groups of younger men.

A number of factors seem to have been changing drinking behaviors even before the 1953 repeal. In the wake of livestock reduction, wage work was a necessity for most families, and most jobs were off the reservation. During World War II, many Navajos worked in the war industries, and many of the most educated served in the military. During the postwar recession, many worked in seasonal wage jobs. Some work crews were predominately or entirely Navajo, and most were exclusively male. The uranium and oil industry jobs of the late 1940s and early 1950s provided employment near home. Energy developments brought an influx of non-Indians to the San Juan Basin, and these miners and oil workers brought their own styles of drinking with them. Passage of the Navajo–Hopi Long Range Rehabilitation Act in 1950 led to improved roads that allowed the slowly increasing number of Navajos with vehicles easier access to both border towns and rural communities.

Groups of young males drank in a manner quite distinct from that of older men. Young men were often out of control at public events. Loud arguments and physical fights were common. Some respondents recalled that they drank at this time to "have a good time" and to "overcome shyness" with women. Sometimes the lack of shyness reached intolerable levels. Groups of young men would go to public events at some distance from their homes where few, if any, had close

relatives. They would often accost women without bothering to ascertain whether they were related by clan. When older men traveled to a ceremony in a distant community, they generally established clan relationships or shared ceremonial knowledge that permitted culturally approved interaction and communication.

A good summary of the differences among younger men at ceremonials during the immediate post-World War II period is provided by Vogt (1951:107). Five of the 15 individuals he describes in his study of World War II veterans at Ramah attended 16 or more ceremonials in 1947. Two attended "ceremonials to break the monotony of reservation life, to find liquor to drink, and girls to sleep with," and neither participated in the rituals. Although the other three would "also drink at times there [was] always full and enthusiastic participation in the ritual and singing." This distinction reflects a difference in the attitudes of young men who sought out a ceremony so they could drink and young men who drank because they participated in a ceremony.

Vogt's study also provides some insights into the effect military service had on the attitudes and experiences with alcohol both for the returning veterans and for the communities to which the veterans returned. In the service, most Navajos drank with non-Navajo servicemen. Beer was the beverage of choice, and for many it was their first experience with alcohol.

Some men who had worked in the off-reservation war industries had similar experiences. If they had worked primarily in Navajo crews, they may have rarely, if ever, shared liquor with non-Navajos. Far from the reservation, however, the salience of Indian prohibition diminished. Some seasonal workers developed a pattern of drinking while away from the reservation and abstaining when they returned.

After World War II, it was increasingly difficult for many families to deal with the drinking of returned veterans. There are accounts of sons being secured with rope until they sobered up after returning from drinking bouts. Families that enforced rules against drinking at home caused their sons to drink in more public places: at a bootlegger's camp, near the trading post, or in town. Navajo drinking in border towns became ever more visible. Because it fit non-Indians' stereotype of the "drunken Indian" and because it was the only form of Indian drinking most had observed, it defined the entire range of Navajo drinking styles for many public officials and agencies.

Given the continuation of Indian prohibition, men returning from the service discovered that when they shed their uniform they were again enveloped in their status as "wards" of the federal government. Drinking in bars was still illegal. Moreover, as young men, their status within Navajo society was relatively low. Ideally, a young Navajo man should marry and live with his wife's family where he defers to his father-in-law (Aberle 1961:148, 163; see also Reynolds et al., 1967). As Navajo men mature, they gain social standing by demonstrating com-

petence in handling family resources. As their daughters marry, they become the father-in-law to whom deference is owed. Livestock reduction altered these customs by transforming families' economic lives. The veterans, with some education and some familiarity with the off-reservation social world, were well situated to seek an alternative basis for social standing in the emergent wage economy. They could seek a livelihood independent of their elders and thereby contribute financial resources to their families. With veterans' benefits or money from wage jobs, they could also afford commercially produced liquor.

While we cannot reconstruct with certainty changing frequencies of types of drinking events or categories of drinkers, respondents convey the impression that there was an increase in deviant drinking. Today those who neglect their economic and social obligations and refuse to share their alcohol are often said to be "really addicted to it" or "real alcoholic." The distinction made between "real alcoholics" and others with an "alcohol problem" is partly related to the degree of isolated drinking and partly related to the motivations for drinking imputed to the individual. "Real alcoholics" seek out a variety of others in order to drink. Those who have problems with alcohol associate with friends who drink too much. In essence, this is a distinction between those who make friends in order to drink and those who happen to have drinking companions. The alcoholics value alcohol more than social roles and obligations. The problem drinkers give priority to their social obligations, but alcohol inevitably becomes part of social life.

During the 1950s, drinking was more in evidence around Shiprock than it was in the Tuba City area. With the exploitation of uranium and oil resources, the non-Indian population near Shiprock grew rapidly. The "roughnecks," many from Texas and Oklahoma, brought their own values and styles of drinking. In the early years of the boom, Indian prohibition was repealed so that it is now difficult to disentangle the effects on Navajo drinking behaviors of the repeal from those of the economic boom. Respondents remember it as a time when patterns of drinking changed radically, when drinking behaviors, attitudes toward alcohol, and the types of beverages consumed were all affected.

In 1953, Congress repealed the federal prohibition of liquor possession within Indian Country (Cohen, 1982:307). One justification for the repeal was consistent with the Termination policy of the time, the aim of which was to repeal laws that set Native-Americans apart from other citizens. Tribes had the option to continue prohibition on their reservations or to regulate the sale of alcohol in conformity with state law (Cohen, 1982:307). Although the Navajo Tribe has continued prohibition, many of the older Navajos who were interviewed noted the importance of the repeal of the federal act because it allowed them to purchase alcohol legally off-reservation, thus altering patterns of purchase and consumption.

The repeal of Indian prohibition had different affects in the Tuba City and

Shiprock areas. In the west, all the reservation communities were 40 miles or more from Flagstaff, the nearest border town, although liquor could be obtained at a few stores near the reservation boundary. Repeal made bootlegging easier, and, because most families in both the agency town and the rural chapters did not own motor vehicles, bootleggers prospered.

The situation was similar in the more remote rural chapters of the Shiprock Service Unit but quite different in the town of Shiprock and the farming communities on the San Juan River. Farmington is less than 30 miles from Shiprock, and alcohol was available from several bars along the reservation border less than 10 miles from Shiprock. Proximity, automobiles, and availability led to the demise of bootlegging, as those who wished to drink could easily make their own trip into town to buy liquor for consumption back home. "Repeal of the liquor law made wine available at less than half the price formerly paid to bootleggers" (Sasaki, 1960:102).

One veteran from a relatively well-to-do family remembered that, during the late 1950s, he drank more than his father because he had a job and a vehicle and his father had neither. Before stock reduction, his father traded lambs from his ample flock for whiskey. By the late 1950s, the son controlled more resources with income from his job as a laborer for a gas line company. He drank beer with "military friends" in Gallup and Farmington and brought whiskey and wine home where he usually drank by himself.

The son of another wealthy man gave an insightful analysis of how the oil boom contributed to his eldest brother's heavy drinking. In the late 1950s, the brother lived on his wife's family farm near Shiprock and worked as a heavy equipment operator. He drank excessively, mostly beer, but, like their father, he would buy whiskey when he had the money. His brother "lived when you made quick money here in town [Farmington]. During the boom, that's when he was drinking heavy." The oil fields were opening up, and one could quit a job and get another right away. The brother "would blow one thousand dollars in one night of drinking," and such behavior was common among "those oil field guys." He "learned from the oil workers. They'd put eight hundred dollars down on the bar and it would be drinks all around." If this is an exaggerated account, it nevertheless resonates with how many Navajos perceived the oil boom during the time they entered adulthood. It expresses concern over "excess" and implicitly ascribes the source of excess to newly arrived "roughnecks" in the border towns

The type of beverage consumed also seems to have changed in the period between World War II and the repeal of Indian prohibition. Muscatel wine was the most prevalent beverage among Fruitland Project residents in 1950 (Sasaki, 1960:9), and one veteran insisted that a shift from whiskey to wine occurred precisely in 1952. Fortified wines became available in the border towns, presumably

because they were cheaper than whiskey, which few Navajos could afford in the wake of livestock reduction.

Men born between 1927 and 1936, who had generally begun to drink regularly between World War II and repeal, reported that they "preferred" wine to beer. Younger age cohorts increasingly report preferring beer, as wine was increasingly associated with alcoholism. Seasonal agricultural and railroad workers report drinking wine during the 1950s and 1960s. Heavy drinkers most commonly claimed wine as their beverage of choice, although many had no particular preference and would drink whatever was available.

Whiskey seems to have remained the beverage of choice for those who could afford it and among those ceremonialists who drank during the performance of a ceremony. Distilled spirits were also preferred by tribal councilmen. A man from Kaibeto who served on the tribal council in the 1950s said that "all" the councilmen drank. To emphasize that *all* councilmen drank, he told of a time when he and another councilman, a "Christian," were flown to Dallas to meet with "big shots" concerning energy developments on the reservation. The Kaibeto councilman was very impressed by the evening barbecue that included kegs of beer and bottles of hard liquor. They were told to serve themselves, and he drank quite a bit but "didn't get drunk." The Christian councilman was reluctant to drink but eventually did so. White "big shots" drink a lot, the Kaibeto councilman asserted, noting that Washington "big shots" have bars in their offices. Some councilmen were known for the type of "hard liquor" they preferred: One from Red Lake was known as a Vodka drinker, and the Kaibeto councilman drank bourbon.

FIRST DRINKING EXPERIENCES

Few respondents had difficulty describing their first experience with alcohol. It was a memorable occasion. Although there may be a tendency to reinterpret past events in the light of contemporary concerns, there is little reason to disbelieve the basic information in the narratives provided.

Topper (1980:139) has described how Navajo children first learned about drinking:

> Children are introduced to drinking as something pleasurable associated with the family. Usually it is the parents or some other close kinsman from the child's outfit who introduces the Navajo boy to drink. . . . The drinking is taught to the boy as something that relatives should enjoy together. They are told that "it is good to drink with your relatives (clansmen) because they are your friends, and you should share things you enjoy with them."

This pattern has changed considerably over the years, however. Fifty-three percent of the male controls who had their first drink during the 1950s had done so with older relatives. In contrast, only 25% of those who first drank during the 1980s learned from older relatives (Table 3-1). The trend is similar for the women. Drinking with peers increased from more than 37% to 72% among the men and from 33% to 71% among the women. The greatest increase for both men and women was drinking with schoolmates.

The amount consumed in the initial drinking experience was relatively moderate. Over half of the men and all six women interviewed who took their first drink during the 1950s estimated that they imbibed anywhere from a few sips to the equivalent of one drink. Less than 10% consumed very high amounts, estimated as equivalent to a six-pack of beer or more than a pint of fortified wine (Table 3-2). The proportion of those estimating consumption of higher amounts increased during the 1960s and has continued to increase.

During the 1950s, nearly half the men were given fortified wine and about one-third drank beer (Table 3-3). Over the years, the proportion of men who drank fortified wine decreased to less than 5% as the use of beer increased from 32% to 77%. The increased preference for beer is also found among the women, although there was never a majority who drank fortified wine.

The differences among first drinking experiences during the 1950s and 1960s mark the beginning of a set of interrelated trends continuing through the

Table 3-1. Relationship of Controls to Those with Whom the First Drink Was Experienced, as Percentage

DECADE OF FIRST DRINK	OLDER RELATIVES	SCHOOLMATES	COUSINS	FRIENDS	N
		*Men**			
1950–1959	53.0	8.4	8.4	20.5	83
1960–1969	33.6	15.3	14.5	29.1	131
1970–1979	32.0	21.9	16.0	26.0	169
1980–1989	24.7	29.9	11.3	31.0	97
		Women†*			
1950–1959	50.0	0.0	0.0	33.4	6
1960–1969	26.9	19.2	7.7	42.3	26
1970–1979	19.0	20.6	4.8	53.9	63
1980–1989	27.0	19.0	7.9	44.5	63

Note: Those whose first drink was with spouse (N = 3) or alone (N = 29) are not shown.

*Chi square = 36.42; d.f. = 9; $P = 0.0015$.

†Chi square = 0.218; d.f. = 9; $P = 0.24$.

Table 3-2. Estimated Amount of Alcohol Consumed by Controls at Time of First Drink, as Percentages

DECADE OF FIRST DRINK	ONE DRINK OR LESS	EQUIVALENT OF SIX OR MORE BEERS	N
	*Men**		
1950–1959	52.6	9.2	76
1960–1969	43.1	19.5	123
1970–1979	36.0	21.1	161
1980–1989	27.2	33.7	92
	Women†*		
1950–1959	100.0	0.0	6
1960–1969	61.1	5.6	18
1970–1979	31.0	24.1	58
1980–1989	35.6	11.9	92

*Chi square = 20.52; d.f. = 3; $P = 0.002$.

†Chi square = 18.27; d.f. = 3; $P = 0.006$.

Table 3-3. Type of First Alcoholic Beverage Consumed by Controls, as Percentages

	TYPE OF BEVERAGE		
DECADE OF FIRST DRINK	FORTIFIED WINE	BEER	N
	*Men**		
1950–1959	44.4	32.1	81
1960–1969	38.3	42.2	128
1970–1979	18.3	68.6	169
1980–1989	4.1	77.3	97
	Women†*		
1950–1959	20.0	40.0	5
1960–1969	16.0	56.0	25
1970–1979	3.3	68.3	60
1880–1989	1.6	76.2	63

Note: Other beverages (spirits, home brew, or combination) not shown.

*Chi square = 80.18; d.f. = 3; $P = 0.000$.

†Chi square = 20.94; d.f. = 3; $P = 0.051$.

ensuing decades—the decline of wine as the beverage of choice, the shift away from drinking with older relatives to drinking with peers, and an increase in the quantity of alcohol consumed when one is first introduced to drinking. These trends are clearer among men than women, and there appears to be a divergence between men and women in the 1990s.

There are some differences between the Shiprock and Tuba City Service Units, but these are marginally significant at best and relate primarily to the timing of the changes rather than to the overall trend. Several elements account for the shift from wine to beer and why it began earlier in Shiprock. First, the energy developments in the San Juan Basin brought non-Navajo blue-collar workers who drank beer to the region, and Navajos joined many of these crews.

Second, fortified wine provides more alcohol per unit volume than does beer and so costs more. In the Tuba City area, bootlegging has been more significant than in the Shiprock area, and thus wine, the bootlegger's staple, was more prevalent. In the San Juan Basin, a "beer run" to Farmington was easy and thus more common than purchasing from a bootlegger.

Third, and perhaps the most important yet difficult to prove, was that wine became increasingly "stigmatized" as a beverage of alcoholics during the 1960s. Over two thirds of the drinkers in the mid-1960s who were in Levy and Kunitz's sample of drinkers in treatment preferred wine (Levy and Kunitz, 1974:141). Reports from treatment projects in Gallup and Fort Defiance also indicate that fortified wine was the primary beverage of alcoholics (Ferguson, 1968:162; Savard, 1968:913). Those drinking in public in border towns and at reservation events were primarily drinking wine. They were the "winos," out of control, and increasingly defined as "sick." In contrast, Navajo residents of border towns preferred beer and drank more moderately and at home (Levy and Kunitz, 1974:78, 141).

Fourth, younger Navajos were increasingly drinking with their peers rather than their older relatives, and beer was the party beverage of preference among non-Indian high school students in border towns. Many respondents associated wine with problem drinking but beer with the more "normal" and acceptable drinking of the general non-Indian population. At least some younger Navajos shared the negative view of non-Navajo border town residents regarding the publicly intoxicated Navajo. Drinking beer set younger males apart from "winos" yet allowed for inebriated partying with peers. Some of the youngest group of respondents expressed the view that one could not become "addicted" to beer.

As the beverage of choice has changed in recent decades, so too have there been changes in patterns of drinking. Overall, the older styles persist among some drinkers, but the trend has been a proliferation of drinking patterns or styles. This proliferation appears to be related to increasing differentiation among the Navajo population by measures such as education, occupation, and commu-

nity of residence that has taken place at the same time that regional differences are diminishing.

By the 1970s, most Navajo students were enrolled in public schools in or near their home communities. In both the Shiprock and Tuba City Service Units, many younger individuals in some reservation chapters had commuted by bus to border town high schools. In both agency towns, in the densely settled and growing farming communities near Shiprock, and in the border towns, Navajo adolescents since the 1960s have inhabited an environment that is quite different from the dispersed rural communities. Peer groups of neighbors and schoolmates became more stable in membership. While kinship idioms and overt recognition of kin obligations are still prevalent among many youths, these groups are not founded on the same kinship principles of family and clan that previously dominated Navajo social life. In a number of ways, these peer groups are more socially significant in shaping behavior and values than are adults. There are also a variety of types of such groups. Many are all male. Some of these are self-identified as gangs (Henderson, et al., 1999; Armstrong and Mendenhall, 1997). There may be a smaller number of "girl gangs." Other drinking groups consist of all-Navajo single-sex cliques of friends, "cousin-brothers" or "cousin-sisters." In border towns there are a number of multiethnic cliques: Some are "dopers," and others are "straights" or "jocks." It would be difficult, especially since the 1970s, to catalog the array of types of adolescent experiences of Navajos much less to generalize to a single Navajo type of experience, but community of residence, type of school, and family status continue to shape these peer groups. Peers more than older relatives influence drinking styles.

Unlike the very specific behavioral moment recounted in the narratives of the first drinking experience, descriptions of characteristic drinking histories were of necessity somewhat general and subject to the editing preferences of the respondent. The weight and meaning of some accounts seemed to be recast in light of more recent experiences or structured by the paradigms of various treatment programs. In most interviews, however, the narratives were rather consistent with the responses to specific questions. These data provide some insights into past drinking practices but overall provide less consistently concrete data about dates, places, and persons than the first drink narratives.

"Extended kin group drinking" and the "house party" are no longer reported frequently, but the "traditional" style of peer group drinking of both older men and younger men continues at ceremonies and other events on the reservation and in public places in the border towns. There are also numerous "parties," usually on weekends, in locations a few miles from the agency town and other settlements. Most of those who find a "party place" in the "boonies" are younger males, often high school students, but women sometimes join in these parties in smaller numbers. In some communities, there are networks of older males who

"binge" with one another frequently and heavily, often going from the home of one to the home of another with forays into town or the nearest package store when they run out of alcohol in the middle of a binge. Some of the heaviest drinkers go on long binges that involve moving from one setting to another. Several men described binges in which they drove from Farmington to Albuquerque to Gallup and even more distant places. More frequently, the drinking pattern of younger men involves a weekend of heavy beer drinking with friends, often beginning at a bar after work and continuing at the home of one of the group or going to a "party place." One respondent said this was his pattern—"What do you call [it]? A 'weekend warrior.'" He described his former drinking pattern as "pretty heavy" every weekend, usually 12 cans of beer plus whiskey, hard liquor of all kinds—Bacardi, Vodka, Jack Daniels. He was slowing up a little when he met his wife. They would party together but not as much as when he was a weekend warrior.

Drinking in bars generally demands some monitoring of one's drinking, some "control," or the ability to "maintain" one's behavior within socially acceptable limits. Failure to maintain leads to ejection from the bar. Based on studies in urban Native-American bars, Weibel-Orlando (1985:215) notes that "increasing numbers of Native Americans have adopted maintaining as a precautionary measure" against trouble with the police, getting "rolled," and the censure of drinking compatriots. She implies that the need to "maintain" may be less significant in "Indian bars" (i.e., those with a predominately Native-American clientele) where drinking behavior is "flamboyant" (Weibel-Orlando, 1985:212). Since the repeal of Indian prohibition, some Navajos have frequented bars. Some Native-American bars in border towns developed reputations as being primarily for low status heavy drinkers—the "winos." One bar in Gallup during the 1960s attracted a more "upscale" clientele and was frequented by members of the tribal council. Navajos frequented, and continue to frequent, a variety of kinds of bars in border towns.[3]

Non-alcohol-dependent controls, almost by definition, generally "maintain." They often describe their drinking as imbibing a beer or two with coworkers after work on an occasional Friday or a beer or two at home on a weekend watching a game. A few older non-alcohol-dependent controls drank a beer or two infrequently, by themselves, and often at an isolated spot a few miles from home. As Levy and Kunitz (1974:78) reported for Flagstaff residents in the late 1960s, so too in San Juan County were long-term border town residents in the 1990s likely to drink beer at home in moderation. Many who were raised in the border towns reported that this was the drinking pattern of their parents.

Most women do not drink. Of those who do, some heavy drinkers join predominately male groups in the border towns. More commonly, however, women drink in bars or at home, more often with relatives than is the case among men. A

relatively common drinking group among women who drink is a small set of peers of the same sex and similar education and type of job. Many young women quit drinking entirely when they become pregnant. Some, of course, do not (see Chapter 9).

There is some evidence that the taste preferences of women and men have recently begun to diverge as well. Table 3.4 compares the beverage preferences for men and women in each sample controlling for the time when these drinkers and former drinkers first began to drink regularly. Before the 1980s, there are no sex differences across the samples in the preference for beer compared with the preference for any other type of alcoholic beverage. Across all samples, those who began drinking regularly in the 1970s reported a greater preference for beer than those who began drinking before the 1970s. The trend continues for all males and for female cases through the 1980s. Only among controls who began drinking regularly during and after the 1980s does sex make a statistically significant difference. Women controls' preference for beer has declined, and, except for women in treatment, preferences are shifting from beer to wine coolers and mixed drinks.

THE PREVALENCE OF DRINKING

During the 1960s, the prevalence of alcohol use among Navajo men and women was very different from what had been observed in national studies. Compared with data from national surveys, at any given time a larger proportion of Navajos than non-Indians were nondrinkers, not because they had always been abstainers

Table 3-4. Preference for Beer Among Regular Drinkers and Former Regular Drinkers, as Percentages

		CONTROLS	
START REGULAR DRINKING	CASES	HISTORY OF ALCOHOL DEPENDENCE	NO ALCOHOL DEPENDENCE
	Men		
Before 1970	22.2	48.5	63.0
1970–1979	59.5	69.4	73.9
1980–1990	69.4	92.7	89.2
	Women		
Before 1970	42.9	33.3	50.0
1970–1979	60.0	70.0	70.6
1980–1990	73.7	55.2	57.9

but because they had ceased to use alcohol. In the three communities studied at that time, virtually all women and most men were abstainers (Table 3-5). Almost all the men who were abstainers had been heavy drinkers who had given it up. Most of the women who were not drinking were life-long abstainers (Levy and Kunitz, 1974:136).

In 1984, May and Smith (1988) performed a similar survey of a clinic population that included reservation and border town residents. The striking finding was that many more women were drinking in the later period than earlier. In the mid-1960s, the highest proportion of women currently using alcohol was in the border town (23.3%). In the two reservation communities, it was less than 10%. In 1984, the proportion currently drinking was 40%. It is not appropriate to test for significant differences, but substantively they appear to be meaningful, particularly in view of the increase in fetal alcohol syndrome that had been observed between the two survey periods (Kunitz and Levy, 1994: 64–65).

Table 3-6 displays the rates of alcohol use and abstinence among controls in the present study according to type of community of residence. The results for men are similar to those in Table 3-5 from a generation ago. Among women, the proportion currently drinking is higher in all community types than it was in the mid-1960s but about the same as what had been reported from the mid-1980s. In the Epidemiological Catchment Area study, 15.4% of women and 4.8% of men

Table 3-5. Alcohol Use in Samples of Navajo Men and Women, 1960s and 1980s

	COMMUNITY TYPE			
DRINKING STATUS	RURAL (1966)	AGENCY TOWN (1966)	BORDER TOWN (1967)	MIXED BORDER AND RESERVATION (1984)
		Women		
Lifelong abstainer	37.5%	64.3%	66.7%	—
Stopped drinking	58.3%	28.6%	10.0%	—
Total not drinking	95.8%	92.9%	76.7%	60%
Currently drinking	4.2%	7.1%	23.3%	40%
N	24	14	30	90
		Men		
Lifelong abstainer	5%	0%	11.1%	—
Stopped drinking	60%	31.6%	38.9%	—
Total not drinking	65%	31.6%	50.0%	36%
Currently drinking	35%	68.4%	50.0%	64%
N	20	19	18	84

Source: Kunitz and Levy (1994:65).

Table 3-6. Drinking Status of Male and Female Controls as Percentages

	AGENCY TOWN		BORDER TOWN		RESERVATION COMMUNITY	
DRINKING STATUS	MEN (N = 162)	WOMEN (N = 97)	MEN (N = 80)	WOMEN (N = 29)	MEN (N = 289)	WOMEN (N=77)
Abstainer	3.7	33.0	10.0	6.9	7.6	36.4
Former drinker	41.4	48.4	46.3	55.2	54.3	50.6
Current drinker	54.9	18.6	43.7	37.9	38.1	13.0

CHI-SQUARE ANALYSES	χ^2	D.F.	*P*
	Comparisons between community types		
Men	14.204	4	0.0067
Women	13.420	4	0.0094
	Comparison of men and women within community types		
Border town	0.743	2	0.6898
Agency town	55.600	2	0.0000
Reservation	48.603	2	0.0000

were lifelong abstainers. Among Navajo women, lifelong abstainers are more than twice as frequent in agency towns and other reservation communities as in the nationwide sample and half as frequent in border towns. Navajo men are about as likely to be abstainers as the national figure (Helzer, et al., 1992). We do not have comparable regional data, that would be more relevant.

There are significant differences among both men and women from one type of community to another. Among men, there is a smaller proportion currently drinking and a greater proportion of former drinkers in rural reservation communities than in border and agency towns. The proportion of abstainers does not differ significantly among community types. The pattern is different among women. Those in border towns are less likely to be abstainers than are women in agency towns or other reservation communities, although the small numbers urge that we be cautious in interpreting these results.

Finally, when men and women are compared within each type of community, the differences are significant in the two types of reservation communities but not in border towns. In the former, men are far more likely than women to be currently drinking and less likely to be abstainers. In the latter, the patterns are similar for men and women.

Because the age structures of populations in different types of communities are different, and because drinking patterns vary with age, Table 3-7 displays the

Table 3-7. Drinking Status and Abstainer Status Regressed Separately onto Age and Community of Residence, Men and Women Controls Separately

	NO. OF PARAMETERS	DEGREES OF FREEDOM	CHI SQUARE	*P* VALUE
Drinkers Status-Abstainer versus Non-abstainer				
Effect test				
Men				
Age	1	1	0.282	0.5950
Community	2	2	3.892	0.1428
Women				
Age	1	1	5.146	0.0233
Community	2	2	6.314	0.0425
Parameter estimates (women)				
Community				
Agency town	0.638*	0.297†	4.62	0.0317
Border town	−1.259*	0.501†	6.30	0.0121
Rural Reservation	0.620*	0.305†	4.14	0.0420
Age	0.039	0.017	5.15	0.0233
Drinking Status-former versus Current				
Effect test				
Men				
Age	1	1	33.598	0.0000
Community	2	2	5.297	0.0707
Women				
Age	1	1	0.324	0.5688
Community	2	2	3.327	0.1894
Parimeter Estimates (Men)				
Age	0.058*	0.010†	33.60	<0.0001

Note: Parameter estimates are not given for those variables with $P > 0.05$ in the effect test.

*Estimate.

†Standard error.

results of logistic regressions of drinking status onto community type and age of informants for men and women separately. When life-long abstainers are contrasted with all nonabstainers, neither age nor community type is significant for men. Both are significant for women. Older women are more likely than younger to be abstainers, but community of residence continues to be significant as well. Thus age does not account for the lower proportion of women abstainers in bor-

der towns. When abstainers are excluded and current and former drinkers are compared, neither age nor community type is significant for women, and age but not community type is significant for men.

These results mean that among women it is the fact of being an abstainer or not that is important: Abstainers are found on the reservation among older women. Among men, lifelong abstainers are uncommon in all communities and at all ages, and the important distinction is between current and former drinkers. Age explains the difference in drinking status. Older men are more likely than younger men to have ceased drinking regardless of type of community of residence. Because the rural reservation population contains a high proportion of older adults, the prevalence of current drinking is lower there.

Because the use of alcohol is so widespread, particularly among men, male abstainers are rare. We turn, therefore, to a brief consideration of the risk factors for being an abstainer. Included among abstainers are people who have never drunk at all as well as those who have tried alcohol only once. In a series of comparisons of sociodemographic features (parents' education, livestock holdings, religion and drinking patterns, informants' age and education) they are indistinguishable, and in the following analysis they are therefore combined into one group defined as abstainers. Logistic regressions of drinking status (abstainer vs. nonabstainer) separately onto a number of background variables, given stratification (the variable that combines the stratification variables of age, sex, and community type) indicate that none of the background variables examined is significantly associated with being an abstainer.[4] Perhaps most surprising is the lack of importance of parental drinking patterns. Life histories give some sense of why this might be so.

One man recalled that once, when he was a child, he was walking with his father who was drunk. His father passed out and was unconscious for several hours, his son remaining near him the entire time. When his father finally awoke and they returned home, our respondent announced to his parents that he would never drink. His mother sent him on Mormon placement a few years later. He is still a Mormon and has never consumed alcohol. On the other hand, several men recalled frequent lectures from one or both of their abstemious parents about the dangers of drinking, and they also saw examples of the ravages of alcohol abuse among close kin. They too never drank. Several others had disabilities of various types that limited their ability to socialize with peers. They lived in highly protective families, and some never learned to drive. Hence alcohol was not readily accessible. Thus, some men from families of heavy drinkers and some from families of light drinkers and abstainers reached the same point from different starting places, and because there are so few abstainers there is no predictor that stands out as significant.

AMOUNTS CONSUMED

In previous studies, it was impossible to quantify the amount of alcohol consumed by informants because the common pattern of passing a bottle of wine from person to person made such estimates unreliable. At present, with a change in drinking styles such that most often people drink from their own cans or bottles of beer, estimates are more reliable. Figure 3-1 displays data on average daily

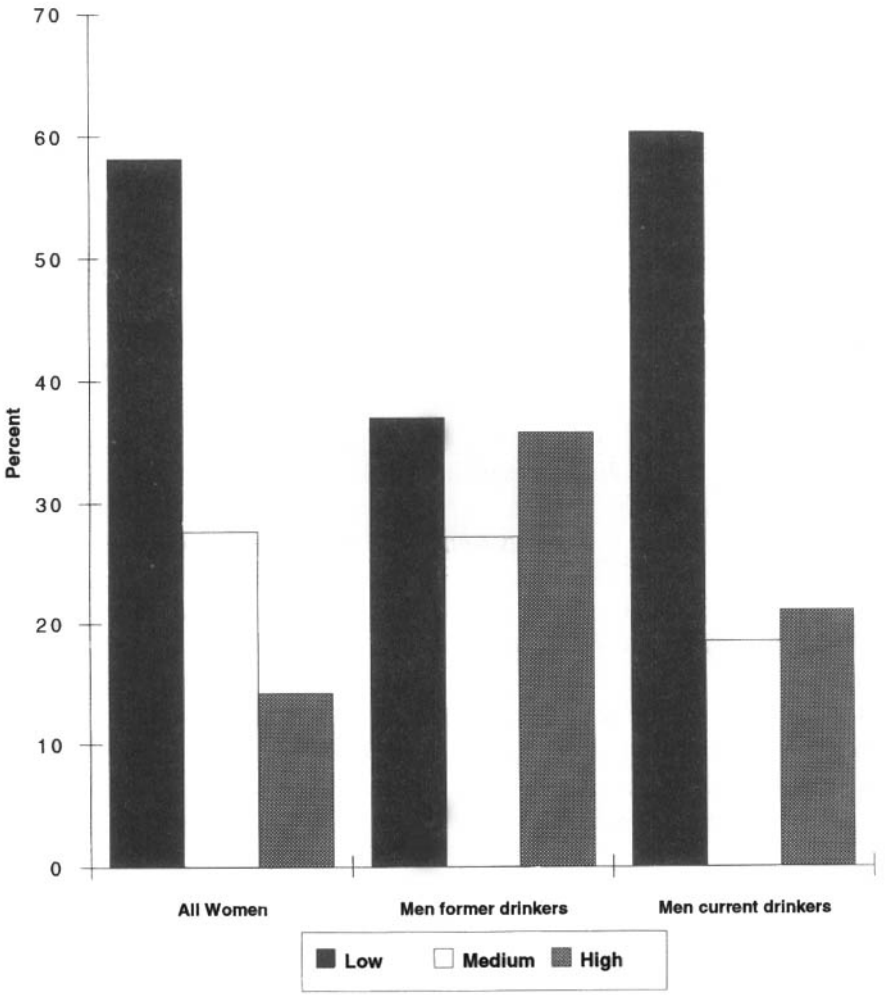

Figure 3-1. Average daily alcohol consumption by drinking status of male and female controls.

consumption of ounces of alcohol per day by drinkers among male and female controls. Low consumption is less than 1 ounce; medium is 1.0–1.9 ounces; and high is 2 or more ounces per day. Abstainers are excluded. Among women, there is no difference between former and current drinkers, so all women drinkers are combined. Among men, there is a significant difference, so former and current drinkers are shown separately.

It is striking that current male drinkers report much lower consumption than former drinkers. Table 3-8 displays the results of an ordinal logistic regression with average daily alcohol consumption as the dependent variable. There are no significant effects of age or community type, but sex and drinking status are significant. Women consume less than men, and former drinkers (who are on average older than current drinkers) are more likely to have consumed more than current drinkers. It is of course possible that former drinkers exaggerate the amounts they used to drink, that current drinkers minimize the amounts they presently drink, or both. We think the differences are real, however, because they are consistent with the narratives, with the diversity of drinking styles and venues that have developed in the past decade or two, and with the decline in alcohol-related mortality that has been reported elsewhere (Kunitz and Levy, 1994:51). These findings suggest that not only has there been a revolution in tastes and styles of drinking, but there has been a revolution in amounts consumed as well.

Table 3-8. Daily Alcohol Consumption Regressed onto Stratification Variables and Drinking Status, Controls Only, Lifelong Abstainers Excluded

Effect Test				
SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	2	5.845103	0.0538
Age	1	1	0.642447	0.4228
Sex	1	1	10.352023	0.0013
Drinking status	1	1	13.788476	0.0002

Parameter Estimates*				
	P VALUE	ESTIMATE	STANDARD ERROR	CHI SQUARE
Sex (female)†	0.32566078	0.1012169	10.35	0.0013
Drinking status†	–0.3063527	0.0825018	13.79	0.0002

*Parameter estimates are not displayed for variables in which the *P* value of the effect test is >0.05.

†Parameter estimates are given as deviations from the mean. For dichotomous independent variables estimates are given for only one category. The other is implicit.

CONCLUSION

Writing about Navajo drinking patterns found during the late 1960s, Levy and Kunitz (1974:79) suggested that Navajos had only recently been exposed to the contemporary forms of drinking then acceptable to the American middle class. The narratives of respondents who began drinking regularly after 1970 reveal a stark contrast with their descriptions of the previous decades. Less than one forth of the nearly 700 individuals[5] who began their regular drinking after 1970 had never lived off the reservation. Nearly 40% had lived off the reservation for 5 or more years, and 36% lived off for 1–4 years. The nature of these off-reservation experiences varied, but there was considerable social involvement with non-Indians encountered at college, in the military, and at work. Our impression is that about equal proportions of the those who lived off the reservation reported drinking primarily with "working class" and "middle class" non-Indians. In addition, a substantial proportion of the Navajo population in both the east and the west has been reared in border towns since 1970. Attitudes about drinking and drinking behaviors have been shaped, in part, by these factors.

The degree to which some attitudes are shaped may be illustrated by the extreme example of a young Navajo man who grew up entirely in Farmington. His friends included other Navajos whose families attended the same Protestant church and who lived in town and some Anglos and Hispanics in his lower middle class neighborhood. His high school drinking companions were usually about a half dozen Navajo friends. They drank on rare occasions (three or four times a year) at a "party place" in the hills north of Farmington frequently mentioned by both Navajo and Anglo youths, and each drank about four or five cans of beer "just to get a buzz." He felt that there was never any discrimination against Navajos in Farmington. On the other hand, he later commented that some of the drunks from the reservation had a hard time in town, but he gave the impression that these particular Navajos deserved the treatment they received because they were often obnoxious. Before his graduation from high school, in about 1990, he and his friends sometimes "rolled drunk Navajos for fun."[6] He quickly added that they never really hurt anybody, however. While in the service, he was stationed in Germany and drank with the other soldiers in his unit when "stress builds up." The amount he drank was about the same as during high school.

Another respondent, from a farming community near Fruitland, drank in high school during the mid-1980s but "kept it moderate" (only one beer or a wine cooler) because he was usually the designated driver. After graduation he stopped drinking. He began drinking again while in the service in Germany. He drank only on the weekends and most frequently with an Anglo couple—a fellow serviceman and his wife. They would take weekend trips to different places in Germany, stay at an inn, and sample the local beers and wines. He drank more from

"curiosity than anything." Usually he would have a bottle, but, he added, "those were big bottles, a liter." He especially liked Oktoberfest and went to three such celebrations in Germany. He tended to drink more at these occasions.

Today, the range of drinking styles is great so that it would be a mistake to speak of a typical style. The kinds of drinking events in which Navajos have participated are also varied, and the "learning models" presented to all Navajos are numerous. These include not only those of one's family, home community, and the border towns, but also working class bars in Texas, college "keggers" in Tempe, and Oktoberfests in the Rhineland. The drinking behaviors of non-Indians have also changed considerably over time and have provided models of both normative and deviant drinking for Navajos over the years at the same time that the attraction of drinking and the traditional values of sharing and avoiding excess have also persisted.

Notes

1. Levy and Kunitz (1974:73) commented that "all informants [in the Tuba City Service Unit during the 1960s] emphasized the prestige status of whiskey."

2. It is difficult to estimate the economics of the bootleg business in the 1930s and 1940s. A Two Gray Hills man said commercial wine purchased from bootleggers within the reservation cost $2 per pint (sometimes for only a half-pint) in the early 1950s. Another man noted that a Fruitland trader would exchange a pint of whiskey for one lamb in the 1930s.

3. Indian bars remain in Farmington but are no longer found in Cortez and Flagstaff. In Cortez, many Navajos avoided one of the "Indian bars" because its clientele was predominately Ute. One informant said that the bar was known as "the place where the Utes slide out" because of the ramp at the front entrance. An "Indian bar" was never really established in Page. There are no bars of any kind in Blanding. Most agreed that only the "alcoholics" would drink at Farmington's Turnaround and that the Copper Penny had a similar clientele. There were also two bars with almost exclusively Navajo clienteles, My Place and Zia Lounge, located across from one another on the highway about half-way between Farmington and Shiprock.

4. The background variables are Parents' livestock; Father's education; Mother's education; Community in which raised; Informant's education; Father's drinking; Mother's drinking.

5. N = 694; 20, no information; 157 (23.3% of 674) never lived off-reservation; 36.8% lived off for 1–4 years; and 39.9% lived off for 5+ years.

6. Most references to "rolling" drunks do not involve physical violence.

4

ALCOHOL DEPENDENCE: DEFINITION, PREVALENCE, AND RISK FACTORS

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Thus far we have considered alcohol use as normative without paying much attention to the difficulties it causes for individuals, families, and a variety of institutions. In Chapter 1 we noted that the lifetime prevalence of alcohol dependence in this population is high compared with national figures. In this chapter, therefore, we turn to a consideration of its definition and prevalence and to some possible risk factors.

DEFINITION

The diagnosis of alcohol dependence is not without problems. In this study, the diagnosis is based on the criteria in DSM-III-R, to which the version of the Diagnostic Interview Schedule (DIS) we used is matched (see Appendix 1). The criteria for alcohol dependence according to DSM-III-R are as follows:

A. At least three of the following:
   1. Alcohol often taken in larger amounts or over a longer period than the person intended
   2. Persistent desire or one or more unsuccessful efforts to cut down or control alcohol use
   3. A great deal of time spent in activities necessary to get alcohol, consuming it, or recovering from its effects

4. Frequent intoxication or withdrawal symptoms when expected to fulfill major role obligations at work, school, or home or when alcohol use is physically hazardous
5. Important social, occupational, or recreational activities given up or reduced because of alcohol use
6. Continued alcohol use despite knowledge of having a persistent or recurrent social, psychological, or physical problem that is caused or exacerbated by the use of the substance
7. Marked tolerance: need for markedly increased amounts of alcohol to achieve intoxication or desired effect or markedly diminished effect with continued use of the same amount
8. Characteristic withdrawal symptoms
9. Alcohol often used to relieve or avoid withdrawal symptoms

B. Some symptoms of the disturbance have persisted for at least 1 month or have occurred repeatedly over a longer period of time

The criteria for severity are as follows

1. Mild: Few, if any symptoms in excess of those required to make the diagnosis, and the symptoms result in only mild impairment in occupational functioning, or in usual social activities or relationships with others
2. Moderate: Symptom or functional impairment intermediate between "mild" and "severe"
3. Severe: Many symptoms in excess of those required to make the diagnosis, and the symptoms markedly interfere with occupational functioning or with usual social activities or relationships with others

These criteria for alcohol dependence and for severity of dependence imply, first, that alcohol dependence is a discrete entity—either one has it or not—and not a continuous variable. Second, it also means that there are degrees of severity once one has the condition. The problem this raises is where precisely to draw the line between alcohol dependence and nondependence. Why three criteria rather than two? Or four? Thus, as we noted in Chapter 1, alcohol dependence can also be considered a continuous variable, with nonabusive drinking gradually shading into abusive drinking. This is an important issue both in understanding the phenomenon and in analyzing it. It is one thing to consider it as an unequivocal dichotomy with each person either being definitely alcohol dependent or definitely not being dependent, and it is quite another thing to consider it as a continuum from people who are completely nondependent on alcohol, through various intermediate levels of dependence, to people who are highly dependent on alcohol. In this study, we use both ways of assessing alcohol dependence. When treated

as a discrete variable, the term *alcohol dependence* is used. When treated as a continuous variable, the acronym ALCSUMAB is used. In order to get a continuous variable of alcohol dependence we sum the positive answers to the 26 questions from the DIS for the diagnosis of alcohol dependence (A) and severity (B).

Both ways of analyzing alcohol dependence have advantages. Consider first the continuous measure. For each respondent, there are responses to 26 distinct questions (see Table 4-1), each of which is related to an aspect of alcohol dependence. These can be used to obtain the distributions of the controls of each sex by the number of positive responses to the 26 questions—the ALCSUMAB variable—as shown in Figure 4-1.

The most frequent ALCSUMAB score is zero, the distribution being asymmetric, with the frequencies falling off as the score increases. Among the men, about 12% have zero scores, and lesser and lesser percentages have scores from 1 to about 20, beyond which there are very few men. For women, on the other

Table 4-1. Questions from the Diagnostic Interview Schedule for the Diagnosis of Alcohol Dependence (ALCSUMAB)

97a:	Neglect some of responsibilities when on binges?
97b:	Did that several times?
98:	Ever get tolerant to alcohol?
101:	Many days when drank more than expected?
102:	Tried to cut down or quit more than once?
104:	Found couldn't cut down or quit?
105:	Unable to quite more than once?
108:	Made rules because of having trouble limiting drinking?
109:	Tried to follow rules several times or once for at least a month?
110:	Too much time drinking or getting over its effects?
111:	Did this period last more than a month?
112:	Ever reduced activities in order to drink?
113:	Once for more than a month or several times?
114:	Drinking kept you from responsibilities?
120:	After having had problems, continued to drink more than once?
121:	Ever had trouble driving?
122:	Trouble driving several times?
124:	Injured self more than one time during drinking?
125:	Drinking in risky situations?
126:	Withdrawal symptoms?
126b:	Withdrawal symptoms more than once?
127:	Drink to keep from having a hangover or the shakes?
128:	Do that more than once?
129:	Health problems from drinking?
131:	Continue drinking more than once after that?
132:	Continue drinking after any other serious illness made worse by drinking?

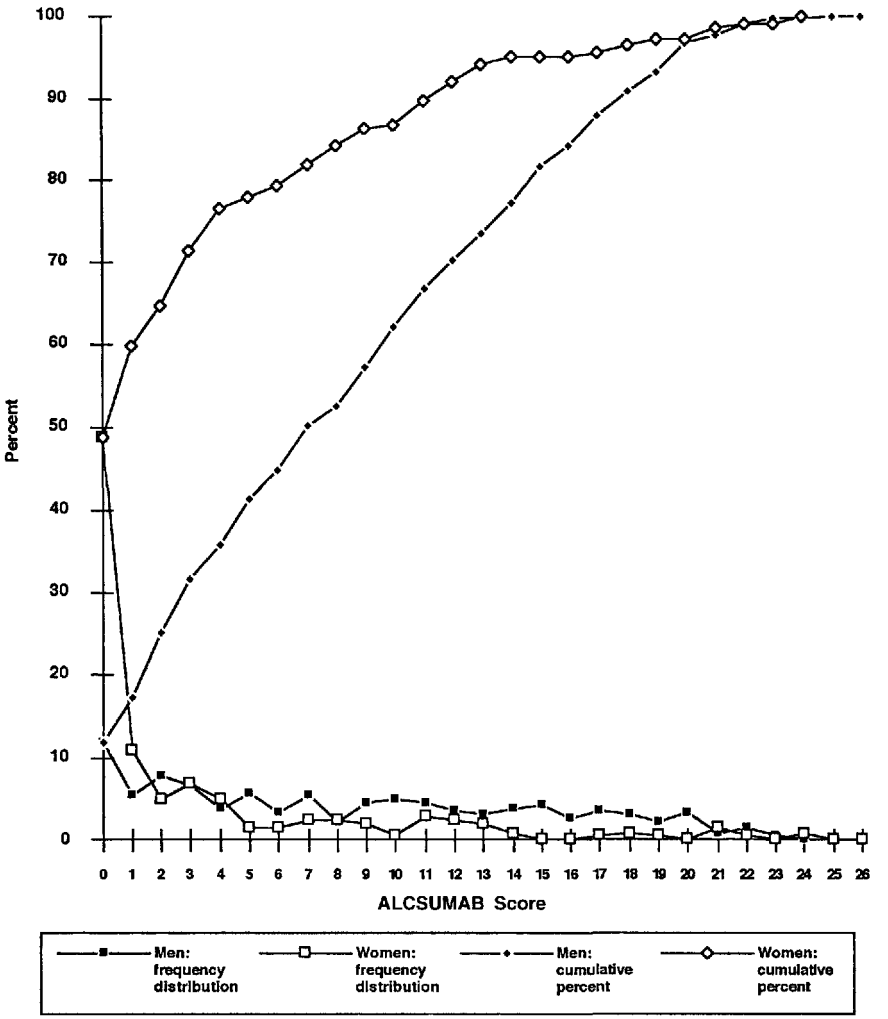

Figure 4-1. ALCSUMAB scores: male and female controls.

hand, as many as 49% have zero scores, and most of the others have scores between 1 and 4, with rare women having scores beyond 4.

The wide extension of the men's distribution (i.e., the large spread of their scores) indicates a continuously varying phenomenon, without any obvious partition into typically alcohol-dependent individuals as distinct from nondependent ones. For women, on the other hand, there is a sharp distinction between the zero-score clearly nondependent ones and the somewhat alcohol dependent ones with one to four positive responses. This is typical of a bimodal phenomenon.

The same 26 items may also be used to determine which of them most power-

fully distinguishes among the three samples. The details are described in Appendix 2. Here we shall say simply that the variables that best distinguish among the samples for both women and men are those that have to do with the loss of control and with the physiologic consequences of alcohol use. Those having to do with risky behavior, such as driving while drinking, and with failure to meet responsibilities do not loom as large. Evidently this sort of behavior is more evenly distributed across samples. Moreover, fewer variables are needed to differentiate among the samples of women than among the samples of men due to the fact that alcohol dependence is more nearly bimodal among the former than the latter.

PREVALENCE

Despite the continuous nature of the distribution of male (and to a lesser degree female) responses described above, it is useful for some purposes to consider alcohol dependence a discrete variable, and we do so in the following discussion. Table 4-2 lists the proportions of male and female controls with a lifetime history of alcohol dependence. They are precise mirror images of each other: 70.4% of men and 29.6% of women have a lifetime history of alcohol dependence, and 29.6% of men and 70.4% of women have no such history. There are no significant differences between the two Service Units.

The rates in Table 4-2 are a reasonable estimation of the lifetime prevalence of alcohol dependence in the adult Navajo population because the controls are an adequate random sample of the adult Navajo population (see Appendix 1). They are virtually identical to those reported from an Indian community in the Northwest (Leung et al., 1993) and from another in the Southwest (Robin, et al., 1998). They are substantially higher than those reported by the Epidemiological Catchment Area Study using an only slightly different version of the questionnaire used in this study. The lifetime prevalence rates reported in that study ranged from 12.2% to 15.1% among men aged 18 to 64 years, and from 3.5% to 2.2% among women aged 18 to 64 years (Helzer et al., 1991:91).

Table 4-2. Lifetime Prevalence of Alcohol Dependence Among Male and Female Controls

	MALE		FEMALE	
	N	PERCENT	N	PERCENT
Alcohol dependent	374	70.4	60	29.6
Non-alcohol dependent	157	29.6	143	70.4
Total	531	100.0	203	100.0

RISK FACTORS

Family Background

One of the major explanations of alcohol dependence among American Indians is the stress of social change and acculturation (Levy and Kunitz, 1974). This would lead us to expect that measures of acculturation should be observed more commonly in the families of origin of alcoholics than non-alcoholics. On the other hand, our previous work has indicated that behavior consistent with alcohol dependence has been widespread among Navajos of all backgrounds and social statuses for at least a century.

If the acculturation explanation were true, we would expect that alcohol dependence would be especially likely among people who grew up in agency and border towns, in single household camps, with parents who owned little or no livestock and did unskilled wage work, that is, people marginal in both the traditional and contemporary stratification systems. If the alternative explanation is true, then none of these variables should differentiate alcohol-dependent from non-alcohol-dependent respondents. Tables 4-3 and 4-4 display the results of comparisons among the three samples for men and women separately.

In fact, there are few significant differences among the samples. Type of community of origin does not differ (Table 4-3) nor do parents' livestock holdings and educational attainments. It would seem that women cases (CAS) come from smaller camps than women non-alcohol-dependent controls (NADC), but men CAS come from larger camps then men NADC.

Table 4-5 displays the proportions of men and women who had mothers and fathers in the household at various ages. The results indicate that, among both women and men, CAS are more likely than NADC or alcohol-dependent controls (DEP) to have had one or both parents absent in late childhood and adolescence.

Table 4-3. Type of Community of Origin, by Sex and Sample, as Percentages

	MEN*			WOMEN†		
COMMUNITY TYPE	CAS (N = 204)	DEP (N = 374)	NADC (N = 157)	CAS (148)	DEP (60)	NADC (N = 143)
Reservation rural	42.2	52.1	56.1	33.8	20.0	32.9
Agency town	14.2	15.5	10.8	14.2	15.0	12.6
Off-reservation	4.9	4.8	3.8	5.4	0	4.2
Combination	38.7	27.5	29.3	46.6	65.0	50.4

*Pearson's chi-square = 11.488; d.f. = 8; *P* value = 0.0744.

†Pearson's chi-square = 9.103; d.f. = 8; *P* value = 0.1679.

Table 4-4. Household and Parental Attributes and *P* values of One Way ANOVAs, by Sex and Sample

	MEN				WOMEN			
	CAS	DEP	NADC	*P*-VALUE (F RATIOS)	CAS	DEP	NADC	*P*-VALUE (F RATIOS)
Number of households								
at age 0–6 (S.E.)	1.90 (0.09)	1.75 (0.06)	1.81 (0.09)	0.3914 (0.9392)	1.66 (0.09)	1.40 (0.14)	1.96 (0.09)	0.0043 (5.5483)
at age 7–12 (S.E.)	1.93 (0.09)	1.63 (0.06)	1.82 (0.10)	0.0248 (3.7152)	1.68 (0.09)	1.26 (0.15)	2.02 (0.10)	0.0002 (8.9621)
at age 13 or older (S.E.)	1.76 (0.08)	1.54 (0.06)	1.73 (0.09)	0.0897 (2.4198)	1.63 (0.11)	1.45 (0.17)	1.88 (0.11)	0.0772 (2.5806)
Parents' livestock (S.E.)	208.5 (31.2)	250.9 (23.1)	293.5 (35.9)	0.2012 (1.6071)	99.5 (19.4)	123.0 (29.0)	147.1 (17.8)	0.1979 (1.6286)
Father's education (S.E.)	5.2 (0.4)	4.8 (0.3)	4.5 (0.4)	0.5270 (0.6413)	5.8 (0.5)	6.6 (0.8)	5.2 (0.5)	0.3384 (1.0880)
Mother's education (S.E.)	4.1 (0.3)	4.0 (0.2)	3.8 (0.4)	0.8198 (0.1987)	4.4 (0.4)	6.2 (0.7)	5.2 (0.4)	0.0994 (2.3251)

Table 4-5. Proportion with Mothers and with Fathers in the Home, by Sex, Age, and Sample

	MOTHER IN HOME					FATHER IN HOME				
AGE (YEARS)	CAS	DEP	NADC	χ^{2*}	*P* VALUE	CAS	DEP	NADC	χ^{2*}	*P* VALUE
					Women					
0–6	88.5%	90.0%	93.7%	3.161	0.2059	78.3%	82.8%	82.3%	0.900	0.6376
7–12	81.7%	83.3%	88.1%	7.009	0.1354	66.4%	78.6%	74.2%	3.534	0.1708
>13	79.8%	94.6%	90.5%	10.697	0.0048	56.7%	74.5%	69.0%	6.779	0.0337
					Men					
0–6	92.1%	92.2%	96.2%	2.445	0.2945	82.6%	86.4%	88.9%	3.091	0.2132
7–12	79.4%	87.9%	89.8%	12.641	0.0491	70.9%	81.2%	79.3%	7.766	0.0206
>13	82.1%	90.2%	88.6%	7.966	0.0186	67.6%	77.6%	72.1%	6.476	0.0392

*Pearson's chi square, d.f. = 2 for each test.

As discussed in Chapter 2, the livestock-based system of social stratification was fundamentally altered with the reduction program in the late 1930s. Thus, the parents of our informants may have engaged in a wide range of occupations, from "traditional" to "modern." There are no differences in parents' occupation among women in the three samples (data not shown), but there is a marginally significant ($P = 0.0478$) difference among men, accounted for by the proportion of parents in each sample who combined traditional and unskilled blue-collar occupations: CAS, 34.3%; DEP, 42.2%; and NADC, 45.9%. The substantive significance of this finding is also questionable.

These measures taken one at a time do not adequately represent the complexity of status change, however. Although livestock holding continued to be an important element in local concepts of status, wage work provided "a new foundation for income and wealth differentiation" (Henderson, 1989:399). Individuals and families adjusted to the rapid change in the economy in a variety of ways. For those who were poor in livestock, the expanding involvement in wage labor was potentially beneficial. By acquiring a skilled trade or obtaining a white-collar job, one could establish greater economic security than was formerly possible. For the former "ricos," acquisition of steady and well-paying jobs was necessary simply to maintain some semblance of their former well being.

Given the dual measures that are salient in the Navajo ascription of social status, we have constructed a social status variable that acknowledges the enduring legacy of the disrupted livestock economy as well as the new basis of status derived from employment. We have divided the sample into four categories based on typical parental occupations and family livestock holdings:

1. Those whose parents had few stock (less than 100 head of sheep) and low status in the emergent wage economy (engaging primarily in unskilled labor such as migrant farm work) or who had not worked for wages
2. Those whose parents had few stock but obtained skilled blue-collar or white-collar positions in the emergent wage economy (such as carpenter, bus driver, or bureaucrat)
3. Those whose parents had substantial numbers of stock (more than 100 head of sheep) but low status in the wage economy
4. Those whose parents had relatively high status in both the livestock and the wage economies.

There was no significant association of alcohol dependence and this measure of family status for either men or women or for people below age 50 years and age 50 years and above (data not shown). Thus, there is no evidence that

broad differences in the way respondents' families of orientation adapted economically to "modernization" is associated with alcohol dependency.

One of the most important markers of acculturation is religious affiliation and change. Moreover, religions take very different positions with regard to the use of alcohol. Historically, America's Protestant churches have been leaders in the various temperance movements. Today, however, although all preach sobriety, only the Church of Jesus Christ of Latter Day Saints (Mormon) and the various evangelical sects demand total abstinence. In addition, the Native American Church, also known as the *peyote religion,* is thought by many to be a particularly effective antidote to alcohol abuse.

Despite early Navajo rejection of Christian missionary efforts, the twentieth century has witnessed a growing acceptance of evangelical protestantism whether fundamentalist or charismatic. In large part this is due to the fact that they, like the Native American Church, promise access to new sources of supernatural power, and, like traditional religion, this power can be used for healing. They have also come to use the Navajo language in religious services and to provide significant roles for Navajos (Aberle, 1982:219). The decline of traditional religion and the growth of evangelical protestantism and the Native American Church are reflected in the religious affiliations of the youngest male controls (aged 21–30 years) when compared with the religious affiliations of those of their fathers who were born before 1920. Whereas today only 12% of male controls between 21 and 30 years of age identify themselves as religiously traditional, some 41% of the fathers of controls born before 1920 were traditional. All of the "new" religions have made gains over the years, but the most dramatic increase in membership has been achieved by the various evangelical groups, which have increased 14-fold. The proportions claiming exclusive affiliation with the Native American Church and the established Protestant denominations have doubled, while the proportion of those who combine traditionalism with the Native American Church has increased eightfold. As the Native American Church and evangelical sects have grown, however, the proportion of those claiming adherence to no religion has tripled.

Thus, two seemingly disparate trends are at work. On the one hand, religions that eschew alcohol have become more prevalent, presumably leading their members to abstain and to encourage their children to abstain as well. On the other hand, it is argued by many that the loss of traditional culture as reflected in adherence to nontraditional religions has resulted in cultural confusion, which is a risk factor for alcohol misuse. Thus, we should expect that people raised in different religious traditions will differ in their use of alcohol, although the direction of the difference is not entirely obvious.

Table 4-6 indicates that among men there is a significant difference in religion in which raised depending on sample. NADC are significantly more likely

Table 4-6. Religion in Which Informants Were Raised, by Sample, as Percentages

	MEN*			WOMEN†		
RELIGION	CASES (N = 204)	DEP (N = 372)	NADC (N = 157)	CASES (N = 148)	DEP (N = 60)	NADC (N = 148)
Traditional	24.0	22.0	28.0	16.9	13.3	19.7
Native American Church	5.9	3.8	6.4	6.8	5.0	4.2
Protestant (established)	12.2	8.1	11.5	18.9	21.7	14.8
Protestant (evangelical)	11.3	8.6	4.5	10.8	11.7	6.3
Catholic	4.9	2.4	2.5	6.1	5.0	1.4
Mormon	2.9	6.4	5.1	7.4	11.7	13.4
Traditional and Native American church	4.9	8.6	15.3	1.3	3.3	6.3
Traditional and Christian	24.0	32.3	22.3	25.0	23.3	28.2
None	9.8	7.8	4.5	6.8	5.0	5.6
Total	99.9	100.0	100.1	100.0	100.0	99.9

*Pearson's chi-square = 36.86; d.f. = 16; $P = 0.002$.

†Pearson's chi-square = 17.61; d.f. = 16; $P = 0.347$.

than DEP or CAS to have been raised with a combination of traditional religion and the Native American Church and are less likely to have been raised as evangelical Christians. Among women there are no significant differences.

Explaining the different effects of the two religious categories is not a simple matter, as both take a similar position with regard to alcohol use. Much previous work has shown that the Native American Church has been associated with reductions in alcohol misuse among people with a history of alcohol abuse, and it is thus not surprising that it should also be associated with the prevention of abuse among those who have been raised in the church. The reasons for the reverse effect of evangelical Christianity is not clear. Certainly not all forms of Christianity are associated with alcohol misuse, so religious change per se is not necessarily a risk factor for—or protective against—alcoholism. With the data at hand, we cannot answer this question. Clearly, it deserves further attention.

The language spoken at home is another variable that is frequently used as a measure of acculturation. Language loss is a concern among many North American Indian tribes, among whom it is sometimes posited that the failure to transmit the native language is associated with loss of culture generally. There has been less decline in the use of the native language among the Navajo than among most American Indian tribes (e.g., Snipp, 1989:175–176). Across our samples there is some evidence of a shift to the use of English in the home, but even among those under age 50 years less than 15% of all respondents grew up in homes where En-

glish was the primary language. On the other hand, use of both English and Navajo in their home was substantial among younger respondents.

If use in the home of a language other than the native language of one's parents creates problems for individuals, or is a marker of acculturation leading to difficulties later in life, then we would predict that those learning English at home would be most likely to have problems with alcohol. What the data in Table 4-7 suggest is that people with primarily English at home indeed are rarest among NADC, but those with English and Navajo are most frequent among NADC. These results are consistent for all four groups, although significant only for younger males.

Parents' Drinking Patterns

It is widely observed that alcoholics tend to have parents who were alcoholics. Table 4-8 displays parental drinking patterns at the time informants were growing up. The indication is that alcohol-dependent informants generally had parents who were abusive drinkers. The exception is that paternal drinking patterns are not significantly associated with alcohol dependence among women. For men (data not shown), the results are also significant for drinking patterns of siblings, other camp members, and visitors to the home. For women, none of these is significant. Thus, male alcoholics described themselves as having been surrounded

Table 4-7. Language Spoken at Home when Informants Were Growing up, by Sex, Age, and Sample, as Percentages

	MEN			WOMEN		
	CAS	DEP	NADC	CAS	DEP	NADC
Under 50 (N)*	180	322	122	133	54	128
Primarily Navajo	75.0%	67.4%	62.3%	46.6%	48.1%	43.0%
Primarily english	12.8%	12.4%	10.7%	16.5%	18.5%	15.6%
Combination of English and Navajo	12.2%	20.2%	27.0%	36.8%	33.3%	41.4%
Over 50 (N)†	23	52	35	14	6	15
Primary Navajo	95.7%	92.3%	91.4%	64.3%	50.0%	60.0%
Primarily English	0	1.9%	0	7.1%	16.7%	6.7%
Combination of English and Navajo	4.3%	5.8%	8.6%	28.6%	33.3%	33.3%

*For men, $P = 0.029$; d.f. = 6; Pearson's chi square = 10.78; for women, $P = 0.872$; d.f. = 6; Pearson's chi square = 1.24.

†For men, $P = 0.811$, d.f. = 6; Pearson's chi square = 1.59; for women, $P = 0.944$; d.f. = 6; Pearson's chi square = 0.76.

Table 4-8. Parental Drinking Patterns, by Sex and Sample

	MEN			WOMEN		
	CAS	DEP	NADC	CAS	DEP	NADC
Fathers*						
Abstainer	15.4%	16.1%	22.3%	20.0%	22.0%	20.2%
Occasional drinker	17.5%	26.3%	31.1%	17.8%	13.6%	17.2%
Non abusive problem drinker	32.4%	28.5%	24.3%	22.2%	25.4%	27.6%
Physically abusive problem drinker	34.6%	29.1%	22.3%	40.0%	39.0%	35.0%
N	188	354	148	135	59	134
Mothers†						
Abstainer	60.0%	64.4%	75.6%	55.1%	65.0%	72.3%
Occasional drinker	16.5%	16.2%	15.4%	15.0%	13.3%	9.2%
Non abusive problem drinker	13.5%	14.8%	5.8%	15.0%	16.7%	12.1%
Physically abusive problem drinker	10.0%	4.6%	3.2%	15.0%	5.0%	6.4%
N	200	371	156	147	60	141

Note: For men, the results are also significant for drinking patterns of siblings, other camp members, and visitors. For women, none of these associations are significant.

*For men, chi square = 15.621; d.f. = 6; $P = 0.0159$; for women, chi square = 1.793; d.f. = 6; $P = 0.9377$.

†For men, chi square = 19.787, d.f. = 6, $P = 0.003$; for women, chi square = 13.240; d.f. = 6, $P = 0.0394$.

by problem drinkers, whereas, for women, only the mother's drinking behavior was significant.

If family socioeconomic background is not associated directly with alcohol dependence among the informants, perhaps that is because it is mediated by parental drinking. To analyze the causes of parental drinking, only the parents of controls are considered, fathers of men and women are treated together, and mothers of men and women are also combined. The first question is whether there are generational differences in parental use of alcohol. Table 4-9 displays fathers' and mothers' average years of birth by drinking pattern.

Among fathers, occasional drinkers were significantly more likely to have been born earlier than either abstainers or problem drinkers (both nonabusive and abusive). In other words, there was a tendency for drinking patterns to have bifurcated, with younger fathers becoming either abstainers or problem drinkers. The trend was similar for mothers but did not reach statistical

Table 4-9. Parents' Average Birthyear and Parents' Drinking Patterns, Controls Only; One-Way ANOVAs

	FATHERS*			MOTHERS†		
DRINKING PATTERNS	N	YEAR	S.E.	N	YEAR	S.E.
Abstainer	113	1926.4	1.3	458	1930.1	0.5
Occasional drinker	145	1920.0	1.1	93	1927.9	1.3
Problem drinker	166	1924.7	1.1	83	1929.6	1.4
Abusive problem drinker	181	1927.8	1.0	33	1933.8	2.2
Total	604			667		

*F ratio = 9.0649; $P < 0.0001$.

†F ratio = 1.8526; $P = 0.1363$.

significance. Among mothers, abstainers were by far more numerous than problem drinkers. Among fathers, problem drinkers became more numerous than abstainers.

It appears that religious affiliation is a large part of the explanation of paternal drinking patterns. Among the fathers of male and female informants, the only religious affiliations significantly associated with drinking pattern are traditional Navajo religion and membership in the Native American Church. Of fathers who were described as traditional (including those who combined traditional with other religion; N = 477), 15.9% were abstainers. Of fathers who were members of the Native American (peyote) Church (also including some who combined it with other religions: N = 183), 27.8% were abstainers. Other religious affiliations were too infrequent to have had an impact. Fathers who were members of the Native American Church were significantly younger than other fathers but did not differ in educational attainment or livestock ownership. In a multiple regression analysis with fathers' drinking pattern as an ordinal dependent variable and fathers' education, livestock ownership, religious affiliation, year of birth, and stratification as independent variables, only father's membership in the Native American Church was significant (see Appendix 3, Table A3-1).

These results suggest that in the course of the twentieth century the secular trend in paternal drinking patterns was more complex than simply a shift to increasingly abusive drinking and that it was not associated in any obvious way with measures of social stratification. Abstainers also became more frequent. Thus, with regard to alcohol use, there appears to have been increasing heterogeneity among the fathers of our informants in the years before World War II, but there was a real increase in the proportion who were abusive drinkers. The story is less complex for mothers. None of the variables is significant. This appears to

be because a very high proportion of mothers of all ages were abstainers (see Appendix 3, Table A3-1).

The limited evidence available thus suggests that the drinking of fathers has become more heterogeneous over time but that being "traditional" is not associated in any simple fashion with parental drinking behavior. Heavy drinking was as pervasive among the fathers of our informants as it is among the informants themselves, and no measures of status, traditionalism, or acculturation (except membership in the Native American Church) are significantly associated with it. There is, however, suggestive evidence that different risk factors are important for men and women. Men who became alcohol dependent describe themselves as having been surrounded by pervasive drinking. Women who became alcohol dependent seem to be responding much more to specific familial issues reflected in camp size and maternal drinking behavior. Absence of parents during childhood and adolescence was important for both men and women.

Conduct Disorder

One of the major risk factors for alcohol dependence in many populations is antisocial personality disorder (ASPD). As many as 40% of men and 20% of women in alcohol treatment programs meet the criteria for ASPD (Hesselbrock et al., 1985; Ross et al., 1988). These alcohol-dependent people are likely to manifest more severe alcohol-related problems than others; are more likely to have family histories of alcohol abuse; have a wider array of other problems; and do not improve as significantly after treatment (Kadden et al., 1989; Litt et al., 1992; Rounsaville et al., 1987). In the population-based Epidemiologic Catchment Area Study, the odds ratio for people with ASPD having alcohol dependence was 21, higher than for any other comorbid condition (Regier et al., 1990).

As noted in Chapter 1, in our 25-year follow-up study of three groups of Navajo Indians (Kunitz and Levy, 1994), we found that those who died young seemed to have characteristics that were compatible with a diagnosis of ASPD. That observation led to the present study, which was meant to test the hypothesis that conduct disorder before age 15 years, which is a necessary precondition for a diagnosis of ASPD, is also an important risk factor for, and thus a useful predictor of, subsequent alcohol dependence. Conduct disorder was diagnosed with questions from the DIS. Like alcohol dependence, it can be treated as a dichotomous or continuous variable. When treated as dichotomous, the term *conduct disorder* is used. When continuous, the variable is logASYES (see Appendix 1 for further discussion).

Although conduct disorder occurred before age 15 years, alcohol dependence and abuse may occur at any age. To assert a causal association, conduct disorder must precede alcohol abuse and dependence. Therefore, the ages at

which individuals first drank at all, first drank at least once a month for 6 months, and first thought that alcohol was a problem for them were all examined. People with a history of conduct disorder began drinking at earlier ages than people without such a history, but in no sample or subgroup within a sample did regular drinking begin at an average age below 15 years, and in no group did problem drinking begin on average before the early 20s (see Appendix 3, Table A3-2). Thus, for most informants, even those with conduct disorder, regular alcohol use began after the age when conduct disorder was manifested even though the age at which alcohol was first tried was substantially younger.

Table 4-10 displays for each sample and sex the average conduct disorder scores (logASYES) and the proportion with a history of conduct disorder. In each analysis it is clear that there is a progression of conduct disorder from a high among the cases (CAS), to intermediate among the alcohol-dependent controls (DEP), to a low among the non-alcohol-dependent controls (NADC), which supports the importance of conduct disorder as a risk factor for alcohol dependence.

We are also interested in knowing whether the presence of conduct disorder increases the risk of alcohol-related and non-alcohol-related problems. This is examined by regressing the three samples onto the conduct disorder score (logASYES) and several variables indicating problematic behaviors, both alcohol and non-alcohol related (Table 4-11).[1]

The results establish a significant association between conduct disorder and alcohol dependence as well as between alcohol dependence and several dysfunctional behaviors. Dysfunctional behavior is therefore likely to be associated with conduct disorder, but this association may or may not be entirely mediated by alcohol dependence. To test this, logistic regressions of the dysfunction variables onto logASYES, given the stratification, were run separately for CAS, DEP, and NADC and the resulting *P* values listed in Table 4-12. The results show that conduct disorder is strongly associated with dysfunctional behavior *within* the CAS

Table 4-10. Conduct Disorder by Sex and Sample

	MALE			FEMALE		
	CAS	DEP	NADC	CAS	DEP	NADC
Mean logASYES	1.19	0.84	0.50	0.88	0.79	0.46
S.E.*	0.03	0.03	0.05	0.04	0.07	0.04
Percent with conduct disorder before age 15 years†	54.4	27.3	10.2	33.1	25.0	7.0

*For men, F ratio = 55.0512, $P < 0.0001$; for women, F ratio = 19.9539, $P < 0.0001$.

†For men, chi square = 86.239, d.f. = 2, $P < 0.0001$; for women, chi square = 30.479; d.f. = 2, $P < 0.0001$.

Table 4-11. Multiple Ordinal Regressions of Sample onto Each Dysfunctional Behavior and Stratification Separately: Partial Regression Coefficients on Dysfunctional Behaviors

EXPLANATORY VARIABLES	ESTIMATED	S.E.	*P* VALUE
Has struck partner	0.447	0.063	<0.0001
Has struck partner first	0.087	0.123	0.4792
logASYES	1.073	0.098	<0.0001
Square root ALCSUMAB	2.300	0.107	<0.0001
Presently employed	–0.562	0.620	<0.0001
Number of drugs used	0.289	0.032	<0.0001
Ever been fired more than once	1.347	0.201	<0.0001
Quit three or more times before having another job	1.168	0.209	<0.0001
Arrested for non-alcohol-related offense	–0.405	0.091	<0.0001
Imprisoned for non-alcohol-related offense	–0.637	0.113	<0.0001
Involved in drunken fights	2.022	0.134	<0.0001

and DEP groups and much more weakly among the NADC. This means that conduct disorder is positively associated with alcohol dependence and, additionly is associated with dysfunctional behavior. Thus people with a history of conduct disorder engage in more problematic behaviors and have more severe alcohol-related problems than other people, even taking alcohol dependence into account.

Recall that the lifetime prevalence of alcohol dependence was 70.4% among men and 29.6% among women. We now estimate how much of this alcohol dependence is attributable to conduct disorder. To do this, we ask what the prevalence of alcohol dependence would be if there were no conduct disorder. This is done by comparing the prevalence of alcohol dependence among all those without conduct disorder to the prevalence in the total population. The results are displayed in Table 4-13, which uses only data from the controls (DEP and NADC). Women are treated as one group, but men are divided by age and community because the prevalence of alcohol dependence differed among strata for men but not for women (see Appendix 1).

To understand the calculations, consider the first row of the table. Among *only* those women controls without a history of conduct disorder, the proportion with a history of alcohol dependence (DEP) is 0.253 (column 4). Among *all* women controls, including those both with and without a history of conduct disorder, the proportion DEP is 0.296 (column 6). If there were no conduct disorder, the lifetime prevalence of alcohol dependence among women would be 0.253, not 0.296. Thus the attributable risk is 0.296 – 0.253 = 0.043, or 4.3% (Gordis, 1996). Table 4-13 also displays 95% confidence intervals for the attributable risks. The rest of the calculations in the table are done the same way. They indi-

Table 4-12. Multiple Regressions of Dysfunction Variables on logASYES and Stratification, by Sample: Partial Regression Coefficients of logASYES

	CAS			DEP			NADC		
	ESTIMATED	S.E.	*P*	ESTIMATED	S.E.	*P*	ESTIMATED	S.E.	*P*
No. different drugs	1.347	0.179	<0.0001	0.962	0.154	<0.0001	0.352	0.170	0.0015
Fights when drunk	0.173	0.038	<0.0001	0.227	0.038	<0.0001	0.057	0.022	0.0116
In prison for non-acohol offenses	–0.818	0.291	0.0050	–1.072	0.373	0.0041	0.979	1.112	0.3786
Arrested for non-acohol offenses	–0.685	0.265	0.0099	–0.705	0.268	0.0086	1.037	0.656	0.1138
Severity of alcohol *dependency* ALCSUMAB	0.389	0.057	<0.0001	0.349	0.066	<0.0001	0.098	0.076	0.1989
Ever struck partner	0.394	0.201	0.0503	0.310	0.185	0.0941	0.683	0.288	0.0177
Ever struck partner first	0.660	0.334	0.0482	0.233	0.391	0.550	0.577	0.578	0.3181
Quit job three or more times before having another	0.048	0.031	0.1284	0.048	0.023	0.0367	0.058	0.016	0.0005
Fired more than once	0.059	0.033	0.0794	0.049	0.025	0.0529	0.008	0.009	0.3803

Table 4-13. Proportion Alcohol Dependent (DEP) Among Controls, with Calculation of Risk Attributable to Conduct Disorder (CD), by Sex, Age, and Type of Community of Residence

	CD		NO CD		ALL CONTROLS			ATTRIBUTABLE RISK	95% CI†
	1	2	3	4	5	6	7	8	9
	N	PROP. DEP	N	PROP. DEP	N	PROP. DEP	*P**	COL. 6 – COL. 4	
Women	25	0.600	178	0.253	203	0.296	0.001	0.043	0.02, 0.07
Men 50 years or older									
Agency town	1	NA	16	0.312	17	0.353	0.163	0.040	—‡
Border town	2	NA	7	0.714	9	0.667	0.571	–0.048	—‡
Other reservation	4	0.750	57	0.649	61	0.656	0.682	0.007	–0.02, 0.04
Men younger than 50 years									
Agency town	45	0.911	100	0.770	145	0.814	0.043	0.044	0.01, 0.08
Border town	16	0.812	55	0.618	71	0.662	0.148	0.044	–0.01, 0.10
Other reservation	50	0.860	178	0.640	228	0.689	0.003	0.0484	0.02, 0.07

Note: Prop., proportion; col., column, NA, not applicable.

* *P* value for difference between proportion DEP among CD and among no CD.

† Approximate confidence interval on attributable risk.

‡ No reliable estimate because of small sample of controls with CD.

cate that, for both men and women, the proportion of alcohol dependence that may be attributed to conduct disorder is well below 10%.

This means that conduct disorder is a sufficient but not a necessary cause of alcohol dependence. That is to say, a history of conduct disorder is strongly predictive of alcohol dependence, but a great deal of alcohol dependence occurs in the absence of conduct disorder. On the other hand, among those alcohol-dependent people with a history of conduct disorder, alcohol-related and non-alcohol-related problems are more severe than they are among people without such a history.

Childhood Sexual and Physical Abuse

The evidence from Native-American communities, limited though it is, indicates that child abuse is not unknown (U.S. Congress, Office of Technology Assessment, 1990). For Navajo children, White and Cornely (1981) and Hauswald (1987) report a rate of 13.5 per 1,000. Drawing on a medical chart review and staff survey at the San Carlos (Apache) Indian Health Service Hospital, Fischler (1985) found a rate of 5.7 per 1,000. For Cheyenne River Sioux Reservation children, Wichlacz, et al., (1978) reported a rate of 26 per 1,000, derived from a register of suspected cases. The highest rate comes from a community study of an Alaskan village where one third (28 of 84) of the native children were considered to have severe problems of abuse, neglect, and homelessness related to poverty and demoralization in the village (Jones, 1969). The reported age-specific incidence rate of abuse of children less than 18 years of age on the Navajo Reservation in 1992–1995 varied between 3.3 and 4.3 per 1,000 (Northern Navajo Medical Center, 1996). Because these data come from the Navajo Criminal Justice System and represent reported cases, they are very likely much lower than the true incidence.

Human service providers who work with Native-American children and adolescents in the Albuquerque and Phoenix Indian Health Service service areas attributed abuse and neglect "to chaotic family situations and to other mental health problems such as alcoholism and depression" (Piasecki et al., 1989:59; see also Lujan et al., 1989). Indeed, there are data to support the association of alcohol abuse by parents and other caretakers and the abuse of Native-American children. Based on a case-control study in several southwestern Native-American communities, DeBruyn et al., (1992) claim that alcohol abuse is a necessary but not sufficient cause of abuse and neglect. They also observed that, in addition to alcohol abuse, abuse of other substances by parents, "histories of divorce, death in the immediate family, single-parent households, alcohol abuse by grandparents and deaths in the family associated with alcoholism" were all risk factors for abuse of children (DeBruyn et al., 1992:309). An early case–control study of ne-

glected infants in one Navajo community indicated that neglected infants were especially likely to have mothers who were single, widowed, or divorced and who came from smaller families than did controls (Oakland and Kane, 1973). Although none of these is inconsistent with what is known from studies of non-Indian populations (e.g., Mullen et al., 1996), virtually all studies in Native-American communities have been of cases known to official agencies. Thus their reported severity as well as the significance of multiproblem families may be greater than would be found in community surveys.

What is less clear than the risk factors for abuse are the long-term sequelae. Studies in other populations indicate that there are a number of untoward consequences, including depression (Mullen et al., 1996) and violence (Widom, 1989). There is some disagreement about alcohol abuse, however. In a recent review of the literature and report of a retrospective cohort study of abused and nonabused children, Widom et al., (1995) have suggested that studies of clinical populations tend to show an association between the experience of childhood abuse and subsequent alcohol dependence but that in community studies, including their own, no such association was observed. On the other hand, Mullen et al., (1996) found that a history of sexual abuse, but not physical and emotional abuse, in childhood was a risk factor for heavy drinking among severely abused women. Holmes and Robins (1988) have found that severe parental discipline in childhood was a risk factor for subsequent alcohol abuse. McCauley et al., (1997) have shown that, among women, childhood physical and sexual abuse are risk factors for substance (including alcohol) misuse. Additionally, in a study of a southwestern Native-American community, a history of childhood sexual abuse was found to be a risk factor for multiple psychiatric problems in adulthood, including alcohol dependence and abuse (Robin et al., 1997). Of these four studies, three are of community populations and one (by McCauley et al., 1997) is of patients in general medical practices.

Many of the risk factors for conduct disorder are the same as those for childhood abuse, most notably unstable families, low socioeconomic status, and alcohol abuse by parents and other caretakers (Offord et al., 1986; McGaha and Leoni, 1995; Salzinger et al., 1991; Velleman, 1992a,b). Moreover, because the adult sequelae of childhood abuse and conduct disorder are also similar and in some studies include alcohol abuse, it is important to examine and if possible disentangle the associations between abuse and conduct disorder and their relative contributions to alcohol dependence.

Because the age, community, and gender distributions of controls reflected the distribution of cases and not that of the adult population, we first consider the degree to which the stratification variables influence the distribution of childhood abuse and conduct disorder among the controls (see Appendix 3, Table A3-3). None of the stratification variables is significantly associated with physical

abuse.[2] That is, there is no significant difference between people above and below age 50 years, between men and women, or between people living in different kinds of communities in their self-reported histories of physical abuse. This means that the prevalence of a history of physical abuse in the adult population can be inferred from the controls without adjustment for sampling strata. Overall, 12.7% of the sample reported such a history.

The pattern is different for self-reported histories of sexual abuse. Sex is significantly associated with this measure, but age and community of residence are not. This means that the prevalence of a history of childhood sexual abuse can be inferred for each sex, without adjustment for age and residence. Among women, 12.7% report such a history compared with 2.4 % of men. The age patterns of each type of abuse indicate that there may well have been no change in incidence during most of this century.

As noted above, conduct disorder is a complicating factor in the analysis because the risk factors for abuse are similar to the risk factors for conduct disorder. Thus, they may all co-occur. To explore this further, Table 4-14 displays the relationships separately between each form of abuse and conduct disorder.

Among both men and women, there are strong associations between abuse and conduct disorder. It is likely that the experience of abuse of either sort is a risk factor for conduct disorder (e.g., Kendall-Tackett et al., 1993; Straus et al., 1997), but it is also conceivable that causality works the other way: that children with conduct disorder are at increased risk of being abused, for example, by provoking their parents to punish them with extreme harshness. With the data at hand, the causal direction cannot be disentangled. What is clear is that, among both men and women, those with conduct disorder before age 15 years were more likely to have experienced both physical and sexual abuse than those without conduct disorder.

Turning now to a consideration of childhood physical and sexual abuse as risk factors for alcohol dependence, in Table 4-15 the order of the three sample groups is regressed onto each type of abuse and conduct disorder, given stratification. Conduct disorder (logASYES) continues to be a significant risk factor, as in the previous analyses, but physical abuse is also significant, independent of the

Table 4-14. Regression of logASYES onto Physical Abuse Below Age 15 and Sexual Abuse Below Age 15, Given Stratification, Controls Only

RISK FACTORS	PARTIAL REGRESSION COEFFICIENT	S.E.	*P* VALUE
Physical abuse before age 15 years	0.141	0.033	<0.0001
Sexual abuse before age 15 years	0.159	0.074	0.0015

Table 4-15. Ordinal Logistic Multiple Regression of Sample onto Physical Abuse, Sexual Abuse, logASYES, and Stratification

Effect Test				
SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Sex, age, and type of community of residence	11	11	11.68009	0.3882
Physical abuse before age 15	1	1	4.79252	0.0286
Sexual abuse before age 15	1	1	1.19669	0.2740
logASYES	1	1	104.04300	0.0000

Parameter Estimates				
TERM	ESTIMATE	S.E.	CHI SQUARE	*P* VALUE
Physical abuse before age 15	0.187	0.085	4.79	0.0286
Sexual abuse before age 15	0.137	0.125	1.20	0.2740
logASYES	1.045	0.102	104.04	<0.0001

Note: The estimates for both physical and sexual abuse are of affirmative answers versus the mean.

effect of conduct disorder. Sexual abuse is not a significant risk factor for alcohol dependence once physical abuse and conduct disorder are included in the analysis. More extensive consideration of childhood abuse is provided in Chapter 7.

Education

The effects of a boarding school education on Native-American students has generated controversy over the years. Critics of the boarding school system have asserted that the boarding school breaks up families (DeJong, 1993:ix) and "invariably sets parents and children, home and school, to warring with one another" (Ortiz, 1972:83). Critics further propose that the experience may have long-term negative consequences for the personality development of the students (Leon, 1969:2205). Moreover, boarding schools have long been criticized for depriving students of their own tribal cultures, which of course was one reason for creating them in the first place.

Mental health workers have often expressed the view, generally on the basis of clinical impressions, that the boarding school experience was very damaging. Leon (1969:2205), a psychiatrist, suggested that the parental separation associated with residential schooling of young children led to serious, irreversible psychological damage. Bergman (1968:1126), a psychiatrist in the Indian Health Service in the 1960s, wrote:

> Among the young adults who are the first generation of Navajos in which the majority went to school, there are many severe problems. The problems that occur with excessive frequency are ones involving the breakdown of social control: drunkenness, child neglect, and drunken and reckless driving. Alarming numbers of people have lapsed into an alienated, apathetic life marked by episodes of delinquency and irresponsibility. . . . It seems a reasonable hypothesis that their having been placed by their own parents in an impersonal institution contributes to such attitudes, and it is noticeable that the boarding schools provide children and adolescents with little or no opportunity to take care of other children or even of themselves.

More recently, Topper (1985:237) has observed that "among the Navajo . . . employment and boarding school experiences are major contributors to the development of the problems many young Navajos have in relating to strangers and to the recent increase in the levels of socio- and psychopathology. . . ." He notes that many factors, such as genetic history and quality of parenting, are important in understanding why specific individuals become alcohol abusers. He continues that, however, apart from family life, the "boarding school experiences" and employment conditions have the greatest "impact on the development of psychopathology and maladaptive behavior" (Topper, 1985:237). In a subsequent paper, Topper and Curtis (1987:337) point to the values inculcated by "Western education" in "agency-town schools" (which could be either boarding or public) as contributing to a form of social pathology ("synergistic dual anomic depression") among Navajo male adolescents. In several places they indicate, however, that boarding school experience is more detrimental than public school in generating this mental health problem (Topper and Curtis, 1987:339, 343, 344).

A study of Inuit (Eskimo) students in Alaskan boarding schools in the 1970s indicated high levels of psychological disturbance. The extent of the problems varied from one boarding school environment to another, but Kleinfeld and Bloom (1977:411) posited that, generally, Indian boarding school environments "can contribute to the development of long-standing character pathology." In a study of Canadian boarding school students during the 1960s, Hobart (1974) found that students from families more involved in the subsistence economy had greater problems than those from families relying primarily on wage work. Krush et al. (1968) found a high level of emotional disturbance among Native-American students at a Bureau of Indian Affairs (BIA) boarding school in South Dakota. Dick et al., (1993:172) claim that "Alcohol use/abuse has approached near epidemic proportion in Native-American boarding schools." They go on to say that it was the observation of an association between "high levels of dysfunction, notably substance abuse and depression," in "this type of environment" that "fueled the decentralization of educational resources and increased local control of schools."

In the late 1960s, a U.S. Senate subcommittee, after hearings on the BIA boarding school system, concluded that off-reservation boarding schools had "generally become dumping grounds for Indian students with severe social and emotional problems" but also included students who simply "had no other school available to them" (quoted in U.S. Senate, 1995:2). One critic counseled that "finding viable alternatives to boarding schools for the young is undoubtedly the biggest and most urgent challenge facing the Subcommittee" (Ortiz, 1972:84). The Navajo Tribal Council, discounting the claimed link between boarding schools and emotional problems, requested that the BIA expand the boarding school program "working closely with the Navajo Tribe" (quoted in Fuchs and Havighurst, 1972:223).

Some studies of specific boarding schools have, however, emphasized their positive aspects. Trennert (1988:207) noted that "those who passed through the system generally praised it," believing "that the brand of education and strict discipline associated with the school developed moral character, a sense of responsibility, and integrity." Writing about the Dakota Sioux, Erikson (1963:159) claimed that the boarding school environment was generally more physically comfortable than the home environment and that the times spent at the schools were among "the pleasantest years in the child's life—and yet the great majority of students who enter high school do not graduate; they sooner or later play truant and finally quit for good."

Not only are there differences of opinion about the damage done by boarding schools, but the alternatives have been criticized as well. Based on work among Navajo children in the early 1940s, Leighton and Kluckhohn wrote that (1947:68)

> [t]he psychological conflicts and stresses which are perhaps the most momentous for the personality formation of Navaho children taught by white teachers . . . arise from two features of white culture: (1) the great stress upon competition between individuals; (2) the lack of definite status for the child at each age level. . . . It is frequently observed that Navaho children who leave the hogans calm and well-poised return at the end of the first school year nervous and tense. This is less true of children attending the present Indian Service day and semi-boarding schools.

More recently, some analysts of Native-American education noted that "public schools serving Indian children . . . present a picture which is little better" than the boarding schools (Ortiz, 1972:84). Both "the Public and Bureau of Indian Affairs schools have failed Indian children, parents, and communities" (Otis, 1972:71). Teachers in schools both on and off the reservations "lack understanding" of students and their culture (Otis, 1972:72). Thus, "in the cultural conflict between school and home, children, by the time they reach adolescence, have often developed an 'Identity-Orientation' psychosis so acute that conflict is

resolved only by complete withdrawal and alienation from self and society" (Otis, 1972:72).

Moreover, the discussion in Chapter 2 suggests that day schools in agency towns may also be fertile grounds for the development of problematic behaviors. Thus, there is reason to think that boarding schools may have been disasterous for some and beneficial for other students and that the day schools that were designed to replace them and to keep students close to their homes may also be a mixed blessing.

Alcohol consumption has been widely observed to be associated with educational attainment. In the U.S. population, "those with the lowest levels of education have the highest rates of heavy drinking" with "a consistent fall in these percentages as educational level rises" (Helzer et al., 1992:86). Between 1967 and 1984, symptoms of alcohol dependence increased "somewhat disproportionately among those with less income and less education" (Room, 1991:157). Similar observations have been made among Native Americans. Reporting on data from three widely separated tribes, Manson et al. (1992:120) found that people with at least some college education were slightly less likely to have alcohol problems than those with less education.

This review of the existing literature suggests that one would expect (1) an inverse association between age and educational attainment; (2) an inverse association between education and alcohol dependence; (3) a higher proportion of boarding school alumni among alcohol-dependent than non-alcohol-dependent people; and (4) that, because conduct disorder before age 15 years is often manifested in truancy and other school-related problems, the associations between educational experience and alcohol dependence will be explained by the presence of conduct disorder.

As expected, the association between age and education is indeed negative and significant within each sex and sample (data not shown). Older people have substantially less education than younger people. Figure 4-2 displays regression lines of years of education onto age for each sample (men and women are combined because the results are similar for each sex). Although all the regressions are significant, the one for non-alcohol-dependent controls (NADC) is most significant and that for cases (CAS), the least. This means that the youngest NADC are the best educated and the oldest, the least educated among the three samples. These results suggest that the meaning of education has changed over several generations. In the past, people who did not attend school seem to have had the least problems with alcohol. More recently, education has been associated with reduced levels of difficulties with alcohol.

Considering the level of schooling achieved, for men and women the same pattern pertains. Overwhelmingly, NADC were less likely to be high school dropouts and more likely to be high school graduates. Among men, NADC were

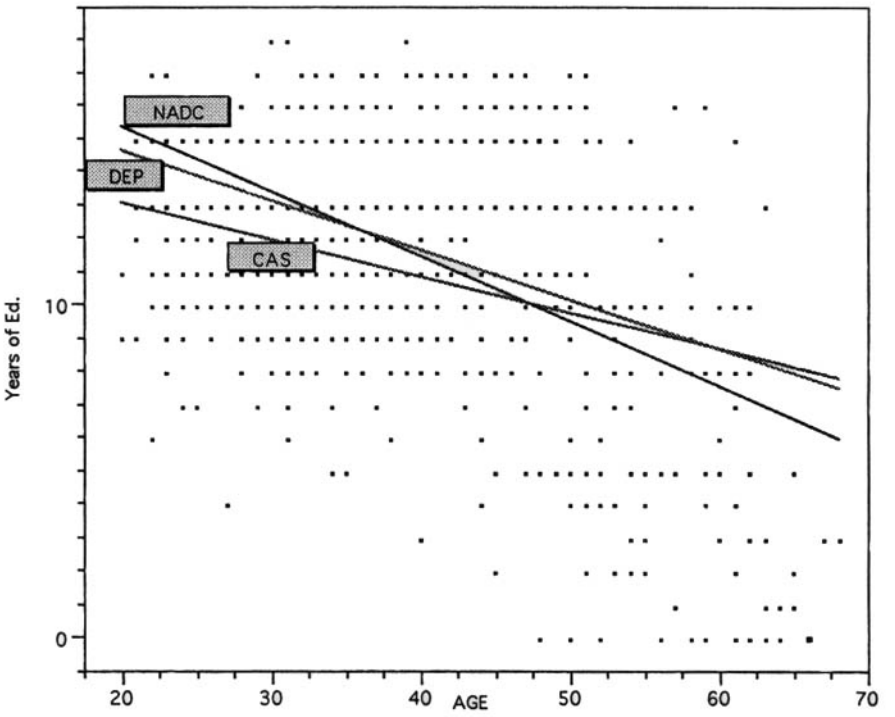

Figure 4-2. Regressions of years of education onto age, by sample.

also more likely not to have attended school at all (see Appendix 3, Table A3-4). It is of course possible that being a high school dropout is simply a proxy for having conduct disorder. Regression analysis of sample onto school level and conduct disorder score (logASYES), given stratification, indicates that the two have independent effects. Thus, conduct disorder is not the underlying cause that explains both dropping out of school and alcohol dependence (see Appendix 3, Table A3-5).

As described previously, the school experience itself has been said to be a punishing one that causes all manner of psychological distress, including alcohol abuse and dependence. Table 4-16 displays the types of grade schools and high schools attended by those informants who attended any school at all. There is no difference among samples with regard to grade schools. There is a significant difference among men but not women at the high school level. The difference is accounted for entirely by the men who attended the special 5-year programs, which are no longer in existence.[3] The people who were in this program were among the oldest informants; they averaged 53 years of age, about 15 years older than the average age of all the samples. Because male cases were on average about 2

Table 4-16. Types of Schools Attended, by Sample and Sex

	MEN*			WOMEN†		
	CAS	DEP	NADC	CAS	DEP	NADC
Grade Schools						
BIA boarding on reservation	25.2%	25.9%	25.0%	23.9%	22.4%	18.7%
BIA dorm, off-reservation public school	0.5%	0.5%	0.7%	0.7%	1.7%	0.7%
BIA on-reservation day school	3.5%	2.1%	4.7%	3.4%	1.7%	2.1%
On-reservation public school	17.3%	14.5%	13.5%	27.4%	17.2%	23.7%
Off-reservation public school	10.4%	10.8%	11.5%	6.8%	10.3%	10.1%
Mission or Mormon placement	2.5%	4.0%	2.7%	2.7%	5.2%	3.6%
BIA off-reservation boarding	2.9%	1.9%	8.8%	2.7%	1.7%	3.6%
Combination	37.6%	40.1%	33.1%	32.2%	39.7%	37.4%
N	202	371	148	146	58	137
High schools						
BIA boarding on reservation	8.0%	5.8%	5.3%	5.2%	3.6%	3.8%
Bia dorm, off-reservation	2.9%	3.3%	5.3%	2.2%	9.1%	3.8%
On-reservation public school	26.3%	29.2%	18.8%	29.1%	32.7%	41.2%
Off-reservation public school	24.6%	19.1%	27.8%	20.1%	18.2%	18.3%
Mission or Mormon placement	2.9%	5.8%	7.5%	7%	3.6%	3.1%
BIA off-reservation boarding	12.0%	15.5%	11.3%	9.7%	3.6%	4.6%
Combination	20.0%	19.5%	15.0%	29.9%	29.1%	22.1%
5-Year program	3.4%	1.8%	9.0%	3.0%	0.0%	3.1%
N	175	329	133	134	55	131

*Grade schools: Pearson' chi square = 20.47; d.f. = 14; $P = 0.1159$.

High schools: Pearson's chi square = 29.43; d.f. = 14; $P = 0.009$.

†Grade schools: Pearson's chi square = 7.12; d.f. = 14; $P = 0.9306$.

High schools:Pearson's chi square = 17.01; d.f. = 14; $P = 0.256$.

years younger than male controls (DEP and NADC), age potentially confounds the comparison. A regression analysis of sample onto school type and conduct disorder score (logASYES) indicates that school type is not significant once age is adjusted (see Appendix 3, Table A3-6).

That dropping out of high school is an independent risk factor for alcohol dependence is consistent with what has been observed in the Epidemiologic Catchment Area Study, in which dropping instead of completing any school program was also associated with alcohol dependence (Helzer et al., 1991:101). It is not clear what the explanation is, but evidently dropping out of school taps a different dimension from the one tapped by the questions dealing with conduct disorder.

That alcohol dependence is in general associated with lower levels of school attainment is also consistent with studies in the general population. These results are complicated, however, by the finding that men who did not attend school or who attended the special 5-year program were disproportionately found among the NADC. Men in these categories were older than other respondents. This finding may be the result of a different experience among previous generations in which not attending school or attending a 5-year program as a teenager without ever having completed grade school was in fact protective against the development of alcohol dependence. Clearly that is not possible now, and among younger people failure to complete high school is associated with an increased risk of alcohol dependence.

Perhaps more surprising in light of the observations cited previously is the fact that type of school attended is not associated with alcohol dependence. There are several points to be made. The first is that, with such a high lifetime prevalence of alcohol dependence in the population and with people having such a wide variety of educational experiences, it is less surprising that no single type of educational institution should be particularly effective in producing alcohol dependence.

Second, boarding schools, which have generally been the focus of criticism, have also been cited by many of their former students as having effectively taught them skills needed for survival in an Anglo-dominated world (Levy and Kunitz, 1974:122–124). Some informants, indeed, claim that going to boarding school got them out of very disrupted and abusive home situations. Thus, while the experience must have been devastating for many, it was not universally so, and the variability helps to account for the fact that it is not a risk factor for alcohol dependence.

Third, the discussion in Chapter 2 of the emergence of a peer group culture in agency towns suggests that other sorts of school environments may also result in behavior leading to alcohol dependence. This too is a reason that boarding school would not stand out as contributing uniquely to alcohol dependence.

Relocation

Over the past several decades, the simmering territorial dispute between the Navajos and their neighbors, the Hopis has boiled over with the decision by Congress that Navajos would have to leave some of the land claimed by the Hopis and that Hopis would have to leave some of the land apportioned to the Navajos. Much has been written of the trauma caused by such forced relocation, especially the trauma experienced by the Navajos. Evidence supports the idea that there has been an increase in treatment for mental health problems as a result of reloca-

tion (Topper, 1987), and it has been claimed that relocation has resulted in increased rates of alcoholism as well as other signs and symptoms of despair (e.g., Schwarz, 1997:49–50). On the other hand, we have shown elsewhere that depression was no higher among elderly people living in or recently relocated from the disputed area than it was among people who were unaffected by the dispute (Kunitz and Levy, 1991:69–70). This is not to deny that relocation or even the threat of relocation is anxiety provoking for many individuals but simply to suggest that the evidence for a causal association between relocation and measures of psychological distress at the population level is tenuous and not fully supported by the existing data.

In the present study, there were no women and only a small number of men who had been affected by the land partition and relocation. Overall, only 6.0% of the men had been affected by the land dispute, and there were no differences among the samples: CAS, 5.8%; DEP, 6.7%; and NADC, 4.3%. The issue of relocation did, however, raise the broader question of whether migration of any sort would be associated with an increased risk of alcohol dependence. Schwarz (1997) has claimed that for Navajos removal from one's natal home, where the umbilical cord is buried, disrupts the sense of self and attachment to a particular place and that this causes the despair associated with alcohol dependence and other mental health problems. She was talking of forced relocation from the so-called Joint Use Area, but to be consistent the argument should be applicable more broadly to anyone who has left his or her natal home, for otherwise the sense of attachment is not a general phenomenon. Indeed, Griffin-Pierce (1997) has made precisely this argument.

We have examined this possibility by considering the degree to which people have lived consistently in their home communities, that is, the communities in which they spent the first 6 years of their lives. The following comparisons among sample groups were made: (1) community types in which raised and presently residing and (2) community was the same or not (a) between ages 0–6 and 7–12 years and (b) between 0–6 and 13 years and above. The results of several regression analyses indicate that there is no association between moves from one community to another and alcohol dependence (data not shown).

It is of course possible that it is only movement among certain kinds of communities that is significant. For example, people raised in rural communities might suffer especially severely if they move to more densely settled areas with which their families have not previously been associated. This possibility was also examined by regressing sample onto migration pattern and type of community of origin, given stratification (data not shown). None of the tests is significant. Moreover, when only those people from rural reservation areas are considered (data not shown), there is no difference between alcoholics and non-

alcoholics with regard to patterns of movement. The evidence suggests, therefore, that migration at various ages is not associated with an increased risk of alcohol dependence.

Clearly there are weaknesses in this analysis. For example, the circumstances leading people to move are not known. Nor is it known if families of origin remain in the home communities so that all ties have not been severed. We can say, however, that the limited data on relocation in particular and migration in general do not support an association with alcohol dependence. Moreover, even if there were an association with alcohol dependence that we have been unable to measure, the population attributable risk would be very small.

Conclusion

The lifetime prevalence of alcohol dependence is very high in the adult Navajo population, more so for men than for women. A number of the risk factors that have been said to cause it have been shown not to be associated. This includes type of school attended, migration patterns, sexual abuse in childhood (once conduct disorder is taken into account), and parents' social and economic status. On the other hand, some significant risk factors have been identified: conduct disorder and physical abuse before age 15 years; dropping out of school and absent parents during childhood and adolescence for both men and women; parental and family drinking for men; and for women, mothers' drinking and camp size in childhood.

These results support the suggestion that alcohol dependence is a somewhat different phenomenon for most men than for most women. For men, the more pervasive drinking is in the environment, the greater is the risk of becoming alcohol dependent. That is why being brought up as part of the Native American Church is protective for men. For women, heavy drinking by fathers and others is equally common among the three samples. Only drinking by mothers differed. Thus, for women the risk factors seem to be associated primarily with family dynamics, perhaps particularly with mothers as role models, rather than with the broader social environment.

Notes

1. Elsewhere (Kunitz et al., 1999), we have done a slightly different analysis of the same data by comparing samples in the following way: CAS with DEP, and DEP with NADC and using one-sided *P* values. This double test procedure is quite conservative in that it tests each extreme group (CAS or NADC) against the intermediate group (DEP), and a test of the ordering might have been more powerful. Logistic regressions of the

alcohol-dependence dichotomies (DEP versus NADC and CAS versus DEP) were run with respect to logASYES and each of the dysfunction indicator variables.

The significance levels (one-sided P values) of the partial associations of alcohol dependence with logASYES and with each dysfunction, given the stratification were all in the expected direction ($P < 0.5$) and at least one of them was significant at $P = 0.0001$.

2. These results and those for sexual abuse are confirmed by simple cross-tabulations of each abuse variable with the 12-fold stratification variable described in Appendix 1.

3. The "Special Five Year Navajo Educational Program" was initiated by the BIA in 1946 with 290 Navajo students enrolled at the Sherman Institute (Riverside, CA). The program was designed to provide Navajos between the ages of 12 and 18 years (who had little or no previous schooling) with basic skills in English and with vocational training. In the mid-1940s, only about one third of Navajo children of school age attended school. The first 3 years focused on academic and English skills with bilingual instruction by a classroom teacher and a Navajo-speaking "teacher-interpreter". By 1950, there were 3,431 Navajos enrolled at several off-reservation boarding schools. Enrollment peaked at 6,560 in 1957. The program was modified during the 1950s to accommodate students who had some prior schooling and was phased out during the 1960s. Between 1951 and 1961, the program graduated 4,347 students.

5

TYPES OF ALCOHOLICS

Stephen J. Kunitz
K. Ruben Gabriel

The facts that conduct disorder before age 15 years is a risk factor for both antisocial personality disorder (ASPD) and alcohol dependence and that ASPD is also a significant risk factor for alcohol dependence have suggested to some observers that there may be at least two different types of alcoholics (Irwin et al., 1990). Cloninger (1987) has proposed a typology that captures the distinction; it is summarized in Table 5-1.

Like many disease typologies Cloninger's is based on signs, symptoms, and behavioral measures. This has proved problematic in the past, for signs, symptoms, and behavior may be shaped by culture and context as much as by some underlying biological process. For example, among nineteenth century physicians, there was great disagreement about the nature of fever: whether it was one disease or many. Lester King (1991:98) has written that "Physicians, depending entirely on clinical symptoms, described many different 'diseases' with many different names, such as putrid fever, adynamic fever, slow fever, and the like. Cullen . . . considered them all synonyms of typhus, but this did not settle the question of whether the conditions were really identical. On purely clinical grounds, there was no way to tell. When, however, clinical findings could be correlated with a pattern of morbid anatomical changes, new possibilities for analysis appeared."

Even by the end of the nineteenth century there was resistance to the idea of

Table 5.1. Distinguishing Characteristics of Two Types of Alcoholism

	TYPE OF ALCOHOLISM	
CHACTERISTIC FEATURES	TYPE I	TYPE II
Usual age of onset (years)	After 25	Before 25
Inability to abstain	Infrequent	Frequent
Fighting and arrests when drinking	Infrequent	Frequent
Loss of control	Frequent	Infrequent
Guilt and fear about alcohol dependence	Frequent	Infrequent
Sex	Men and women	Mainly men

Source: Modified from Cloninger (1987:411).

discrete disease entities. According to Charles Rosenberg (1979:19), "[M]ost physicians still found it difficult to accept the reductionist implications of the view that disease ordinarily manifests itself in the form of discrete clinical entities, with unique causes, courses, and pathologies. Physicians still spoke of epidemic influences, of diarrhoeas shifting into cholera, of minor fevers efflorescing into typhoid or yellow fever, if improperly managed." Smallpox was an important exception, according to Rosenberg, because it had characteristic attributes that made it readily distinguishable from other conditions.

Contemporary psychiatry is in a similar situation. The authors of the *Diagnostic and Statistical Manual of Mental Disorders,* forth edition (DSM-IV) write:

> DSM-IV is a categorical classification that divides mental disorders into types based on criteria sets with defining features. This naming of categories is the traditional method of organizing and transmitting information in everyday life and has been the fundamental approach used in all systems of medical diagnosis. A categorical approach to classification works best when all members of a diagnostic class are homogeneous, when there are clear boundaries between classes, and when the different classes are mutually exclusive. Nonetheless, the limitation of the categorical classification system must be recognized.
>
> In DSM-IV, there is no assumption that each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other mental disorders or from no mental disorder. There is also no assumption that all individuals described as having the same mental disorder are alike in all-important ways. (American Psychiatric Association, 1994:xxii)

Thus, nosologists believe that psychiatric categories are useful but do not represent distinct entities, and they warn against the dangers of reification (e.g., Kendall, 1975). As Sedler (1994:223) has asked, however, what is the alternative:

"[I]f we do not reify these symptom groups, if we do not succumb to the ontological drift of this categorical language, how are we to regard these 'disorders': 'schizophrenia,' 'bipolar disorder,' 'major depression'?"

These debates bear a strong resemblance to the nineteenth century debates about the nature of fever, for in each instance the basis of the taxonomy is clinical observation. As the nineteenth century debate suggests, the problem with clinical signs and symptoms is that it is often difficult to identify a syndrome comprised of findings that "go together" consistently enough among a sufficient number of patients to form a clinical "entity." This is particularly so when the signs observed and the symptoms reported are behaviors, beliefs, and feelings that are heavily dependent on culture and context.

If signs and symptoms are not the same from one place or culture to another, does this mean that there is no underlying entity that is the same from place to place? It would be prudent to leave open the possibility that signs and symptoms may be epiphenomena and that underlying entities may indeed exist, but, as Babor and Dolinsky (1988:262) observe in their historical review of typologies of alcoholism, "Ideally, a typology should have cross-cultural generalizability. This would constitute persuasive evidence that the typology is reflecting essential and universal elements of alcoholism."

In discussing the typology described in Table 5-1, Cloninger (1987) is careful to warn against reification. He writes: "These subgroups should not be considered discrete disease entities, because many alcohol abusers have some features of each type. Rather, the different alcohol-related syndromes are associated with polar extremes of personality traits that vary continuously" (Cloninger, 1987: 411). More recently, he and his colleagues have written that "[T]hese two alcoholism subtypes . . . represent only the prototypes or extremes of a continuous spectrum of manifestations of alcoholism. Many of the subtype characteristics (e.g., personality traits) are inherited independently of each other, and all possible combinations of personality traits occur" (Cloninger et al., 1996:23).

Therefore, although mixed types may exist, one would expect that, at the extremes, types I and II should be inversely correlated: Individuals who meet the criteria for one would be expected not to meet the criteria for the other. There is, however, evidence that these types are not readily differentiated and that the people who combine attributes of both are more numerous and may have more difficulties than those who manifest the attributes of only one (Penick et al., 1990; Hall and Sannibale, 1996).

Further complicating this taxonomic problem is the suggestion that type II alcoholics are best thought of as people with ASPD who are alcoholic secondary to their personality disorder (Irwin et al., 1990). If this is true, types I and II should not be considered part of the same continuum at all. They would be truly distinct entities. The presence of alcoholism among type II individuals would

then be a secondary phenomenon, unlike the primary alcoholism that purportedly characterizes type I individuals.

With this background in mind, the aims of this chapter are twofold. The first is to determine whether, among Navajos, types I and II alcoholics are distinguishable in any significant way. If they are, then the typology would have some cross-cultural validity to support claims that it reflects essential and universal features of alcoholism. If the types are not distinct, however, then it does not necessarily mean that no essential and universal categories are possible but (1) that this particular typology may not be adequate cross-culturally and (2) that basing typologies of alcohol dependence on signs and symptoms that are highly influenced by contextual variables may not be a very powerful way to distinguish among types of alcoholics, if indeed different types exist at all.

The second aim is related to the first: to determine whether conduct disorder occurring before age 15 years is more often a risk factor for type II than for type I alcoholism. If it is, then the typology may be, as suggested above, a manifestation of the difference between primary alcoholism and secondary alcoholism due to ASPD.

The Diagnostic Interview Schedule (DIS) provides virtually all of the items for the typology described by Cloninger et al. (1996). The only exception is the question about feelings of guilt, which does not appear in the DIS and which was not asked in our interviews. The other items are displayed in Appendix 4, Table A4-1. Affirmative responses were coded as 1, negative as 0.

In addition to the typology, several other variables were created. Although the questions in the DIS for the diagnosis of ASPD were not all included in the questionnaire, a few were—arrest and imprisonment for non-alcohol-related offenses, being fired, and quitting jobs. Affirmative answers were coded 1; negative answers were coded as 0. They were then combined into a scale. Similar scales were created for the use of drugs, with a 1 being assigned for each class of drugs used and a 0 when the class had not been used.

Finally, there are a number of family variables that were examined both individually and combined into a scale: whether mother and father had ever had a drinking problem, drinking patterns of parents when the informant was growing up, and whether any first-degree relatives had died of a drinking-related problem.

One analysis makes use of the biplot (Gabriel, 1971, 1973; Gabriel et al., 1974). In biplot displays, dots represent individual respondents and arrows represent variables and radiate from a central point, which represents the means of all variables. Dots that are close together represent individuals who are similar on the variables being measured. The angles formed between the arrows on the biplot reflect the correlations of the variables in the following manner. If two arrows subtend an acute angle, the corresponding variables are positively correlated: that is, both variables are high for the same individuals and low for the

same individuals. If, in contrast, two arrows subtend an obtuse angle or go in opposite directions, the variables they represent are negatively correlated. A lack of correlation between variables is represented by a right angle. In addition, the lengths of the arrows are proportional to the variables' standard deviations, This, however, is not very informative in the present context in which different variables are measured in different units (Kunitz, 1983:16). In the analyses presented below, the variables are the focus of most discussion. The biplot is used rather than correlation coefficients for ease of exposition, but it has to be taken into account that the biplot is only an approximation to the correlations because it uses only two dimensions.

RESULTS

In the first part of the analysis, a biplot is used to display the associations between the variables that comprise type I and type II alcoholism (Fig. 5-1). For this purpose, the arrow for each variable is labeled with both its name and an indication of whether it is characteristic of type I or II. This biplot displays the results for all informants, whether alcohol dependent or not, and has a goodness of fit of 39.4% which is adequate to show the main features of the data. Separate biplots for each sample and sex do not differ much from the one presented here

What the display makes clear is that six of the eight variables are highly correlated: Their arrows form a narrow sheaf. The exceptions are age at which drinking first became a problem and whether the individual had engaged in drunken fights. The younger that people were when their drinking became a problem, the more likely they were to have engaged in fights. Altogether, the arrows are not found to cluster into two separate sheaves, one sheaf for each type, as the idea of the typology had implied. Nor do the arrows representing one type of variables form obtuse angles with the arrows representing the other type, as would have been expected if the two types had been at opposite ends of a spectrum and negatively correlated with each other. They also do not form two separate but correlated clusters.

To examine the associations between the types further, the type II scores have been subtracted from the type I scores. Thus, if an individual were a pure type I, the score would be +4. A pure type II would be –4. Mixed types would have values between +3 and –3. Likewise, individuals who score 0 on each would have scores of 0. Figure 5-2 displays histograms of the results for the total sample, all men, all women, and all alcohol-dependent men and women. If the population had contained several distinct pure types, some or all of these distributions would have had several modes. Actually, the values all tend to cluster in the middle and thus suggest a joint distribution of the two types. Figure 5-2, in-

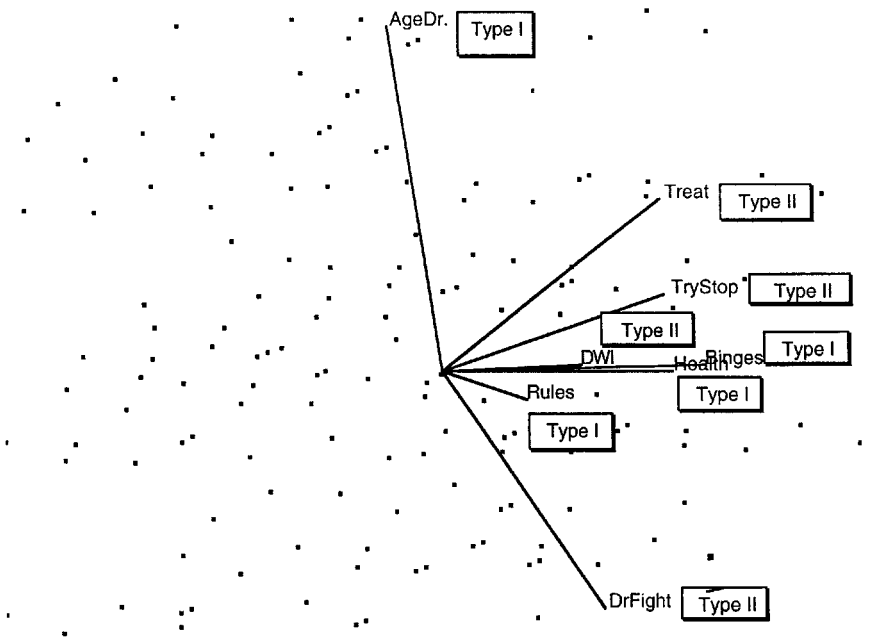

Figure 5-1. Biplot of variables for types I and II alcoholism.

deed, shows no instance of a bimodal distribution; all distributions have a single mode at the center. Thus, there is no evidence of clusters of different types.

In the second step of the analysis, correlations are displayed between types I and II for each combination of sex and sample, as well as for all controls combined—the latter as a representative sample of the Navajo population (Table 5-2). When all respondents are combined, there is a significant positive correlation between types I and II for the entire sample as well as for men and women separately. Within sample groups, the correlations weaken and in several instances disappear. Thus, among male cases (CAS) and among non-alcohol-dependent controls (NADC), there is no significant correlation. Among female cases and male and female alcohol-dependent controls (DEP), there are significant positive correlations. This is because, among NADC and male cases, the values for each scale are extreme, either very low or very high. Only among female cases, DEP of each sex, and in the sample of the total population (NADC + DEP) is there great variability in both scores. This is illustrated in Figure 5-3, which displays concentration ellipses that contain approximately 50% of the individuals in each sample.

It is evident from Figure 5-3 that the distributions of both type I and II shift upward from NADC to DEP to CAS (i.e., there is a trend to higher values). This is what one would expect because the sample definition is very similar to that of

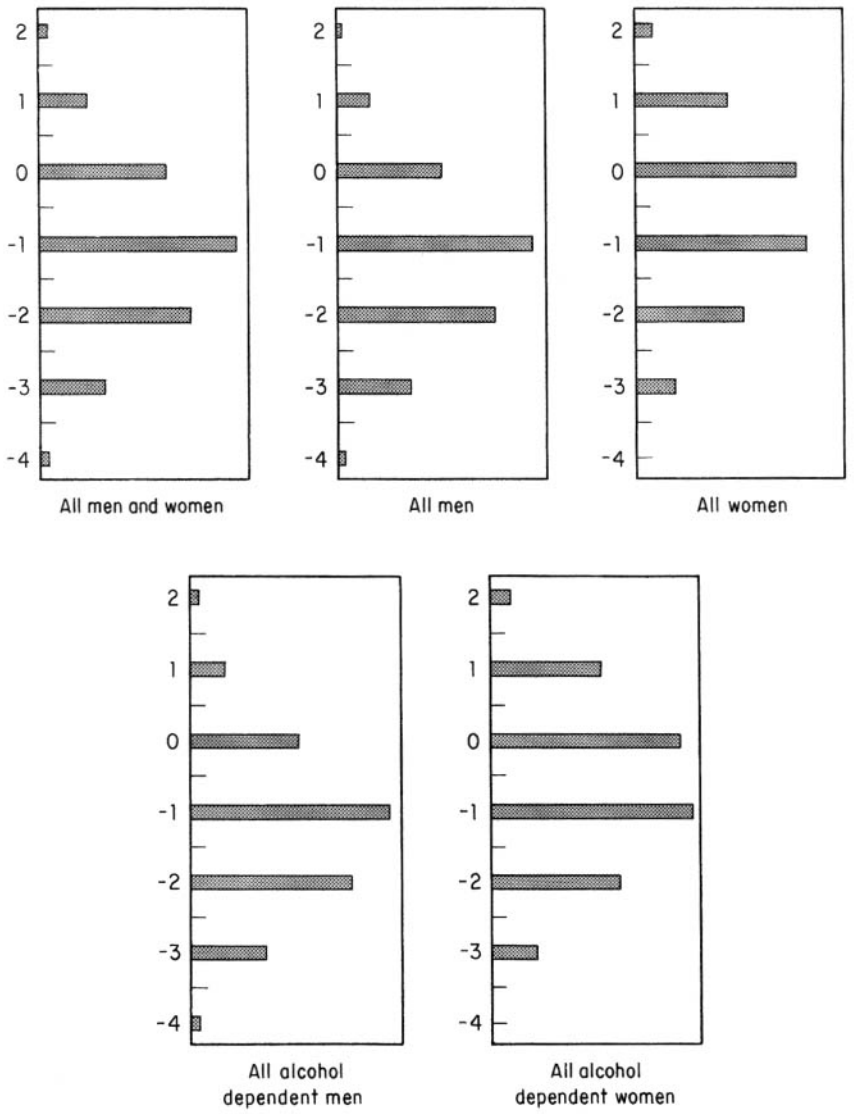

Figure 5-2. Type I scores minis type II scores.

the typology and uses many of the same variables. From the shape of the concentration ellipses, one also sees that variability is very much smaller for NADC than for the others. This is due to NADC having, by definition, minimal scores on some of the criteria. DEP has greater variability on type II than type I. The variability in type II is less among CAS than among DEP because the behaviors char-

Table 5-2. Correlation of Type I and Type II Scores by Sex and Sample

SAMPLE	PEARSON'S R	*P* VALUE
All samples	0.29	<0.0001
All men	0.31	<0.0001
All women	0.31	<0.0001
All CAS	0.16	0.0057
Male CAS	0.12	0.1059
Female CAS	0.21	0.0178
All DEP	0.17	0.0011
Male DEP	0.21	0.0002
Female DEP	0.28	0.0560
All NADC	–0.35	0.3506
Male NADC	–0.35	0.4366
Female NADC	—	—
All controls	0.19	0.0003
Male controls	0.23	<0.0001
Female controls	0.29	0.0379

acteristic of type II are the ones that lead to referral to treatment, usually through the courts.

Figure 5-4 is similar to Figure 5-3 except that it displays ellipses for each sex and sample combination. In all samples, men have higher type II scores than women but the same type I scores as the women. This accords with expectations from Cloninger's typology. The variability in type II is greater for male than for female NADC, it is the same for male and for female DEP, and it is less for male than female CAS. Again, this is the result of referral patterns, with men more likely than women to exhibit the antisocial behavior that leads to referral to treatment.

These results suggest that the lack of correlation between types among male cases is a function of the way people come into treatment, and it is this very lack of correlation that might lead to the inference that there are in fact two different types of alcohol-dependent men. Considering the nontreatment alcohol-dependent sample, however, it is clear that the two types are highly correlated and thus that they are not at opposite ends of a spectrum of alcoholics.

The analysis also compares the type I and II scores with the antisocial behavior variables because the original suggestion was that the latter would be associated with type II rather than with type I. Type II is thought to be a manifestation of antisocial behavior, so the two types are combined in two different ways.

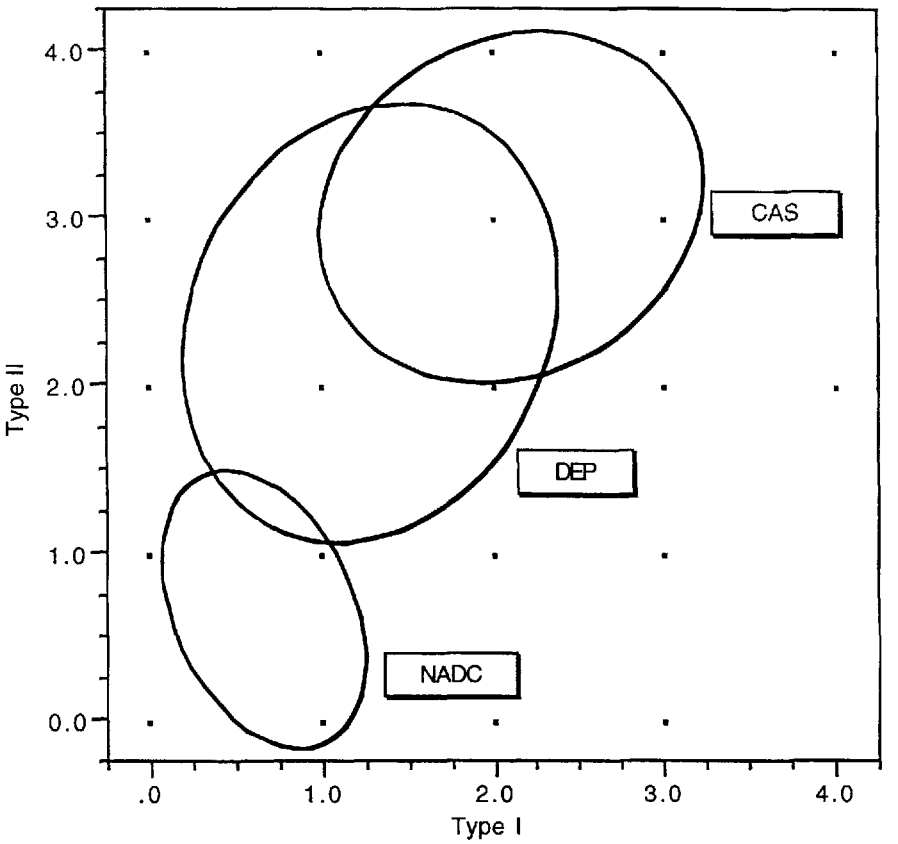

Figure 5-3. Density ellipses for samples.

First, as in Figure 5-2 above, type II scores are subtracted from type I scores (type I – II). Higher negative scores thus represent more nearly pure type II. Second, types I and II scores are added to get a cumulative measure of severity of alcohol use (type I + II). These two combined scores are then correlated with a number of measures of antisocial behavior and family history of alcohol abuse. Table 5-3 displays the partial correlations of these measures with type I – II and type I + II, given the stratification. Coefficients are calculated separately for the DEP and the CAS samples. The expectation was that if the Cloninger typology adequately characterized Navajo drinkers, type I – II should be more highly correlated with logASYES, antisocial behavior, extensive drug use, and family history of alcohol misuse than type I + II. If, however, severity of alcohol dependence is most closely associated with such behaviors, then type I + II should be more strongly correlated.

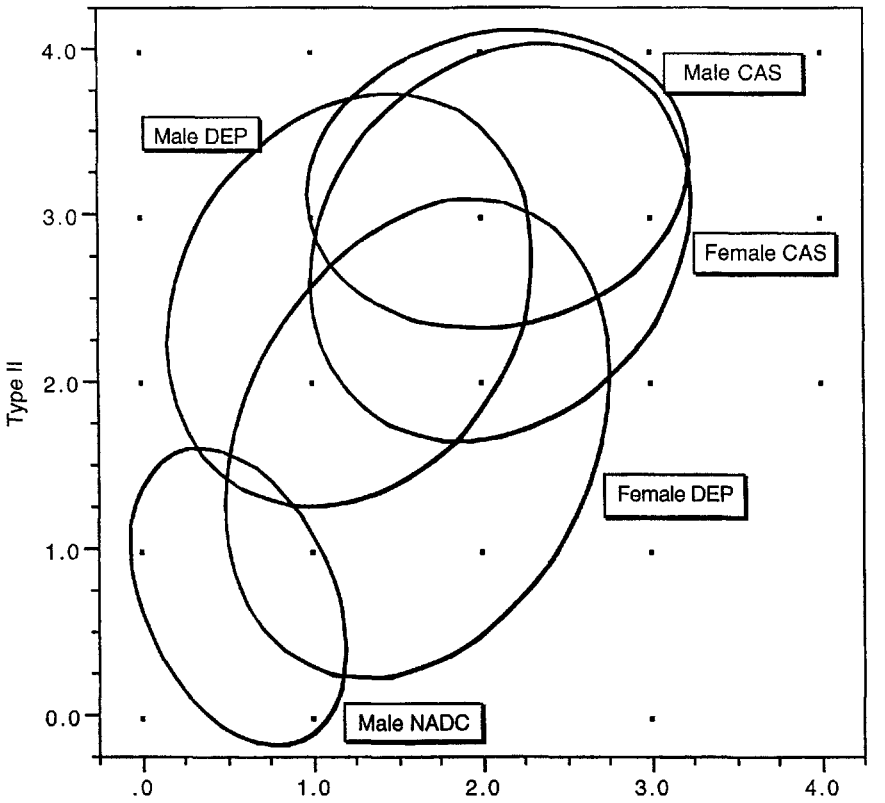

Figure 5-4. Density ellipses for sex and sample. *Note:* Female NADC are not included.

Table 5-3. Anti social Behaviors and Family History of Alcohol-Related Problems, Regressed on Alcohol Typologies, CAS and DEP Only, Given Stratification (two-Sided *P* Values)

	TYPE I + II				TYPE I - II			
	DEP		CAS		DEP		CAS	
	R	*P*	R	*P*	R	*P*	R	*P*
logASYES	0.08	0.131	0.18	0.002	–0.03	0.572	0.2	0.725
ASPD	0.24	<0.0001	0.14	0.012	–0.012	0.031	–0.05	0.393
All drugs	0.22	<0.0001	0.21	0.0002	–0.17	0.001	–0.12	0.038
Family history	0.06	0.239	0.23	<0.0001	–0.004	0.938	0.007	0.904

The results suggest that, in general, severity of alcohol dependence is more strongly correlated with antisocial behaviors and with a family history of problems with alcohol than is the type I – II difference. Among CAS, the sample with the most severe alcohol-related problems, the difference is most evident. type I + II is positively correlated with all four measures thought to be associated with ASPD. Only one of the four (use of drugs) is significantly correlated with type I – II. Among DEP, the same pattern exists but in attenuated form.

Finally, we have analyzed the association of the conduct disorder score (logASYES) with each of the variables used to construct the typology (see Appendix 4, Table A4-2). The association was significant for three of the four type I variables among the cases (CAS) and for two of the four among alcohol-dependent controls (DEP). In general, people who had gone on binges and who had health problems had higher conduct disorder scores (logASYES) than others, which is the reverse of what would have been predicted based on the Cloninger typology. On the other hand, people whose drinking problems began after age 25 years had lower scores than did those whose problems had begun earlier, which is what would have been predicted. Of the type II variables, only fighting when drunk was significant and in the expected direction. People who had engaged in drunken fights had significantly higher conduct disorder scores (logASYES) than those who had not. None of the other variables were differentiated by logASYES.

Thus, four of the eight variables differed on conduct disorder, two in the expected direction and two in the opposite direction. Those that went in the opposite direction were ones for which logASYES was high when it would have been expected to be low. This again indicates that logASYES is associated with severity of drinking problems more than with any particular style of drinking.

CONCLUSIONS

We have used an imperfect replication of the typology first described by Cloninger and colleagues (1996) because our informants were not asked how guilty they felt about their drinking. If the typology is sufficiently robust, however, it should be able to survive the absence of one question, especially one that is so subjective.

Our results indicate that types I and II alcoholics cannot be differentiated and that the variables said to comprise each type are not more highly correlated with each other than they are with the variables that are said to comprise the other type. Moreover, types I and II are correlated with each other among both men and women in several samples, which one would not expect if they were at opposite ends of a spectrum of types of alcoholism. Among the samples in which they are not correlated, the reason is that the values of each type are at the extremes, either

very high among male cases or very low among male and female non-alcoholic controls. In no instance are the types inversely correlated.

Although the data also indicate that type II is indeed associated with some measures of antisocial behavior, severity of alcohol dependence is even more strongly associated with the same measures. This suggests that, in this population, severity of alcohol dependence rather than the distinction between types I and II alcoholics is more closely related to antisocial personality.

Type II alcoholism is said by Cloninger et al., (1996) to reflect endogenous factors that are inherited, but in the Navajo population the relevant criteria may be every bit as likely to be dependent on the context. For example, abstaining is difficult in peer groups in which drinking is pervasive and begins at an early age; accidents and arrests for drunken driving are frequent when people must drive long distances to return home after drinking; and treatment is often mandated by the courts after an episode of drunken driving (Levy and Kunitz, 1974). Thus, most Navajo men, and many women, who drink have a high probability of satisfying at least some type II criteria. For a few, these behaviors may be largely the result of endogenous, inherited causes. For most, however, it appears that the context is overwhelmingly important. Cloninger et al., (1996) label type I alcoholics "milieu determined," but in the Navajo context it appears that type II, if it exists at all, may be similarly determined.

This possibility accords with Moffitt's suggestion (1993), to which we have already referred several times, that there may be two forms of antisocial behavior, "life-course-persistent" and "adolescence-limited." The former begins early in life, persists into adulthood, and may well have important biological determinants. The latter begins and ends in adolescence and is the result of oppositional behavior that is shaped by the increasing prolongation of childhood well after physical maturity is reached. During adolescence, young people in the latter category may model their behavior on that of peers in the former category and then outgrow the behavior in their late teens and twenties. In the Navajo context, before they outgrow it, such young people may have engaged in heavy drinking, substance use, and other antisocial behaviors to a degree sufficient to meet the criteria of type II alcoholism and conduct disorder. If this were the case, these criteria would not differentiate between alcohol types that are endogenous and milieu determined.

The first question we asked was, are types I and II distinguishable in any significant way? The second was whether type II alcoholics, if they exist as a meaningful category, are in fact people with ASPD. The answer to the first question is that the two types are not separable and do not represent opposite ends of a spectrum. They are so positively correlated that there are very few who meet the criteria of type II alone. This means, then, that the answer to the second question is also negative. It is true that the more nearly type II someone is, the more anti-

social behaviors he or she is likely to have displayed, but an even more powerful predictor is simply the severity of alcohol dependence. The same is true of a family history of alcohol misuse.

These observations bring us back to the issues with which we began. We noted that dependence on clinical symptoms alone had made nineteenth century medical diagnoses highly problematic because, with some exceptions (e.g., smallpox), signs, symptoms, and clinical course were so highly variable that identifying those that formed a common cluster, or syndrome, was often extremely difficult. The same seems to be true in much of psychiatric diagnosis, including the study of alcohol typologies. Behaviors allegedly diagnostic of particular types of alcoholism may be sufficiently responsive to particular contexts that they do not form stable clusters across cultures. This suggests that alcohol abuse and dependence may present contemporary observers with problems very similar to those presented to nineteenth century physicians by patients with fever: how to decide if there is only one type or many? We cannot answer that question. There may well be underlying personality attributes that distinguish different types of alcoholics. Indeed, as we argue in the concluding chapter, we think the evidence points in that direction. We have argued instead that drinking-related behaviors are not enough to reveal the differences because they are so powerfully shaped by the particular context.

6

CONDUCT DISORDER: RISK FACTORS AND CHANGING PREVALENCE

Stephen J. Kunitz
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There is widespread agreement in the literature on conduct disorder that, whatever role biological causes might play, the social environment is of enormous importance (Moffitt, 1993; Lyons et al., 1995). Studies from several different national populations indicate that, among environmental causes, family disruption, discord, abusive behavior, and peer effects are especially significant (Offord et al., 1986; Vellemen 1992a,b). Moreover, the prevalence of conduct disorder among young people may have increased over the past several decades (Loeber, 1990; Robins and McEvoy, 1990; Moffitt, 1993; Achenbach and Howell, 1993; Hinshaw, 1994). The causes may have to do with changes in family organization as well as with long-term changes in the economies of developed nations. For example, Moffitt (1993) has proposed that the growing gap between the increasingly early age of physical maturation and the increasingly late age at which adult roles are assumed accounts for the secular trend of increasing delinquency in the adolescent years.

The prevalence of conduct disorder varies among studies as a function of both the population and the criteria and instruments used. In general, however, figures for children range between about 1% and 10% (Offord et al., 1986; Robins and McEvoy, 1990; Zoccolillo, 1993). Although there is debate on the issue, girls seem to have lower rates than boys. In the Epidemiologic Catchment Area study, lifetime prevalence of conduct disorder before age 15 years diag-

nosed retrospectively among men from ages 18 to over 65 years was 16.7%. Among women it was 3.8% (calculated from Robins et al., 1991b:265–266). Because conduct disorder is an important risk factor for the more extreme manifestations of alcohol and non-alcohol-related problems, in this chapter we examine its prevalence and some of the risk factors that account for it.

We are particularly interested in determining the degree to which its prevalence and risk factors are similar to or different from what has been found in other populations. For example, is the high prevalence of alcohol dependence among Navajos matched by a high prevalence of conduct disorder? Is the prevalence increasing, as the rise in juvenile problems noted in Chapter 2 might suggest? Descriptions of Navajo culture and social organization, with few exceptions, do not include domestic violence, child abuse, or family disintegration as characteristic of the "traditional" Navajo family. If these risk factors for conduct disorder are found to be recent phenomena, then the stresses attendant on modernization that have occurred since the Second World War must be examined as they function as risk factors for alcohol dependence.[1]

The frequency and cumulative distributions of respondents' scores on the conduct disorder scale (ASYES) among male and female controls are displayed in Figure 6-1.[2] The curves for men and women resemble more closely the distribution of alcohol severity (ALCSUMAB) for women than they do for men (see Fig. 4-1). That is, a large minority of respondents of each sex answered none of the questions affirmatively, and the remainder all fell between scores of 1 and 7 out of a possible 15. Furthermore, as with the women's ALCSUMAB scores, so here too the pattern is essentially bipolar. Moreover, although a smaller proportion of men than women had zero scores, the curves are essentially the same for each sex.

RISK FACTORS FOR CONDUCT DISORDER

Stratification variables. Among controls, the dependent variable (the conduct disorder score logASYES) differs significantly between the levels of each of the three variables (see Appendix 5, Table A5-1). People age 50 years and older have lower scores than younger people. People from agency towns have higher scores than those from border towns, who in turn have higher scores than those from other reservation communities. And men have higher scores than women. This is, of course, very much what one would expect to find if life in the agency and border towns is more stressful than it is in the more rural areas and if prevalence rates are on the increase.

Type of community in which informant was raised. Earlier, we suggested that being raised in an agency town is a risk factor for alcohol dependence (Kunitz and Levy, 1994), and this appears to be the case with respect to conduct

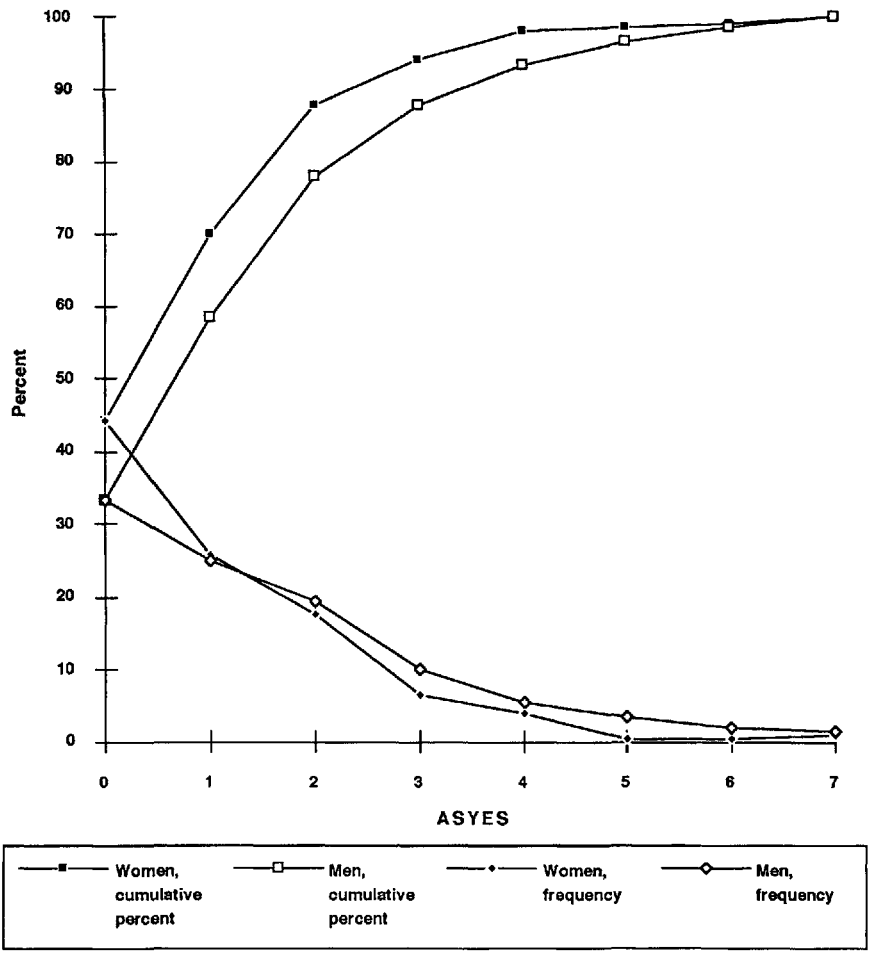

Figure 6-1. ASYES, cumulative and frequency distributions (%), male and female DEP.

disorder as well. People raised in rural communities tend to have the lowest scores. The association is only marginally significant, however (P = 0.0637), as shown by the results displayed in Appendix 5, Table A5-2.

Camp size. People who grew up in agency and border towns lived in the smallest camps, and there is an inverse association between conduct disorder score (logASYES) and camp size: the more households in the camp, the lower the value of logASYES (Appendix 5, Table A5-2). The largest camps in which respondents were raised between the ages of 0 and 6 years were found in rural areas (Appendix 5, Table A5-3).[3]

Migration. Although migration was shown in Chapter 4 to be unrelated to subsequent alcohol dependence, there is a significant association between changes of residence before the age of 12 years and an increase in logASYES (Appendix 5, Table A5-2).[4]

Social status. Low social class is associated with an increased risk of conduct disorder in other populations (Offord et al., 1986). In the present sample, however, only parents' livestock ownership is significantly and negatively associated with logASYES: The more livestock the parents owned, the lower the score. There is no significant association with other markers of social status—education of either parent, parental occupation and the social status variable that combines parental occupation(s) and livestock holdings.[5]

Religion. If social change exposes children to an increased risk of developing conduct disorder by disrupting established beliefs and relationships, then one might expect that people brought up in families that continued to adhere to traditional Navajo religion would have lower conduct disorder scores than other people. Moreover, since parents' and other family members' drinking is associated with an increase in logASYES (see below), religions that condemn drinking (i.e., the Mormon, Evangelical Protestant, and Native American Churches) and take a stand against such behavior ought also to be associated with lower conduct disorder scores. The results of several analyses of religious background and logASYES indicate that there are no significant associations (Appendix 5, Table A5-2).

Presence of parents in the home and family drinking patterns. Family disruption is known from other studies to be associated with the development of conduct disorder. That does not appear to be the case among the people we interviewed, for there is no difference between the conduct disorder scores of men and women depending on whether their mothers or fathers were present in the home. On the other hand, parental drinking, which has also frequently been observed to be associated with both conduct disorder and alcohol dependence in their offspring, is important in this population as well.

Detailed examination of the average conduct disorder scores within various categories of parental drinking showed that informants who were the children of abstainers, and whose siblings and other camp members were also abstainers, all had low logASYES. Conversely, respondents whose parents and other family members were abusive problem drinkers had higher than average scores (Appendix 5, Table A5-2).

The experience of abuse. In Chapter 4, we showed that physical and sexual abuse before age 15 years are associated with conduct disorder (see also Appendix 5, Table A5-2). As noted there, it seems likely that abuse is a true risk factor for conduct disorder. It is also possible, however, that children with conduct disorder provoke abuse by so antagonizing their parents and others

that they are beaten severely and may also put themselves in high-risk situations in which sexual abuse is likely to occur. Unfortunately, our data do not allow us to distinguish between the possibilities.

Educational attainment. Dropping out of high school is a significant risk factor for becoming alcohol dependent, even when conduct disorder is taken into account (see Chapter 4). There is also evidence that being a high school dropout is significantly associated with an elevated logASYES (Appendix 5, Table A5-4). It seems probable, however, that dropping out of high school is more likely to be the result of conduct disorder than the cause, due in part to the strong association between attention deficit hyperactivity disorder and conduct disorder documented in many studies.

The most important risk factors. Of all the risk factors previous analyses have shown to be significantly associated with conduct disorder, only number of households in the camp, sex, age, mothers' drinking, and both physical and sexual abuse remained significant in a multiple regression in which all were included (Appendix 5, Table A5-5). In addition, the stratification variables—Community of present residence, sex, and age—were included separately instead of the combined stratification variable because we wished to consider their independent effects. Level of education was not included because it is not clear that it is a risk factor. Change of residence before age 12 years, the type of community in which the respondent was raised, the present community of residence, parental livestock ownership, and fathers' drinking are no longer significant. Interaction terms were also examined and not found to be significant. Thus, lower than average scores were found among women, older people, people brought up in large camps, those whose mothers were not abusive drinkers, and those who had not experienced physical or sexual abuse in childhood.

LIFETIME PREVALENCE AND TEMPORAL CHANGES IN CONDUCT DISORDER

The analyses thus far have shown that several of the risk factors for conduct disorder that have been found to be important in other populations are also important among Navajos. This should evoke no surprise: Families in which there is heavy drinking accompanied by abusive behavior seem to put children at risk for developing conduct disorder. What we wish to consider now is the lifetime prevalence of conduct disorder as well as the degree to which it and its risk factors have changed over the course of this century.

Figure 6-2 shows that the prevalence of conduct disorder among the men in our two control groups is higher among younger than older men. This agrees

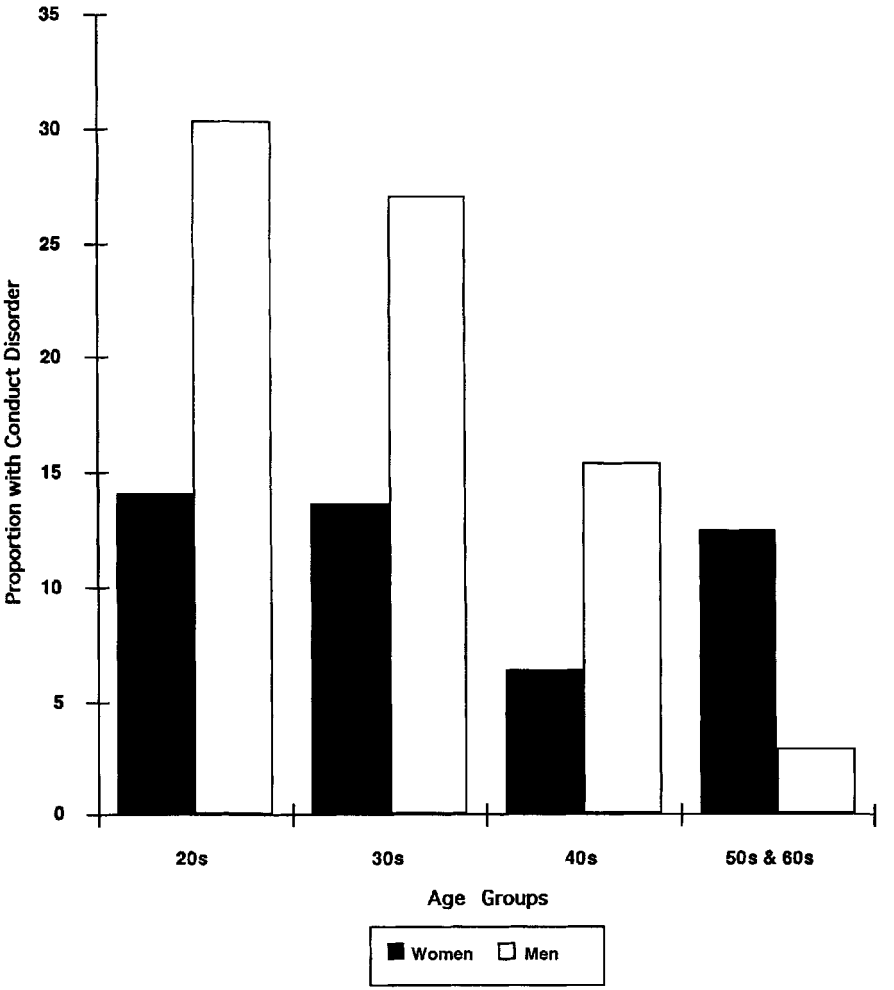

Figure 6-2. Proportions of men and women with conduct disorder by age at time of interview.

with the association we have already noted between the conduct disorder score (logASYES) and age. The stepwise pattern of decline in the rates at successive ages among Navajo men is virtually identical to the pattern among men in the Epidemiologic Catchment Area sample, although the rates at every age tend to be higher among Navajos. Navajo women do not show the same sort of decline with increasing age as is observed in the sample of women in the Epidemiologic Catchment Area study (Robins et al., 1991b: 269). Among Navajo women, the prevalence in each age cohort is essentially the same and higher than what was found in the national sample.

Making historical inferences from cross-sectional data such as these is

highly problematic, however, because of the potential bias introduced by selective recall and selective mortality. We know that premature mortality among Navajos, especially men, is due to accidental deaths, many of which are alcohol related (Carr and Lee, 1978). We have also shown that people with conduct disorder in childhood are at higher risk for alcohol dependence and for more severe alcohol and non-alcohol-related problems than people without conduct disorder. Thus it seems reasonable to expect that people with conduct disorder would die earlier from alcohol-related accidents than would people without conduct disorder. The result would be a decreasing proportion of people who had had conduct disorder in childhood among people, especially men, of increasing age, which is just the pattern we observe.

We have attempted to determine if there is a generational effect independent of selective mortality by taking advantage of the fact that the study was a case–control design. This resulted in separate data within each sex for the three study groups—cases (CAS), alcohol-dependent controls (DEP), and non-alcohol-dependent controls (NADC).

Because premature mortality is almost entirely alcohol-related and because people with conduct disorder are likely to be at greatest risk of dying prematurely, we would expect CAS to have the strongest inverse relation between age and logASYES, the least among NADC, and DEP in between. If there is a negative slope even in the NADC sample, which was noted to have very low levels of ASYES, we would have reason to think that, along with selective mortality, there may also be a true increase in the incidence of conduct disorder in recent decades.

Figure 6-3 displays regressions of logASYES on age for all six sex-sample groups. The patterns are as we had predicted. The steepest slopes are found among CAS, then among DEP, and then among NADC. Among women NADC, the regression line is essentially flat, suggesting no temporal change. The negative, statistically significant, but shallow slope among NADC men, among whom conduct disorder was very infrequent and ASYES on average very low, provides suggestive evidence for a real increase in the conduct disorder score in recent decades, although inability to recall childhood misconduct among people as they age cannot be ruled out. To address this possibility, however imperfectly, we next consider the degree to which risk factors for conduct disorder have changed over the course of this century.

Among the risk factors thus far found to be significant are average number of households per camp, physical and sexual abuse before age 15 years and maternal drinking. We have done regressions of these risk factors onto informants' age (Appendix 5, Table A5-6). We expect that younger informants will have grown up in smaller camps with more abusive maternal drinking. Moreover, some observers have suggested that childhood abuse has increased in recent years as well (e.g., Hauswald, 1987). The results indicate that younger informants are significantly more likely to have grown up in smaller camps than older

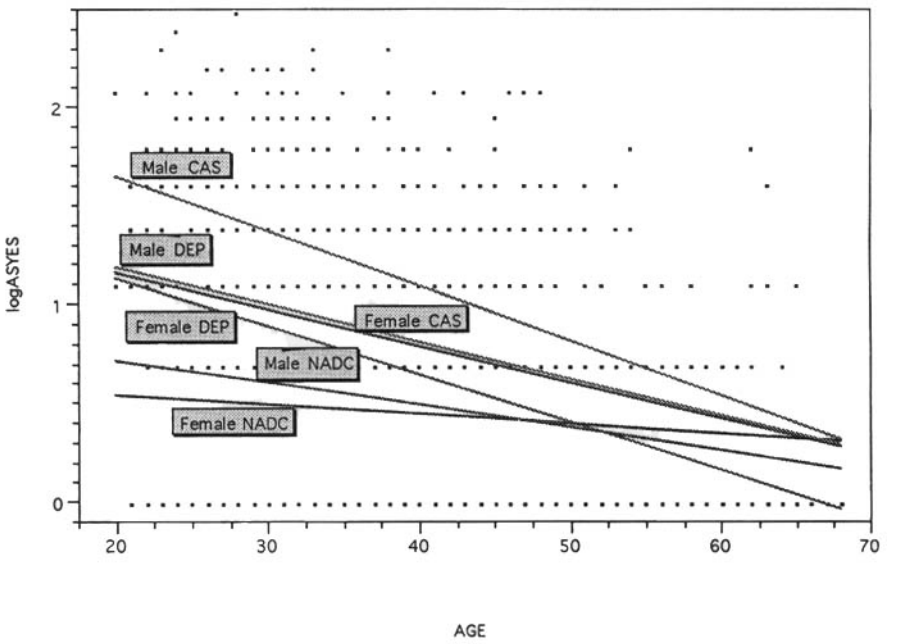

Figure 6-3. Regressions of logASYES on age for each sex and sample separately.

informants. There is, however, no tendency for younger informants to have reported physical or sexual abuse more frequently than have older people. Maternal drinking patterns were not more problematic among younger informants. These results indicate that small camp size has become more common in recent years but that the other significant risk factors have not.

We observed above that the conduct disorder score was elevated among high school dropouts but that it was not clear whether school problems were a cause or an effect of conduct disorder. Chapter 2 suggested that the creation of a peer group culture in school appears to be associated with the creation of groups of young people who get into difficulty and may, therefore, drop out. Thus, schools may foster as well as respond to behavioral problems. Moreover, because schools and school attendance patterns have changed dramatically over the past several generations, it is extremely difficult to analyze the relationship between schooling and conduct disorder. We have attempted to do this in Figure 6-4, however, which displays regressions of logASYES onto age for people with different levels of levels education.

What is most striking is that the association between age and logASYES is significant and inverse only for people with a grade school or some high school education. That is, among young respondents, the conduct disorder score is sub-

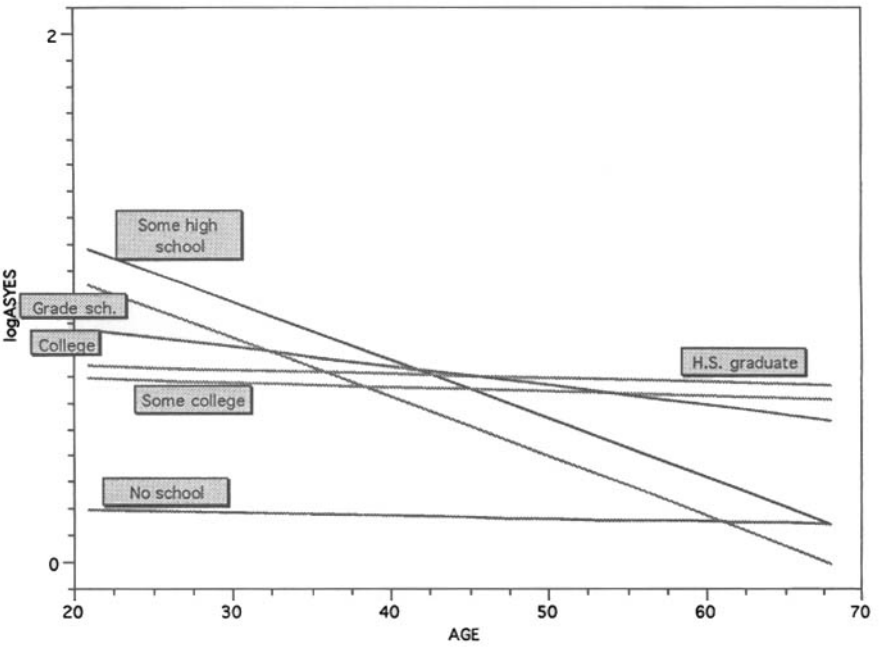

Figure 6-4. logASYES regressed onto age for different levels of educational attainment, male and female controls.

stantially higher for those with only a grade school or some high school education than it is for those with no education or more than a high school education. On the other hand, among older people, those with no education, only grade school, or some high school have lower logASYES scores than do people with more education. Among high school graduates and people with some college, scores do not differ by age. This suggests that the meaning of school attainment has changed substantially since World War II and that dropping out of school early is now associated with behavior problems, whereas it does not seem to have been previously. Most young people attend school, and in this context not finishing is associated with increased conduct disorder scores.[6]

CONCLUSIONS

The retrospective nature of the data may cause biases of two different sorts: one resulting from difficulties of recalling events that occurred in childhood and the other from selective mortality of people with conduct disorder. With regard to recall, people with conduct disorder may have been more likely than others to minimize their childhood misbehavior. If this were the case, the effect would be

to diminish the differences between those with and those without conduct disorder. On the other hand, if recall were diminished regardless of conduct disorder, then the result would be to weaken equally the associations between the risk factors and conduct disorder. In either case, the results will be conservative; that is, risk factors that are significant may be declared insignificant.

In addition, if recall of childhood misbehavior is simply diminished with age, it might help account for the lower logASYES scores with increasing age. Moreover, selective mortality of people with conduct disorder is undoubtedly a very real phenomenon. It was the observation in our 25-year follow-up study of increased risk of death among a subset of young men that led to the present study, and it too would help account for the decrease in logASYES with increasing age.

Despite these confounding age-related effects, there is suggestive evidence of a true increase in conduct disorder. The decline of the livestock economy, the development of a cash economy, the movement to agency and border towns with the accompanying diminution in camp size, and the expansion of the educational system are post-World War II phenomena. In the past, multihousehold camps were more common than they are today, and even single household camps were likely to be part of a cooperating kin network. Indeed, town camps are likely to consist of a nuclear family in a single household, occasionally with an additional friend or relative.

Inevitably there has been much mixing of unrelated people in border and agency town residential neighborhoods and schools. As we have noted, there was also disruption of the network of obligations to kin that provided a context within which alcohol use was moderated by a sense of responsibility (Kunitz and Levy, 1994). Instead, peer groups of unrelated young people drank together, unimpeded by the constraints of kinship obligations and responsible behavior. Indeed, since the early 1970s, agency towns have seen the emergence of a youth culture and of youth gangs, often in the context of the school. Such social structural risk factors are similar to those found in other populations (Moffitt, 1993).

Abusive maternal drinking is very rare, and there is no evidence that it has increased over the period (before the 1970s) during which most of our informants were growing up (Levy and Kunitz, 1974). There is, however, evidence that drinking by women became more common during the 1980s and that fetal alcohol syndrome has increased in prevalence as a result (May and Smith, 1988). It is thus possible that if a study comparable to this one were to be done in another 10 or 20 years, an increase in abusive maternal drinking would be observed.

In the analyses in Appendix 5 (Table A5-2), abusive maternal and paternal drinking were both significantly associated with an increase in conduct disorder scores, whereas in the multiple regression in Appendix 5 (Table A5-6) only maternal drinking was. This is probably because abusive paternal drinking is widespread, whereas mothers, in general, do not drink abusively and thus represent a source of domestic stability. When mothers drink abusively, it is almost always

along with an abusively drinking partner, thus depriving the child of an important source of stability.

Physical abuse and corporal punishment have been shown to be followed by increased aggression among children (Straus et al., 1997), and the results presented here are consistent with those findings. On the other hand, while sexual abuse in childhood is associated with a variety of subsequent psychological problems, in studies of clinical populations aggression and antisocial behavior are not prominent among them. In studies of nonclinical populations, however, such behavior is more common among sexually abused than nonabused children (e.g., Kendall-Tackett et al., 1993). The results of the present study, then, are consistent with those from other populations.

In one respect, the results of the present study are at variance with results observed elsewhere, for, contrary to other studies (Offord et al., 1986), we found virtually no association between any measure of social status of family of origin and the conduct disorder score. The only measure that was significant—amount of livestock owned by the parents—became insignificant in the multiple regression. The likely explanation is the one suggested by Offord et al., (1986), that it is not social status per se but what they call the "under-the-roof culture" of the household that is important. Thus, abuse and parental, especially maternal, drinking in this population may bear no relationship to social status. This is discussed in more detail in Chapter 7.

An especially important issue raised by our data, but about which we can only speculate, has to do with the strong association observed in other populations between conduct disorder and attention deficit hyperactivity disorder (ADHD) (Foley et al., 1996; Satterfield and Schell, 1990). The prevalence of ADHD is 3%–7% among school children. It is three times more common in boys than in girls. Among those diagnosed in childhood, ADHD persists into adolescence in 50%–80% and into adulthood in 30%–50% (Barkley, 1997). As many as one third of people with ADHD fail to finish high school (Barkley et al., 1991). They are at increased risk of becoming delinquent, of abusing a variety of substances, and of having difficult interpersonal relationships. These problems are more severe when ADHD co-occurs with conduct disorder, which it does at greater than chance levels. The reason for the co-occurrence is not known (Hinshaw, 1994:12; Loeber et al., 1995; Faraone et al., 1998), but the fact of co-occurrence is relevant here because it may help explain two of our findings: (1) that conduct disorder is strongly associated with dropping out of high school and (2) that dropping out of high school and conduct disorder are each independent risk factors for alcohol dependence.

It is possible that among the people with conduct disorder who drop out of high school is a disproportionate number who have ADHD. If this were the case, then dropping out of high school would be an indicator of additional risk of trouble in adult life over and above that resulting from conduct disorder alone. This is

only speculative, or course, because we have no data on ADHD in this population. We raise the possibility because it is consistent with what has been observed in other populations and because it is a problem deserving further investigation in this population.

Finally, while the same risk factors are important for women as well as for men, women have a substantially lower prevalence of conduct disorder. As noted at the outset, there has been debate about the meaning of this same difference between the sexes in other populations: whether it has to do with innate differences between males and females or whether the criteria relevant to males are simply not relevant to females. Our data do not speak to these issues, and we can only say that women appear to be less responsive to the risk factors that affect men.

Thus, several of the same risk factors associated with conduct disorder in other populations are also important among Navajos. Moreover, there is suggestive evidence that some important risk factors may have increased in prevalence in recent decades. If so, there may have been an associated increase in conduct disorder as well. If true, this too may be something that Navajos share with other populations.

Notes

1. The analytic methods and tables for this chapter are given in Appendix 5. Unless otherwise noted, only controls are included in the analyses.

2. The ASYES scale is described in Appendix 1.

3. Only camp size before age 6 years is displayed in Appendix 5, Table A5-3, but the results for older ages do not differ significantly from those we have used.

4. As we were concerned only with conduct disorder before age 15 years, we did not ask whether a similar association holds for changes of residence during adulthood.

5. See Appendix 5, Table A5-2 and Chapter 4 for a description.

6. In a national study of high school dropouts, Coleman (1988) has shown that "social capital" and "human capital" of the families of origin were significant contributors to dropping out. Dropouts were more likely to come from single parent families, to have large numbers of siblings and to be lower in the birth order, and to have parents with less education and lower expectations regarding college attendence. We divided our sample into people older than 45 years, 30–44 years, and 21–29 years to take into account changes in the educational system and then examined a number of the variables found to be significant in the national study. Parental education was significantly associated with college attendence but not with being a school dropout as compared with being a high school graduate. The results were significant only for people aged 30 years and older. Number of siblings, birth order, who raised the individual, livestock holdings, and parental drinking were not significant for any of the three age groups. Thus, a number of the factors implicated in dropping out of high school in the national study do not seem to be significant in the population we studied.

7

ANTECEDENTS OF VIOLENCE IN ADULTHOOD

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K. Ruben Gabriel
Jerrold E. Levy

It has long been known that there is an association between alcohol use and violence. What has not been at all clear is whether the association is causal and, if it is, what the causal mechanism is. Does alcohol lower inhibitions and release aggressive impulses? Does it stimulate aggression? Is violence when drinking simply learned behavior? That is, do people behave when drinking as their culture has taught them to behave?

Some of our early work addressed the question of the association between alcohol and violence. In studies at both the population and individual levels, we were often able to show an association between alcohol and violence, but we were never able to demonstrate that alcohol was a necessary cause of violence, one without which violence would not have occurred. The present study gives us the opportunity to consider the question again.

We showed in Chapter 4 that childhood abuse and conduct disorder are risk factors for subsequent alcohol dependence. In this chapter, we ask whether severity of alcohol dependence is associated with the commission of both domestic and other forms of violence. We also ask whether other factors, notably a history of childhood abuse and of conduct disorder, underlie whatever association may be found between alcohol dependence and violence. In other words, we ask whether people who commit violence when drunk have personal histories that explain both their drunkenness and their violence.

It is commonly assumed that there is a cycle of violence and that people who were abused as children are more likely to become abusive as adults. Straus (1995:410) has observed, however, that, "For the most part, quantitative data demonstrating such an association are lacking." His own study did not show an impressive association between the degree to which parents reported having experienced physical punishment as children and the degree to which they were violent toward their own children.

Regarding being the recipient of violence, on the other hand, calculations from data published by McCauley et al. (1997) from women patients in general internal medicine practices indicate that, of the 400 who had experienced some form of childhood abuse, 49% had also experienced abuse in adulthood, whereas, of 1,460 who did not experience childhood abuse, only 13.9% experienced abuse in adulthood. This more than three-fold difference suggests that abuse in childhood is a risk factor for being the victim of abuse in adulthood.

The associations between abuse in childhood and being the giver or recipient of abuse in adulthood are complicated by the association between alcohol misuse and violence (Martin, 1993). Kaufman-Kantor and Straus (1995:211) found that 76% of cases of family violence did not involve the use of alcohol. They did, however, find that, for people who drank a great deal or drank in binges, a much higher proportion of cases of family violence involved alcohol than among more moderate drinkers. Using a subset of data from Native-American informants from the same national survey used by Kaufman-Kantor and Straus (1995), Bachman (1992:105–106) found a similar relationship.

RESULTS

We showed in Chapter 4 that neither physical abuse nor sexual abuse in childhood differ by age or present community of residence of the informant. Moreover, a history of physical abuse was as common among men as among women. Sexual abuse, however, was more commonly experienced by women than by men. We now ask, who were the perpetrators of the abuse? Table 7-1 lists the results for male and female controls who had experienced physical abuse. For each sex, the perpetrators were most likely to be kin, most commonly parents. Among women, the abusive parent was most frequently said to be the mother, whereas among men it was said to be the father.

Table 7-2 lists the results for male and female controls who had been sexually abused. In this instance, the perpetrators were as likely to be non-kin as kin. Among the kin who were said to have abused the women, fathers, stepfathers, mothers' brothers, and mothers' siblings' sons were all listed about equally. Among the very few men who said they had been sexually abused by kin, a

Table 7-1. Perpetrators of Physical Abuse on Male and Female Controls Who Were Abused Before Age 15 Years, as Percentages

	RESPONDENTS	
PERPETRATOR	FEMALES (N = 29)	MALES (N = 63)
Father	13.8	41.3
Mother	38.0	14.3
Other kin	24.1	14.2
Non-kin	24.1	30.2

brother, a stepbrother, cousins, an aunt, and in one case a clan relative were listed.

We examined the associations between a number of variables having to do with the characteristics of the families of origin and the experience of each type of abuse: parents' and informants' religion when the informant was young; parental livestock ownership, education, and social status; camp size; and parental drinking patterns. Of them all, only mothers' and fathers' drinking patterns were associated with physical abuse. This is because alcohol abuse by parents was distributed in the population without relation to family attributes (see Chapter 4). Essentially no family variables were associated with sexual abuse (see Appendix 6, Tables A6-1 and A6-2). This is not entirely surprising, considering that the perpetrators of sexual abuse were as likely to be non-kin as kin of any sort.

Turning now to our respondents' involvement in family violence as adults, we examined whether it was associated with the three stratification variables of age, sex, and community of residence. With regard to being the perpetrator of violence, only age was significant (see Appendix 6, Table A6-3). The results of a similar analysis of answers to the question whether the informant had ever been

Table 7-2. Perpetrators of Sexual Abuse on Male and Female Controls Who Were Abused Before Age 15 Years, as Percentages

	RESPONDENTS	
PERPETRATORS	FEMALES (N = 25)	MALES (N = 13)
Kin	52	46.2
Non-kin	48	53.8

struck by his or her partner indicate that both age and sex are significant. Women are more likely than men, and people younger than 50 years more likely than people 50 years and older to answer affirmatively. The proportions answering affirmatively are displayed in Table 7-3.

Witt and Olson (1996) have summarized results obtained in a number of prevalence studies and have found that the lifetime prevalence of violence against women by their partners varies from 21% to 30%, and when either partner is the perpetrator the rate does not change appreciably (28%–30%). Pagelow (1984:45), summing up her review of research findings, thinks lifetime prevalence ranges from 21% to 35% if restricted to men beating their partners and excluding episodes when partners beat each other. She also estimates that between 25% and 30% of women are beaten at least once during the course of a single intimate relationship.

Men reported having beaten their partners somewhat less than did the women. The lifetime rate for the male controls was 39.2%. If instances when the woman is also violent (as reported by the women) are excluded, the rate is only 21.6% and comparable with Pagelow's low estimate (Table 7-4). When either or both partners are the perpetrator, however, the rate of domestic violence reported by Navajo women controls is about 60%. The rate reported by the men is about 49%. Men and women controls both report that just under 10% of men were beaten by their partners without their having beaten in return.

The amount by which Navajo domestic violence exceeds the rates found in other studies is largely accounted for by encounters involving mutual violence, and alcohol is involved in 77% of these episodes (Table 7-5). Regardless of which partner is violent, however, it is the man who is most often the one who is drinking, and even when only the woman is violent, she is drinking less often than her partner.

Because a predilection for violence may result from stress due to income inequality, for example, we also examined the association between occupation and whether people had ever struck their partners. With the advent of a wage work economy after the stock reduction programs, men found themselves at a disad-

Table 7-3. Proportions of Men and Women Controls Who Struck and Who Had Been Struck by Their Partners, as Percentages

	STRUCK PARTNER		STRUCK BY PARTNER	
AGE (YEARS)	MEN	WOMEN	MEN	WOMEN
Below 50	43.4	42.5	37.5	52.7
50 and above	21.0	9.5	17.3	28.6

Table 7-4. Who Did the Beating as Reported by Male and Female Controls, as Percentages, Unknowns and Those Never Having Had a Partner Excluded

	MEN (N = 446)	WOMEN (N = 185)
Both	24.2	28.6
Man only	15.0	21.6
Woman only	9.6	9.7
Neither	51.0	40.1
Total	99.8	100.0

vantage. Jobs available to men were, until recently, most often low paying, blue-collar positions that did not confer much respect in non-Indian society. Many women in contrast became teachers, nurses, and secretaries, all white-collar and better-paid positions. It became difficult for women to find husbands equally well educated and paid. We thought the higher rates of domestic violence reported by younger than older informants might in part reflect this pattern. It turns out, however, that there is no association between violence and occupational status of either men or women (data not shown). The age differences in prevalence rates are not explained by occupational change.

In contrast, as Figure 7-1 illustrates, educational attainment is associated with commission of violence against a spouse or partner. We have displayed regression lines of education onto age for men and women controls who had and had not struck their partners. Men and women are combined because the patterns are similar for each. The results indicate that, among people who had not struck their partners, there was a strong inverse relationship between age and education.

Table 7-5. Involvement of Alcohol in Events of Domestic Violence Reported by Female Controls, as Percentages

	PERPETRATOR		
WHO WAS DRINKING	BOTH (N = 52) (77.4% WITH ALCOHOL)	MAN ONLY (N = 40) (82.5% WITH ALCOHOL)	WOMAN ONLY (N = 18) (27.8% WITH ALCOHOL)
Both	21.9	12.1	0.0
Man only	70.7	84.8	60.0
Women only	7.3	3.0	40.0
Total	99.9	99.9	100.0

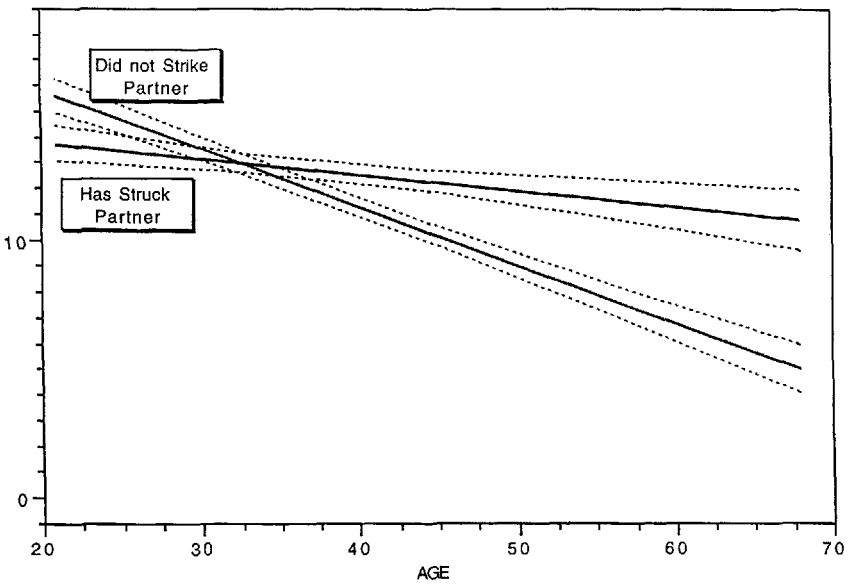

Figure 7-1. Regression lines of number of years of school onto age, men and women controls combined, those who have struck their partners, and those who have not struck their partners (with 95% confident curves).

For people who had struck their partners, the relationship between age and education is much weaker.

What this shows is that older informants who were relatively well educated were more likely to have struck their partners than were people of the same age who were poorly educated. On the other hand, among young people, those who have struck their partners are less educated than those who have not. These results parallel those displayed in Figure 4-3, which show that older non-alcohol-dependent controls (NADC) are less well educated than either cases (CAS) or alcohol-dependent controls (DEP), whereas younger NADC are better educated than younger people in either of the other two samples. They also parallel the results in Figure 6-4, which show a similar changing association between the conduct disorder score (logASYES) and level of educational attainment. Thus, for the oldest men and women in our sample, those who were of school age in the 1930s and 1940s, the risk of committing family violence as well as of developing conduct disorder before age 15 years and of becoming alcohol dependent subsequently was greatest among those with the most education. Among younger generations, these relationships have reversed.

ABUSE, CONDUCT DISORDER, AND ALCOHOL DEPENDENCE AS RISK FACTORS FOR FAMILY VIOLENCE

We turn now to a consideration of several other risk factors for the commission of family violence (see Appendix 6, Table A6-4). A history of sexual abuse and logASYES have no effects additional to those of physical abuse and the severity of alcohol dependence (ALCSUMAB). A history of physical abuse affects the probability of hitting beyond the effect of ALCSUMAB (i.e., for fixed ALCSUMAB, individuals who were physically abused have a higher probability of hitting than individuals without such abuse).

A similar analysis of whether informants were struck by their partners gives essentially the same results. That is, sexual abuse and the conduct disorder score (logASYES) are not significant, and both physical abuse and severity of alcohol use (ALCSUMAB) are significant (see Appendix 6, Table A6-5).

We turn next to a more detailed consideration of the associations between childhood abuse and conduct disorder on the one hand and family violence in adulthood on the other, given level of alcohol abuse. For the following analyses all three samples, not only the controls, are used. Table 7-6 lists the proportions who have been involved in family violence by sex and sample. It is clear that there is a progression of prevalence from NADC to DEP to CAS and that at every

Table 7-6. Proportions of Men and Women Who Have Struck and/or Been Struck by Their Partners, by Sample

	CAS	DEP	NADC	χ^2	*P* VALUE
		Men			
Both struck and was struck	39.9%	28.0%	14.4%		
Strick partner	11.3%	18.4%	6.4%		
Was struck	13.7%	9.7%	9.6%		
Neither	35.1%	49.9%	69.6%		
N	168	321	125	48.032	0.0000
		Women			
Both struck and was struck	57.6%	44.8%	21.5%		
Struck partner	6.5%	12.1%	9.2%		
Was struck	25.2%	22.4%	20.8%		
Neither	10.8%	20.7%	48.5%		
N	139	58	130	59.535	0.0000

level of alcohol use women are less likely than men to have escaped involvement in violence.

The question is, given level of alcohol use/abuse, do conduct disorder and the experience of physical and sexual abuse before age 15 years add to the ability to predict involvement in domestic violence? The answer is that, within each sample, a history of physical abuse has a significant positive effect on both hitting and being hit (see Appendix 6, Tables A6-6 and A6-7). The effect is particularly significant among non-alcohol-dependent controls (NADC). A history of sexual abuse has no effect. Conduct disorder (logASYES) has a variable effect. With regard to the commission of violence against a partner, it is significant among both NADC and CAS but not among DEP. With regard to being the recipient of violence, it has no effect. Thus, having been the victim of physical abuse before age 15 years is associated with being both a perpetrator and a victim of family violence, regardless of level of alcohol dependence; sexual abuse has no measurable effect; and an increased conduct disorder score tends to be associated with being a perpetrator but not with being a victim of violence.

INVOLVEMENT IN FIGHTS WHEN DRINKING

The association between alcohol use and violence extends well beyond family violence. Indeed, Topper (1985) has suggested that the change in composition of Navajo drinking groups to include more non-kin and even strangers has created a context in which the risk of violence is increased. In this section, we address the associations between conduct disorder, a history of abuse, and severity of alcohol use on involvement in fights. When considering NADC, abstainers are excluded. The analyses follow the same pattern as those for family violence.

Among controls, a history of violence is more common among men than women; among the young than the old; and among agency and border town residents than among rural reservation residents (see Appendix 6, Table A6-8). There are, however, significant differences in the participation in violence among drinkers across samples (Table 7-7). Not surprisingly, violence is most frequent among CAS, then among DEP, and then among non-abstainer NADC. Considering only the controls, a history of physical abuse, increased conduct disorder score (logASYES), and severity of alcohol misuse (ALCSUMAB) are all independent risk factors for involvement in drunken fights. A history of sexual abuse is not (see Appendix 6, Table A6-9).

We next ask whether, given the sample, abuse and conduct disorder (logASYES) increase the ability to predict involvement in drunken fights (see Appendix 6, Table A6-10). The results indicate that not only are CAS and DEP more likely than NADC to have been in fights but that even given sample,

Table 7-7. Involvement of Men and of Women in Fights While Drinking, by Sample

	CAS	DEP	NADC*
	Men†		
Percent involved in fights	71.1	58.6	9.1
Total N	204	374	127
	Women‡		
Percent involved in fights	64.9	41.7	3.7
Total N	148	60	81

*Abstainers excluded.

†Pearson's chi square = 125.152; $P < 0.0001$.

‡Person's chi square = 79.9; $P < 0.0001$.

logASYES and physical abuse continue to have an effect on involvement in fights. (Sexual abuse has not been included because it has not been associated with violence in any of the previous analyses.) The results thus suggest that, in addition to severity of alcohol dependence, conduct disorder and a history of physical abuse in childhood contribute significantly to involvement in fights when drinking.

Finally, in Figure 7-2 we display regressions of education onto age for male controls only, comparing those who have been in fights with those who have not. The pattern is the same as the pattern displayed in Figure 7-1 for domestic violence. Older men who had engaged in violence had higher levels of education than did men of the same age who had not engaged in violence, whereas for younger men the pattern was reversed (although the 95% confidence limits overlap for younger men). Unlike the pattern for men, the regression lines for women (not shown) were parallel, indicating no change in the relationship of violence to education at different age levels.

We have no measures of the frequency and intensity of violence when drinking so we cannot assess its severity. We do have reports of the age at which such fights first occurred, however, and this may be something of a proxy for the propensity of individuals to engage in violence. It is not entirely adequate, of course, because violence is one of the criteria for conduct disorder. Within each sample, age at first fight was unaffected by a history of physical abuse and inversely associated with the conduct disorder score (logASYES): The higher the score, the younger the age at which the first fight had occurred (see Appendix 6, Table A6-11). Thus, fighting when drinking is not simply a result of having been drinking, but other attributes of individuals are also significant. Moreover, to the degree that those attributes are shaped by changes in the social context, as con-

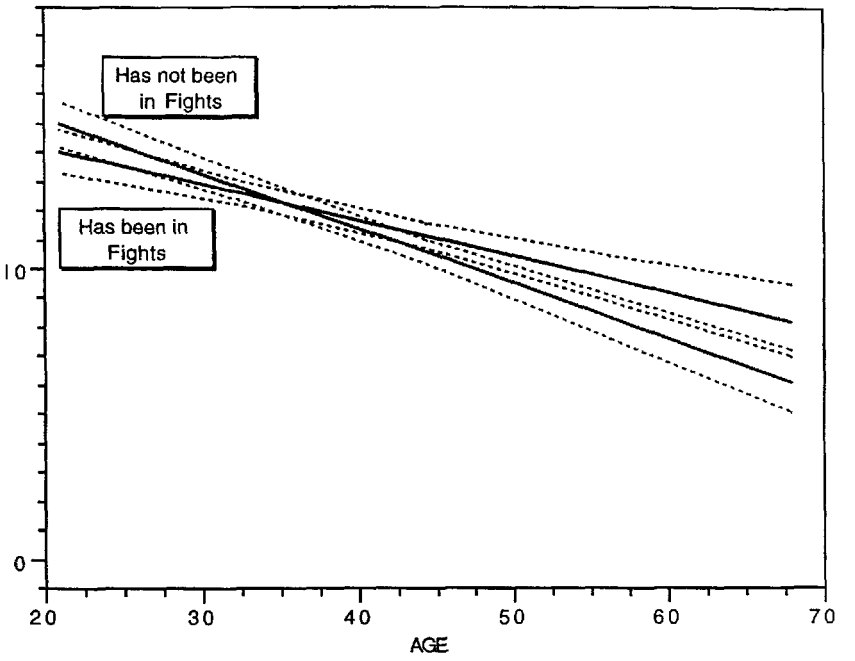

Figure 7-2. Education regressed onto age, for men who have been in fights and men who have not been in fights, controls only (with 95% confidence curves).

duct disorder seems to be, this sort of violence may well have become more frequent in recent decades.

It has been suggested that changes in the composition of drinking groups have resulted in more fights and that people who drink with peers and strangers are more likely than those who drink with kin to get into fights. The results of an imperfect test of this hypothesis are displayed in Appendix 6, Table A6-12, in which the association between fighting and usual drinking companions is examined. The usual composition of drinking groups is not associated with an increased probability of having engaged in violence, although a proper test of the hypothesis would require observation of many different drinking occasions. There is, however, a tendency for solitary drinkers not to have engaged in fights.

Considering that the risk factors for family violence and for fighting are very similar, we would expect that the people who do one are more likely to do the other as well. Indeed, that turns out to be the case (see Appendix 6, Table A6-13). People who struck their partners were more likely to have engaged in fighting while drinking as well. There are, of course, many people who do one and not

the other, but these data suggest that for a significant number of people violence is not limited only to the domestic sphere but occurs elsewhere as well.

DISCUSSION

The major limitations of the data reported in this chapter have to do with recall and reporting biases of abuse in childhood. Reporting may be biased if people were unwilling to discuss or unable to remember episodes of childhood abuse. Assuming underreporting occurred, it would result in an underestimation of the prevalence of abuse, but it would not necessarily distort the analyses of abuse as a risk factor unless underreporting was selective. That is, if NADC were more likely to underreport abuse than DEP or CAS, a spurious association between alcohol dependence and abuse would result. This could happen if people who had been in treatment had been encouraged or even taught to recall episodes of childhood abuse.

To check this potential treatment bias, the histories of abuse and conduct disorder were compared between alcohol-dependent controls (DEP) who had been in treatment programs and those who had not. For neither men nor women were there any significant differences. Thus, we can find no effect of treatment bias, although we think it likely that there has been underreporting across all samples, especially for men who experience sexual abuse.

The results indicate the following. First, the prevalence of abuse before age 15 years is within the limits described in other populations. With regard to sexual abuse, Finkelhor (1993:67) has written that "Prevalence estimates in community surveys range from 6 to 62 percent for females and 3 to 16 percent for males with the better studies generally finding higher rates. . . . A rough expectation that at least one in four girls, and one in ten boys will suffer victimization, gives the order of magnitude that professionals ought to expect" (see also Siegel et al., 1987). The prevalence reported by the people in this study was 2.4% among men and 12.7% among women.

It has proven more difficult to find comparable figures for physical abuse, but the historical rates reported in this study appear to be within the range from national studies. In the Second National Family Violence Survey in 1985, Minor Violence against children was 619 per 1,000. Severe Violence was 110 per 1,000 (Wolfner and Gelles, 1993). In other words, in the survey year, 62% of children experienced minor violence and 11% experienced major violence. This compares with a lifetime prevalence of violence of all sort of 12.7% reported by Navajo adults.

The analyses of abuse by sampling strata also indicate that there is no difference in prevalence among those aged 50 years and above and those less than 50

years. Contrary to what has been assumed by other writers (Hauswald, 1987), this suggests that there has not been an increase in the abuse of children over the past several generations.

Second, of all the variables having to do with family of origin, only parental drinking affects physical abuse and none affects sexual abuse. This is congruent with the analyses in Chapter 4 that indicated that parental drinking patterns were not associated with any other parental attributes except membership of fathers in the Native American Church. That is to say, because heavy drinking by parents, especially fathers, is distributed about evenly throughout the population, so is physical abuse.

Third, both abuse and conduct disorder are risk factors for alcohol dependence. The analysis of the association between conduct disorder and alcohol dependence is described in Chapter 4. In the present context, what this finding suggests is that people who were abused had a higher probability of becoming alcohol dependent than did those people who were not abused whether or not they also manifested the behavior characteristic of conduct disorder. Again, this is congruent with much, but not all, that has been published previously (Widom et al., 1995). Nonetheless, conduct disorder, whatever its source, is a more powerful predictor of alcohol dependence than is abuse.

Fourth, alcohol dependence, increased conduct disorder score (logASYES), and a history of physical abuse are all independent risk factors for violence. This means that the personal histories people bring with them to interpersonal relationships shape the way they deal with anger, resentment, and frustration. There is nothing surprising about this. It also means, however, that alcohol affects violence independently of these personal histories, but it is still far from clear how this occurs: whether by lowering inhibitions; by stimulating aggression; as a reflection of learned behavior and what is culturally acceptable; (MacAndrew and Edgerton, 1969; Pernanen, 1991; Martin, 1993); or by causing a sort of myopia "in which the breadth, depth, and time line of our understanding is constrained" (Steele and Josephs, 1990:921). According to this view, alcohol causes extreme behavior in "situations where, if the individual were sober, a strong immediate response to salient cues would be inhibited by other strong cues that require further processing to grasp" (Steele and Josephs, 1990:923). We return to this possibility below.

Fifth, the association between alcohol dependence and education has changed. Among older informants, education is a risk factor for increased conduct disorder score (logASYES) and alcohol dependence. Among younger informants, lack of education is a risk factor. This means that violent behavior that is strongly affected by conduct disorder and alcohol dependence has had the same changing association with education as they do. It is not clear what precisely ac-

counts for this change. At the very least it suggests that, when education was not universal, those who persisted in school were likely to include a disproportionate number who developed difficulties. Now that education is well nigh universal, the people who get into difficulties are likely to be those who do not persist in school.

Family violence appears to be more common in this population than in many others that have been surveyed. The proportion of women who say they have been struck at least once is 28.6% among women 50 years and older and 52.7% among women below age 50 years compared with a range of 9%–30% in other populations (Witt and Olson, 1996:79). The fact that a substantially higher proportion of younger than older women acknowledges being struck suggests that there may have been an increase in recent decades. Although differential survival and reporting biases cannot be ruled out, they seem unlikely to explain the age differences because overall female mortality is far less than male mortality (Kunitz, 1983). The high rates are consistent with the high rates of homicides of Navajo and other Southwestern Native-American women resulting from domestic disputes (Levy et al., 1969; Arbuckle et al., 1996).

It seems unlikely to us that alcohol abuse alone can entirely explain the high and increasing rates of family violence. We have already said that other risk factors play an important role. Those we have measured are individual attributes, but there is an important larger context as well. In their book, *Drunken Comportment*, MacAndrew and Edgerton (1969) argue that how we behave when intoxicated is determined largely by what we have been taught about the nature of alcohol as well as what our society considers socially acceptable or unacceptable behavior while drunk. Similar conclusions with respect to North American Indians have been reached by Lurie (1974), Kemnitzer (1972), and Dailey (1968). Mancall (1995:79–84) has shown that, as early as the Colonial period, Native Americans had accepted the belief that liquor was the criminal, not the man, that alcohol was the cause of domestic violence, and that a man was not accountable for acts performed while intoxicated.

Long before alcohol was readily available on the reservation, there is evidence of considerable tension between the sexes. In a Navajo autobiography recorded by Walter Dyk, Son of Old Man Hat tells of a discussion he had with his mother when he was a boy sometime in the 1870s. Her response refers to a period before the removal to a reservation:

> When a man talks as you're talking now, he gets that way. As soon as he gets a woman, as soon as they get acquainted he may start beating his wife, and they'll begin to have a quarrel every once in a while. . . . It's pretty dangerous to have a wife or a husband. Some men, when they have wives, may kill their wives or may get killed by them, and some commit suicide. (Dyk, 1966:47–49).

The descriptions of family conflicts in *Son of Old Man Hat* and those described in a more recent autobiography by Emerson Blackhorse Mitchell are strikingly similar (Mitchell and Allen, 1967). The emotional lability of Navajo males and the traditional instability of Navajo marriage have been described by Leighton and Kluckhohn (1948:109–111), who also say that physical conflict between husbands and wives was frequent and common. It appears that the difficulties of Navajo marriage have not changed appreciably over the years. Navajo women, however, are not passive recipients of domestic violence. Of the 175 male controls who had struck their partners, 108 (61.7%) also report having been hit by their partners. Furthermore, of the 94 women controls who reported having been struck by their partner, 54 (57.4%) admit to having struck their partner as well.

Before the 1960s, Navajo men committed suicide 14 times as often as Navajo women, and the motivation was most often sexual jealousy. Age-specific rates were highest between ages 20 and 40 years, and married men were more likely to commit suicide than the single, the sick, or the divorced or widowed. The act was aggressive rather than retreatist because Navajos believe that the ghost of the deceased is dangerous and may cause illness or death among the living, and most male suicides took place in the homes of their wives where they would be sure to be seen. There was also a high proportion of wife killing followed immediately by the suicide of the husband. Women's suicides, in contrast, were more often retreatist in nature and took place away from the home (Levy, 1965).

More Navajo women were victims of homicide than were men, and women were killed at six times the rate of women nationally. The Navajo homicide victim was also most often the wife or lover of the offender. Domestic quarrels and sexual jealousy accounted for 41% of all homicides during the 10-year period 1956 through 1965 (Levy et al., 1969). In contrast, only 11% of homicides in the general population involved spouses or lovers, and husbands and boyfriends were victims almost as often as wives and girl friends (0.75 males to 1 female; Hacker, 1983:216–217). These patterns of homicide and suicide, moreover, appear not to have changed appreciably from the nineteenth century to the 1960s, despite the many strains attendant on Navajo adjustments to a wage-work economy that make the lives of males especially difficult. Wyman and Thorne (1945) noted it in the 1930s, and Kneal (1950), writing of the 1920s, called a murder followed by a suicide the "Navajo custom." (That the number of Navajo male victims of homicide began to equal the number of Navajo female victims in the 1970s is perhaps partially due to an increase in gang activity, as we have suggested in Chapter 2.)

Elsewhere we have discussed the reasons for an early development of con-

flict between men and women (Levy, 1998). After the Navajos arrived in the Southwest, their society underwent several major economic transitions that affected the relative status of women. During a period of intense interaction with matrilineal Pueblo societies, which lasted from about 1690 to 1770, the Navajos adopted irrigation agriculture and developed a system of matrilineal descent that elevated women's status considerably. After 1770, however, a period of drought and intensified raiding by Utes led to the a dispersal of the population and the abandonment of the more sedentary settlements referred to by archaeologists as *pueblitos*. By 1830, the Navajos were obtaining over half of their subsistence from pastoral pursuits, and raiding for livestock had become common. Pastoralism is virtually always a male-managed affair, as are raiding and warfare. Just as male dominance was challenged during the period of intense contact with the Pueblos, so men struggled to attain the influence they felt they deserved once they came to manage the larger flocks and herds and to lead raiding parties in the years before their removal to a reservation.

Further evidence of the stressful position of Navajo males in a matrilineal society was obtained by a study of elderly Navajos (Kunitz and Levy, 1991:73–91). Among the last Navajo age cohort raised before the stock reduction programs of the 1930s and 1940s, there was no significant difference between men and women in the proportion of diagnosed hypertensives (about 17%). Nor was there a significant difference among age groups. The prevalence was substantially lower than in the general U.S. population of the same age, in which it was 31.5% among men and 43.4% among women. Social isolation, that is, not living in extended families, and acculturation as measured by level of education, skill in English, and time spent living off reservation put women but not men at risk for hypertension. For men, those who spent a year or more off reservation tended to have a lower prevalence of diagnosed hypertension than did those who remained on the reservation.

Tension between the sexes is also a prominent theme of Navajo myths. A pivotal episode in the Navajo creation story is the separation of the sexes after a leader finds that his wife has been unfaithful and believes that she can live without the help of a male (O'Bryan, 1956). First Woman also decreed that women would commit adultery as often as men. Thus, historical changes in social structure as well as in Navajo beliefs suggest that tension between the sexes was high even without the presence of alcohol.

Nonetheless, greater access to alcohol seems to be implicated in the increase in family violence. The theory of "alcoholic myopia" described briefly above may offer part of an explanation. The theory suggests that the extreme behavior—whether affectionate, sentimental, or violent—often exhibited when people are intoxicated occurs because alcohol

> restrict[s] attention and thought to the most salient cues in a setting. . . . [T]he primary determinants of social behavior during intoxication, as during sobriety, are the internal and external cues that become salient to the actor. . . . Sometimes these will be cues that provoke only a weak response, and not much will happen; sometimes these will even be cues inhibiting a response; and sometimes, of course, these will be strong response-provoking cues. Even then, alcohol intoxication may add little to the extremeness of the response. If there are few inhibiting pressures that futher processing would access, then alcohol's impairment of this processing will do little to make the response more extreme. But when further processing would access inhibiting pressures, the myopia of alcohol intoxication should occlude these pressures, disinhibiting the response. (Steele and Josephs, 1990:924)

Where there is considerable tension built into many domestic relationships, the most salient cues prompting physical conflict (e.g., a disagreement of some sort) may be only weakly inhibited in the best of circumstances. If alcohol diminishes further the ability to access inhibiting pressures—for example, concern over causing pain to one's partner, or traumatizing children who witness the violence, or suffering legal retribution—then violence has a high probability of erupting. This implies that alcohol has real effects and that, short of unconsciousness or physical incapacitation, the greater the dose, the more myopic the response. But it also means that between and within cultures the responses to similar situations will not invariably be the same but will depend to a great degree on the salience of particular cues.

Thus, among the people with whom we have worked, violence in adulthood has been affected not simply by the historical legacy of tension between the sexes but also by parental drinking, physical abuse in childhood, conduct disorder, and, not least, by the widespread abuse of alcohol.

8

TREATMENT AND REMISSION

Gilbert Quintero

Previous considerations of alcoholism treatment on the Navajo Reservation focused attention on a number of issues: the effects of social labeling and secondary deviance on heavy drinkers (Levy and Kunitz, 1974; Levy, 1988); the influence of the treatment industry on local economies and ideologies; the latent economic functions of treatment programs; the "bureaucratization of Navajo tradition" (Levy and Kunitz, 1981; Kunitz and Levy, 1994); the demographic and psychological characteristics of Navajos in specific treatment programs (Ferguson, 1968); the social ramifications of Antabuse treatment (Savard, 1968); and the need to develop treatment programs that are responsive to a drastically changing cultural milieu (Topper, 1985). The purpose of this chapter is to provide a brief description of the different treatments and therapies utilized by Navajos and to determine which problem drinkers go into treatment and which eventually improve and why.

We first describe patterns of utilization of various treatments of alcohol misuse. The alcohol-dependent controls provide data from the general population on a range of treatments for alcohol-related problems. Data from the cases are then used to describe utilization patterns of those in active treatment in formal inpatient and outpatient programs. We then use data from the alcohol-dependent controls again to explore factors associated with remission of alcohol-related problems.

THE CONTROLS

Forty percent of the alcohol-dependent controls (DEP) reported seeking some form of help for their drinking. The stratification variables of community type and sex do not distinguish between those who had and had not sought help. Older DEP, however, are somewhat more likely to have sought help. Only severity of alcohol-related problems is strongly associated with having sought help (see Appendix 7, Table A7-1). This help seeking involves both formal and informal sources. We discuss each in turn.

The use of formal treatment programs

Currently, there is a wide array of formal treatment options available to Navajos seeking help to alleviate problem drinking. These treatments range from local versions of worldwide self-help groups like Alcoholics Anonymous to tribally sponsored individual and group counseling sessions held in Navajo communities. There are also inpatient treatment programs located off the reservation, which include counseling, family therapy, "traditional" healing, alcohol education, disulfiram (Antabuse) therapy, various constituents of 12 step programs such as the Big Book, and group meetings (Kunitz and Levy, 1994:192–225). Many of the residential treatment programs, although located off reservation, often include various forms of "traditional" healing, such as traditional Navajo medicine, the Native American Church, or the sweat lodge.

Among DEP, men are more likely than women to have used formal services (see Appendix 7, Table A7-2). We have analyzed the associations of utilization and possible predictors of utilization. Severity of alcohol-related problems (ALCSUMAB) is significant, but so too are the types of relationships respondents have had and the number of their common-law relationships. DEP with one steady relationship are less likely, and those with more common-law relationships are more likely, to have used treatment services. People currently employed are less likely to have used services. Religion in which raised and education are not important. Service unit is significant: DEP from Tuba City are more likely than those from Shiprock to have used treatment services (see Appendix 7, Table A7-3).

A multiple regression of utilization onto the significant antecedents of utilization noted above indicates that type of relationships and conduct disorder score (logASYES) are no longer significant, but the others are. (see Appendix 7, Table A7-4). These observations suggest that the DEP who used treatment services are the more severe alcoholics whose lives are characterized by unstable relationships. Even taking that into account, however, sex makes an important difference. Women are less likely than men to have used the formal treatment

system, perhaps because their alcohol problems are less visible to referral agencies.

Those people who attended treatment reported a number of motivating factors. For many, a string of personal difficulties, including the potential or real loss of employment, arrests, legal complications, family pressures, and quarrels, provided the impetus to enter treatment. Often these troubles were compounded by the destructive effect of alcohol on loved ones and the development of health problems related to drinking.

A 45-year-old man provided the following narrative:

> Later on we got into it [drinking heavily]. When they brought a case from Gray Mountain we'd steal it. I thought it was just fun. Later on I got addicted to it when I was about 21. I'd go out and get drunk and pass out with my brother. Then I got married when I was about 22 and I moved to Shiprock and I used to still drink over there.
>
> My brother had to go to the hospital because of brain damage. He got drunk and fell off the truck and hurt himself. He was getting worse and worse. I moved back here to Tuba City in 1982. He was bad. One time I caught him drinking Lysol and hairspray.
>
> I told him, "You get way into it too much, brother. You've gone too far. It's gonna kill you."
>
> He kept doing it and kept doing it. He lost his sight and his mind is not all there. I was thinking about that and I decided to slow down. My brother passed away from alcohol not too long ago. When we were kids, he forced us to drink alcohol. My sister was there drinking too. He's the one that told us to drink. They sent him to the hospital and nursing home in Chinle. We'd visit and he wouldn't remember us. He really suffered and he finally passed away.
>
> My dad used to drink too. I didn't know him until I was 14 years old. I seen him drinking with my aunt. He passed out right there. He died of it too. He got drunk and passed out in the cold and got pneumonia and died. One of my brothers is still drinking but he's slowing down on it.
>
> I was drinking until I got caught with a DUI. So when I got out of jail, I was thinking about it. At that time my brother was in rehabilitation. I went to Phoenix for three and a half months with the Salvation Army. They taught me real good down there about it. Before that I didn't know what alcohol is. I was just drinking and didn't know what it was. Now I know what alcohol can do to you. Before that I was thinking different but it was really a disease, you know. I came back and I was different. I went to church and I talked about the Big Book. Finally, I made a decision to put the bottle down.
>
> I came back and I saw my people here drinking. They were having fun but now they are killing themselves. They don't know what it can do to them. They don't understand it. They don't know how to use it. Alcohol is a disease, you know. That's how I think about it. They don't know—these kids that use it—they don't know how it will affect them. I got treatment. It has put my thinking back on me. I got well. You might kill somebody, your wife, your friend. That's what alcohol will do. It will ruin your life. You might kill yourself or someone else. Later on it might affect your age and you might get sick from it.

> So now . . . a year now I haven't had to drink anything yet. I'll keep it that way. When I go to Phoenix, I stop by and tell them thank you. I was sick before. That's all I have to say now. I don't know, I think about these other kids that use it. I told them what I learned about it in Phoenix. These days they like me. They're happy I don't use it and my sister and brother appreciate what I am now.

Informal forms of help

Although formal alcoholism treatment programs are a common experience for many Navajos with drinking problems, they are a limited segment of a much broader spectrum of care options, support networks, and therapeutic services. Help seeking for drinking problems and the use of multiple sources of help outside the formal sector were common. Fifty percent of those who sought help reported using only one option, 26% reported using two, and the remaining 24% reported using three or more.

These less formalized but commonly utilized approaches include the support of family, friends, and spouses and the use of counseling and healing services provided by various religious groups. Table 8-1 lists the different sources of help utilized by the DEP.

Narrative accounts of treatment histories revealed a number of pressures and motivations that influenced the trajectory of help seeking and the selection of specific treatment options. Several respondents thought that problem drinking was often caused by witchcraft and that traditional ceremonies were called for. Some drinkers to restore personal and social harmony used traditional Blessingway ceremonies. Very little is currently known regarding Navajo "explanatory models" (Good, 1977) of alcoholism or how such models might be formulated and negotiated during the course of determining proper treatment. Nor are the social dynamics within families and the "therapy management groups" (Janzen, 1977) that shape the production of these models and guide the course of treatment seeking well explicated.

Narratives recounting treatment often conveyed the important role played by family members, whose advice and example guided the selection of therapeutic alternatives. Many respondents told of family members who had been heavy drinkers but who had stopped or drastically curtailed their use of alcohol. These family members were often reported to have stopped drinking on their own without recourse to treatment of any kind. Sometimes dramatic changes in drinking patterns were the result of religious experiences during meetings of the Native American Church or fundamentalist church services. One 37-year-old man described his father's experience, which had influenced his own subsequent cessation of drinking: "My father was traditional, but he got involved with the Chris-

Table 8-1. Number of Alcohol-Dependent Men and Women Seeking Help for Problem Drinking by Source of Help and Order of Mention*

	MENTION				
SOURCE	1ST	2ND	3RD	4TH	5TH
Friends	1	0	1	0	0
Relatives	22	3	4	0	0
Spouse	11	4	2	0	0
Navajo religion	27	10	7	2	0
Native American Church	22	14	5	3	2
Clergy, established	3	1	2	0	0
Clergy, evangelical	19	10	6	2	1
Alcoholics Anonymous	20	12	7	6	2
Inpatient	21	14	6	3	1
Counseling, Indian Health Service	7	5	1	1	0
Counseling, tribal	17	8	1	0	1
Other	10	9	2	1	2
Total	180	90	44	18	9

*The order mentioned by each respondent—presumably order of importance to respondent.

tian revival church in 1969. He had an alcohol problem back then and one time he went into the church drunk. He went to that church just once and prayed and decided to quit. He was saved. After that, he didn't drink anymore."

Individuals who have undergone these dramatic changes often serve as role models for others seeking help for their drinking problems. The apparent efficacy of such therapies often provides individuals with the motivation to seek help for themselves.

Some respondents expressed discomfort with formal treatment programs that required them to discuss their personal problems with other Navajos in a group setting. Others said the desire to remain near home, family, and familiar surroundings led them to forego travel to off-reservation facilities for extended periods of time. For still others, treatment seemed to be a prohibitive inconvenience requiring a substantial amount of time, travel, and effort.

A great deal of help-seeking behavior occurs, and the formal treatment system represents only a part of the help that is provided. At some point, however, the most severe alcoholics were likely to have had contact with the formal system. In addition, referral patterns are clearly important. Alcohol-dependent controls from Tuba City were more likely than those from Shiprock to have been in treatment, almost certainly because, in the years before our field work, a very active alcohol prevention and treatment program existed there.

THE CASES

Turning now to the people (cases) who were interviewed while in treatment, we explore the reasons for the use of inpatient and outpatient programs. People from border town were more likely to be in residential programs, whereas people from agency towns and other reservation communities were more likely to be in outpatient services (see Appendix 7, Table A7-5). This is largely because the outpatient programs are provided by the Navajo Tribe's Division of Behavioral Health and are based in reservation communities that are not readily accessible to border town residents. In addition, sex is significantly associated with type of service. Women are more likely than men to use outpatient services.

Several antecedents were thought likely to be predictors of the type of service. The most significant are severity of alcohol-related problems, education, and Service Unit of residence. Inpatients are likely to have come from Shiprock and to be less well educated than outpatients. (see Appendix 7, Table A7-6).

In a multiple regression analysis with type of treatment as the dependent variable, education became insignificant and all the other antecedents remained significant (see Appendix 7, Table A7-7). Thus, severity of alcohol-related problems is significant, but sex, place of residence, and referral policies in different Service Units are significant as well. Courts and the Indian Health Service refer people mainly to residential treatment programs. Tribal agencies refer people primarily to the tribal outpatient program, even given severity of alcohol-related problems (see Appendix 7, Table A7-8).

A number of different therapies were utilized by those currently in treatment. These ranged from individual counseling and group therapy to Alcoholics Anonymous and individual study regarding the effects of alcohol on social, emotional, and biologic functioning. Individual counseling, group therapy, and Alcoholics Anonymous meetings were by far the most commonly used modalities, mentioned by over 80% of cases. No one treatment modality was singled out as being the most effective. Instead, most respondents preferred a combination of treatments.

REMISSION

In this section, we examine the antecedents of remission among the DEP and the reasons people give for reducing their use of alcohol or abstaining entirely. Two different definitions of remission are used. The first is from DSM-III-R: no use of alcohol or no symptoms of alcohol dependence during the past 6 months. The second is far more stringent—simply the number of years since the last drink.

Considering first the DSM-III-R criterion, there is no difference between

men and women, but older people were more and people from agency towns were less likely to have been in remission (see Appendix 7, Table A7-9). DEP who were not in remission were more likely than those in remission to have had severe alcohol-related problems and unstable relationships, to be unemployed, to have had fewer marriages, to live in larger camps, to be inactive in religious activities, and to have had a history of admission to formal treatment. Religious affiliation and conduct disorder score (logASYES) were not associated with remission (see Appendix 7, Table A7-10). The variable that we used in Chapter 5, which combined several measures of antisocial personality (data not shown), also was not associated with remission. In a multiple logistic regression, community type, severity of alcohol dependence, a history of unstable relationship, having been in treatment, number of households per camp, and religious activism all remain significant (see Appendix 7, Table A7-11).

What these observations suggest is that people in remission are those with less severe drinking problems to begin with, who live in stable relationships, are able to keep a job, and are active in religion, although the choice of religion seems to be insignificant. That they are less likely to have been in treatment suggests not that treatment causes people to fail to improve but that the people who have entered treatment have a whole series of attributes, only a few of which we have measured, that reduce their chances of going into remission.

Using the second, more stringent, definition of remission (number of years since last drink), we find that agency town residents are less likely and older DEP are more likely to be in remission. Again, sex is not significant (Appendix 7, Table A7-12). Analyses comparable with those described immediately above yeild similar results (Appendix 7, Tables A7-13 and A7-14). In general, remission, however defined, is a function of age, severity of drinking, intensity of religious involvement, and stability of employment and domestic relations. Clearly, these are not easily separable. Severe alcohol dependence makes the establishment and maintenance of a stable domestic and work life difficult, and absence of stable support makes it much more difficult to remain in remission.

On the other hand, treatment is not positively associated with remission. Indeed, even among people in remission who have been in treatment, only 39% credit treatment for having reduced their problems with alcohol (Table 8-2). Most indicated that treatment was roughly as important as their own individual volition in effecting this outcome.

Among DEP who had never been in treatment, a number of factors motivated their efforts to stop or to cut down their drinking. About 40% eventually found drinking personally and socially unrewarding. Alcohol caused friction with spouses and family members, drained family finances, contributed to difficulties on the job, and often led to legal troubles. In addition, the burden of physical problems associated with heavy drinking, the devastating effect alcohol had on

Table 8-2. Reasons Alcohol Stopped Being a Problem, Male and Female DEP in Remission Who also Had Been in Treatment

REASON FOR REMISSION	N
Religion	4
Treatment	22
Family support	3
On own	25
Other reason	3
Total	57

friends and loved ones, and the financial cost became prohibitive for this group of drinkers.

A 39-year-old man recalled how he decided to stop after more than 10 years of regular drinking:

> One time I took a long look at myself and where I had been and I found out that I didn't have anything. And that's when I decided to settle down and live with my wife. That's when I started living—purchasing things—a TV, a house, a car. I remember that time I was just looking at my truck and I had four bald tires and I just started thinking and I decided to make changes. We were just living out in this one shack. We didn't have anything in the house and I was sick of it.

A 46-year-old male jewelry maker noted:

> I quit drinking 17 years ago. All I had was hangovers and tired blood. I had no house—nothing. Then I quit drinking and I got a house and a lot of things but at that time I had nothing—just one truck. Now I've built four houses for my kids and I am able to buy things for my family. I was drinking for a week at a time without eating. I got sick. After that I quit drinking and I have never even tasted it anymore.

Different religions were also mentioned, but, although some drinkers turn to religion for help and remain active after gaining abstinence, others use religion to quit but do not maintain their interest in any particular religion. In the following account, a 61-year-old man emphasizes the impact of fundamentalist Christianity on his drinking. He began drinking regularly in Gallup, New Mexico, when he was about 21 years old with friends from work, and soon noticed that he was drinking almost every day. He recalled:

I came back to the reservation and I started working at the trading post and I started drinking again. I got married and the trouble started. I got into arguments with my wife and sometimes with her family too.

I tried to quit for a long time but I just couldn't stop and it seemed to get worse. I just kept drinking everyday. I tried to quit but I couldn't so finally this guy came to me and told me what's alcohol going to do to me and all that. I listened and the words made sense and I decided to quit. It was the first time somebody talked to me that way. He's a Christian. He kept after me for my drinking and he would open his Bible and all that. That was in 1969. I quit that and became a Christian. After that I never had trouble again. You don't really realize anything when you drink—you just exist with people that are drunk. When I put it aside, my mind was totally different, my thinking was different. Now today I look at the people in Tuba City that drink and it is a pitiful sight. I wonder why they would use this. What is their problem? It's like a disease that really controls a person. I'm glad I put it aside. I realize that if I hadn't put it aside I'd be dead now.

A 47-year-old man offered the following account relating his religious involvement and its effect on his drinking. He began drinking at 10 years of age with his father and uncle when they were doing migrant farm work in California. He was drinking regularly by the time he was 21, and it soon became a problem. In 1976, he stopped drinking after almost killing himself twice while drinking and driving. These events, along with increasing family pressures, motivated him to attend a Native American Church service to treat his alcohol problem. He said:

Some of my family came by and they lectured me here and they told me to use the Native American Church. They took me in there and they lectured me. That's when I started thinking. The elderlies talked to me. They told me, "Drinking's not good for you. It might infect your kids." Now everything is happy all the time. My boys are teenagers and I'm proud of them not drinking. They are good. I tell them not to do that because it just brings trouble home.

When I start thinking about it . . . it's the way it smells that I think of and I think, "No way!" Like those people that pass by. I smell them and I think, "No way!" They are drunk and they get a headache. My boss' wife . . . her husband died of alcohol. I told him, "You've got a nice family. You should quit drinking. They're going to follow you if they see you like this." I guess he was drinking down in Page and he got hit by a car. The doctor told him not to drink because that would be it. He didn't listen and he drank and he died. He didn't believe in that.

He could have believed that he was alive and that he had children. How we are Navajo; how we become aware here and how, and why, we were put here. And the purpose of the Stars, the Earth, the Water, and the Air. The Sun is always looking at us all day and all night. You are not alone. If you have kids you have to think about them. You brought them into this world and now you're drinking.

I used to run out and party but not anymore. I like to stay home. You see with your eyes, your kids, the way they talk, the way they grow. You'll see them and you'll be happy.

Many men mentioned the importance of children as the reason to stop drinking. Among the most powerful influences reported by men who were former heavy drinkers were the new responsibilities and roles associated with becoming fathers. Having children and dealing with the attendant changes in life apparently inspired change for many drinkers. Several respondents noted that they were not able to justify the squandering of resources on drinking when their own children were in need of food and clothing. Others related the desire to provide good role models for their children, something many of these men wanted when they were young. Children demanded more time and attention from fathers and required them to participate in new activities with them. One result of this was that these fathers had less time and inclination to drink. Children also began to ask questions about their father's drinking, and many men did not want to undergo the alcohol problems that they saw other couples and families enduring.

As these men aged, they assumed new responsibilities that precluded drinking. Often, this change in lifestyle was framed in a way that reasserted traditional Navajo values. The following narratives from a 31-year-old man illustrates this and many other themes common to accounts of remission:

> Being without alcohol brings a better quality of life. Financially, you're not spending $20 a month on beer. And if you are not intoxicated you don't make as many bad decisions, like drinking and driving. Education and personal experiences have helped me a lot. Like seeing family members stricken down—having to drink and dying rather than not drinking and living. I'd rather be in a healthy condition later in life for my kids. Lot's of kids need models. I see myself in this role. I'm a happier guy without drinking.
>
> The consequences of my drinking had an effect on me. My daughter is five now. She'll be entering school and will be exposed to kids from other homes. So we want her to have a strong home, a strong culture. I am an alcoholic. Ever since I took that first drink there was no turning back. I know if I pick up a drink it will be hard for me to put it down. Alcoholism is a disease brought to our people in the last 200 years. Before that Navajos were sober and they survived and they endured. It's something brought upon our people. We can't handle it. It is a real illness.
>
> Native Americans inevitably drink. They cannot avoid it. There is so much alcohol around that there is a great potential for a kid to go into an overbearing pressure situation. To say no is hard. There is even more opportunity to drink today. More kids are drinking at a very young age. They will run into a situation where they are confronted with this choice earlier. It's worse now than it was in the past. There's teen pregnancy and population is increasing. People are partying and having a good time and kids are rolling out left and right.

Other respondents expressed similar sentiments. A 37-year-old father of three focused on the impact the birth of his first child had on him. He had begun drinking regularly when he was 15 years old, and from the very beginning this led to a number of difficulties. He skipped school frequently to drink and eventu-

ally was expelled before graduating. He drove while drunk and wrecked his vehicle. His drinking adversely affected his job performance. Despite 5 years of constant, excessive drinking, however, he stopped abruptly soon after his first child was born. He recalled:

> I totally gave it up when my little girl was born. I was working . . . and we didn't have any Similac. So I went to Gray Mountain and I only had a little money and so I had to decide then if I wanted to get beer or to feed my baby. I got the Similac. I put the six-pack back. I stopped right then and I didn't drink for 13 years.

He continued:

> I talk to my son about drinking. I tell him, "You see me drink but I don't drink until I can't stand up. That part's not right. Don't humiliate yourself. It should be taken care of. I don't remember things and it shouldn't be that way."
>
> Right now I know he hasn't drank. It feels good to drink it and then you drink more and you get sick and he says he doesn't want to get sick. You're a totally different person when you are intoxicated. I talk to him about people that drink alcohol and how they act and talk. They make excuses and they think they can take the world on. I tell him having a can of beer every day, or once a month, isn't bad but don't get into it more. People should be told it's okay to drink, but you don't have to abuse it. You can have wine with dinner, but you don't have to drink until you can't stand up—until it ruins your life.

Other factors also play a part in shaping the expression of drinking patterns. Many men noted that their spouses pressured them to reduce or stop their drinking. The wives of chronic drinkers were often instrumental in getting them into treatment or stopping on their own. The women in these relationships often exercised a moderating influence. A 36-year-old man said, "If I drink every day, my wife will sometimes say, 'don't drink too much.' When I get paid, I give her all the money, and I'll ask her to buy a beer. But she just ignores me. Sometimes I get pissed off. She'll give money to the kids and to me if I work. But my wife is cool. She stays at home and cooks for me."

Another man made a similar observation: "When you drink, you never know where you are at or what you are doing. My wife drives around all the time looking for me when I go out drinking. She tries to make sure I'm all right. She'll find me and bring me home, and I'll wake up and not even know where I've been." When both partners drink, however, there is little to restrain the drinker. This may be of special relevance for women because they were far more likely to drink with their spouses or partners than men were. About 12% of alcohol-dependent women (cases and controls) reported drinking with their spouses as opposed to only 1% of alcohol-dependent men.

The factors associated with remission are the same as those reported by other studies of "spontaneous remission" (Cahalan and Room, 1974; Clark, 1976; Donovan et al., 1983; Drew, 1968; Tuchfield, 1981; Vaillant, 1983:120–133). Some argue that stable abstinence is associated with both the severity of previous alcohol abuse and the development of "substitute dependencies" (Vaillant and Milofsky, 1982). Vaillant (1983) emphasizes the importance of employment, education, and socioeconomic status in the remission of problem drinking. Others note that the decline and stabilization of alcohol use among men, and evidence of an associated change in value orientation, are connected to personal transitions related to marriage (Miller-Tutzauer et al., 1991). Many problem drinkers were motivated to reduce their heavy drinking in order to maintain a desirable degree of social function and to alleviate anxieties associated with growing health concerns (Knupfer, 1972).

Brady (1993) notes the importance of similar factors in her study of Australian Aborigines who quit without benefit of treatment. Trauma from accidents, health issues, doctors' warnings, conversions to Christianity, family pressures, and the cultural importance of personal autonomy are all implicated in the process of "giving away the grog." But Brady (1993) further notes that the general material and physical well being that resulted from quitting were also important factors, serving not only to initiate the decline of drinking but also to help to maintain sobriety.

The Epidemiologic Catchment Area study calculated remission rates for men and women "alcoholics" at 50% and 53% respectively (Helzer et al., 1991:88). An alcoholic was someone who satisfied the diagnostic criteria for alcohol dependence and/or abuse at any time during his or her life. Remission was defined as not having had a drink or drinking but not having experienced any alcohol problems during the year before the interview. Among Navajo controls who were diagnosed as alcohol dependent or as abusers, approximately 43% of both men and women had not had a drink for at least 1 year. In addition, 51% of men and 48% of women were in remission according to the criteria used in this chapter (no alcohol or no problems with alcohol within the the previous 6 months.) Thus, despite much higher lifetime prevalence rates among the Navajo, remission rates are similar to those reported for the general population. As for non-Indians, remission rates are higher for people age 50 years and above (75% among men) than for people who are younger than 50 years (48% for women, 47% for men).

CONCLUSION

With regard to the use of formal treatment, the type of treatment utilized, and remission of dependence, severity of alcohol-related problems is a powerful deter-

minant of what happens to alcohol-dependent people. Disentangling the importance of severity from other associated circumstances has not, however, proven easy. It is clear from the multiple regressions and narrative accounts that even when severity is taken into account, the social context is of enormous importance, including referral policies, the perception of alcohol problems among men as contrasted with women, the presence of stable domestic relationships and of children, and the intensity of religious involvement. None of this is surprising and is congruent with what many others have observed in other populations.

Two points are noteworthy. The first is that the very high prevalence of alcohol dependence has resulted in a very large treatment industry on and adjacent to the reservation, with consequences that have never been fully explored. In addition to the economic and social impacts mentioned briefly at the beginning of this chapter and discussed again in Chapter 10, the therapeutic consequences deserve attention. A true assessment of effectiveness would require a randomized controlled trial, which, as far as we know, has not been done. The evidence presented in this chapter suggests that people who have been in treatment programs are no more likely to be in remission than are those who have not, even adjusting for severity of alcohol dependence. Indeed, their remission rates are lower than people who have not been in treatment.

This is very likely due in large measure to the fact that people in treatment have fewer social supports and seem to lead more unstable lives than do people who have not been in treatment. Nonetheless, it is disquieting that their remission rates are worse even taking severity of alcohol dependence into account. Because alcohol dependence is so prevalent and treatment is so costly, it is important to assess programs more rigorously than we have been able to do here to discover if some work better than others.

The second striking result is, considering the significance of conduct disorder as a risk factor for severe alcohol-related problems, just how unimportant conduct disorder has proven to be with regard to treatment and outcome. This may be because people with conduct disorder who have survived into adulthood become less and less different from others of the same age who did not manifest these childhood behaviors. If this is the case, perhaps it is because for most Navajos conduct disorder is not embedded deeply in the personality but is limited to childhood and especially to adolescence, and then it is outgrown—but not before serious risks have been run and serious damage has been done. It may also be because once alcohol dependence has become sufficiently severe, it is of most prognostic significance. Conduct disorder may thus have its effect by increasing the severity of alcohol dependence.

9

RISK AND PROTECTIVE FACTORS AFFECTING NAVAJO WOMEN'S DRINKING PATTERNS

Joanne McCloskey

We have shown that men and women from similar family backgrounds and living in comparable social, cultural, and economic environments exhibit markedly different prevalence rates of alcohol dependence. Navajo women's rates of problem drinking are a fraction of those of men's. We have also shown that Navajo women have higher lifetime prevalence rates of alcohol dependence (29%) than non-Indian women but almost the same rates as those reported from a Native American Northwest Coast village (31%) (Leung et al., 1993).

Epidemiologic studies of women's drinking patterns identify subgroup variations in age, employment status, type of occupation, marital status, and unwanted statuses in regard to employment, marriage, or parenthood. Younger women consistently drink more than older women and tend to engage in heavy episodic drinking (Wilsnack, 1996). Women who are employed are less often abstainers than are unemployed women, but working women most often establish light to moderate drinking patterns (Shore, 1992). Women who work in occupations in which over 50% of the employees are men have more drinking problems than do those women in occupations that are not male dominated. Marital statuses that are associated with increased risk of women's problem drinking are cohabitation, divorce, and separation. The unwanted statuses of being unemployed or underemployed, being childless, being unmarried and placing a high value on being married, or experiencing marital distress also contribute to higher rates of problem drinking (Wilsnack, 1996).

In addition to demographic high-risk subgroups of women, other risk factors for alcohol abuse among women are polysubstance abuse, a partner who drinks heavily, sexual dysfunction, depression, a history of sexual abuse, and domestic violence (Wilsnack, 1996). Accumulating evidence on domestic violence indicates that its effects on women are bidirectional; that is, the experience of physical abuse can lead to problem drinking, while a heavy-drinking woman is more vulnerable to partner violence (Miller, 1996). Lower levels of education place women at increased risk for drinking problems (Gomberg, 1991). Because of their frequent occurrence, risk factors that are particularly salient for Navajo women are (1) having a partner who drinks heavily and (2) experiencing domestic violence.

Risk factors identified for Navajo women in this study are: growing up in camps that were smaller than those lived in by non-alcohol-dependent women, the absence of a parent during the early adolescent years, and having a mother who was a problem drinker while the informant was growing up. Thus, while a family history of alcohol abuse generally predicts later alcoholism in women (McGue, 1994), among these Navajo women only the mother's drinking is associated with alcohol dependence. Furthermore, childhood abuse puts Navajo women at risk for alcohol dependence. Although alcohol-dependent women cases experienced more childhood physical abuse and sexual abuse, of the two only physical abuse is significant in multiple regression analyses.

The disparity between rates of alcohol dependence for Navajo women and those for men raises questions about the role of protective factors against alcohol abuse as well as the risk factors that contribute to abuse. As with other possible adverse outcomes besides alcohol dependence, some individuals demonstrate greater vulnerability to high-risk environments while others gain resilience from protective factors. Efforts to disentangle processes leading to resiliency or vulnerability focus on individual, family, community, and societal level circumstances that promote both protective and risk factors. Some children whose backgrounds are marked by poverty, violence, and family disruption emerge relatively unscathed, while others develop lifestyles involving delinquency, crime, violence, and alcohol and drug abuse (Engle et al., 1996; Rutter, 1987).

Many Navajo women also grow up in multiple risk environments. High rates of alcohol abuse (Kunitz and Levy, 1994, Levy and Kunitz, 1974; May and Smith, 1988), poverty (Navajo Nation, Division of Community Development, 1993), suicide (Levy, 1965; Van Winkle and May, 1993), homicide (Levy et al., 1969), child abuse and neglect (DeBruyn et al., 1992; Hauswald, 1987), premature mortality (Howard, 1993), and unemployment (Navajo Nation, Office of Support Services, Division of Economic Development, 1997) are reported on the Navajo Reservation. Nevertheless, among potentially vulnerable Navajo women and men, more women than men abstain from drinking alcohol altogether, drink only occasionally, or have quit drinking.

Four case studies of Navajo women illustrate the complex mix of risk and protective factors that give rise to alcohol dependence in some women and allow others to avoid problem drinking behaviors. Findings from recent studies on risk factors of alcohol abuse among women dovetail with the associations highlighted in the case studies of Navajo women. Rather than simple, clear-cut relationships between risk and protective factors and drinking behavior in Navajo women's lives, the case studies detail the multiple, interactive, and sometimes unpredictable interplay of protective and risk factors in determining alcohol abuse. The women profiled in four case studies are all identified by pseudonyms.

Risk factors to be explored in Navajo women's lives are

1. Parents' drinking during childhood
2. Childhood physical and sexual abuse
3. The family structure variables of smaller camp size throughout childhood and the absence of either parent during early adolescence
4. Conduct disorder
5. The absence of supportive family relationships
6. A husband's or partner's drinking
7. Domestic violence
8. Abuse of drugs other than alcohol
9. Lower levels of education
10. Sporadic work histories.

The risk and protective factors analyzed in the case studies are empirically derived variables that correlate with women's problem drinking (Gomberg, 1994; Wills et al., 1992; Wilsnack, 1996). A risk factor converts to a protective factor either when it is totally absent or when it occurs to a lesser degree. For example, the absence of childhood physical and sexual abuse and higher levels of education become protective factors for Navajo women.

ALCOHOL-DEPENDENT WOMEN

Lenore

Lenore's life history illustrates the majority of the risk factors for alcohol dependence. Lenore is a case who underwent both inpatient and outpatient treatment before she quit drinking. Thirty-two years old when interviewed, she grew up in southeastern Utah, first on the reservation and later in nearby small towns. She has no memory of her father and spent her early years in a remote rural area in a matrilocal residence group with her mother, maternal grandmother, and maternal

aunts and their families. Later Lenore's mother met a man who became Lenore's stepfather. They had five children in quick succession when Lenore was between the ages of seven and eleven. While she was growing up, Lenore and her parents attended the Mormon church and also participated in traditional Navajo ceremonies. The family moved to a border town, where Lenore attended kindergarten through second grade, and later to another nearby town where she attended third to ninth grades before she quit school. These school years were the bright spot in her childhood. Her mother and stepfather had begun drinking, and when they did, her stepfather abused her mother and all of the children. "Being at school was the only thing that kept everything off my mind. In my case, I lied about the drinking in my family. I kept it hidden inside me."

Lenore's stepfather began sexually abusing her when she was 13 years old. She gave birth to the oldest of her six children when she was 16, at which point in her life history she began to refer to her stepfather as her husband. At the time of her interview, the children ranged in age from 9 to 16 years.

Lenore's stepfather began forcing her to drink when she was 15. By the time she was 17, she was drinking on her own. "First I was forced; I didn't want to. Then I couldn't take it anymore—the arguments. I was sexually abused. I just got into drinking." He also repeated with her the violent behavior he had begun with her mother. "Alcohol was involved. He was a violent person ever since I knew him. He was a jealous person. When I was abused and neglected, I would come up here [to her mother's home] for a week to get away from him. I'd bring my kids up here."

Lenore's stepfather died when she was 28, but her drinking problem remained with her. Throughout her 20s, Lenore consumed as much as a case of beer at a time, drinking until she passed out. She never used any drugs other than alcohol. Several times she was arrested for driving while intoxicated and ended up in jail. She went to treatment, both outpatient counseling and a 28-day inpatient treatment program. For 6 months after treatment, she did not drink but then relapsed when her friends coaxed her to come with them when they went drinking. "I was asking myself, 'What am I doing? I've tried so hard all these years to quit drinking.' Now my friends come by, and I just say, 'Hi.' I tell them to go to town without me."

At the time she was interviewed, Lenore had not had anything to drink for 2 years. She was living with her mother in a residence group that also included her mother's sister and family. Currently unemployed, she had worked off and on as a motel maid in a nearby border town during these 2 years. Her children attend a boarding school run by a Protestant denomination in another community. She herself was hoping to continue her education. As she looks towards the future, she says, "I just try not to look back."

Throughout the life course, family members or partners who are abusers act as important risk factors for women's drinking. Gomberg and Nirenberg (1993:124) emphasize this relationship: "Starting with early family members in

the family of origin, and moving on to the boyfriend, husband, and/or lover, the impact of an abuser who is a significant other is great, and must be considered a major antecedant."

When Lenore's mother and stepfather drank together, they diminished their physical and emotional availability to their children. In the sample of Navajo women controls, only a mother's drinking, not the father's, acts as a significant risk factor (see Chapter 4). A father's drinking may be less disruptive when a mother remains the focus of family stability. As a pivotal member of a matrilineal kinship network, a mother who joins her drinking husband creates a void not only in the nuclear family but also in extended family and clan relationships as well. Most important to a Navajo woman's resistance to drinking with her partner is having had a mother who acted as a nondrinking role model (Klee and Ames, 1987).

Lenore's stepfather's drinking resulted in physically violent aggression toward herself, her mother, and her half-siblings when she was a child. Although evidence about the relationship between parental physical abuse and women's alcohol abuse is equivocal (Widom et al., 1995), a recent study found that alcoholic women in treatment had experienced more parent-to-child violence and sexual abuse than did women in drinking and driving classes and randomly selected women in households (Miller et al., 1993). Furthermore, a study of women in an outpatient psychiatric clinic reported that those with a history of physical or sexual abuse scored higher on the Michigan Alcoholism Screening Test (Swett et al., 1991).

Lenore singled out sexual abuse as a major cause of her alcohol dependence. The posited relationship between childhood sexual abuse and women's problem drinking is supported by the responses in a representative national sample of women (Wilsnack et al., 1997) indicating that women with histories of childhood sexual abuse had higher rates of problems with alcohol than did women having no such histories. Controlling for the demographic variables of age, ethnicity, and parental education, sexual abuse in childhood was strongly related to five of six measures of problem drinking, including recent alcohol consumption, intoxication, drinking-related problems, alcohol dependence symptoms, and the Summary Problem Drinking Index. The findings indicate that childhood sexual abuse is "an important risk factor for later abuse of alcohol and illicit drugs" (Wilsnack et al., 1997:268).

The family structure variables during childhood that are significant for alcohol dependence in women for this sample of Navajo women, smaller camp size and the absence of her biological father during adolescence, apply to Lenore. During her elementary and junior high school years, Lenore lived with her nuclear family in small towns rather than in an extended family camp as they had done in her preschool years. Also, of course, her stepfather rather than her biological father raised her.

By forcing her to drink, Lenore's stepfather introduced her to alcohol, which

soon became a coping mechanism for the overwhelmingly adverse circumstances of her life. Consistently, research on alcohol problems among women identifies the influence of a partner who drinks to be a major risk factor (Gomberg, 1996; Wilsnack and Wilsnack, 1993; Wilsnack, 1996). A study of lower socioeconomic status Mexican-American couples found those wives whose husbands drank to be at risk for alcohol abuse (Gorbet et al., 1991).

What began as childhood physical abuse for Lenore when her stepfather was intoxicated, continued as domestic violence during the 14 years that he lived with her as her husband. After his physically violent outbursts, Lenore often left him for short periods of time. The relationship between women's problem drinking and partner violence may be bidirectional in that women who are abused by a partner are more likely to become problem drinkers; meanwhile, a woman who drinks is more vulnerable to the assaults of her partner (Miller, 1996; Kaufman-Kantor and Straus, 1987, 1989). Navajo women may become alcohol dependent because they have been abused, but they may also be more vulnerable to their partner's attacks.

Lenore's life history reveals a multitude of risk factors for alcohol abuse, including her mother's and stepfather's drinking, childhood physical and sexual abuse, and domestic violence. Family disharmony prevailed throughout her childhood and young adult years to put her at risk for adult alcohol dependence.

Katie

Katie's life history illustrates some of the same risk factors found in Lenore's background as well as conduct disorder and polysubstance abuse. At the time she was interviewed, Katie was 29 and pregnant with her fourth child. She is an alcohol-dependent case who had been in a tribal outpatient treatment program but who had resisted the efforts of her counselor to get her into inpatient treatment. During our interview, a partially completed Navajo rug stood on the loom in the home where she lived with her boyfriend.

Katie grew up on a farm near the San Juan River, where she lived only with her nuclear family because "we didn't have any relatives." Katie's mother continued to farm after her husband died and later when she remarried. The sixth of 10 children, Katie has three full sisters, five half-sisters, and one half-brother. She enjoyed elementary school at a reservation boarding school, where she received good grades and was sometimes named student of the month. She was never sexually abused during childhood. During her childhood, Katie and her parents attended the Assembly of God church, and her mother and stepfather also participated in Navajo traditional ceremonies.

Katie's mother drank with Katie's abusive father and survived the alcohol-related vehicle accident that killed him when Katie was 3 years old. Katie de-

scribed her father: "He drank a lot. I guess he was an alcoholic. He used to be real mean—I mean—mean, mean, mean! He used to beat up mom. He was a womanizer. In the end, my mom started drinking with him. He'd beat her up and force her to drink. He tried to kill my mom a couple of times."

For a few years after Katie's father's death, Katie's mother drank. When Katie was 4 years old, she and a sister had their first drink from a bottle of Thunderbird wine they found. Her mother later "went to church" and married a man who did not drink.

Katie attended a border town public junior high school but fell behind after she began ditching school with her friends to drink and use drugs. In the hopes of improving Katie's behavior after she was expelled, her mother sent her to a boarding school in the eighth grade, but Katie found a new group of friends with whom she sneaked out of the dormitory at night. Besides being truant, she engaged in other behaviors associated with conduct disorder. In addition to starting fights and telling lies, she killed a dog when she was 11 years old. By the time she was 14, she was drinking heavily. In her early teen years, she used inhalants and later marijuana, speed, and peyote as recreational drugs. When she was 13 and 14, her stepfather would sometimes beat her. She was an angry young woman: "I didn't really seem to care about school then. I used to ditch. I'd go get some drug money, drink. I was never home. I didn't want anyone picking on me so I was never home. I'd hitchhike around."

Katie went as far as the eleventh grade when she dropped out of school to care for her oldest son, who is now 10. This son, two younger children, aged 5 and 3 years, and the child she is carrying all have different fathers. Katie has been "in and out of relationships. Because of one thing or another it didn't work out." She never worked in the labor force but makes pottery and weaves rugs at home.

In the year before the interview, Katie and her boyfriend began drinking heavily and using drugs.

> I started drinking. I got back into my drug business. That's what I started doing last year, staggering around. I'd be here three or four hours and go across [to some bars north of the San Juan River] and drink. I'd visit my boyfriend and be all drunk. I didn't care. I quit drinking in December after I found out I was pregnant.

To avoid the involvement of Social Services, two of Katie's sisters and her mother took over the care of her three children when she was drinking heavily. Although she drank during all of her pregnancies, only her second son, the 5-year-old, seems to have been affected with some degree of alcohol-related birth defects. "He's weak. He has muscle problems. He can't open the door."

Many of Katie's teeth are missing because a former boyfriend knocked them out. With her current boyfriend, physical violence repeatedly erupts when they

drink together. Katie recalled: "Drink, drink, drink all the time. And we'd get into a fight. Last year my boyfriend beat me up a lot." Like other heavy-drinking women, Katie is vulnerable to partner violence.

Katie avoided driving while drinking, but when she was picked up while drinking in Farmington, she was taken to a detoxification center. Although she attended Alcoholics Anonymous meetings and met with a tribal behavioral health counselor, she resisted going to inpatient treatment because "I didn't have anyone to take care of my kids. Then I went back to drinking. I thought I could do it on my own. I lost my kids. Sometimes I cry about it."

With the birth of each child, Katie would quit drinking temporarily. After the birth of her youngest, who is now 3, she quit drinking for a couple of years. Now she is determined not to repeat the past behavior that led to the loss of her children. "This time I'm not going to make a lot of mistakes. I got a little baby to take care of. I can't be drinking and thinking of myself. Even now I don't miss drinking, and I don't miss my drugs. Every time I used to get money I would spend it on drinking and to get drugs."

Although several risk factors for Katie were similar to those that Lenore experienced, the timing and context differed. Katie was exposed to her parents' drinking, her partners' drinking, domestic violence, a smaller camp size, and, during adolescence, the absence of her biological father. Because her stepfather's beatings were limited to the same time period that she was missing a lot of school and drinking heavily, labeling them as physical abuse is questionable. Her parents' drinking together was confined to the first 3 years of her life before her father was killed in a car accident. Her stepfather never drank or hit her mother. Already drinking heavily by the time she was in the tenth grade, Katie's drinking patterns were well established by the time she became involved with the problem drinking men who fathered her children. She had also begun using inhalants at about the same time, and since then she has used cocaine, psychedelics, marijuana, stimulants, and peyote.

Her behavior is consistent with what has been observed in other populations. Findings from the Epidemiologic Catchment Area study demonstrate that the incidence of conduct disorder is lower for girls than for boys but that conduct disorder among girls as well as boys is positively correlated with alcohol abuse or dependence later in life (Robins, 1986). Likewise, multiple substance use is a consistent risk factor for alcohol abuse (Gomberg and Nirenberg, 1993; Wilsnack, 1996). In a longitudinal national survey of women's drinking and related behaviors in 1981 and a follow-up in 1986, the lifetime use of drugs other than alcohol was one of the "most consistent predictors of onset of heavier drinking or adverse drinking consequences" (Wilsnack et al., 1991:314).

Lenore and Katie share a number of attributes that put them at high risk for alcohol dependence. During their childhood years, family disruption ensued from

their parents' drinking, often leading to family violence and, in Lenore's case, to sexual abuse. Particularly disruptive was their mothers' drinking with their father or stepfather, which created a vacuum instead of stability and support in the family. Each grew up with a stepfather, although one drank and one did not. Each lived in a nuclear family household, and each began drinking during adolescence, although only Katie abused drugs as well as alcohol. Neither of them completed high school or worked steadily in the labor force. Finally, as adults, Katie and Lenore established relationships with alcohol-abusing men and were victims of physical violence.

NON-ALCOHOL-DEPENDENT CONTROLS

Two non-alcohol-dependent controls, Brenda and Renee, represent the majority of Navajo women who have avoided problem drinking. Despite vulnerability to alcohol dependence, these women overcame the risk factors documented in their life histories. They demonstrate instead the resiliency associated with key protective factors for alcohol abuse: family support, higher levels of education, and steady employment histories. In a study that measured life events, family support, and personal competence as areas of potential risk and protective factors for substance abuse among adolescents, Wills et al., (1992) found that such protective factors were most instrumental when the adolescents also had a high level of vulnerability resulting from the presence of risk factors for substance abuse. Protective factors against substance abuse were adolescents' supportive relationships with parents and other adults and higher levels of personal competence in academic performance.

Brenda

Brenda's life history shows how pivotal protective factors outweigh the influence of risk factors for alcohol abuse. She is 31 years old and lives in a matrilocal extended family in a remote rural area. Like her children, who invited me to come into their mobile home before their mother returned from an errand, Brenda is open and friendly. She and her husband have been together for 13 years and have been married for 8 years. They have three children, aged 10 years, 9 years, and 6 months. Since graduation from public high school in an agency town, Brenda has worked steadily in the labor force except for 2 years at home.

Throughout her childhood, Brenda lived in a patrilocal extended family camp. During those years, she and her mother attended the Mormon church, and both parents participated in Navajo traditional ceremonies. Brenda's father drank

when she was growing up, but her mother never did. Her father "was violent towards my mother. I remember a lot of times we were chased out of the house." Despite repeated separations, her parents stayed together until her father's death 1 year before the interview.

Brenda is the second of nine children, all full siblings, of which the six oldest are girls and the three youngest are boys. Neither she nor her sisters drank while she was growing up, nor did she engage in behaviors that characterize conduct disorder.

When Brenda was 4 years old, her mother's brother sexually abused her. "At first it was touching. The last it was intercourse." When he learned of it 6 years before the interview, her husband reacted to the information with taunts.

> He would say mean things to me like, "I'm going to tell people what kind of filth you are." I was angry, frustrated, and scared at the same time. He would come home at night, drunk, and knock on the door and say, "This is Gary," my uncle's name. It kept going on for six months, and I couldn't take it. I went into my mom's house and took a bunch of my dad's pills and walked out. Since then we're better, and he doesn't do that anymore—except he still drinks.

A suicide attempt (or gesture) 6 years previously stopped her husband's verbal abuse but not his drinking. He was physically abusive to her only once, while drinking. She reminisced about her husband's attempt to stop drinking: "For three weeks he was off of it. I praised him everyday. The two days out of the three weeks, he didn't work. I came home, and the dishes were all washed. [Of his sobriety] he said, 'I enjoyed being that way.'"

She is now resigned to his drinking. "He know he's an alcoholic. I don't bother him."

Brenda drank only twice in her life, both times in attempts to get back at her husband because of his drinking. When asked why she does not drink, she said: "My mother. I talk to her, and she talks to me. She always put us before herself, before anybody. I have to be a role model for my kids like she was. My dad wasn't good to her, but she stuck with him until the day he died."

Brenda's life history reveals three risk factors for alcohol abuse: her father's drinking, her husband's drinking, and the childhood sexual abuse she experienced as a preschooler and never told anyone about until 6 years ago. Her close relationship with her mother may explain her resistance to alcohol abuse. Moreover, despite her father's drinking, Brenda's parents stayed together, and their nine children witnessed the example of a steadfast mother who never drank and always looked after her children.

For many Navajo women whose fathers were heavy drinkers, it was their mothers' abstinence or light to moderate drinking that overrode the fathers' nega-

tive influence and protected them from becoming problem drinkers. This is consistent with work in other populations on the role of protective factors for high-risk children, which suggests that the presence of one good parent–child relationship is sufficient to safeguard children (Rutter, 1987). Furthermore, the relationship between parent and child may be sex specific. A longitudinal study in Kauai, Hawaii, found that a steadily employed mother who acted as a positive role model and delegated responsibilities to her teenage daughter acted as a protective factor for high-risk girls (Werner and Smith, 1992).

Brenda's husband's drinking, another potential risk factor, may also have been mitigated by her mother's positive example. A study of blue-collar wives of heavy-drinking husbands indicated that mothers who acted as positive role models protected them against problem drinking (Klee and Ames, 1987). The mothers, most often abstainers or light drinkers, clearly distinguished between what was appropriate drinking behavior for men and women. They disapproved of women drinking yet tolerated drinking by men, believing it was a necessary outlet for men who had the responsibility of supporting a family.

Brenda's education was another protective factor. She graduated from high school and, with the exception of 2 years at home, has worked as a clerk. Although not a high level of educational attainment, graduating from high school may be an important protection against alcohol abuse. In a study that compared alcohol use rates between students and high school dropouts among Anglos, Native Americans, and Mexican Americans, Swaim et al., (1997) found that dropouts used alcohol more often than did students. Higher percentages of Native-American dropouts as well as other ethnic minorities had a lifetime prevalence of intoxication and of drinking to the point of intoxication during the month before interview. The authors concluded that "minority students who were in good standing in school were no more likely to use drugs (including alcohol) than other students" (Swaim et al., 1997:55). Thus, for Native Americans as well as for Hispanics (white and nonwhite), the problem is not ethnicity but ability and an environment that makes it possible to succeed in school.

A retrospective study of women alcoholics found that they left school earlier than nonalcoholic women (Gomberg, 1991). The results reported in Chapter 5 also indicate that being a high school dropout is a risk factor for alcohol dependence in this as in other populations. Unfortunately, a high proportion of Navajo students drop out of high school—31%, according to one recent study (Platero et al., 1986).

During their years of marriage, Brenda's reactions to her husband's drinking have been typical of coping strategies adopted by Navajo women who decide to stay with their alcoholic husbands (Remacle-Taylor, 1983). She objected to his drinking and suggested that he go to treatment. The two times that she drank wine coolers were an angry protest against his drinking. During a period when he

quit drinking, she supported his attempt. More recently, though, she has passively accepted his drinking as something he will continue to do no matter how she objects.

Since graduating from high school, Brenda has worked steadily, with only 2 years spent unemployed, and this may also be a protective factor against drinking problems. Among the Tohono O'odham, Waddell (1980) found that women's employment and steady income protected against alcohol abuse in contrast to men whose jobs were more temporary. Tohono O'odham women's income was used for economic support of the family, while men's was often spent on drinking with their buddies.

Renee

Although both of Renee's parents eventually became alcoholics and died from alcohol-related causes, Renee found sources of strength in her background that enabled her to succeed in school and at work and to be a life-long abstainer. She has been married to her common-law husband for 23 of her 40 years and has four children who range in age from 3 to 18 years. She works as an advocate for the Navajo tribal legal agency.

As a preschooler, Renee lived in off-reservation towns in Utah and Colorado, where her father worked as a uranium miner. Her religious background combined Catholicism with Navajo traditionalism. She has three older brothers and two younger sisters. She recalls family outings when they went fishing, picnicing, and picking piñons together. She was never physically or sexually abused. The family moved back to an agency town when Renee started school, and her father worked as a policeman. Later, her father acquired a lease for land that he and her older brothers farmed.

Although Renee's father drank when he worked as a uranium miner, her mother did not. Her father was physically abusive to her mother but not to the children. He did not drink for several years after the family moved back to the reservation. While she was growing up, Renee felt close to her father. "My father was a good father. He was very open and taught us a lot of values. I think I was closest to him. He knew a lot about life. We had a good father–daughter relationship. He did care for us kids, and he showed us his love. He wanted to be with us."

When Renee was 10 years old, however, her father resumed drinking, putting pressure on her mother to drink with him. As his drinking increased, he was only employed intermittently, which forced her mother to rely on General Assistance to support the family. "In the seventh grade, she started drinking with him. Essentially over the years, that's what happened—our family fell apart. They both became alcoholic, and by the time we finished school, they would just come and go."

In her ninth grade year, Renee went on placement to Utah, where she lived with a Mormon family and attended school. She returned home because her younger sisters were left alone whenever her parents left to drink. She and a brother assumed responsibility for raising their younger sisters.

> My brother and I took over the role of my parents. I started working at a young age, and some of the money would go to buying groceries. We felt out of control, not being able to do anything about our parents' drinking problem. I didn't want my sisters with someone else. I wanted to keep my family together. I think that scared me the most—Social Services would have stepped in.

As part of her responsible role, Renee did not allow her parents' friends to come into the house when they came home with them after drinking. In 1974, when Renee was 20 years old, her mother died in an alcohol-related vehicle accident. Her father died in 1982 from cirrhosis.

She and her two sisters resolved that they would never drink. "We saw what happened, what it did to our parents. We saw what it did to their lives and the disruptions. We didn't want that for our lives."

They compared the happy times they had together as a family with the devastation that ensued as their parents' drinking took control of their lives. In the early years when her father was not drinking, "we lived a relatively normal life. We were all happy." When she was 17 years old, she experimented with marijuana, and all three of her older brothers experimented with alcohol when they were adolescents. Renee and her siblings have avoided the alcoholism that killed their parents, and only the oldest brother drinks as an adult.

Renee and her husband have been together since high school, and their oldest daughter was born when Renee was 18 years old. After a tempestuous period during the early years of their marriage, they were separated for a few months. Renee insisted that a condition for reconciliation was that her husband quit drinking. Commenting on her mother's giving in to her father's pressure to drink, Renee stated emphatically: "I would never do that. I would leave him [her husband] before I would do that. I told him from the beginning that I know I have the initiative and ability to take care of my kids if I have to."

Renee has worked throughout her marriage. Already the mother of three children, she attended her state's university and graduated with a degree in political science. She attended law school for 1 year but dropped out because of health problems. Since her return to the reservation, Renee has worked for 8 years as a legal advocate. Although she was exposed to Mormonism and Catholicism as well as to traditional Navajo religion in the past, Renee and her family now participate only in the Native American Church and traditional ceremonies.

Risk factors for Renee were her parents' drinking, living in a nuclear family during most of her childhood, and her husband's drinking early in her marriage.

Both parents became alcoholics, but Renee's father did not drink for approximately 6 years when she was between the ages of 4 and 10 years, and her mother did not start drinking until Renee was in the seventh grade. Thus, during a major portion of her formative years her parents did not drink. Indeed, she identified her relationship with her father as a supportive one from which she gained guidance for living and a feeling of being loved. As a result, although her parents became alcoholics who abandoned their responsibilities for their children, the dissolution of the family occurred at a point when Renee's maturity enabled her to assume a parenting role and to reject a similar lifestyle for herself. After witnessing the deterioration of her family, Renee decided never "to have anything to do with alcohol."

Renee's education enabled her to be well employed despite the high rate of unemployment on the Navajo Reservation. In 1996, the unemployment rates in the Shiprock and Tuba City areas were 35% and 42% respectively (Navajo Nation, Office of Support Services, Division of Economic Development, 1997). In their longitudinal studies of the relationship of women to alcohol abuse, Sharon and Richard Wilsnack suggest that unemployment becomes a risk factor for alcohol abuse when perceived as an unwanted status for women (Wilsnack, 1992; Wilsnack, 1996; Wilsnack et al., 1994). Conversely, the highly desired status of being employed becomes a protective factor. Furthermore, "comparisons of lighter and heavier drinkers suggest that women's drinking is more of an effect than a cause of unwanted statuses" (Wilsnack, 1992:239).

Another proposed explanation for the protective benefits of employment against women's problem drinking is that labor force participation creates an additional role for women. Multiple roles, in turn, enhance women's self-esteem and social support (Wilsnack, 1996; Wilsnack and Wilsnack, 1993). It also provides an independent source of income and allows women like Renee to leave, or threaten to leave, abusive relationships. Navajo women were livestock owners and craft producers in the subsistence economy of the reservation before livestock reduction. With the transition to a wage economy came the expectation that women would continue to contribute to the family economy through wage work (McCloskey, 1993).

The overall association between employment and a woman's drinking appears to be "a trend toward decreased abstention and increased light to moderate drinking, but little evidence of heavier or problem drinking" (Shore, 1992:164). Thus, for women, steady employment protects against problem drinking.

Despite the lifetime presence of known risk factors for women's problem drinking, Brenda and Renee remain free of alcohol abuse or dependence. Protective factors that have had a role in this outcome are good parent–child relationships, higher levels of education, and steady lifetime work histories. Brenda has an ongoing supportive relationship with her mother, and Renee had a close relationship with her father when he was alive. Since Brenda's graduation from high

school, she has worked continuously in retail sales with the exception of a 2 year period. Renee's college degree and 1 year of law school have enabled her to work throughout her adult years.

CONCLUSION

A constellation of risk and protective factors occurring throughout the life course influence Navajo women's adult drinking behaviors. During childhood, a mother's drinking, physical and sexual abuse, and small camp size contribute to problem drinking, whereas a supportive relationship with at least one parent protects against later drinking. The transition to adulthood assumes primary importance when young women experiment with alcohol and other drugs; choose a partner; complete, interrupt, or halt their education; and perhaps enter the labor force. During the pivotal adolescent years, conduct disorder and not living with parents, most often a father, create vulnerability to later alcohol abuse. A high school education and higher education qualify women for steady wage work throughout the adult years, a pattern that provides resiliency. During late adolescence or adulthood, polysubstance use, the influence of a drinking partner, and domestic violence may act as risk factors. Navajo husbands or partners play a crucial role in influencing women's alcohol dependence; they are often a pivotal influence in the initiation of Navajo women's drinking, or they may support previously established drinking patterns.

Finally, the data presented in Chapters 4 and 7 as well as elsewhere (Kunitz and Levy, 1994) indicate that drinking by women and the lifetime history of domestic violence have increased in recent decades. The data in this chapter suggest that there is a causal relationship between the two increases. As drinking by women has become more common, so has alcohol abuse and dependence. Furthermore, increasing rates of alcohol abuse and alcohol dependence place women at greater risk of violence.

Why alcohol use and alcohol dependence have increased so significantly is not entirely obvious, but several processes seem to be involved. It is possible that a shift from matrilineal extended camps to nuclear households has deprived women of support from their sisters, mothers, and maternal aunts and has made them more dependent on, and vulnerable to, their partners. If their partners are abusive drinkers, such women may also be at very high risk of becoming problem drinkers as well as the recipients of abuse, particularly if they have no job skills. In addition, the processes of migration to towns and universal schooling and the creation of a peer group culture have had as much impact on young women as on young men. To the degree that young women become mothers and continue to be problem drinkers, they reproduce the same difficulties for their children.

10

CONCLUSIONS

Stephen J. Kunitz
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This book is the culmination of more than 30 years of collaborative research on changes in health conditions, health care, and alcohol use among Native Americans, particularly Navajos. We first described both historically and culturally the people with whom we have worked and then discussed and explained the ways in which patterns of alcohol use, homicide, and suicide among these people differ from, and are similar to, patterns observed among other Indian and non-Indian peoples. The differences have often been substantial. This is important because even intensive study of a single culture can at best suggest causal relationships. It cannot test them. Posited cultural or genetic determinants of drinking behavior may only be demonstrated by comparing populations with a high lifetime prevalence of alcohol dependence with more abstemious communities. Unfortunately, comparative studies are rare given the time and cost demanded by the types of clinical measures contemporary methodology requires. In addition, the continued devolution of the Indian Health Service makes the collection of comparative morbidity and mortality data increasingly difficult, and investigators' understandable desire to protect the privacy of tribes (especially small ones) ensures that it will be virtually impossible to interpret comparative studies. We do not have a ready solution, and we simply note that to treat all Native-American populations as the same is to assume that which must be demonstrated. Whether it will be worth the considerable cost and effort to overcome these difficulties depends on

how important the nation believes the problem of dealing with the costs and social consequences of alcohol dependence is.

Not only are differences between populations—both Indian and non-Indian— substantial, but historical differences are important as well, as we have shown in previous chapters. Our original work was carried out in the mid-1960s in and around Tuba City, an area that at the time was still more remote from day-to-day contact with Anglo-Americans than many other parts of the reservation. The samples included people from a rural area, from Tuba City, from a border town, and from a treatment program. We did not include denizens of skid rows in border towns and more distant cities, nor did we discuss in much depth the social changes implied by increasing school attendance and immigration to agency towns. The processes were underway but did not figure prominently in our work except when we considered the border town residents.

In an important sense, this was an advantage because it increased our sensitivity to other antecedents of alcohol misuse than those being emphasized by most other investigators and commentators at the time, as well as subsequently. It was, however, an incomplete picture. The present study has given us the opportunity to consider again in much greater depth the factors that were not emphasized, as well as the changes that have occurred over the past 30 years.

In our first study, we argued that the failure of economic development as well as access to federal subsidies and supports had helped "to maintain the traditional economy, not to destroy it" (Levy and Kunitz, 1974:44–45). Thus, relatively unacculturated communities still existed, and very heavy drinking was found among the people who lived in them. Moreover, the heavy drinking in such communities had a long history that antedated the changes wrought by stock reduction.

Tuba City, on the other hand, was at the time already a transitional community, which was becoming discernibly similar to off-reservation border towns in some respects. Nonetheless in the mid-1960s it was still very small, with a population of 800–1,000 people, about half of whom were non-Indians working for various government agencies and a very few private enterprises (Levy and Kunitz, 1974:42). By 1990, the town had grown to about 8,000, more than 90% of whom were Native Americans, and school attendance had become universal. Both processes have created fertile terrain for the growth of the youth culture described in Chapter 2, which had been scarcely visible three decades previously.

We observed at the time "that we have been impressed by the persistence of older traditions and forms of social organization and life styles alongside . . . continuing change" and that "there have been changing attitudes toward drinking behavior but that these have not proceeded uniformly within the Navajo population" (Levy and Kunitz, 1974:189).

A generation later, many of those older forms of social organization and

ways of life have changed even more. Indeed, the world we first saw in the 1960s, itself the remnant of an earlier way of life, is now largely gone and with it many of the institutions and values that constrained, however imperfectly, the worst excesses of alcohol abuse. It was possible to see even then, of course, the emergence of new values and institutions that would limit alcohol misuse. The peyote church for some reservation residents and the development of moderate drinking behavior by our off-reservation informants were both important in this respect. In the present study, we have seen that patterns of alcohol use have become more complex as the century has progressed. On the one hand, there has been an apparent decline in average levels of consumption by current drinkers. On the other, there has been an apparent increase in the proportion of both abstainers from and abusers of alcohol and a decline in the proportion of non-problem drinkers. In general, heavy drinking has worsened over the past 30 years and carries with it enormously high psychological, social, and institutional costs.

The growing severity of alcohol abuse in the population reflects major social changes since the end of World War II, changes that have also been implicated in an apparent increasing incidence and prevalence of conduct disorder. It is the question of the causal relationship between conduct disorder and alcohol dependence that prompted this study. The question with which we began was seemingly straightforward: Is conduct disorder a cause of severe alcohol dependence among Navajo women and men as it is among non-Indians? If it is, what is the magnitude of the problem? What are the implications for treatment and especially for prevention?

Based on our earlier follow-up study, we had reason to suspect that conduct disorder would be a significant risk factor and that has indeed turned out to be the case. Because the lifetime prevalence of alcohol dependence is so much higher than that of conduct disorder before age 15 years, however, the proportion of alcohol dependence attributable to conduct disorder is less than 10% among both women and men.

The assertions in the previous paragraph are based on assumptions and definitions that are not beyond challenge. We have used the DSM-III-R definitions of both alcohol dependence and conduct disorder before age 15 years, which may be culture bound and which have a certain quality of arbitrariness about them. Why, for instance, is the minimum number of criteria for a diagnosis of conduct disorder three and not four? If virtually all adults who drink have a history of having driven while under the influence of alcohol, is this not normative behavior in the society and thus not a reasonable choice as one of the possible criteria of alcohol dependence?

The question of arbitrariness has to do with whether conditions such as alcohol dependence and conduct disorder are best understood as continuous or discrete. In general, a wide variety of biological phenomena (blood pressure, blood

sugar level) are most realistically treated as continuous variables. There are, however, good pragmatic reasons for considering conditions to be discrete as well. These do not have to do only with the need for a label in order to be paid by an insurance company but because such useful concepts as prevalence, incidence, and attributable risk require them. Moreover, as we have suggested in Chapter 4, alcohol use–abuse is both: It is a continuum among men and more nearly dichotomous among women. Here, we have analyzed problematic use as both a continuous and as a dichotomous variable.

Our answer to the question about the cultural appropriateness of items selected as criteria for conduct disorder and alcohol dependence is again a pragmatic one. We do not take the essentialist position that conduct disorder is an entity. It is enough that the series of questions seems to tap a meaningful collection of behaviors, a syndrome, with predictive validity for problematic alcohol-related behaviors.

With regard to alcohol dependence, it may be argued that the prevalence rates are so high that the criteria cannot be appropriate. We have, however, an external check: The people who were identified as cases, either by themselves, their families, official agencies, or a combination, all met these criteria of alcohol dependence. Similarly, many of the alcohol-dependent controls had been in treatment. Thus there is good reason to think that these criteria do reflect behavior regarded as problematic in and by the population. Moreover, using the same criteria in different populations is the only way to make meaningful comparisons.

PREVALENCE

That the lifetime prevalence of alcohol dependence is very high in those we studied is no doubt unusual but not unprecedented. Similar findings have been reported from other Native-American populations (e.g., Leung et al., 1993; Robin et al., 1998; Brown et al., 1993). These high rates indicate that heavy drinking is diffused widely in the population, especially among men, and helps to explain why no variable or set of related variables is likely to explain much of it. This is particularly true of measures reflecting stressful life events, such as forced relocation and acculturation. Moreover, it is noteworthy that the drinking behavior of family and friends when our male informants were young are significant risk factors. That is, the pervasiveness of problem drinking is itself a risk factor for men, suggesting that it has become self-perpetuating. Its very pervasiveness makes it difficult for young men to avoid becoming caught up in it, particularly given the increasing ease of access over the past several decades. This is not as true of women, for whom only mothers' problem drinking among those mentioned above is a risk factor.

The considerable social pressure brought to bear on men who did not participate willingly in group drinking bouts may be discerned as early as the late nineteenth century. Referring to the 1870s, a Navajo telling his life history recounted how "friends would come around with whiskey and would try to make me drink. They would try to pour it down my throat but I would let it run out on the ground" (Dyk 1947:19). One of the younger men from Tuba City in our early study "was persuaded to go with his friends to an off-reservation bar. He intended not to drink as he was on Antabuse but thought he could enjoy the company of his friends without imbibing. In the event, he was taunted and teased until at last he took a drink. He suffered the inevitable consequences" (Kunitz and Levy, 1994:121).

Thus peer pressure to drink has existed for over a century, although town life may have made it increasingly pervasive simply because there are more opportunities for groups to form and to acquire alcohol. Nonetheless, there is some evidence that drinking behavior may be moderating, as suggested by declines in both mortality rates and amounts of alcohol consumed. This does not appear to be associated with the shift from fortified wine to beer, however, as there is no association among controls between the estimated average daily consumption of ounces of absolute alcohol and beverage of choice. We think it may be due to increasing exposure to a variety of different, and more moderate, drinking styles, although our data are not really adequate to deal with this issue. If this indeed turns out to be the case, it is a most hopeful sign. Whatever the association with quantities of alcohol consumed, however, the shift from wine to beer is important as a marker of a profound change in tastes and, we believe, as an indication of the penetration of the Navajo economy and culture by the advertisers' art and the tastes of the larger regional population. This is but one measure among many of the growing integration of the Navajo Reservation population with the local non-Indian culture.

THE EMERGENCE OF A YOUTH CULTURE

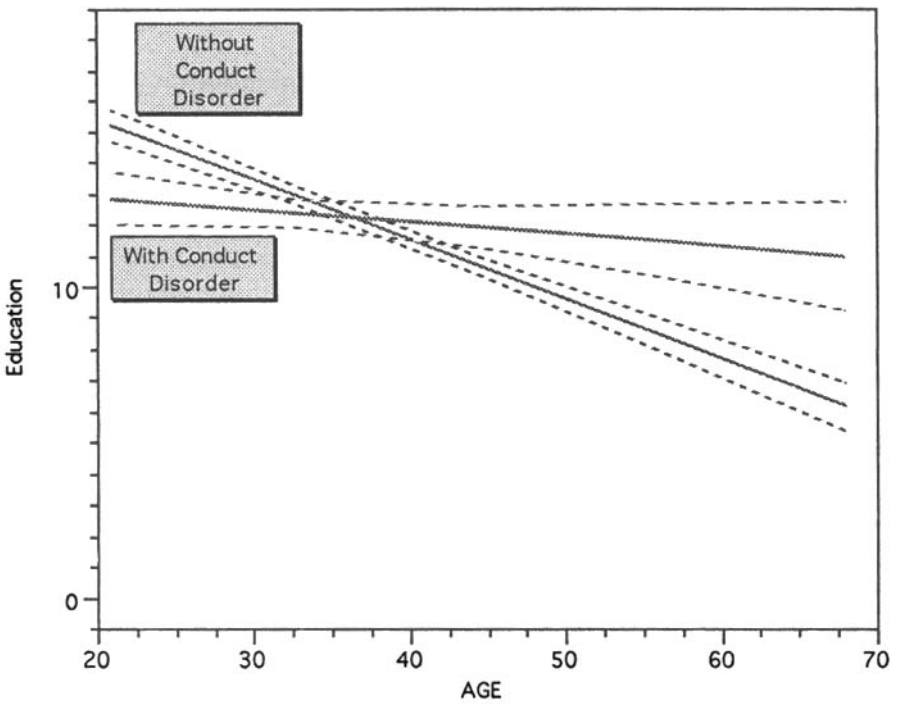
Although there may be some hopeful signs, there is also evidence of the emergence in recent decades of troubling developments as well. We refer to the suggestive evidence that, after the decline of the livestock economy in the pre-war years, the growth of agency towns and universal education have created a context in which the growth of a youth culture has resulted in more frequent behaviors consistent with conduct disorder. The presence of youth gangs is one indicator of this culture, although most young people are not members of self-identified gangs. Most peer groups are far more amorphous, but their effects are real nonetheless. Because alcoholic beverages are readily available in agency and

border towns, conditions are created that encourage heavy and frequent drinking unimpeded by the restraining presence of older kinsmen and women.

Schools have played an increasingly important part in the creation of a youth culture, but the association between schooling and subsequent alcohol-related problems is complicated. Day schools on reservation were meant to keep young people in their home communities and to protect them from the damaging effects of boarding schools, but we have found that type of school attended is not associated with subsequent alcohol dependence. This may well be because reservation day schools have themselves become places where antisocial as well as pro-social behavior is learned. On the other hand, completing high school of any type has been associated in recent years with reduced risks of becoming alcohol dependent, and of engaging in domestic violence and with a reduced probability of conduct disorder.

When education was not universal, those who attended and had the highest average years of attainment were most likely to engage in undesirable behavior such as delinquency, alcohol dependence, and family violence. Since education has become universal, those who do not complete high school are the most likely to engage in these behaviors. To illustrate, in Figure 10-1 we have displayed regressions of number of years of education onto age for male and female controls with and without conduct disorder (men and women are combined because the results are the same for each). This figure is similar to those in Chapters 4, 6, and 7, which show that alcohol dependence and involvement in domestic violence have the same associations with age and education as does conduct disorder.

Average years of schooling actually have not changed significantly for those with conduct disorder and/or alcohol dependence. It has increased significantly for those without either one or both conditions. Unfortunately, because this was not a study of the educational system, we cannot explain with any certainty why these patterns have occurred. We simply offer the speculation that contemporary youths who drop out of school may do so both because they have become involved with an antisocial peer group and because they have learning difficulties. The former may be an early stage of a deviant career from which it may become increasingly difficult to extricate oneself as time goes by. The latter may be a partial reflection of the association of conduct disorder with attention deficit hyperactivity disorder (ADHD), which makes adjustment to school especially difficult. The prevalence of ADHD is unknown, but in the general population of school-aged children it is thought to be 3%–5% (American Psychiatric Association, 1994:82). Thus, it is unlikely to account for a large proportion of those who do not complete high school. Other factors are no doubt more significant. Whatever the causes, dropping out of school now has serious consequences. In the 1930s and 1940s, dropping out of school, or not attending at all, had an entirely differ-



Figures 10-1. Regressions of education onto age for people with and without conduct disorder, male and female controls (with 95% confidence curves).

ent meaning than has been the case more recently. It was not predictive of subsequent trouble as it is now that the expectation of school attendance is universal.[1]

As with changing tastes in alcoholic beverages, though far more profoundly, the emergence of a youth culture reflects similar processes at work in the larger society, a transition from what has been called *narrow* to *broad socialization* (Arnett and Taber, 1994).[2] Narrow socialization refers to contexts in which young people are socialized into a relatively limited number of culturally approved adult roles, usually by working in close association with adult kin. With industrialization, universal and extended schooling, and urbanization, young people acquire a broader range of choice of adult roles and are encouraged to express their individuality. The change from narrow to broad is double-edged, however. For the middle classes and above, it may mean enhanced opportunities for self-expression and for self-fulfilling and rewarding occupations. For the poor, it may mean dead-end jobs, a criminal career, and/or unemployment. These latter unattractive alternatives, and the growing irrelevancy of adults for the socialization of the young, have been described in an urban African-American community

(Anderson, 1990), but similar situations arise in other settings, such as Indian reservations.

Thus, the transition from narrow to broad socialization is implicated in the development of youth cultures, whether in private preparatory or Bureau of Indian Affairs boarding schools, whether in urban and rural slums or in affluent suburban and urban neighborhoods. Furthermore, although "recreational recklessness" (Arnett and Taber, 1994) and antisocial behavior may, indeed do, occur in all these settings, the evidence suggests that they are more common in poor than in nonpoor communities. What we have observed in reservation agency towns is not dissimilar to processes occurring elsewhere.

FAMILY HISTORY

Parental alcohol abuse is a risk factor for alcohol dependence among our respondents as it is in many other populations, but for men both paternal and maternal drinking were significant whereas for women only maternal drinking was. In fact, for men, abusive drinking by other family members and visitors as well as by parents were significant risk factors, whereas for women neither was. This suggests that, with regard to alcohol use, men are herd animals. Men seem to drink abusively when those around them do. The more abusive drinkers there are, the more likely a young boy is to become alcohol dependent in adulthood. This is consistent with our emphasis on the importance of peer groups as a risk factor for alcohol abuse.

For women, the dynamic seems to be different. Heavy drinkers surround girls just as they do boys, but their presence is unrelated to increased risk of subsequent alcohol dependence among girls. It is only abusive maternal drinking that is significant. This may reflect the importance of the mother–daughter bond among a matrilineal people. We found similar differences between men and women in an earlier study of hypertension among elderly Navajos (Kunitz and Levy, 1986). In that instance, the expected positive association between hypertension and several measures of acculturation was found only among women. It appeared that, although the more acculturated women were at greater risk for hypertension, the opposite was true for the men, who were less at risk the more acculturated they were. At that time, we suggested that young Navajo men were more vulnerable to strains within Navajo society than were the women, who had a more secure place: "The mother–daughter bond is especially significant; typically women remain in their families of origin upon marrying, their husbands moving to join them; they have typically also owned their own livestock and retained rights of decision making regarding their property" (Kunitz and Levy, 1986:101).

Nevertheless, it can also be argued that the mother–daughter bond is more important than the mother–son bond in many societies. Regardless of family organization, boys are raised to emulate their fathers and to enter the world beyond that of family as girls are conditioned to follow their mothers' example and create a new family. Comparative research on this question would be instructive.

Parental alcohol abuse has been suggested to have both direct and indirect effects (Peterson et al., 1995:36). The direct effects have to do with parents as role models for alcohol use and how one behaves when under the influence. Indirect effects include such things as family management skills and physically abusive behavior. *Family management* refers to parental monitoring of their childrens' activities and whereabouts; clarity of family rules; and positive reinforcement by parents of pro-social behaviors such as doing well in school, participating in organized afterschool activities, and helping with household chores. In other populations, parents who abuse alcohol are less likely to possess adequate family management skills, but even in the absence of parental alcohol abuse inadequate skills are a risk factor for conduct disorder in the children (Peterson et al., 1995). Clearly, physical abuse, including harsh physical punishment, of children may be considered an indicator of inadequate family management skills as well, for it is the very antithesis of positive reinforcement and is a significant risk factor for later alcohol dependence and participation in domestic violence by the child who is subjected to it.

ALCOHOL AND VIOLENCE

Elsewhere we have shown that Navajo homicide has historically been different from Anglo-American and African-American homicide, for among Navajos wives and girlfriends were far more likely to be victims. Since the 1960s, however, the homicide rate has increased about threefold and the ratio of male to female victims has increased from 1:1 to about 4:1 (Kunitz and Levy, 1994). Reporting procedures have changed over this period, so we must be wary of overinterpreting the data. Nonetheless, we believe the evidence supports the existence of a real increase in male homicide victimization, which may well be the result of the growth of the youth culture we have described.

At the same time, homicides of women remain high. This is an old pattern and is only the tip of the iceberg of violence against women. Alcohol is clearly associated with this form of violence, which appears to be more common among younger than older women, suggesting an increase in recent decades. Indeed, the rate of violence against Navajo women below age 50 years is at the high end of the range reported from other populations.

More than two decades ago we suggested "that Navajo men do not beat up

their wives because they are drunk but . . . they get drunk so that they may beat up their wives. Drunken violence may represent an attempt to assert one's self in a situation where self-assertion is valued covertly but sanctioned overtly. Hostility, then, may be expressed upon repeated occasions in the form of fights and beatings rather than being repressed and, for the unfortunate few, finally exploding in a seriously damaging form such as murder" (Levy and Kunitz, 1974:188). This still seems to us highly likely, but the data are not available with which to demonstrate it. Alcohol is associated with the commission of violence, but, as discussed in Chapter 7, the reasons remain unknown. Our results are consistent with the idea that drinking and domestic violence are associated as a result of learned behavior, for example, witnessing parental abuse, as well as with the idea of alcohol myopia described in Chapter 7. It is, however, clear that whatever the mechanism by which alcohol affects violence, there is a legacy of tension between the sexes that is exacerbated by alcohol abuse and that contributes to the high rate of family violence.

On the other hand, reducing the highest levels of consumption would not have as dramatic an effect on violence as might be wished. The data in Table 10-1 show that there is indeed a significant association between being a perpetrator of family violence and average daily consumption of alcohol: The more one consumes, the more likely one is to have struck one's partner. Nonetheless, if men who drink more than two ounces of alcohol per day had consumed only half that amount, the proportion who had struck their wives would have been 43% (41/96) rather than 51% (63/123), a difference of only 8%. If all men who drank more than an ounce a day had consumed less than an ounce a day, the proportion would have changed from 47% (104/219) to 33% (64/193). This is not trivial, but the rate is still high even at the lowest level of consumption.

This is roughly analogous to the calculation of attributable risk in Chapter 4 and in this context is meant to illustrate two points. First, although there is an association between average daily amounts of alcohol consumed and involvement in domestic violence, a very substantial proportion of moderate drinkers also engage in domestic violence. Second, reducing a high-risk behavior such as very heavy drinking may well have less impact on undesirable behavior than might be expected because many people who engage in the behavior do not have especially high levels of the risk factor (high daily consumption). This is an example of the prevention paradox to which we return below.

Significantly, conduct disorder does not affect domestic violence after alcohol dependence and a history of physical abuse are taken into account, but it does affect fighting when drinking. This suggests that domestic violence may not be the result of a characterological problem but is behavior that is commonly engaged in by a very large proportion of the normal population.[3] Fighting while drinking, on the other hand, may not be normative as domestic violence seems to

Table 10-1. Involvement in Family Violence and Average Daily Consumption of Alcohol; All Male and Female Controls

	INVOLVEMENT IN DOMESTIC VIOLENCE				
	YES		NO		TOTAL
AMOUNT CONSUMED	NO.	ROW %	NO.	ROW %	N
		*Men**			
Abstain	3	11.5	23	88.5	26
Less than 1 oz/day	64	33.2	129	66.8	193
1.0–1.9 oz/day	41	42.7	55	57.3	96
More than 2 oz/day	63	51.2	60	48.8	123
Total	171	39.0	267	61.0	438
		Women†			
Abstain	12	22.2	42	77.8	54
Less than 1 oz/day	31	42.5	42	57.5	73
1.0–1.9 oz/day	17	48.6	18	51.4	35
More than 2 oz/day	13	68.4	6	31.6	19
Total	73	40.3	108	59.7	181

*For men, Pearson's chi square = 19.276; d.f. = 3; $P = 0.0002$.

†For women, Pearson's chi square = 14.714; d.f. = 3; $P = 0.0021$.

be, and the recent increase in conduct disorder that we think has occurred may be associated with the increase in homicide rates and with the change in the ratio of male to female deaths that occurred after the 1960s. This is of course so far only speculative, but it deserves further attention.

OTHER CONSEQUENCES OF ALCOHOL MISUSE

In addition to domestic violence, the effects of alcohol use were experienced by our respondents in many other ways (Table 10-2). Despite the fact that many did not know whether a relative had died from an alcohol-related condition or not, about one fourth of men and women controls reported that one or more first-degree relatives had died from alcohol-related causes. About half had lost a second-degree relative. More than half of the fathers and 16%–19% of the mothers had been problem drinkers. More than 60% of men and women controls had been arrested for driving while intoxicated.

In addition to drunk driving and public intoxication charges, women alcoholics especially may face child abuse and neglect charges. Among Tuba City

Table 10-2. Experience of Alcohol-Related Events by Controls, as Percentages

	MEN (N = 531)	WOMEN (N = 202)
Alcohol-related health problem	7	5
Alcohol-related death		
Of first-degree relatives	25	28
Of second-degree relatives	47	54
Withdrawal symptoms	31	11
Father a problem drinker	52	64
Mother a problem drinker	16	19
DUI arrests	69	63

and Shiprock women, only alcohol-dependent women have at any time had their children taken from them and placed in foster homes. Furthermore, female alcohol-dependent controls who did not use any type of formal treatment were least likely to have had children placed in foster homes (13.3%). Cases who had outpatient treatment were more likely to have their children taken from them (28.2%), and cases who had inpatient treatment were most likely to have had their children removed (40.6%). Thus, severity of alcohol dependence among women is associated with major family disruption with potentially devastating consequences for children, for, as we have observed, maternal alcoholism is an especially important risk factor for alcohol dependence in the children. Moreover, the association between treatment and loss of children may well create an incentive for women to avoid treatment if at all possible.

The pervasiveness of alcohol dependence and abuse also has significant economic implications. Here we provide very rough estimates of the amounts spent by drinkers, as well as by treatment and law enforcement agencies. The data on quantity, frequency, and beverage of choice allow us to estimate the amount spent on alcohol. At the time of interview, slightly less than half the males and about one fourth of the females in our control samples were currently drinking. Frequency and amount consumed at a sitting were positively correlated, although there were of course variations. In general, the more frequently one drinks, the more alcohol one consumes at a sitting. Among those who drank once or twice a month, cash expenditures varied from a few dollars a month for alcoholic beverages to as high as $20 for a single day's drinking (or $40 or more a month for those who drank twice a month). A few of the heavy drinkers, who reported to us that they only drank once a month, drank a case of beer or more when they did drink.

Moderately frequent drinkers who usually drank once a week tended to drink higher amounts of alcoholic beverages than did the infrequent drinkers. Their expenditures for alcoholic beverages ranged again from a few dollars a month for a light drinker to $80 a month for a heavy drinker.

Frequent drinkers, who drank from several times a week to daily, tended also to be heavy drinkers. This was especially true for drinkers of fortified wine. Many current problem drinkers reported that they drank from a six-pack to a case of beer daily. According to our interviewees who were beer drinkers, they averaged a twelve-pack a day. Frequent and heavy fortified wine drinkers reported that they drank from two to four pints a day. Those who drank beer and wine in combination might drink a six-pack of beer plus two pints of wine. Expenditures for these frequent drinkers varied from perhaps $15–20 a month to several hundred dollars a month.

The amount spent for alcoholic beverages reflects not only the frequency of drinking and the amount drunk, but also the source of the alcohol. Navajos generally acquire alcohol from one of three sources. The first, and the most economical, are the liquor and grocery stores located in the border towns surrounding the reservation. A second source is stores located just outside the reservation border. These often specialize in alcoholic beverages, such as fortified wine or quarts of beer. Prices at these stores are often 10%–25% higher than in the border towns.

The highest prices for alcohol products are from on-reservation bootleggers. They charge double or triple the off-reservation price. In the communities we studied near the reservation border, there were few if any bootleggers. It was easy for the residents of these communities to drive to Page, Farmington, and Flagstaff. In a community such as Tuba City, however, which is far from off-reservation sources of supply, as many as 40 bootleggers sell alcoholic beverages to community residents. Bootleggers often sell to the frequent and heavy drinkers in these communities. These persons therefore have to spend considerably more on alcohol than those who live nearer to the reservation border.

How do some of the reservation problem drinkers, especially those with a long-term alcohol abuse problem, obtain alcohol? A number of our interviewees stated that they did whatever they could to support their habit. For example, one man said, "I do odd jobs. I round up cattle for people, I clean yards, I do anything I have to to support my habit." He said he drank 4–5 days a week and spent $40 to $50 a week on beer (he buys twelve-packs, his daily consumption, for $6.99 in an off-reservation border town). Another man, also a frequent drinker, said he did odd jobs as well as stole for the money to buy alcohol. He said, "I steal from people sometimes. I break into a house to get something that I can sell quickly." Other interviewees told us that they obtained money to buy alcohol by panhandling in border towns, shoplifting, stealing from their family, or working for beer or wine (i.e., they were paid in alcohol for jobs they performed).

To estimate the amount spent on alcoholic beverages in a year by the on-reservation Navajo population, we combined the data on quantity, frequency, type of beverage, and prices from current drinkers and then extrapolated to the total population. Price data were obtained by visiting liquor outlets and using interview data (for bootleg prices). We estimated what percentage of products was purchased at the three locations (with their different prices) where Navajos obtained these goods. Our conservative estimate is that Navajos spend approximately $9–11 million dollars a year on alcoholic beverages.

The treatment industry on and adjacent to the reservation is very substantial, as we have observed in Chapter 8. Indian Health Service expenditures on alcohol treatment programs were $11.1 million in fiscal year 1997. About $10.4 million were spent on contracts with the Navajo Tribe. The remainder was for services and was paid for by Indian Health Services directly.

Informants estimate that at least as much is spent by the Navajo and other police forces on alcohol-related arrests and incarceration. Similarly, tribal and other social service programs must deal with the consequences of alcohol-related family problems, and hospitals and clinics must treat the medical and surgical sequelae of alcohol misuse. A conservative minimum estimate of the annual expenditure for dealing with alcohol misuse and its consequences would be in the range of $30–40 million, or about $150–200 per person.

The resources devoted to dealing with the effects of alcohol misuse are substantial on and adjacent to the reservation and appear to reflect more serious alcohol-related problems there than in non-reservation communities. We showed in Chapter 1, for instance, that Navajo alcohol-related mortality rates are at the high end of the range of rates observed in all New Mexico and Arizona counties. That is to say, even by the standards of the regional culture, Navajo rates tend to be high. Nonetheless, regional rates in general are high and are accounted for not simply by the presence of Native Americans in the population but by rural residence and low incomes. Indeed, rurality and poverty are widely shared facts of life for both Indians and non-Indians in the Mountain West, although among the same New Mexico and Arizona counties there are strong correlations between proportion of the population that is Native-American (not simply Navajo) and percent living in poverty and percent rural. That is, Native Americans tend to be rural and poor, but rural residence and poverty have effects on alcohol-related mortality that are independent of being Native American.

Prevention

The number of treatment programs has increased dramatically over the past 30 years (Kunitz and Levy, 1994:193–194), but, considering the high lifetime preva-

lence of alcohol dependence, the amount spent on treatment is not enormous, perhaps $100 per person over the age of 20 years. Salaries for counselors in the tribal treatment programs are low, turnover rates are high, and continuity of care is minimal. Residential treatment programs also seem to have high staff turnover. Add to that the fact that treatment programs get the most severe alcoholics, and it is not surprising that we were unable to detect a positive association between treatment and remission. Among female alcohol-dependent controls who had been in treatment, 40% were in remission. Among men, the figure was 38.2%. Clearly the treatment system as it now exists is not having nearly the desired effect, as a number of evaluations have shown (Kunitz and Levy, 1994:196). Most treatment systems elsewhere are not remarkably successful either, so perhaps this should not be a surprise. It does indicate, however, that improvements in treatment need to be sought and that more attention ought to be paid to prevention.

As described in Chapter 1, there are two approaches to prevention. One is to focus on high-risk individuals; the other is to try to reduce the risks in the entire population. The first requires devoting special attention to people in the tail of the distribution where severity and the risk of harm are very high. The second assumes that there is a continuous distribution of severity and that the greatest impact can be achieved by moving the entire distribution downward (e.g., Rose, 1992:vii).

We have argued that conduct disorder increases both the risk and the severity of alcohol dependence. Differential severity is illustrated in Figures 10-2 and 10-3, which display cumulative scores of alcohol severity (ALCSUMAB) for women (Fig. 10-2) and men (Fig. 10-3) with and without conduct disorder. For each sex, the scores of people with conduct disorder are shifted to the right. This might be interpreted as an argument for pursuing a high-risk strategy. Because, however, the contribution of conduct disorder to overall prevalence of alcohol dependence is very low (less than 10%), the impact of such a strategy on the entire population would not be great.

What sort of interventions ought then be pursued? Because parental behavior, especially abusive drinking, is such an important risk factor for both conduct disorder and alcohol dependence in their children, several approaches would be appropriate. One is the teaching of family management skills, for there is evidence from other populations that teaching parents family management can have beneficial effects on children who manifest antisocial behavior, although long-term follow-up data are not yet available (Maguin et al., 1995). Such interventions are costly and labor intensive, but, because they address risk factors that are common to conduct disorder and alcohol dependence and because alcohol dependence is very prevalent, they may be appropriately applied to the entire population and not only to the families of the high-risk individuals, those with conduct disorder. Such family-based prevention programs should not be viewed as alter-

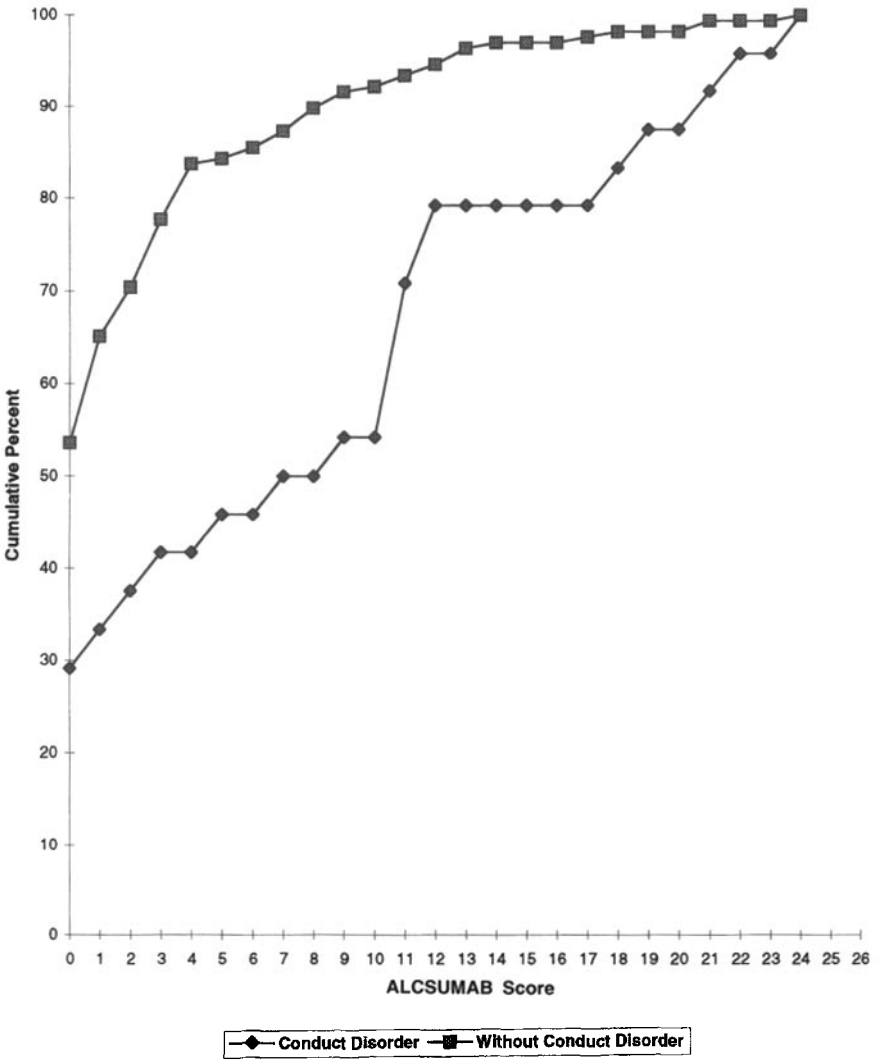


Figure 10-2. Women with and without conduct disorder: cumulative proportions with ALCSUMAB scores.

natives to the more common school-based programs but as complementary (Barnes et al., 1995).

Another appropriate intervention is to work to shift the entire distribution of alcohol consumption downward, not simply to influence people who drink very large amounts. As illustrated in Table 10-3, among both men and women there is

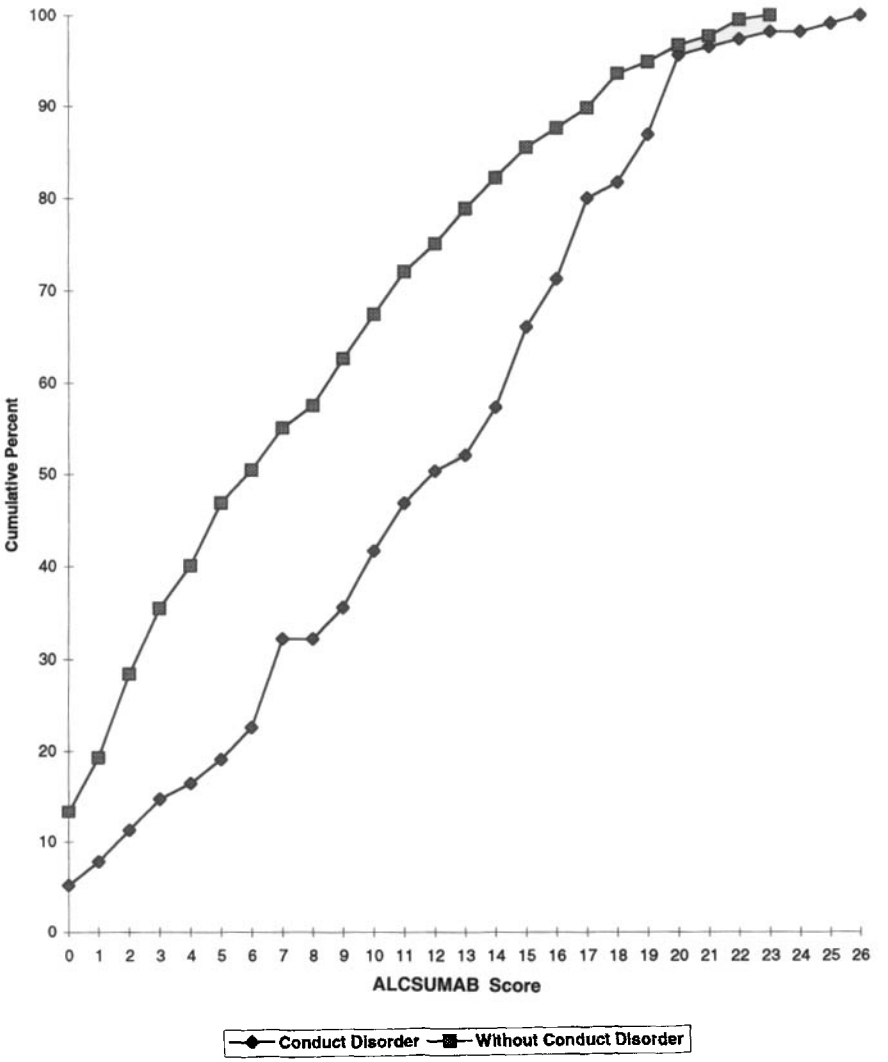


Figure 10.3. Men with and without conduct disorder: cumulative proportions with ALCSUMAB scores.

a significant difference between alcohol-dependent (DEP) and non-alcohol-dependent (NADC) controls with regard to average daily consumption. The former are likely to consume more than the latter. If one attempted, however, to reduce consumption from more than 2 ounces a day to 1–1.9 ounce a day among current male drinkers, assuming this would reduce the proportion who are alco-

Table 10-3. Average Quantity of Alcohol Consumed per day by Current Drinkers, Alcohol Dependent and Non-Dependent Controls Only

AMOUNT CONSUMED PER DAY	ALCOHOL DEPENDENT		NON-ALCOHOL DEPENDENT		TOTAL N
	NO.	ROW %	NO.	ROW %	
		*Men**			
Low (<1 oz).	105	75	35	25	140
Medium (1–1.9 oz)	41	95.4	2	4.6	43
High (>2 oz)	46	93.9	3	6.1	49
Total	192	82.8	40	17.2	232
		Women†			
Low (<1 oz)	7	41.2	10	58.8	17
Medium (1–1.9 oz)	11	68.7	5	31.3	16
High (>2 oz)	5	100	0	0	5
Total	23	60.5	15	39.5	38

*For men: Pearson's chi square = 14.929; d.f. = 2; $P = 0.0006$.

†For women, Pearson's chi square = 6.378; d.f. = 2; $P = 0.0412$.

hol dependent, the results would be very disappointing. There would be no change. Even if all men who drank more than an ounce a day were to drink less than that, the proportion of current drinkers who are alcohol dependent would still be 75%. That is to say, reducing the risk of alcohol dependence by focusing only, or primarily, on those who drink the most will not have as much impact on the entire population as might be desired, although it would not be insignificant.

This is yet another example of the "paradox of prevention" (Kreitman, 1986; Rose, 1992): Pursuing a high-risk strategy will ignore most of the people who are at risk. This is especially important because widespread alcohol misuse is itself an important risk factor for further misuse. An entire culture of drinking needs to be affected, not simply people who obviously drink very large quantities. Previous studies as well as data presented in Chapter 3 agree that at any time a very high proportion of Navajos are not using alcohol. Either they never have (mainly women), or they have done so in the past and have now stopped (mainly men). When they do drink, however, they tend to develop problems at much higher rates than non-drinkers. Thus, finding ways to encourage substantially diminished consumption among all drinkers, even those who consume less than an ounce a day, would be an important step.

Several considerations lead us to conclude that population-based rather than high-risk preventive interventions are most appropriate in this population:

1. Alcohol dependence is widespread and, especially among men, is continuous rather than discrete in its distribution.
2. Although people who are delinquent before age 15 years are at highest risk for becoming alcohol dependent and manifesting the greatest severity, conduct disorder accounts for less than 10% of alcohol dependence. Programs focused on these high-risk people will not reduce the prevalence of alcohol dependence or its sequelae in the population.
3. Because conduct disorder and alcohol dependence share some common risk factors, similar types of preventive measures may be appropriate for everyone. Clearly, however, special efforts need to be made to involve the families of young people who manifest conduct disorder in prevention programs.

Developing and implementing population-based preventive interventions that focus on families is a daunting and very expensive task. Assume that, at some point in the family life cycle, 70% of families are affected by an alcohol-dependent member. Then assume that, in a population of about 200,000, there are 40,000 households. If 70% of the households are at some time affected by alcohol misuse, then 28,000 households might be the targets of family-based interventions. If the focus were only on households with school-aged children, the number would be smaller, perhaps 14,000, but still substantial. We have no good way of estimating the cost per household of an effective preventive intervention. Even if it were $1,000 a year, however, it would still be less than half of what is spent annually on treatment and incarceration. If it could be found, the money might be well spent.

Nonetheless, population based programs such as those for which we have argued are not inevitably successful. "Cultures" of heavy drinking present almost insuperable problems for health programs. Societies or subcultures in which heavy drinking is normative behavior value such behavior positively, ensuring that learning to drink heavily will be transmitted from generation to generation. Nothing short of a direct challenge to these values is necessary to effect large-scale changes of behavior. In an attempt to combat pervasive obesity and its sequelae in the United States, the mass media continually exhort the public to exercise, refrain from fat-laden fast foods, and eat a balanced diet. Although large numbers of people jog, do aerobics, and buy low-fat products, the battle is far from being won. Similarly, alleviation of some of the supposed root causes of excessive drinking does not guarantee success. In Ireland, for example, when economic conditions improved, the amount of alcohol consumed did not decline. Instead, drinkers switched from beer to more costly distilled spirits (Walsh, 1979:402).

TYPES OF ALCOHOLISM

Our discussion of prevention implicitly raises the question of whether there is one type of alcoholism or several. The population approach to risk is based on the assumption that there is only one sort, with varying degrees of severity. The high-risk strategy may imply that there are at least two types, that average severity is greater in one than the other, and that people responsive to one intervention may not be responsive to another. This is an old debate among researchers on alcoholism, and, as we noted in Chapter 5, it is a common problem in psychiatry and in medicine more generally. Using behavioral patterns to create typologies is problematic for, as we have also observed, behavior is shaped by culture to a very high degree. The result is that disease types based on behavioral manifestations may not be stable from place to place. This is the rock on which we believe the type I/type II distinction founders. The number of symptoms reflects severity, but clusters of alcohol-related symptoms do not appear to form stable syndromes that are separable from one another.

Does this mean that alcohol dependence is a unitary condition? Vaillant (1995:31) writes: "It probably makes sense to talk about different alcoholisms only when each is caused by different yet necessary and sufficient etiological factors." A necessary cause is one without which a condition cannot occur. Smallpox cannot occur without the smallpox virus. A sufficient cause is one that is followed by a particular effect. Smallpox results from exposure to the virus. Thus the virus is both necessary and sufficient.

This is probably too stringent a requirement. After all, smallpox does not invariably result from exposure to the virus. Apart from the infectious diseases, there are very few conditions that result from a necessary cause. More often diseases are the result of multiple weakly sufficient causes or risk factors (Kunitz, 1987).

On the other hand, one can make a reasonable case for the claim that, at our present stage of knowledge, alcoholism is a single condition. Once people develop it, they begin to behave similarly, and whether or not they were sociopathic previously does not distinguish their alcohol-related behavior (Vaillant, 1995: 91). Indeed, Vaillant, (1995) argues that once alcoholism is firmly established, it takes on a life of its own and becomes a single phenomenon, the disease of alcoholism, which may vary in severity but is otherwise a unitary condition. Thus, although there may be a variety of pathways to alcohol dependence, in the end there is only one type (Vaillant, 1995:37). Analogously, there may be several routes to atherosclerotic heart disease (including such risk factors as smoking, high-fat diets, lack of exercise, and heredity), but that does not mean that it is more than one condition. This may be why a history of conduct disorder before age 15 years is a risk factor for alcohol dependence but is not associated with remission.

The view of alcoholism as a unitary condition has been severely criticized. The individuals who experience it, its presentation, and its course are all heterogeneous, according to a committee of the Institute of Medicine (1990:31–37). Our data support the committee's position, for in terms of both course (Kunitz and Levy, 1994) and etiology there appear to be differences among Navajo alcoholics. There is a subset of people who manifest alcohol and non-alcohol-related problems early in life, who have more severe alcohol-related problems in adulthood than others, and who are at increased risk of premature death. That conduct disorder is such a significant risk factor (sufficient cause) for alcohol dependence in the Navajo population and is associated with increased severity as well as a variety of other problems, we think, suggests that the alcoholism associated with conduct disorder may well be different from other types of alcoholism. To argue by analogy, there are many different types of arthritis, but treatment may be similar for each of them. The same may be true of alcohol dependence.

TREATMENT

Even if there are different types of alcoholisms, the implications for treatment are not at all clear. We have argued that early prevention of alcohol dependence, what has been called *primary prevention,* is best dealt with through a population-based rather than a high-risk strategy. Typically, however, the more developed disease conditions become, the more appropriate a high-risk approach becomes. This is because the high-risk people become an increasingly large part of the population under consideration. Thus, the prevalence of conduct disorder in the U.S. population is about 20% among boys under the age of 15 years. About 25% of them will go on to develop antisocial personality disorder in adulthood (Robins et al., 1991b:266). Therefore, in the young adult population, the prevalence is 4%–5%. Among men in alcohol treatment programs, however, the prevalence is about 10 times that, or 40%. Thus, while a very small proportion of the general population, they are disproportionately represented in the treatment population.

There has been much debate about, and considerable investigation of, the degree to which different modes of treatment are appropriate for different types of alcoholics. Our study was not designed to investigate that issue, and our data do not speak to it directly. We would argue, however, that when problems have begun to become visible but before they have become well established, therapeutic interventions specific to different types of alcoholics (e.g., those with and without antisocial personality disorder) may be appropriate. This may occur at a first admission to a treatment program or at a first arrest for driving while intoxicated. Later, when alcohol problems have become more entrenched, differentia-

tion may no longer be appropriate. These two stages correspond to secondary and tertiary prevention.

Alternatively, secondary prevention such as brief interventions (Fleming et al., 1997) may be useful for a variety of different sorts of alcoholics, whereas at the tertiary level more specific interventions may be appropriate.[4] To our knowledge, investigations have not been done matching individuals to different interventions at various stages in the development of alcohol dependence, although evidence cited in Chapter 4 suggests that alcohol-dependent people with antisocial personality disorder respond to different types of treatment than do alcohol-dependent people without antisocial personality disorder. This may help account for the disagreements in the literature over whether alcoholism is one disease or several and whether different modes of intervention are appropriate or not.

IS ALCOHOLISM A DISEASE?

When we began our research in the mid-1960s, the conventional explanation of Native-American alcohol abuse was that it was a retreatist response to economic deprivation, loss of culture, and anomie. Our work, carried out among people, many of whom could not be described in these terms, led us to question the conventional wisdom. We found that "traditional" Navajos as early as the late nineteenth century had drunk in ways that could be described as excessive and suffered serious consequences as a result. We argued that the reasons for heavy drinking were to be found in traditional Navajo social organization, as well as in models of heavy drinking learned from non-Indians in the nineteenth and early twentieth centuries (Levy and Kunitz, 1974).

Because heavy drinking was the product of normal social and cultural processes and because we could not convince ourselves that in most cases it was a manifestation of psychopathology, we were unwilling to call it a disease. Indeed, we took a strong nominalist position, saying that the definition is not intrinsic to the phenomenon but a label conferred on it by professional experts and other moral entrepreneurs (Kunitz and Levy, 1974). That is a position to which we still adhere.

We have never denied, however, that heavy alcohol use frequently has catastrophic effects on alcoholics, their families and friends, and their communities. It is precisely these consequences that lead some observers to take a very different position. For instance, Vaillant (1995:19–23) has argued that the high mortality of alcoholics and the need for skilled medical attention during acute withdrawal and for treatment of complications all make it a disease. According to this position, etiology does not make it a disease. The magnitude of the risk to health and the necessity for medical treatment are what make it a disease.

Because we take a nominalist position, our argument is again a pragmatic one. Does it do more harm than good to label alcoholism a disease, deviance, or sin? If the disease label is applied because alcohol dependence in its more severe forms requires medical management and the disease label ensures access to the health care system, then it may well be beneficial to call it a disease. If the label is applied because alcoholism is thought to result from psychopathology, however, then it may be unhelpful and misleading. The latter has been the reason for affixing the disease label to Native-American drinking, as well as the source of our objection to such a label. Although intermediate positions are possible, one extreme position is that people drink to excess because they are (psychologically) sick. The other is that people are sick because they drink to excess. The latter seems to us more consistent with the evidence from the vast majority of people who were part of this and previous studies. The exception may be the people who manifested conduct disorder before they began drinking to excess, although even here one must ask whether it is useful to think of conduct disorder as psychopathology or simply misbehavior of a more or less extreme type.

A FINAL WORD

This study has raised a number of issues that are important for the people with whom we have worked, but they have a larger significance as well. Whether alcoholism is a disease; whether it is one condition or many; the associations among conduct disorder and abuse in childhood and alcohol dependence and violence in adulthood; risk factors for and protective factors against the development of alcohol dependence; the implications of different modes of prevention; and the association between social change and deliquency: all have relevance to people elsewhere. There are obviously ways in which the Navajos were and continue to be unique. Much of our previous work and the work of others has demonstrated that. Nonetheless, increasingly they are facing problems that are common to many other peoples, both in the United States and abroad. Perhaps common solutions will be found as well.

Notes

1. Dropping out of school is associated with significant consequences in later life. Among women younger than 30 years of age, highest school level attained is not associated with total number of children borne. Among women controls aged 30–44 years, however, high school dropouts had on average 4.1 children compared with a maximum of 3 among women with only grade school or with a high school diploma. Women college graduates had on average 1.6 children. Among women 45 years and older, those with no

education had the largest number of children. Among men there were no differences in average number of children associated with highest level of schooling achieved.

AGE OF CONTROL, IN YEARS	F RATIO	*P* VALUE	N
	Women		
<30	0.63	0.64	55
30–44	4.49	0.002	114
>44	2.43	0.059	34
	Men		
<30	1.32	0.27	55
30–44	0.38	0.82	285
>44	1.51	0.19	147

2. We are grateful to Maria Swora for calling this citation to our attention.

3. An estimate of the percentage of domestic violence attributable to having been physically abused in childhood is less than 10%. Thus, abuse in childhood is a significant risk factor for involvement in domestic violence, but it does not account for an enormous amount of domestic violence. This calculation is comparable with the calculation reported in chapter 4 of the percentage of alcohol dependence that is attributable to conduct disorder.

4. We are grateful to Frederick B. Glaser for this suggestion.

Appendix 1

METHODS

Scott Russell

The interview data utilized in this study were gathered from two contrasting Indian Health Service (IHS) administrative areas located at opposite corners of the Navajo reservation—the Shiprock and Tuba City Service Units. The Shiprock Service Unit includes portions of Utah, northeastern Arizona, and northwestern New Mexico, while the Tuba City Service Unit is entirely in northeastern Arizona. These two Service Units were thought to differ in several ways and thus to provide desirable diversity as well as potential comparisons. Differences between these two Service Units also affected our research methodology, primarily due to different policies for referring Navajos with alcohol problems to treatment and to differences in the Shiprock and Tuba City IHS computer information systems.[1]

SAMPLING

The study was a case–control design in which alcohol–dependent men and women (the cases) were matched to non-alcohol-dependent men and women (the controls) and then compared in a variety of ways. Our aim was to accumulate four samples, two male and two female, from each Service Unit. The cases were men and women who were, at the time of interview or shortly before, in treat-

ment for alcohol dependence. The controls were not alcohol dependent and were randomly selected from communities within the two Service Units and matched to the cases by age, sex, and community of residence.

Cases

All the male cases from Shiprock (N = 105) were interviewed while they were patients in a residential treatment program. Two treatment centers in New Mexico provided 92 of these cases, comprising nearly every male who had been admitted to one of these programs from the summer of 1993 through the spring of 1994. Another 13 men came from three other programs, two in New Mexico and one in Colorado.

The female cases from Shiprock (N = 91) came nearly equally from residential treatment programs (N = 47) and the Navajo Tribe's outpatient program (N = 44). The inpatients came from the same residential programs as did the men. There were, however, too few to comprise an adequate sample of female cases. Additional cases were identified from a list of 164 former clients provided in August 1993 by the Navajo Nation's outpatient substance abuse treatment program in Shiprock. Of these 164 potential cases, 44 women were interviewed and included among the Shiprock female cases.[2]

The Tuba City Service Unit referred very few alcoholics to residential treatment programs primarily because IHS funding for such referrals from the Tuba City Service Unit was reduced shortly before the present study began. There were also differences in state policies. New Mexico has laws that encourage referring people convicted of two or more DWI offenses to treatment, while Arizona does not. Thus, more Navajos from the Shiprock Service Unit were sent to residential treatment than were those from the Tuba City Service Unit.

Because people from the Tuba City area were referred to outpatient treatment, we obtained most of our cases from lists of former clients provided by the Navajo Nation's outpatient treatment program in Tuba City.[3] They represented former clients seen over a 5–6 year period by the tribal treatment program, and they included the names of 127 women and 193 men who were seen by tribal counselors either in groups or on an individual basis. The Tuba City IHS Hospital also supplied us with the names of 11 women who had been referred to residential treatment during the previous several years.

Most (81.8%) of the Tuba City male cases (N = 99) were derived from lists provided by the tribal treatment program. We interviewed 48.2% of the persons on these lists.[4] The remaining men were interviewed in residential treatment centers in Arizona, Colorado, and New Mexico.

Most (78.9%) of the Tuba City female cases (N = 57) were also derived from lists provided by the Tuba City tribal outpatient program with a few addi-

tional names from the Tuba City IHS hospital. Almost 25% of these women were interviewed at residential treatment centers. We were able to interview 53.5% of the women from the outpatient lists given to us.[5]

For a variety of reasons, some interviewees were excluded from the sample. Some gave unreliable information. Others did not meet the minimum medical criteria for a diagnosis of alcohol dependence, and a few others did not meet our age criteria.[6]

Controls

The controls from both areas were selected because they were not alcohol dependent and were matched to the cases by sex, age, and community of residence. As cases were interviewed, they were assigned to sampling strata based on these criteria. We then sought controls to match these cases. Obtaining adequate controls was perhaps the most difficult part of the entire data-gathering process. There were lists of neither individuals nor households in the study areas. We elected to draw controls from computer-generated lists of all patients seen at least once between 1982 and 1992 at any of the IHS hospitals or clinics in the two Service Units. Selection of interviewees from a particular list (i.e., from a particular sampling stratum) ceased when a sufficient number of non-alcohol-dependent controls had been interviewed to match the number of cases or when at least three people had been interviewed without one being found without a history of alcohol dependence.

A stratified random sampling procedure was used in each Service Unit, although the approaches differed somewhat. In Shiprock, the sampling strata were constructed by first grouping communities into 20 geographic areas, 16 of which were Navajo political units or chapters and 4 of which were off-reservation areas in New Mexico (Farmington, Aztec, Bloomfield, and Kirkland). Then, sex and nine age categories were used to divide each geographic stratum into 5-year intervals for those born between 1927 and 1972. This approach yielded 360 sampling strata for the Shiprock sampling area (sex[2] $\times$ age[9] $\times$ area [20]). For Tuba City, we used the eight chapters as our geographic sampling areas as well as one off-reservation area (Page, Arizona). Division of these by sex and age cohort yielded 162 sampling strata (sex[2] $\times$ age[9] $\times$ area[9]). The lists of potential controls obtained from the IHS varied in size based on age cohort and community. For rural communities, there were sometimes only a handful of entries, particularly in the older age cohorts. In contrast, for the agency towns of Tuba City and Shiprock, the youngest age cohort lists contained hundreds of names.

Shiprock controls were selected from lists provided by the IHS Area Office in Albuquerque, New Mexico, which included all Navajos treated over the previ-

ous 10 years. Unfortunately, these lists were not free of errors, which included duplicate entries and inaccurate codes. Individuals misidentified by sex and duplicate entries were omitted from the list. A more fundamental problem was that some individuals were listed as residing in a chapter or community of which they had never been residents. This problem was most common in Shiprock and in the chapters adjacent to the Farmington area and among the off-reservation communities. It occurred because IHS personnel used an individual's mailing address to designate community of residence. Thus, males from many rural reservation and checkerboard areas were assigned to Farmington because they received their mail at this location. Due to these problems (as well as to the IHS population data being collected over a 10-year period), the sampling strata lists provided by the Albuquerque IHS were larger than the actual populations in those strata.

Even when potential control interviewees could be identified, they were often difficult to locate. This was again particularly the case for males. Shiprock IHS personnel were helpful in providing directions to residences when such information was present in their files. Unfortunately, this information was lacking for many persons in the Service Unit. At the local community level, we utilized chapter officials or local residents to assist us in providing residence locations for potential controls. Locating potential controls was more troublesome in non-reservation communities, where phone books and city directories were checked in an attempt to locate men. Nevertheless, most men on the IHS lists could not be located in these communities. This is not surprising given the transient nature of residence in the Farmington area.

To locate potential controls in the Shiprock area, interviewees were sought by working down the randomized lists. Persons at the top of these lists were sought first. We continued to seek these high-priority controls throughout the fieldwork period to match cases as needed. Because of the problems already noted, male controls were sometimes sought in the community where they were currently residing or to which they had moved even though they were listed for a different community. When that happened, these controls were matched to cases from their current community of residence. Due to the problems with the Shiprock lists, high-priority males on any IHS list were interviewed if they resided anywhere within the Shiprock Service Unit and could be located. In contrast, female controls from Shiprock were only sought in the communities in which they were listed.

For Tuba City, controls were selected from lists provided by the Tuba City IHS Hospital in November 1993. We received a separate list for each of our 162 sampling strata. These lists were derived from the Tuba City patient computer file system (the Resource Patient Management System). These lists contained information on all patients seen at the Tuba City Hospital after 1982. Information on

approximately 70,000 persons, representing a considerably larger population than resided in the Tuba City Service Unit (approximately 26,000 persons), was included in this computer system. Anyone who was seen at the Tuba City Hospital, for any reason, either a resident of the Service Unit or referred by another Service Unit (particularly Kayenta and Winslow), was included in the system. The lists we received from the Tuba City IHS were very accurate. Most importantly, we were able to identify individuals as current or former residents of the communities in which they were listed. We rarely found the same individual listed in two different communities or age cohorts. Few individuals were incorrectly identified by sex.

To assess the accuracy of the Tuba City lists and to better understand what they represented, we compared them with the 1990 Navajo census figures for the same communities. We found that the IHS population for five of the eight communities was higher than expected, and for three it was lower. The total IHS population for all age cohorts and all communities combined was estimated to be higher by 1,708 persons, or 24.7%, than the census enumeration. This came as no surprise because the 1990 U.S. census counts are almost certainly low and because Tuba City itself is a bedroom community, with residents constantly moving in and out. Moreover, the IHS data were collected over a number of years and thus represent cumulative population movements into these communities rather than at one instant in time, as does the census.

To select the controls, we used a random number table to select four individuals to match each case. Before selection, we excluded any known cases (i.e., previously interviewed cases, persons on the tribal case lists we obtained, and so forth). Interviewing from these lists of four potential controls occurred until a person who was not alcohol dependent was identified or the list was exhausted. We worked our way down each list of potential controls beginning with the first selected. We went on to the second or third person if, for any of several reasons, the individual did not fit the criteria for being a control or could not be interviewed (Table A1-1).

In the event a list of four potential controls was exhausted, a new list or lists of four persons was randomly drawn until a person who was not alcohol dependent was located. In less than 10 instances—all from rural chapters—we exhausted the list of potential male controls for a specific age cohort and community without locating a satisfactory interviewee. In these instances, we shifted our search to an adjacent community. As in the Shiprock area, matched controls were not found for all male cases. In both Service Units we were able to interview a higher proportion of women selected than men. The difference may be accounted for by the fact that Navajo women are less likely to seek off-reservation wage work, and, when their husbands or companions seek wage work off-reservation, many women stay home.

Table A1-1. Numbers of Controls Interviewed by Sampling Area

	SHIPROCK		TUBA CITY	
	MALE	FEMALE	MALE	FEMALE
Number sought	792	293	812	156
Number interviewed	268	125	263	78
Percent interviewed	33.8	42.7	32.4	50.0
Reasons not interviewed (%)				
Deceased	2.4	0.0	4.4	0.6
Unable to interview*	53.0	46.1	54.1	37.8
Refused	2.5	2.7	5.5	7.1
Missed three interview appointments	5.2	6.8	0.7	4.5
Alcohol problem	3.0	1.7	2.8	0.0
Totals	99.9	100.0	99.9	100.0

*Could not identify or locate or person had moved away.

INTERVIEWING AND THE SURVEY INSTRUMENT

Interviewing began in May 1993 and ended in September 1995. Each interview was completed and coded by one of the project's six interviewers, four men and two women. Because of the delicate and personal nature of some questions, we tried as much as possible to have a person of the same sex as the respondent conduct the interview. For the most part, we were successful in this endeavor.

Bilingual Navajo field assistants worked with the interviewers. They were responsible for locating potential interviewees, particularly controls. This involved traveling to each study community and contacting community or family members to determine the location and status of the person selected. When the interviewees were located and contacted, the field assistants explained the research to the potential respondents and requested permission to arrange an interview appointment. When necessary, field assistants also acted as interpreters. As most respondents were fluent in English, this was rarely necessary.

The questionnaire sought information on a number of different topics and had been tested and revised at a residential treatment center in New Mexico before the initiation of fieldwork. Included in the questionnaire were questions about the respondent's family and family history, lifetime residence locations, the locations and types of schools attended, educational achievement, past and present religious affiliation, job training, and employment history, as well as information on the interviewee's history of personal relationships and children.

The interviews also included a series of questions from the Diagnostic Inter-

view Schedule (DIS) designed for the Epidemiologic Catchment Area (ECA) study (Robins and Regier, 1991). Items were included that allowed for a diagnosis of both alcohol dependence and conduct disorder. The sexual content of many of the items used to diagnose antisocial personality disorder (ASPD), a common sequel of conduct disorder, was considered too threatening and inappropriate for field interviews conducted by non-Navajos. That and our focus on the early manifestation of problems led us to exclude most of the ASPD items. The version of the DIS we used had been revised to match the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders,* Third Edition, Revised (DSM-III-R) of the American Psychiatric Association (1987).

To diagnose alcohol dependence, a series of 26 questions from the DIS was used (see Chapter 4, Table 4-1). In DSM-III-R, the number of symptoms reported is considered a measure of severity. The variable ALCSUMAB is the total number of affirmative answers to this series of questions: The greater the number of affirmative responses, the more severe the dependence on alcohol. ALCSUMAB is non-negative by definition, as it is a count. Its maximum frequency (of individuals) was found to be at the value of 0, after which frequencies decrease with increasing values of ALCSUMAB. When samples are taken from such distributions, their standard deviations usually are not equal but are larger or smaller as the mean is larger or smaller, respectively. This violates the assumptions underlying simple statistical techniques such as analysis of variance, regression, and so on, but suitable transformations such as the logarithmic or square root usually reduce skewness and stabilize variability and thus better satisfy these assumptions. Thus, to correct for skewness, we have used the square root of ALCSUMAB.

The 26 questions were also used to make a diagnosis of alcohol dependence according to a combination of criteria described in the DSM-III-R. Because they are readily accessible, we have not reproduced them here. In the analyses beginning in Chapter 4, either the continuous variable (ALCSUMAB) or the dichotomous variable (alcohol dependence) is used; sometimes both are included. In general, the continuous variable is used to reflect severity, while the dichotomous variable is useful when lifetime prevalence is being considered. The various criteria entering into ALCSUMAB do not need to have occurred at the same time. Some may have occurred sequentially over several years. It was also possible for people who were alcohol dependent to be in remission by the time they were interviewed. Nonetheless, they are treated as having a lifetime history of alcohol dependence.

The questions that allowed for the diagnosis of conduct disorder were also taken from the DIS and matched the criteria in DSM-III-R. These criteria refer to the period before age 15 years and include three or more of the following:

1. Was often truant
2. Ran away from home overnight at least twice while living in parental or parental surrogate home (or once without returning)
3. Often initiated physical fights
4. Used a weapon in more than one fight
5. Forced someone into sexual activity with him or her
6. Was physically cruel to animals
7. Was physically cruel to other people
8. Deliberately destroyed others' property (other than by fire setting)
9. Deliberately engaged in fire setting
10. Often lied (other than to avoid physical or sexual abuse)
11. Has stolen without confrontation of a victim on more than one occasion (including forgery)
12. Has stolen with confrontation of a victim (e.g., mugging, purse-snatching, extortion, armed robbery)

In addition to the dichotomous variable of the presence or absence of conduct disorder, we have also used the total number of affirmative answers to the relevant questions in the DIS: this is referred to as ASYES. Like ALCSUMAB, it too has a skewed distribution. To reduce skewness and stabilize the variance, logASYES was used in the analyses of the conduct disorder scale (actually, to avoid the problems with ASYES values of 0 for which the logarithm is not defined, the transformation used is log[ASYES+1]).

Besides items from the DIS, there were extensive questions having to do with family; occupational, marital, and educational status; substance use and drinking histories; and histories of physical and sexual abuse. The questions concerning abuse were not part of a previously available standardized instrument. Respondents were asked if they had ever been abused sexually and/or physically and, if so, were then asked to describe what had occurred. Examples were given if the interviewee was uncertain what was meant. Unlike the questions regarding alcohol use and childhood misbehaviors consistent with conduct disorder, abuse has not been a subject of widespread and open discussion among Navajos any more than it has been among other societies until recently. Because of the sensitivity of the topic and the exploratory nature of the investigation, we believed that an open-ended approach was most appropriate and would provide more valid data than a standardized instrument.

Our respondents generally described physical abuse as a severe thrashing including, among other things, parental beating with fists, whipping with a belt or bailing wire, being locked up, being burned with cigarette butts, and twisting of ears or arms. It also included being forced by parents or others to fight other children of the same age with the threat of a beating if the respondent refused. Sexual

abuse was defined as inappropriate touching and fondling as well as actual physical penetration. The reported episodes ranged from fondling by an older relative or acquaintance to homosexual gang rape.

Information about past and present alcohol treatment was also gathered from each respondent. In addition, basic alcohol use and abuse information was obtained for each of the respondent's parents, grandparents, aunts, uncles, siblings, spouses, and children.

Interviews normally took from 1 to 3 hours to complete. Respondents had to be Navajo or part Navajo, reside within the study areas, and be born between January 1, 1927, and December 31, 1972. Before an interview, the project goals and objectives were explained, and potential respondents were asked to read and sign a release form if they agreed to its terms. For monolingual Navajo speakers, the field assistant translated the release form. Interviews were administered at treatment centers, at the homes of respondents, in automobiles, at restaurants, or any other location that the respondent requested. Because of privacy concerns, most interviews were conducted with just the interviewee and the interviewer present. In a few instances, respondents requested that a relative, usually a spouse or sibling, also be present. Respondents were paid $30 at the completion of the interview.

The interview codebook was prepared and reviewed by project personnel early in the interview phase of research. This allowed each interviewer to comment on the possible responses for each question. After the codebook was finalized, a computerized response form was prepared. Each interviewer was responsible for coding the interviews he or she had done. The completed interviews were then submitted for review to the University of Rochester Research Information Management (RIM) Center where a consistency program was developed. Each computer-coded interview was checked for entries that were not appropriate responses and for inconsistencies (codes that were inappropriate given earlier responses). In addition, each interview was reviewed personally by a staff member at the RIM Center. If coding mistakes or errors were detected, the interviews were returned to the interviewer for correction. After these extensive checks, a master database for the interviews was created. Statistical methods of analysis are not described here but are provided elsewhere as the need arises.

THE PROBLEM OF BIAS

Case–control study designs are subject to several different kinds of bias, the most important of which involve selection and recall. They are discussed throughout the book as they become relevant. Here we offer some general observations. Our samples of cases (CAS) represent clients at either off-reservation residential

treatment centers or on-reservation tribal outpatient programs. Most cases were referred to treatment by tribal and state courts. Younger persons or those with their first or only a few DUI/DWI or other alcohol-related arrests were probably sent to treatment, whereas older Navajos with long histories of alcohol arrests were more likely to have been sent to jail than to treatment. In addition, some Navajos with private insurance or with other benefit plans (e.g., military veterans) were sent to treatment facilities or hospitals in Prescott or Phoenix, Arizona, or Albuquerque, New Mexico, where we did not conduct interviews.

Controls represent Navajos listed in the IHS files and present in their communities when we sought them (for Tuba City men and women and Shiprock women) or present in the sampling area (Shiprock men). People who had not visited an IHS facility in their area for many years would not have been listed in the computer lists. Most Navajos would have been seen for some reason (school or work physical, dental examination, outpatient treatment, and so forth) during the period that the IHS kept records current in their systems. Health surveys on the Navajo Reservation have shown that most people of all ages have records at nearby IHS facilities, even if they also use private facilities on occasion. Moreover, "household surveys of health conditions among the Navajo in the late 1970s yielded data that were virtually identical to patient care data from IHS clinics" (May and Smith, 1988:326).

One check on this was to see how many of our Tuba City cases were identified in the IHS lists from which our controls were drawn. About an equal percentage of males (67.7%) and females (69.5%) were listed correctly. It is thus possible that as many as one third of people living in a Service Unit are identified incorrectly by age and community of residence or not identified at all. Whether these individuals are different in some consistent way from those who are listed is unknown. For instance, severe alcoholics like our cases may be more or less underrepresented than people with no, or with less severe, alcohol problems.

Another potential source of bias among controls is selective emigration. It is entirely possible that the best educated and most employable have left and were therefore not available to be sampled. It is also highly likely that among emigrants there are some who are estranged from their families due to alcohol-related and other problems. We have no way of assessing this potential bias either. Thus, our data refer to the population living on and immediately adjacent to the reservation.

Because we continued to interview potential controls until we found one who was not alcohol dependent, it appeared that we had accumulated a stratified random sample of the Navajo population between the ages of 21 and 64 years in the two Service Units. In some of the analyses in this book, we therefore treat the combined controls (alcohol dependent [DEP] and non-alcohol dependent

[NADC]) as just such a sample. It is important to consider what potential biases may result from this type of inference.

First, the combined sample of controls is not biased in terms of alcohol dependence, as can be seen by the following argument. Consider all *first* interviews of potential controls: The probability of encountering a DEP is the proportion of DEPs in the population sampled (i.e., individuals demographically similar to the CAS considered). Denote this proportion p. Next consider all *second* interviews (of whom there will likely be fewer than first interviews), and again the probability of encountering a DEP is p because the same population is sampled. This is true for the third interviews, the fourth, and so on. Thus, for each order of interview, the probability of a DEP is p. Overall, adding up whatever the proportions of first, second, third, and so forth interviews may be, the probability of encountering a DEP is still p. In other words, the method of sampling is unbiased for the proportion DEP, as was to be demonstrated.

Because there was no bias in the proportion DEP among all the controls (DEP + NADC), we had accumulated a sample of the adult Navajo population that was useful for calculating the lifetime prevalence of alcohol dependence among men and women. The number of controls in each stratum (defined by community, sex, and age) was, however, determined by the number of treatment cases in the stratum.[7] The resulting stratified sample of controls is representative of the community–sex–age distribution of the treatment cases rather than of the entire population. To use the controls (DEP + NADC) as a sample of the adult Navajo population thus required adjustment. Otherwise, unbiased estimates of proportion DEP could be obtained only within strata, as represented in Table A1-2. This shows in all strata in which there were samples large enough to allow reliable inferences the proportion alcohol dependent (DEP) to have been very much higher among men than among women.

It further appears from Table A1-2 that the proportions DEP among women do not differ significantly either by age group or by community type. It follows that one may use the overall proportion DEP among all female controls as an estimate of the prevalence of alcohol dependence among Navajo women.

For men, on the other hand, Table A1-2 shows that there do exist significant (at the 5% level and below) differences by age and by type of community. The overall estimate of proportion DEP among all male controls is therefore an average of prevalences among various strata and would have qualified as an estimate of Navajo male prevalence only if the strata had been correctly represented by the control sample.

A comparison of the sample of controls with census data for Shiprock and Tuba City shows 16.4% of the sample's control males to have been in the 50–64 year age group at the time of interview compared with 19.0% of the adult males enumerated in the 1990 census. On the other hand, Table A1-3 shows the sample

Table A1-2. Proportion Alcohol Dependent Controls by Sex, Age, and Community Type, With Number of Respondents in Parentheses

	MEN			WOMEN		
	AGE <50	AGE ≥50	P*	AGE <50	AGE ≥50	P*
Total	0.725 (444)	0.598 (87)	0.17	0.297 (182)	0.286 (21)	0.917
By community						
Agency town	0.814 (145)	0.353 (17)		0.326 (89)	0.625 (8)	
Border town	0.662 (71)	0.667 (9)		0.321 (28)	NA (1)	
Other reservation	0.689 (228)	0.656 (61)		0.246 (65)	0.083 (12)	
P†	0.013	0.072		0.538	0.026‡	

*Chi-square test comparing the proportions in the two age groups.

†Chi-square test comparing the proportions in the three community types.

‡Chi square suspect because of small frequencies.

male controls to have been rarer in border towns and more frequent in other reservation communities than adult Navajo males according to the census. Evidently, the male control sample is not seriously biased for age group, but it is biased for type of community. Therefore, unless adjusted for population distribution, this sample cannot provide a prevalence estimate for the Navajo male population, although it might provide separate estimates for males by type of community. Oddly, when adjustment is made for population distribution, the lifetime prevalence of alcohol dependence among men is 70.4%, identical to the unadjusted rates (see Chapter 1). As noted, no such adjustment is required for the women.

Table A1-3. Distribution of Male and Female Controls* and the Total Population in the Tuba City and Shiprock Service Units, as Percentages

TYPE OF COMMUNITY	MALES	FEMALES	CENSUS
Agency	30.5	47.8	32.8
Other reservation	54.2	38.4	41.9
Border town	15.2	13.8	25.3

*Both alcohol-dependent and non-alcohol-dependent controls.

Source: Calculated from *1990 Census Population and Housing Characteristics of the Navajo Nation*, Division of Community Development, The Navajo Nation, Window Rock, Arizona, 1993.

For detailed analyses it was appropriate to adjust for the sampling strata, so we created a 12-fold stratification variable combining type of community of residence (border town, agency town, other reservation community), sex, and age (less than 50 years, 50 years and above). The distribution of cases and controls by this stratification variable is displayed in Table A1-4. It is used in many of the regression analyses that assess the significance of various risk factors conditional on the stratification.

To summarize, the original design was that of a case–control study, which is appropriate for examining risk factors for alcohol dependence. In addition, however, we found that we were able to treat the controls as a random sample of the adult Navajo population and to infer lifetime prevalence of alcohol dependence, the amount attributable to conduct disorder, and the prevalence of and risk factors for conduct disorder and childhood abuse.

Finally, as noted in Chapter 1, regression analyses are used throughout much of the book. The parameter estimates are given as deviations from the mean. For dichotomous independent variables, estimates are given for only one category level. The other is implicit.

Table A1-4. Distribution of Samples by Stratification Variable

	CAS	DEP	NADC
	Women		
≥50 Border town	2	0	1
≥50 Agency town	4	5	3
≥50 Reservation	8	1	11
<50 Border town	17	9	19
<50 Agency town	62	29	60
<50 Reservation	55	16	49
Totals	148	60	143
	Men		
≥50 Border town	2	6	3
≥50 Agency town	3	6	11
≥Reservation	18	40	21
<50 Border town	43	47	24
<50 Agency town	53	118	27
<50 Reservation	85	157	71
Totals	204	374	157

Notes

1. Before initiating research, we requested and received approval and support from several sources and organizations. At the reservation-wide level, we received approval from the Research and Publications Committee of the Navajo Area Indian Health Service and the support of the Behavioral Health Services Department of the Navajo Nation. At the local IHS level, we obtained the support and approval of the Shiprock Indian Health Board and the Tuba City Indian Health Board. We also obtained the support of the CEOs of the Tuba City and Shiprock IHS hospitals. At the University of Rochester, approval was obtained from the Research Subjects Review Board.

2. Of the remaining 164 potential female Shiprock cases, just under one-third (32.9%) were eliminated without attempting to contact them for various reasons (they did not meet the study age criteria, they were deceased, or insufficient information was on file—in the IHS records—to locate them). Of the remaining women on the list, 31.7% were not at the address given, the location given could not be found, or an interview could not be scheduled with them. Four (2.4%) refused our request for an interview, and four others (2.4%) who were interviewed did not meet the project age criteria, were not alcohol dependent, or their interviews were unreliable. One woman (0.6%) decided after being interviewed that she did not want to have her interview included in the study. Five women (3.1%) who were interviewed in treatment centers also appeared on the outpatient list.

3. These lists were obtained in July 1993 and May 1994 for women and in August 1993 and May 1994 for men.

4. We were unable to interview 14.5% of the males in these lists because they no longer resided in the study area, and we were unable to identify or locate an additional 15.5%. Approximately 8.3% of the men on these lists were deceased, while 4.1% were non-Navajo. We could not interview 1.5% of these men because they were incarcerated. Another 1.0% did not meet our age guidelines and 3.1% refused our request for an interview. Another 3.6% of the persons on these lists were interviewed in a treatment center before our locating them in the Tuba City IHS Service Unit.

5. Of the remaining women on these lists, we were unable to locate or identify 15.0%, and another 12.6% had moved from our study area. In addition, 6.3% of the women on these lists did not meet our age requirement, and 4.7% were interviewed at an inpatient treatment center. Several persons (3.1%) were not interviewed because they were non-Navajo, and one person (0.8%) was mistakenly listed (she was not seen for alcohol treatment). Also, 3.9% refused our request for an interview.

6. Most of these were individuals on the Tuba City outpatient lists. Approximately 20% of the women we interviewed as possible cases from the Tuba City tribal treatment program lists were not alcohol dependent.

7. Communities were aggregated into three types: agency towns (Shiprock and its immediately adjacent farming communities, and Tuba City); border towns (Farmington and nearby New Mexico towns off the reservation, and Page and Flagstaff, Arizona); and all remaining reservation communities in the two Service Units.

Appendix 2

DISCRIMINANT ANALYSIS

K. Ruben Gabriel

Further light on the meaning of alcohol dependence and its measurement can be shed by the correlations of the 26 variables with a criterion of actual alcohol dependence. The criterion used here was based on the ordering of the samples from NADC through DEP to CAS, by assigning criterion scores as follows: NADC criterion = 1; DEP criterion = 2; CAS criterion = 3. This order of the samples is obviously one of increasing alcohol dependence, but the particular weights were chosen for simplicity rather than because there was any reason to think that DEP is exactly midway between NADC and CAS in the severity of alcohol dependence. In practice, it probably makes little difference what the exact weights are as long as they are in the right order and reasonable.

This criterion of alcohol dependence was correlated with each of the 26 variables. These correlations r were calculated for men and women separately and for all respondents together. The multiple correlation R of the criterion with all 26 variables together was also calculated: It is the maximum correlation with the criterion that can be attained by any linear combination of variables (i.e., any weighted sum or difference of any number of these variables). Clearly, therefore, no individual variable's correlation r can exceed the multiple correlation R, although some of them may be close to it.

For comparison of correlations, it is well to use their squares, also referred to as *coefficients of determination,* because r^2 measures how much of the vari-

ability of the criterion can be determined by a particular variable, and R^2 similarly measures how much of the criterion's variability can be determined by all the variables together. Thus, for the two sexes together, $(0.8267)^2 = 0.6834$ (i.e., about 68% of the criterion's variability could be accounted for by the 26 variables, and hence about 32% of the criterion's variability was unrelated to these variables; see Table 5-2). For any individual variable the interpretation is similar. Thus, for q97a , the determination is $(0.4553)^2 = 0.2073$ so that only about 21% of the criterion's variation can be accounted for by q97a. A useful comparative index would be to say that q97a accounts for 0.2073/0.6834 = 0.3033 (i.e., about 30% of the variability determined by all 26 variables together. A caveat is in order here: The previous statements should not be interpreted to mean that the 68% of determined variability was split up between the 26 variables. That is not so. The variables are correlated, and different ones overlap in their contributions to the multiple determination.

Turning now to inspect Table A2-1 in detail, one notes that alcohol dependence, as measured by the criterion, is highly correlated with the 26 variables of the ALCSUMAB score, and they determine at least two-thirds of its variation; for women, they determine as much as 80%. Some individual variables obviously contribute a large part of this regression fit: Thus, for men (and total), the largest individual correlation is that of variable q101 whose determination is 0.3790 (0.4323). That consists of 56% (63%) of the multiple determination of 0.6780 (and 0.6834), which uses all 26 variables. For women, again q101 has the highest correlation, and its determination of 0.5501 is 69% of the multiple determination of 0.8012. Evidently, that single variable has amazingly good predictive capacity, but a further 31%–44% of the prediction is contributed by the remaining 25 variables.

Table A2-2 shows the determination of each of the variables as a percentage of the multiple determination, separately for each sex. A scatterplot of these determination percentages for the two sexes (Fig. A2-1) shows many variables to have fairly similar percentages for both sexes (i.e., they are near the 45-degree line on the plot). Among those, q101, q120, q110, q127, and q104 have relatively high percentages overall; they have therefore been chosen as a common subset of good predictors of alcoholism for both sexes. Figure A2-1 also shows q102 and q98 to be outstanding in the greater percentage determination among women and q97b as well as q129, q131, and q132 to have somewhat larger percentages of determination for men. A subset of good predictors for women can therefore be obtained by combining the above common subset with q102 and q98, and, similarly, a subset of good predictors for men can be obtained by combining the common subset with q97b, q129, q131, and q132: Actually, it was found that q97b, q129 sufficed, making a negligible improvement. Table A2-2 confirms that the resulting combined subsets determine alcohol dependence almost as well as

Table A2-1. Correlation with Criterion and Percentage Determination of Each Diagnostic Interview Schedule Question, by Sex

	CORRELATION WITH CRITERION			PROPORTION OF DETERMINATION		
VARIABLE	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN
q97a	0.4553	0.448	0.4801	0.3033	0.2960	0.2838
q97b	0.4611	0.4886	0.4312	0.3111	0.3521	0.2289
q98	0.5822	0.4967	0.733	0.4959	0.3638	0.6616
q101	0.6575	0.6156	0.7417	0.6325	0.5589	0.6774
q102	0.6122	0.494	0.7858	0.5484	0.3599	0.7604
q104	0.6115	0.6022	0.6534	0.5471	0.5348	0.5257
q105	0.5866	0.586	0.6162	0.5035	0.5064	0.4676
q108	0.4009	0.3352	0.5101	0.2351	0.1657	0.3204
q109	0.3689	0.3134	0.4672	0.1991	0.1448	0.2688
q110	0.5945	0.5669	0.6534	0.5171	0.4740	0.5257
q111	0.499	0.4834	0.5373	0.3643	0.3446	0.3555
q112	0.5653	0.5367	0.6263	0.4676	0.4248	0.4830
q113	0.4498	0.4634	0.4391	0.2960	0.3167	0.2374
q114	0.5402	0.4941	0.6285	0.4270	0.3600	0.4864
q120	0.6178	0.5631	0.7117	0.5584	0.4676	0.6237
q121	0.5641	0.5549	0.6197	0.4656	0.4541	0.4729
q122	0.5154	0.5274	0.5336	0.3886	0.4102	0.3506
q124	0.4088	0.385	0.4588	0.2445	0.2186	0.2592
q125	0.4979	0.4958	0.5422	0.3627	0.3625	0.3620
q126	0.5321	0.5095	0.5662	0.4142	0.3828	0.3948
q126b	0.4933	0.4712	0.5462	0.3560	0.3274	0.3674
q127	0.6085	0.6036	0.6541	0.5418	0.5373	0.5279
q128	0.5821	0.5789	0.6194	0.4958	0.4942	0.4724
q129	0.4036	0.4134	0.3989	0.2383	0.2520	0.1959
q131	0.3829	0.4016	0.3963	0.2145	0.2378	0.1934
q132	0.2898	0.3265	0.2347	0.1228	0.1572	0.0678
Multiple correlation	0.8267	0.8234	0.8951	1.0000	1.0000	1.0000

the total set of 26 variables (93.2% of multiple determination for men and 99.3% of total determination for women).

The method we have described for selecting a subset of variables with a high percentage of determination stressed the distinction between determination that among men and that among women. This is not the only available approach to selecting subsets with high multiple correlation. The most commonly used methods are those of stepwise regression, which proceed in each step to evaluate the next best variable to add as a predictor of the criterion and possibly to omit certain variables whose contribution is small (Neter et al., 1990). A reasonable

Table A2-2. Multiple Determination of the Alcohol Criterion by Various Sets of Variables, by Sex

	MEN	WOMEN
All 26 variables	0.6780 (= 100%)	0.8012 (= 100%)
Common subset q101, 120, 110, 104, 127	0.5934 (= 87.5%)	0.7266 (= 90.7%)
Common subset plus q102, 98	0.5995 (= 88.4%)	0.7958 (= 99.3%)
Common subset plus q129, 97b	0.6317 (= 93.2%	0.7273 (= 90.8%)

criterion for ending such a process and finalizing the choice of subset uses what is known as Mallows' C_p. It is well understood, however, that the chosen subset is not necessarily the "best," as in reality there may be many virtually equally good subsets. No method is available for choosing an unequivocally "best" predictor subset. In the present study, we have run the procedure (with probabilities 0.25 to enter and to leave) and arrived at the results listed in Table A2-3, which

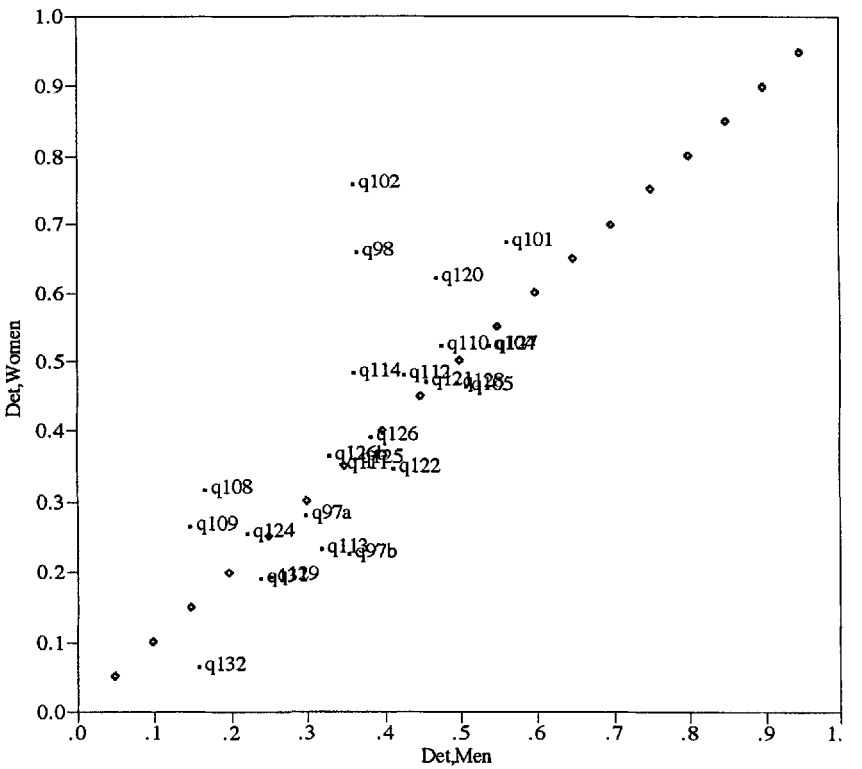


Figure A2-1. Proportion of determination (Det) ascribed to each variable: comparison of women (y-axis) with men (x-axis).

Table A2-3. Subsets of Variables Selected in Stepwise Regression, by Gender, According to Mallows' Criterion

	MEN	WOMEN
Chosen in Table 5-3		
In common subset		
q101	Yes	Yes
q120	Yes	Yes
q110	No	Yes
q104	Yes	No
q127	Yes	Yes
Extra women's variables		
q102	Yes	Yes
q98	No	Yes
Extra men's variables		
q127	Yes	Yes
q97b	No	Yes
Not chosen in Table 5-3		
Others for both genders		
q121	Yes	Yes
Others for women only		
q114	No	Yes
q132	No	Yes
Others for men only		
q109	Yes	No
q113	Yes	No
q122	Yes	No
q129	Yes	No

we have listed in a manner that allows easy comparison with the previous selections of Table A2-2.

The stepwise strategy results in fair agreement with our procedure, but includes some further variables, especially for men, which might be additionally related to alcohol dependence. These results, of both Tables A2-2 and A2-3, must not be interpreted rigidly because the methods on which they are based are exploratory and uncertain. Rather, they should be used as guides to intelligent inspection of the relation of variables to alcohol dependence. They suggest that the variables that best distinguish among the three samples of both men and women are those dealing with loss of control and with the physiological consequences of alcohol use. Variables associated with risky behavior, such as driving while under

the influence of alcohol, and with failure to meet responsibilities do not loom as large. Such behavior is evidently more nearly similar across the groups.

Finally, some comments are in order about the general levels of the correlations and determinations among men and women. Women generally have higher correlations of the variables with the criterion, and fewer of the variables are needed for a subset of variables that provides most of the determination. One may surmise that this is connected with the different characters of the alcohol-dependence distributions of men and women, the men's being continuously variable over a considerable range and the women's being close to bimodal, a yes/no phenomenon. It may well be that it is easier to determine, in other words to predict, and to do so with fewer predictors, when a phenomenon is bimodal than when it is diffused through a wide range.

Appendix 3

SUPPLEMENTARY TABLES FOR CHAPTER 4

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Table A3-1. Multiple Ordinal Logistic Regression of Fathers' and Mothers' Drinking Patterns onto Several Risk Factors (Controls Only; Two-Sided *P* Values)

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
	Fathers			
year Father born	1	1	1.403557	0.2361
Livestock	1	1	0.040591	0.8403
Father's education	1	1	2.447390	0.1177
TRAD.*	1	1	2.700083	0.1003
NAC†	1	1	11.568028	0.0007
Sex, age, and type of community	10	10	16.260995	0.0924
	Mothers			
Sex, age, and type of community	11	11	4.8742948	0.9371
year Mother born	1	1	0.7959258	0.3723
Livestock	1	1	0.0050776	0.9432
Mother's education	1	1	1.7017072	0.1921
TRAD	1	1	0.0238756	0.8772
NAC	1	1	1.0039473	0.3164

Parameter Estimates for Fathers‡

TERM	ESTIMATED	S.E.	CHI SQUARE	*P* > CHI SQUARE
F-NAC	0.32252384	0.094827	11.57	0.0007

Note: The Regression coefficient for Q28-NAC is given for affirmative answers.

*Trad: Adherent of traditional religion

†NAC: member of Native American church

‡Parameter estimates are given only for variables for which the effect test is significant

Table A3-2. Proportion Who Drank Regularly Before Age 15 years and Average Age of First Regular Drinking, by conduct disorder (CD), Sex, and Sample

	CAS			DEP			NADC		
	CD	NO CD	COMBINED	CD	NO CD	COMBINED	CD	NO CD	COMBINED
				Men					
Average age at first drink (years)	12.1	15.9	13.8	12.2	14.6	13.9	11.7	16.5	16.0
(S.E.)	(0.5)	(0.5)	(0.3)	(0.4)	(0.3)	(0.2)	(1.6)	(0.5)	(0.4)
Proportion who drank regularly before age 15	36.0%	4.3%	21.6%	21.3%	5.9%	10.2%	18.7%	0.7%	2.6%
Average age at first regular drinking (years)	16.9	21.4	18.9	17.3	19.5	18.9	15.4	20.8	20.4
S.E.	(0.5)	(0.5)	(0.3)	(0.3)	(0.2)	(0.2)	(1.7)	(0.5)	(0.5)
Average age that drinking became a problem (years)	22.9	26.1	24.9	22.9	24.7	24.1	—	—	—
(S.E.)	(1.0)	(0.7)	(0.6)	(1.9)	(1.2)	(1.0)	—	—	—
Number for whom data are available	109	92	201	99	267	366	7	80	87
Unknown or not applicable	2	1	3	3	5	8	9	61	70
Total number of men in sample	111	93	204	102	272	374	16	141	157
				Women					
Average age at first drink (years)	14.0	17.4	16.3	13.1	16.8	15.9	17.7	19.0	18.9
(S.E.)	(0.7)	(0.5)	(0.4)	(.09)	(0.6)	(0.7)	(1.9)	(0.5)	(0.5)
Proportion who drank regularly before age 15	32.7%	7.0%	15.5%	26.7%	8.9%	13.3%	0.0%	0.8%	0.7%
Average age at first regular drinking (years)	18.3	22.7	21.2	18.4	20.8	20.2	17.0	21.6	21.3
(S.E.)	(0.9)	(0.6)	(0.5)	(1.4)	(0.8)	(0.8)	(2.8)	(0.8)	(1.0)
Average age that drinking became a problem (years)	21.0	27.7	24.0	21.3	24.0	23.2	—	23.1	23.1
(S.E.)	(0.7)	(0.8)	(0.5)	(0.6)	(0.4)	(0.4)	—	(0.2)	(2.3)
Number for whom data are available	47	93	140	14	41	55	3	35	38
Unknown or not applicable	2	6	8	1	4	5	7	98	105
Total number of women in sample	49	99	148	15	45	60	10	143	143

Table A3-3. Logistic Regression of Physical Abuse Before Age 15 Years and of Sexual Abuse Before Age 15 years onto Stratification Variables of Age, Community of Residence, and Sex, Controls Only

Effect Test*

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
	Physical abuse before age 15			
Community type	2	2	3.7801714	0.1511
Age 50	1	1	0.9940602	0.3188
Sex	1	1	0.9290747	0.3351
	Sexual abuse before age 15			
Comminity type	2	2	1.157386	0.5606
Age 50	1	1	1.506691	0.2196
Sex	1	1	22.805066	0.0000

Parameter Estimates

TERM	ESTIMATE	S.E.	CHI SQUARE	$P >$ CHI SQUARE
Sex (female)	0.8575	0.1796	22.81	<0.0001

Note: Two- and three-way interactions are not significant.

*Parameter estimates are only provided for variables for which the effect test is significant.

Table A3-4. Highest Level of Schooling, by Sex and Sample, as Percentages

	MALE*			FEMALE†		
	CAS (N = 202)	DEP (N = 371)	NADC (N = 157)	CAS (N = 148)	DEP (N = 60)	NADC (N = 143)
None	1.0	0.5	5.7	1.3	1.7	2.8
Grade school	14.4	11.3	15.3	10.1	5.0	7.0
Some high school	34.2	29.9	14.0	49.3	33.3	22.4
High school graduate	32.7	36.1	40.1	18.9	18.3	20.3
Some college	17.8	18.9	21.7	18.2	40.0	42.7
College graduate	0.	3.2	3.2	2.0	1.7	4.9

*For males, chi square = 42.327; d.f. = 10; $P = 0.0000$.

†For females, chi square = 35.027; d.f. = 10; $P = 0.0001$.

Table A3-5. Ordinal Logistic Regression of Sample onto School Level and logASYES, Given Stratification.

Effect Test				
SOURCE	NO. OF PARAMETERS	DEGREES OF FREEDOM	CHI-SQUARE	*P*
School level	5	5	44.14116	0.0000
LogASYES	1	1	104.69150	0.0000
Sex, age & community	11	11	12.19261	0.3493

Parameter Estimates				
	ESTIMATE	S.E.	CHI-SQUARE	*P*
School level				
None	–0.7405	0.4110	3.25	0.0716
Grade school	0.7022	0.1867	14.13	0.0002
Some high school	0.7047	0.1452	23.56	<0.0001
High school grad.	0.1609	0.1462	1.21	0.2711
Some college or Assoc.degree.	–0.1261	0.1548	0.66	0.4152
College graduate	–0.7011	0.3253	4.65	0.0311
LogASYES	1.0250	0.1001	104.69	<0.0001

Table A3-6. Ordinal Logistic Regression of Sample onto High School Type, logASYES, and Stratification, Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
High school type	5	5	10.26951	0.0679
logASYES	1	1	104.33459	0.0000
Sex, age and type of community	11	11	9.05249	0.6170

Note: Parameter estimates are not presented because the effect test for high school type is not significant and because the parameter estimate for logASYES appears in Table A3-5. To reduce the number of categories, high school type has been classified as follows:

1. On-reservation day school
2. Off-reservation public school
3. On-reservation boarding school
4. Off-reservation boarding school
5. Other (e.g., mission schools)
6. Any combination

Appendix 4

Supplementary Tables for Chapter 5

Stephen J. Kunitz
K. Ruben Gabriel

Table A4-1. Variables Used for Typology

CLONINGER TYPOLOGY	PRESENT STUDY
Type I	
1. Ever gone on binges and neglect your responsibilities? (yes)	1. Has there ever been a period when you spent so much time drinking alcohol or getting over its effects that you had little time for anything else? (*BINGES*)
2. Ever adopted rules to avoid drinking? (yes)	2. Some people try to control their drinking by making rules like not drinking before 5 o'clock or never drinking alone. Have you ever made rules like that for yourself? (*RULES*)
3. Ever been told by a doctor that you had liver disease, cirrhosis, or yellow jaundice due to drinking? (yes)	3. There are several health problems that can result from drinking. Did drinking cause you to have any of these diseases? (*HEALTH*)
4. Did your problems with drinking begin after you were 25 years of age?	4. At what age did alcohol become a problem for you? (*AgeDr*)
Type II	
1. Have you ever gotten into physical fights when drinking? (yes)	1. Did you ever get into fights while drinking? (*DrFights*)
2. Have you ever gotten into trouble driving a car after drinking? (yes)	2. Have you ever had trouble driving because of drinking, like having an accident or being arrested for drunk driving? (*DWI*)
3. Have you ever had trouble abstaining entirely from drinking alcohol? (yes)	3. Did you find you could not quit or cut down? (*TryStop*)
4. Have you ever had any treatment other than joining Alcoholics Anonymous? (yes)	4. Have you ever been in treatment for an alcohol-related problem? (Before, for people currently in treatment.) Inpatient? Outpatient? Alcoholics Anonymous excluded. (*TREAT*)

Table A4-2. Multiple Logistic Regressions of Type I and Type II Variables* onto logASYES and Stratification, by Sample: Partial Regression Coefficients of logASYES

	CAS			DEP			NADC		
	ESTIMATE	S.E.	*P*	ESTIMATE	S.E.	*P*	ESTIMATE	S.E.	*P*
				Type I					
Binges	–0.817	0.216	0.0002	–0.684	0.175	0.0001	–2.928	2.462	0.234
Rules	–0.315	0.185	0.089	–0.016	0.179	0.928	0.326	0.367	0.376
Health	–0.971	0.212	0.0000	–0.494	0.259	0.0567	0.213	1.343	0.874
AgeDr	0.576	0.209	0.0061	0.507	0.222	0.022	Unstable	Unstable	Unstable
				Type II					
DrFights	–0.885	0.205	0.0000	–1.044	0.187	0.0000	–1.503	0.637	0.584
DWI	0.151	0.254	0.552	–0.045	0.186	0.807	0.401	0.493	0.416
TryStop	–0.327	0.266	0.217	–0.120	0.181	0.507	–0.679	0.785	0.387
Treat†	–0.075	0.196	0.702	–0.274	0.193	0.156	Unstable	Unstable	Unstable

*Defined in Table A4-1.

†CAS are by definition all in treatment. DEP is the relevant sample for this variable.

Appendix 5

METHODS AND ANALYSES FOR CHAPTER 6

Stephen J. Kunitz
K. Ruben Gabriel
Jerrold E. Levy

The effect of various risk factors on conduct disorder was studied with adjustment for 12 strata (3 community types × 2 age groups × 2 sexes). The dependent conduct disorder variable was logASYES, and the analyses were carried out by standard least squares linear model methods, including analyses of variance and multiple comparisons (using the Bonferroni inequality) as follows.

1. For categorical risk factors, the first step was a two-way ANOVA by the risk factor, the strata, and the risk–strata interaction. This interaction was not found to be significant in any of the analyses, as illustrated in Table A5-1 but omitted from all other tables. Hence, a two-way ANOVA without interaction was carried out, and, if the risk factor was found significant at, say, 5%, the effects of individual levels were multiply compared by using significance level 5/k%, where k is the number of levels.
2. For quantitative risk factors, the same sequence was used, although the ANOVAs become multiple regressions. There is only one effect to be tested and that is expressed by the coefficient of partial regression onto the risk factor, given the strata (the latter are entered into the regression by means of dummy variables).

Table A5-1. Analysis of logASYES by Stratification Factors (Community Type, Age, and Sex)

ANOVA (3-way) With Interaction

ALL 3 FACTORS	D.F.	SUM OF SQUARES	MEAN SQUARE	F RATIO	$P(>F)$
Additive model	4				
Interactions	7	2.2487		0.9607	>0.5000
Error	722	241.4406	0.3344		

ANOVA (3-way) Without Interaction

	D.F.	SUM OF SQUARES	MEAN SQUARE	F RATIO	$P(>F)$
Community	2	4.6323		6.9289	0.0010
Age	1	17.8649		53.4431	<0.0001
Sex	1	7.8823		23.5799	<0.0001
Error	729	243.6893	0.3343		

Effects (Deviations from Mean)

ALL 3 FACTORS' EFFECTS*	ESTIMATE	S.E.	T RATIO	$P(>\|T\|)$
Rural reservation	–0.0733	0.0303	–2.42	0.0156
Reservation agency town	+0.1033	0.0322	+3.21	0.0014
Border town	–0.0298	0.0402	–0.74	0.4580
Age: older than 50 years	–0.2230	0.0305	–7.31	<0.0001
Sex: F	–0.1177	0.0242	–4.86	<0.0001

*For dichotomous factors, only one level is displayed.

The ANOVA F test 5% significance rule for looking at individual effects was relaxed in the case of one of the five analyses by drinking patterns because the effects in the five analyses were very similar.

The results of these analyses are presented in Table A5-2. When the ANOVA F test of was clearly nonsignificant, there was no reason to proceed to estimation and testing of the effects of individual risk levels or partial regression coefficients, so estimates and tests are not shown .

A few of the tables have other dependent variables and/or one-way or three-way ANOVAs. (Tables A5-3 through A5-6). They are presented analogously to the above.

Table A5-2. Analysis of logASYES by Stratification (Community type, Age and Sex) and Various Risk factors

RISK FACTOR	ESTIMATE	S.E.	T RATIO	$P(>\|T\|)$
Community raised (P value of F ratio = 0.0637)				
Effects (deviations from mean)				
Reservation rural	–0.0955	0.0415	–2.30	0.0218
Reservation agency town	+0.0873	0.0567	+1.54	0.1238
Off reservation	–0.0188	0.0826	+0.23	0.8197
Combinations	–0.0105	0.0424	–0.25	0.8019
Number of households (P value of F ratio = 0.0031)				
Partial regression coefficient	–0.0422	0.0142	–2.97	0.0031
Same residence (P value of F ratio = 0.0285)				
Effects (deviations from mean)				
Same residence	+0.0574	0.0261	+.2.20	0.0285
Parents' livestock (P value of F ratio = 0.0031)				
Partial regression coefficient	–0.000104	0.000052	–2.01	0.0445
Fathers' education (P value of F ratio = 0.2931)				
Partial regression coefficient	+0.00483	0.00459	+1.05	0.2931
Mothers' education (P value of F ratio = 0.1182)				
Partial regression coefficient	+0.00713	0.00455	+1.56	0.1182
Parents' occupation (P value of F ratio = 0.3857)				
Informants' and parents' religion when growing up (P value of F ratio = 0.1062)				
Fathers' religion when informant was growing up (P value of F ratio = 0.2444)				
Mothers' religion when informant was growing up (P value of F ratio = 0.2534)				
Presence of mothers in the home at ages 0–6 years (P value of F ratio = 0.8342)				
Presence of mothers in the home at ages 7–12 years (P value of F ratio = 0.2776)				
Presence of fathers in the home at ages 0–6 years (P value of F ratio = 0.0521)				
Presence of fathers in the home at ages 7–12 years (P value of F ratio = 0.3919)				
Fathers' drinking pattern (P value of F ratio = 0.0161)				
Effects (deviations from mean)				
Abstainer	–0.0828	0.0425	–1.95	0.0515
Abuser	+0.1027	0.0367	+2.80	0.0053
Occasional	–0.0502	0.0390	–1.29	0.1986
Problem	+0.0304	0.0374	+0.81	0.4161

(*continued*)

Table A5-2. Analysis of log logASYES by Stratification (Community type, Age and Sex) and Various Risk factors (*continued*)

RISK FACTOR	ESTIMATE	S.E.	T RATIO	$P(>\|T\|)$
Mother's drinking pattern (P value of F ratio = 0.0062)				
Effects (deviations from mean)				
Abstainer	–0.0834	0.0379	–2.20	0.0279
Abuser	+0.2583	0.0787	+3.28	0.0011
Occasional	–0.0375	0.0524	–0.72	0.4744
Problem	+0.1372	0.0543	+2.53	0.0017
Siblings' drinking pattern (P value of F ratio = 0.0039)				
Effects (deviations from mean)				
Abstainer	–0.1220	0.0358	–3.41	0.0007
Abuser	+0.1140	0.0556	+2.05	0.0408
Occasional	+0.0209	0.0402	+0.52	0.6028
Problem	–0.0128	0.0510	–0.25	0.8009
Other camp members' drinking pattern (P value of F ratio = 0.0841)				
Effects (deviations from mean)				
Abstainer	–0.0237	0.0412	–0.58	0.5650
Abuser	+0.0268	0.0531	+0.51	0.6135
Occasional	–0.0982	0.0489	–2.01	0.0453
Problem	+0.0951	0.0463	+2.06	0.0403
Visitors' drinking pattern (P value of F ratio = 0.0002)				
Effects (deviations from mean)				
Abstainer	–0.2618	0.0705	–3.71	0.0002
Abuser	+0.2140	0.0658	+3.25	0.0013
Occasional	–0.0573	0.0595	–0.96	0.3363
Problem	+0.1051	0.0497	+2.11	0.0352
Occurrence of physical abuse before age 15 (P value of F ratio < 0.0001)				
Effects (deviations from mean)	+0.1583	0.0319	+4.97	<0.0001
Occurrence of sexual abuse before age 15 (P value of F ratio <0.0001)				
Effects (deviations from mean)	+0.2090	0.0491	+4.26	<0.0001

Table A5-3. Analysis of Number of Households per Camp at Ages 0–6 Years by Community in Which Informant Was Raised

ANOVA (One-way)					
	D.F.	SUM OF SQUARES	MEAN SQUARE	F RATIO	$P(>F)$
Community raised	3	29.7806		6.8034	0.0002
Error	721	1077.4238	1.4591		

Effects (Deviations from Mean)				
COMMUNITY RAISED	ESTIMATE	S.E.	T RATIO	$P(>\|T\|)$
Reservation rural	+0.3693	0.0821	+4.50	<0.0001
Reservation agency town	–0.0505	0.1086	–0.47	0.6419
Off reservation	–0.4284	0.1670	–2.52	0.0119
Combinations	+0.1096	0.0862	+1.27	0.2042

Table A5-4. Analysis of logASYES by Level of Schooling Achieved

ANOVA (Two-way) Without Interaction					
	D.F.	SUM OF SQUARES	MEAN SQUARE	F RATIO	$P(>F)$
School level	5	4.7114		2.8503	0.0147
Strata	11	21.1652		5.8203	<0.0001
Error	714	236.0407	0.3305		

Effects (Deviations From Mean)				
SCHOOL LEVEL	ESTIMATE	S.E.	T RATIO	$P(>\|T\|)$
No School	–0.181	0.165	–1.095	0.2739
Grade school	–0.089	0.081	–1.087	0.2774
Some high school	+0.198	0.062	+3.154	0.0017
High school graduate	–0.004	0.061	–0.065	0.9483
Some college	–0.003	0.064	–0.052	0.9585
College graduate	+0.078	0.126	+0.621	0.5346

Table A5-5. Multiple Regression of logASYES onto Selected Risk Factors

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	SUM OF SQUARES	F RATIO	$P > F$
Community of residence the same at ages 0–6 years and at 7–12 years	1	1	0.0437365	0.1415	0.7069
Community type in which raised	3	3	1.0010886	1.0795	0.3571
Community type in which residing	2	2	0.8404658	1.3594	0.2575
Livestock	1	1	0.0089606	0.0290	0.8649
Fathers' drinking pattern	3	3	2.3237594	2.5057	0.0581
Number of households in the camp when informant was 0–6 years old	1	1	3.4935176	11.3012	0.0008
Sex	1	1	7.0438478	22.7862	<0.0001
Age	1	1	9.3693333	30.3090	<0.0001
Physical abuse before age 15 years	1	1	3.6223211	11.7179	0.0007
Sexual abuse before age 15 years	1	1	2.8679671	9.2776	0.0024
Mother's drinking pattern	3	3	3.0643200	3.3043	0.0199

Parameter Estimates*

RISK FACTORS	ESTIMATE	S.E.	T RATIO	P VALUE
Number of households in the camp when informant was 0–6 years old	–0.061418	0.01827	–3.36	0.0008
Sex (female)	–0.126018	0.0264	–4.77	<0.0001
Age	–0.012838	0.002332	–5.51	<0.0001
Physical abuse	0.1192226	0.034828	3.42	0.0007
Sexual abuse	0.1557437	0.051132	3.05	0.0024
Mothers' drinking				
Abstainer	–0.063	0.0546	–1.16	0.2465
Occasional	–0.006	0.0722	–0.084	0.9328
Problem	–0.215	0.0752	–2.862	0.0043
Abusive	0.2948	0.1105	2.576	0.0102

*Parameter estimates are included for only those risk factors with $P < 0.05$ in the Effect Test.

Table A5-6. Regressions of Significant Risk Factors for Increased logASYES onto Informants' Age and Stratification.*

Number of household in the Camp Ages 0–6, Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	SUM OF SQUARES	F RATIO	*P* > F
Age	1	1	12.755746	5.6588	0.0176
Sex, age, and type of community	11	11	46.034798	1.8566	0.0419

Parameter Estimates

	ESTIMATE	S.E.	T RATIO	*P* VALUE
Age	0.0196391	0.008256	2.38	0.0176

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARES	*P* > CHI SQUARE
Physical abuse before age 15				
Age	1	1	0.4002430	0.5270
Sex, age, and type of community	11	11	6.5456810	0.8346
Sexual abuse before age 15				
Age	1	1	0.572676	0.4492
Sex, age, and type of community	11	11	31.910821	0.0008
Mothers' drinking patterns				
Age	3	3	3.848753	0.2783
Sex, age, and type of community	33	33	18.275835	0.9821

*Parameter estimates are included for only those risk factors with P < 0.05 in the Effect Test.

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Appendix 6

ANALYSES OF DATA IN CHAPTER 7

Stephen J. Kunitz
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Table A6-1. Multiple Regressions of Physical Abuse Before Age 15 Years onto Mothers' Drinking and Fathers' Drinking and Stratification Variables

Mothers' Drinking, Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Mothers' drinking pattern	3	3	19.790678	0.0002
Community type	2	2	3.214338	0.2005
Age 50 years	1	1	0.606609	0.4361
Sex	1	1	0.710574	0.3993

Parameter Estimates

MOTHERS' DRINKING	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Abstainer	0.0466	0.18	6.69	0.0097
Moderate drinker	0.696	0.29	5.78	0.0162
Problem drinker	–0.03	0.25	0.01	0.9035
Abusive drinker	–1.13	0.29	14.96	0.0001

(*continued*)

Table A6-1. Multiple Regressions of Physical Abuse Before Age 15 Years onto Mothers' Drinking and Fathers' Drinking and Stratification Variables (*continued*)

Fathers' drinking, Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	2	3.050877	0.2175
Age 50 years	1	1	0.468365	0.4937
Sex	1	1	0.609543	0.4350
Father's drinking pattern	3	3	16.581435	0.0009

Parameter Estimates

FATHERS' DRINKING	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Abstainer	0.311	0.25	1.53	0.2154
Moderate drinker	0.361	0.24	2.30	0.1290
Problem drinker	0.052	0.21	0.06	0.8047
Abusive drinker	–0.72	0.18	16.40	<0.0001

Table A6-2. Multiple Regressions of Sexual Abuse Before Age 15 Years onto Mothers' Drinking and Fathers' Drinking and Stratification Variables

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
	*Mothers' Drinking**			
Community type	2	2	1.093298	0.5789
Age 50 years	1	1	1.350053	0.2453
Mothers' drinking	3	3	1.433700	0.6977
Sex	1	1	22.311798	0.0000
	Fathers' drinking†*			
Community type	2	2	1.973050	0.3729
Age 50 years	1	1	0.987756	0.3203
Sex	1	1	21.118341	0.0000
Fathers' drinking	3	3	8.107034	0.0439

Parameter Estimates

FATHERS' DRINKING	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Abstainer	0.733	0.475	2.38	0.1227
Moderate drinker	0.365	0.428	0.73	0.3945
Problem drinker	–0.32	0.324	0.98	0.3226
Abusive drinker	–0.78	0.286	7.40	0.0065

*Interaction term MoDr*Sex of informant is >0.05. Partial regression coefficient of sex not included.

†Interaction term FaDr*Sex of informant is >0.05. Partial regression coefficient for sex is not included.

Table A6-3. Multiple Logistic Regressions of Measures of Family Violence onto Stratification Variables, Controls Only

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Struck partner, regressed onto strata, parameter estimates				
Community type				
Agency town	–0.049	0.122	0.16	0.6876
Border town	0.235	0.148	2.51	0.1130
Reservation	0.186	0.116	2.57	0.1087
Sex (female)	0.054	0.092	0.35	0.5552
Age (>50 years)	–0.582	0.135	18.37	0.0000
Struck by partner, regressed onto strata, parameter estimates				
Community type				
Agency town	0.208	0.122	2.90	0.0887
Border town	0.013	0.152	0.01	0.9296
Reservation	–0.222	0.118	3.52	0.0608
Sex (female)	0.283	0.091	9.75	0.0018
Age (>50 years)	–0.491	0.134	13.36	0.0003

Table A6-4. Multiple Logistic Regression of Struck Partner (Yes/No) onto Abuse, LogASYES, and √ALCSUMAB, and Stratification Variables

Effect Test Including all Independent Variables				
SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Physical abuse before age 15 years	1	1	9.903903	0.0016
Sexual abuse before age 15 years	1	1	0.173905	0.6767
logASYES	1	1	2.659273	0.1029
√ALCSUMAB	1	1	39.481024	0.0000
Community type	2	2	2.516547	0.2841
Age 50 years	1	1	12.271007	0.0005
Sex	1	1	5.160665	0.0231

Paramater Estimates				
	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Physical abuse	0.4314	0.1371	9.90	0.0016
√ALCSUMAB	0.4545	0.0723	39.48	<0.0001

Table A6-5. Multiple Logistic Regression of Has Been Struck by Partner (Yes/No) onto Abuse, logASYES and √ALCSUMAB, and Stratification Variables

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
Community type	2	2	3.566218	0.1681
Age 50 years	1	1	9.911634	0.0016
Sex	1	1	22.715348	0.0000
logASYES	1	1	1.436294	0.2307
√ALCSUMAB	1	1	17.540315	0.0000
Physical abuse before age 15 years	1	1	11.560687	0.0007
Sexual abuse before age 15 years	1	1	2.596139	0.1071

Paramater Estimates

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	P
√ALCSUMAB	0.2954	0.0705	17.54	<0.0001
Physical abuse	0.4546	0.1337	11.56	0.0007

Table A6-6. Multiple Logistic Regressions of Having Struck Partner onto logASYES, Abuse Before Age 15 Years, and Stratification Variables, within Samples

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
	NADC			
logASYES	0.634	0.297	4.57	0.0324
Physical abuse before age 15 years (yes)	0.659	0.251	6.90	0.0086
Sexual abuse before age 15 years (yes)	–0.024	0.3295	0.01	0.9421
	DEP			
logASYES	0.297	0.1874	1.92	0.1659
Physical abuse before age 15 years (yes)	0.3292	0.1557	4.47	0.0345
Sexual abuse before age 15 years (yes)	–0.156	0.2494	0.39	0.5304
	CAS			
logASYES	0.4675	0.2088	5.02	0.0251
Physical abuse before age 15 years (yes)	0.38	0.1623	5.48	0.0192
Sexual abuse before age 15 years (yes)	–0.558	0.2164	6.64	0.0100

Note: For ease of presentation, effect tests are not displayed, and all partial regression coefficients for the three independent variables are displayed.

Table A6-7. Multiple Logistic Regressions of Having Been Struck by Partner onto Abuse Before Age 15 Years, logASYES, and Stratification Variables, within Samples

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
	NADC			
Physical abuse before age 15 years (yes)	0.7657	0.256	8.95	0.0028
Sexual abuse before age 15 years (yes)	–0.448	0.3404	1.73	0.1882
logASYES	0.3653	0.2803	1.68	0.1946
	DEP			
Physical abuse before age 15 years (yes)	0.3408	0.158	4.65	0.0310
Sexual abuse before age 15 years (yes)	-0.428	0.269	2.51	0.1130
logASYES	0.2064	0.1959	1.11	0.2921
	CAS			
Physical abuse before age 15 years (yes)	0.3716	0.1788	4.32	0.0377
Sexual abuse before age 15 years (yes)	0.0723	0.2811	0.07	0.7971
logASYES	0.1259	0.2265	0.31	0.5782

Table A6-8. Multiple Logistic Regression of Involvement in Fights While Drinking onto Stratification Variables, Controls Only

Effect Test*				
SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
Community type	2	2	10.637161	0.0049
Age 50 years	1	1	3.637466	0.0565
Sex	1	1	36.319610	0.0000

Paramater Estimates				
	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Community type				
Agency town	0.245	0.125	3.94	0.047
Border town	0.101	0.154	0.43	0.513
Reservation	–0.35	0.119	8.63	0.0033
Age (>50 years)	–0.241	0.127	3.64	0.0565
Sex (female)	–0.712	0.118	36.32	<0.0001

*Interactions are not significant.

Table A6-9. Multiple Logistic Regression of Involvment in Fights While Drinking onto Abuse Before Age 15 Years, logASYES, √ALCSUMAB, and Stratification Variables, Controls Only

Effect Test

SOURCE	NO. OF PARAMETERS	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	2	6.986933	0.0304
Age 50 years	1	1	0.454821	0.5001
Sex	1	1	8.949840	0.0028
Physical abuse before age 15 years	1	1	13.710877	0.0002
Sexual abuse before age 15 years	1	1	0.012971	0.9093
logASYES	1	1	19.390822	0.0000
√ALCSUMAB	1	1	90.478626	0.0000

Paramater Estimates

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
Physical abuse	0.63586536	0.1717246	13.71	0.0002
logASYES	0.81948748	0.1860991	19.39	<0.0001
√ALCSUMAB	0.95477329	0.1003754	90.48	<0.0001

Note: parameter estimates for stratification variables are displayed in Table A6-8.

Table A6-10. Multiple Logistic Regressions of Involvment in Fights While Drinking onto Abuse Before Age 15 Years, logASYES, and Stratification Variables, by Samples

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
	NADC			
logASYES	1.418	0.627	5.12	0.0236
Physical abuse before age 15 years (yes)	1.075	0.450	5.71	0.0169
Sexual abuse before age 15 years (yes)*	–5.104	36.025	0.02	0.8873
	DEP			
logASYES	0.911	0.190	22.94	<0.0001
Physical abuse before age 15 years (yes)	0.613	0.179	11.60	0.0007
Sexual abuse before age 15 years (yes)	0.243	0.272	0.80	0.3723
	CAS			
logASYES	0.888	0.209	17.93	<0.0001
Physical abuse before age 15 years (yes)	0.145	0.164	0.78	0.3786
Sexual abuse before age 15 years (yes)	–0.143	0.218	0.43	0.5113

*Unstable due to small numbers.

Table A6-11. Multiple Regression of Age at First Fight onto Physical Abuse Before Age 15 Years, logASYES, and Stratification

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
	NADC			
logASYES	–3.293	1.021	–3.23	0.0180
Physical abuse before age 15 years (yes)	1.462	1.075	1.36	0.2228
	DEP			
logASYES	–2.097	0.533	–3.94	0.0001
Physical abuse before age 15 years (yes)	–0.682	0.381	–1.79	0.0716
	CAS			
logASYES	–4.374	0.746	–5.85	<0.0001
Physical abuse before age 15 years (yes))	–0.481	0.515	–0.93	0.3514

Table A6-12. Multiple Logistic Regression of Involvement in Fights When Drinking (Yes/No) onto Usual Drinking Companions and Stratification Variables, Controls Only

EFFECT TEST	D.F.	WALD CHI SQUARE	*P*
Usual drinking companions	5	12.925	0.0241*
√ALCSUMAB	1	114.442	0.0000
Community type		210.788	0.0045
Age	1	3.274	0.0704
Sex	1	8.854	0.0029

*According to the Bonferroni equation (0.05/k), the significance level of the individual strata (N = 6) is 0.008. None of the individual values reaches that level. Thus, the parameter estimates are not given.

Table A6-13. Multiple Logistic Regressions of Having Been in Fights onto Having Hit Partner, Age, Sex, and Community, by Sample

	PARTIAL REGRESSION COEFFICIENT	S.E.	CHI SQUARE	*P*
		NADC		
Hit partner (yes)	0.869	0.336	6.70	0.0097
Community type				
Agency town	0.986	0.432	5.22	0.0224
Border town	–0.18	0.563	0.10	0.7491
Reservation	–0.81	0.502	2.57	0.1087
Age (older than 50 years)	0.034	0.461	0.01	0.9419
Sex (female)	–0.82	0.376	4.73	0.0297
		DEP		
Hit partner (yes)	0.272	0.109	6.23	0.0125
Community type				
Agency town	–0.17	0.162	1.14	0.2860
Border town	0.389	0.208	3.50	0.0614
Reservation	–0.22	0.155	1.96	0.1619
Age (older than 50 years)	–0.24	0.153	2.50	0.1135
Sex (female)	–0.43	0.151	8.16	0.0043
		CAS		
Hit partner (yes)	0.561	0.132	18.05	<0.0001
Community type				
Agency town	–0.39	0.199	3.84	0.0500
Border town	0.637	0.267	5.71	0.0168
Reservation	–0.25	0.189	1.71	0.1916
Age (older than 50 years)	–0.55	0.194	8.14	0.0043
Sex (female)	–0.19	0.132	2.07	0.1499

Appendix 7

ANALYSES FOR CHAPTER 8

Gilbert Quintero

Table A7-1. Male and Female DEP: Multiple Logistic Regression of Help Seeking (Yes/No) onto Sex, Age, Community Type, Service Unit of Residence, logASYES, and √ALCSUMAB

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Sex	1	0.453	–0.501
Age	1	3.572	0.059
Community type	2	2.800	0.247
Service Unit	1	0.653	0.419
logASYES	1	0.008	0.927
√ALCSUMAB	1	65.801	<0.0001

Estimates of Partial Regression Coefficient

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
√ALCSUMAB	1.281	0.158	65.801	<0.0001	74.71

Note: Estimates are given only for factors whose effect test was signigicant at 5%.

Table A7-2. Male and Female DEP: Multiple Logistic Regression of Use of Formal Treatment (Yes/No) onto Age, Sex, and Community Type

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	3.383	0.1842
Sex	1	8.363	0.0038
Age	1	0.001	0.9791

Estimates of Effects (from the Mean) or Partial Regression Coefficients

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Sex (f) unstable	–0.494	0.171	8.363	0.0038	0.37

Note: Estimates are given only for factors whose effect test was significant at 5%. Due to small numbers in some classes, the estimates and tests are unstable.

Table A7-3. Male and Female DEP: Multiple Logistic Regression of Treatment (Yes/No) onto Antecedents and Stratification

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
	*Years of education**		
Strata	10	16.306	0.091
Education	1	1.365	0.243
	History of relationships†*		
Strata	10	14.261	0.161
Relationships	3	10.211	0.017
	√ALCUMSAB‡*		
Strata	10	9.669	0.470
√ALCSUMAB	1	58.617	<0.0001
	*logASYES**		
Strata	10	14.986	0.133
logASYES	1	3.743	0.053
	*Number of marriages**		
Strata	10	15.093	0.129
Marriages	1	0.190	0.190

(*continued*)

Table A7-3. (*continued*)

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
	Number of common-law marriages‡		
Strata	10	17.431	0.065
Common-law marriages	1	14.756	0.0001
	Service Unit of residence§		
Strata	10	11.668	0.308
Service Units	1	5.220	0.022
	*Religion in which raised**		
Strata	10	15.452	0.116
Religion	7	3.701	0.814
	Currently employed§		
Strata	9	13.791	0.130
Currently employed	1	12.934	0.0003

Estimates

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
		Effects (from the mean)			
Relations (1)	–0.463	0.177	6.84	0.009	0.40
Relations (2)	0.201	0.273	0.54	0.462	1.44
Relations (3)	0.545	0.288	3.58	0.058	2.98
Relations (4)	–0.283	0.309	0.84	0.360	0.57
Unit (Shiprock)	–0.269	0.118	5.22	0.022	0.58
Employed	–0.396	0.110	12.93	0.0003	0.45
		Partial regression coefficient			
√ALCSUMAB	1.171	0.153	58.62	<0.0001	51.64
Common law marriages	0.610	0.159	14.76	0.0001	11.48

*Estimates are not given for antecedents whose effect test was not significant at 5%.

†Estimates are given for antecedents whose effect test was significant at 5%. Relationships are shown as deviations from the mean: 1 = one steady relationship; 2 = one long-term and several short-term relationships; 3 = short-term relationships; 4 = no relationships.

‡Estimates are given for antecedents whose effect test was significant at 5%.

§Estimates are given for antecedents whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-4. Male and Female DEP: Multiple Logistic Regression of Formal Treatment (Yes/No) onto Antecedents

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
logASYES	1	0.394	0.5300
Relationships	3	2.195	0.5330
Employment	1	2.849	0.0914
Service Unit	1	5.636	0.0176
Sex	1	10.518	0.0012
√ALCSUMAB	1	51.836	<0.0001
Common-law marriage	1	5.497	0.0191

Estimates of Effects (from the mean) or Partial Regression Coefficients

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Sex (f)	–0.722	0.223	10.518	0.0012	0.24
√ALCSUMAB	1.175	0.163	51.836	<0.0001	52.27
Service Unit (Shiprock)	–0.297	0.125	5.636	0.0176	0.55
Common-law marriage	0.447	0.191	5.497	0.0191	5.97

Note: Estimates are given only for factors whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-5. Male and Female CAS: Multiple Logistic Regression of Type of Treatment (Inpatient/Outpatient) onto Age, Sex, and Community Type

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	31.383	<0.0001
Sex	1	9.315	0.002
Age	1	2.085	0.149

Estimates of Effects (from the Mean)

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Community type					
Agency town	−1.119	0.222	25.45	<0.0001	0.11
Border town	1.970	0.356	30.62	<0.0001	51.40
Reservation	−0.851	0.215	15.67	<0.0001	0.18
Sex	−0.374	0.122	9.31	0.0023	0.47

Note: Estimates are given only for factors whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-6. Male and Female CAS: Multiple Logistic Regression of Type of Treatment (Inpatient/Outpatient) onto Antecedents and Stratification

Effect Tests			
SOURCE	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
	*Years of education**		
Strata	10	16.327	0.099
Education	1	11.568	0.0007
	History of relationships†*		
Strata	11	15.317	0.161
Relationships	3	6.796	0.079
	*√ALCSUMAB**		
Strata	11	11.504	0.402
√ALCSUMAB	1	25.258	<0.0001
	logASYES†*		
Strata	11	14.136	0.226
logASYES	1	2.156	0.142
	Number of marriages†*		
Strata	11	17.258	0.100
Marriages	1	0.069	0.793
	Number of common-law marriages†*		
Strata	11	16.473	0.124
Common-law marriages	1	0.482	0.488
	Service Unit of residence‡*		
Strata	11	25.836	0.007
Service Units	1	65.032	<0.0001
	Religion in which raised†*		
Strata	11	3.515	0.982
Religion	7	3.163	0.870
	Currently employed†*		
Strata	11	15.798	0.149
Currently employed	1	0.005	0.942

(*continued*)

Table A7-6. (*continued*)

Estimates of Partial Regression Coefficient					
	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Education	0.158	0.047	11.57	0.0007	14.73
√ALCSUMAB	1.007	0.200	25.26	<0.0001	29.68
Shiprock	1.495	0.185	65.03	<0.0001	19.90

*Estimates are given for antecedents whose effect test was significant at 5%.

†Estimates are not given for antecedents whose effect test was not significant at 5%.

‡Estimates are given for antecedents whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-7. Male and Female CAS: Multiple Logistic Regression of Type of Treatment (Inpatient/Outpatient) onto Antecedents

Effect Tests			
SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Community type	2	7.256	0.0266
Sex	1	14.866	0.0001
√ALCSUMAB	1	15.238	0.0001
Education	1	2.920	0.088
Service Unit	1	59.546	<0.0001

Estimates of Effects (from the Mean) or Partial Regression Coefficients					
	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Community type					
Agency town	–0.645	0.256	6.33	0.012	0.28
Border town	0.987	0.385	6.58	0.010	7.20
Reservation	–0.342	0.245	1.96	0.162	0.50
Sex (f)	–0.708	0.184	14.87	0.0001	0.24
√ALCSUMAB	0.877	0.225	15.24	<0.0001	19.15
Service Unit (Shiprock)	1.440	0.187	59.56	<0.0001	17.81

Note: Estimates are given only for factors whose effect test was significant at 5%.

Table A7-8. Male and Female CAS: Multiple Logistic Regressions of Treatment (Inpatient/Outpatient) onto Sources of Referral and Stratification

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
*Referral from the Indian Health Service**			
Strata	11	13.923	0.237
Referred from IHS	1	3.619	0.057
Referral from the legal justice system†			
Strata	11	11.961	0.367
Referred from court	1	12.494	0.0004
Referral from the tribal agencies†			
Strata	11	10.127	0.519
Referred from Tribe	1	13.719	0.0002

Estimates of Partial Regression Coefficient

REFERRAL	ESTIMATE	S.E.	CHI SQUARE	$P >$ CHI SQUARE
Tribal agencies	–0.745	0.201	13.72	0.0002
Legal justice system	–0.489	0.138	12.49	0.0004

*Estimates are not given for antecedents whose effect test was not significant at 5%.

†Estimates are given for antecedents whose effect test was signigicant at 5%.

Table A7-9. Male and Female DEP: Multiple Logistic Regression of Remission (Yes/No) onto Age, Sex, and Community Type

Effect Tests

SOURCE	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
Community type	2	8.305	0.016
Sex	1	1.582	0.208
Age	1	27.665	<0.0001

Estimates of Effects (from the Mean) or Partial Regression Coefficients

	ESTIMATE	S.E.	CHI SQUARE	$P >$ CHI SQUARE	ODDS RATIO
Community type					
Agency town	–0.452	0.158	8.24	0.004	0.40
Border town	0.351	0.203	2.98	0.084	2.02
Reservation	0.101	0.152	0.44	0.508	1.22
Age	0.064	0.012	27.66	<0.0001	19.81

Note: Estimates are given only for factors whose effect test was significant at 5%.

Table A7-10. Male and Female DEP: Multiple Logistic Regression of Remission (Yes/No) onto Antecedents and Stratification

Effect Tests			
SOURCE	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
	*Education**		
Strata	10	23.480	0.009
Education	1	0.260	0.610
	History of relationships†*		
Strata	10	23.153	0.010
Relationships	3	35.429	<0.0001
	√ALCSUMAB‡*		
Strata	10	26.963	0.003
√ALCSUMAB	1	19.975	<0.0001
	*logASYES**		
Strata	10	23.158	0.008
logASYES	1	0.033	0.857
	Number of marriages‡*		
Strata	10	20.397	0.026
Marriages	1	19.637	<0.0001
	*Number of common-law marriages**		
Strata	11	24.962	0.005
Common-law marriages	1	1.914	0.166
	*Service Unit of residence**		
Strata	10	20.268	0.027
Service Units	1	0.855	0.355
	Currently employed§*		
Strata	9	24.460	0.003
Currently employed	1	38.914	<0.0001
	History of formal treatment§*		
Strata	10	26.708	0.003
Formal treatment	1	25.630	<0.0001
	Number of households in camp‡*		
Strata	10	27.935	0.002
Households	1	8.987	0.003

(*continued*)

Table A7-10. (*continued*)

Effect Tests			
SOURCE	D.F.	WALD CHI SQUARE	$P >$ CHI SQUARE
Active in religion‡			
Strata	10	22.668	0.012
Active	2	32.944	<0.0001
*Current religion**			
Strata	10	20.999	0.021
Religion	8	11.217	0.190

Estimates					
	ESTIMATE	S.E.	CHI SQUARE	$P >$ CHI SQUARE	ODDS RATIO
Effects (from the mean)					
Relations (1)	1.254	0.220	32.56	<0.0001	12.28
Relations (2)	0.704	0.309	5.20	0.023	4.08
Relations (3)	–1.215	0.410	8.79	0.003	0.088
Relations (4)	–0.743	0.410	3.28	0.070	0.23
Employed	0.734	0.118	38.91	<0.0001	4.34
Received treatment	–0.571	0.113	25.63	<0.0001	0.32
Active in religion	0.844	0.149	32.05	<0.0001	5.40
Not active in religion	–0.537	0.163	10.80	0.001	0.34
Irreligious	–0.307	0.167	3.36	0.067	0.067
Partial regression coefficient					
√ALCSUMAB	–0.621	0.139	19.97	<0.0001	0.12
Marriages	0.761	0.172	19.64	<0.0001	944.22
Households	–0.286	0.095	8.99	0.003	0.10

*Estimates are not given for antecedents whose effect test was not significant at 5%.

†Estimates are given for antecedents whose effect test was significant at 5%. Relationships are shown as deviations from the mean: 1 = one steady relationship; 2 = one long-term and several short-term relationships; 3 = short-term relationships; 4 = no relationships.

‡Estimates are given for antecedents whose effect test was significant at 5%.

§Estimates are given for antecedents whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-11. Male and Female DEP: Multiple logistic Regression of Remission (Yes/No) onto Significant Antecedents

Effect Test

SOURCE	D.F.	WALD CHI SQUARE	*P* > CHI SQUARE
Sex	1	0.210	0.647
Age	1	15.722	0.0001
Community type	2	4.929	0.085
√ALCSUMAB	1	5.043	0.025
Relationships	3	11.586	0.009
Marriages	1	0.137	0.711
Treatment (yes/no)	1	10.983	0.888
Employed	1	15.127	0.0001
Households in camp	1	3.522	0.061
Active in religion	2	19.879	<0.0001

Estimates of Effects (from Mean) or Partial Regression Coefficient

	ESTIMATE	S.E.	CHI SQUARE	*P* > CHI SQUARE	ODDS RATIO
Age	0.065	0.016	15.72	<0.0001	19.77
√ALCSUMAB	–0.392	0.175	5.04	0.025	0.27
Relationships (1)	0.759	0.281	7.31	0.007	4.56
Relationships (2)	0.927	0.361	6.58	0.010	6.38
Relationships (3)	–1.008	0.491	4.22	0.040	0.13
Relationships (4)	–0.678	0.501	1.83	0.176	0.26
Treatment (yes)	–0.477	0.144	10.98	0.001	0.39
Employed	0.537	0.138	15.13	0.0001	2.93
Active in religion	0.764	0.174	19.27	<0.0001	4.61
Not active	–0.490	0.189	6.71	0.010	0.38
Irreligious	–0.274	0.194	1.99	0.158	0.58

Note: Estimates are given only for facators whose effect test was signigicant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

Table A7-12. Male and Female DEP: Multiple Regression of Years Since Last Drink onto Age, Sex, and Community Type

Effect Tests				
SOURCE	D.F.	SUM OF SQUARES	F RATIO	P > F
Community type	2	166.406	2.854	0.059
Sex	1	34.931	1.198	0.274
Age	1	3,120.172	107.058	<0.0001
Error*	429	12,503.092		

Estimate of Partial Regression Coefficient				
	ESTIMATE	S.E.	T RATIO	P > |T|
Age	0.287	0.027	10.35	<0.0001

Note: Estimates are given only for factors whose effect test was significant at 5%.

*Mean square error = 29.145.

Table A7-13. Male and Female DEP: Multiple Regression of Years Since Last Drink onto Antecedents and Stratification

Effect Tests				
SOURCE	D.F.	SUM OF SQUARES	F RATIO	P > F
		*ALCSUMAB**		
Stratification	10	3,201.02	10.38	<0.0001
√ALCSUMAB	1	78.98	2.56	0.110
Error	421	12,984.08		
		*logASYES**		
Stratification	10	2,824.89	9.11	<0.0001
logASYES	1	6.76	0.22	0.641
Error	421	13,056.299		
		History of relationships†		
Stratification	10	2,968.63	9.80	<0.0001
Relationships	3	526.50	5.80	0.001
Error	413	12,504.33		
		Current employment‡		
Stratification	9	3,046.59	11.38	<0.0001
Employment	1	519.06	17.45	<0.0001
Error	412	12,258.60		

(*continued*)

Table A7-13. Male and Female DEP: Multiple Regression of Years Since Last Drink onto Antecedents and Stratification (*continued*)

Effect Tests				
SOURCE	D.F.	SUM OF SQUARES	F RATIO	P > F
		*Education**		
Stratification	10	1,863.63	6.02	<0.0001
Education	1	117.29	3.79	0.052
Error	429	12,932.24		
		Number of marriages§		
Stratification	10	2,658.21	8.92	<0.0001
Marriages	1	478.61	16.06	<0.0001
Error	4220	12,516.59		
		Number of common-law marriages§		
Stratification	10	3,059.24	10.13	<0.0001
Common-law marriages	1	235.20	7.79	0.006
Error	419	12,649.87		
		History of formal treatment (yes/no)‡		
Stratification	10	3,230.99	10.84	<0.0001
Treatment	1	515.45	17.29	<0.0001
Error	421	12,547.61		
		*Number of households in camp**		
Stratification	10	3,201.53	10.38	<0.0001
Households	1	80.52	2.48	0.107
Error	421	12,982.54		
		*Service unit**		
Stratification	10	3,025.24	9.76	<0.0001
Service units	1	11.11	0.36	0.550
Error	421	13,051.95		
		Active in religion§		
Stratification	10	2,694.46	9.04	<0.0001
Active in religion	2	547.34	9.18	0.0001
Error	420	12,515.72		
		*Current religion**		
Stratification	10	2,557.40	8.31	<0.0001
Current religion	7	349.61	1.62	0.127
Error	413	12,711.36		

(*continued*)

Table A7-13. (*continued*)

	Estimates			
	ESTIMATE	S.E.	T RATIO	P > |T|
	Effects (from the mean)			
Relations (1)	1.856	0.469	3.95	<0.0001
Relations (2)	0.456	0.732	0.62	0.533
Relations (3)	–1.463	0.769	–1.90	0.058
Relations (4)	–0.849	0.826	–1.03	0.304
Employment	1.171	0.280	4.18	<0.0001
Treatment	–1.161	0.279	–4.16	<0.0001
Active in religion	1.550	0.366	4.24	<0.0001
Not active	–0.909	0.404	–2.25	0.025
Irreligious	–0.640	0.427	–1.50	0.134
	Partial regression coefficient			
Marriages	1.669	0.417	4.01	<0.0001
Common-law marriages	–1.087	0.389	–2.79	0.006

Note: Mean square errors: for ALCSUMAB, 30.841; logASYES, 31.013; history of relationships, 30.277; current employment, 29.754; education, 30.938; number of marriages, 29.801; number of common-law marriages, 30.191; history of formal treatment, 29.804; number of households in camp, 30.837; Service Units, 31.002; active in religion, 29.799; current religion, 30.778.

*Estimates are not given for factors whose effect test was not significant at 5%.

†Estimates are given for antecedents whose effect test was significant at 5%. Relationships are shown as deviations from the mean: 1 = one steady relationship; 2 = one long-term and several short-term relationships; 3= short-term relationships; 4 = no relationships.

‡Estimates are given only for factors whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

§Estimates are given only for factors whose effect test was significant at 5%.

Table A7-14. Male and Female DEP: Multiple Regression of Time Since Last Drink onto Antecedents

Effect Tests

SOURCE	D.F.	SUM OF SQUARES	F RATIO	P > F
Sex	1	0.737	0.03	0.869
Age	1	2,247.434	83.18	<0.0001
√ALCSUMAB	1	0.147	0.01	0.941
Relationships	3	23.152	0.29	0.836
Marriages	1	17.717	0.66	0.418
Common-law marriages	1	76.831	2.84	0.092
Employed	1	299.776	11.10	0.001
Treatment (y/n)	1	230.723	8.54	0.004
Active in religion	2	236.010	4.87	0.008
Error*	402	10,860.778		

Estimate of Effects (from Mean) or Partial Regression Coefficient

	ESTIMATE	S.E.	T RATIO	P > |T|
Age	0.285	0.031	9.12	<0.0001
Employed	0.938	0.282	3.33	0.001
Treatment (yes)	–0.886	0.303	–2.92	0.004
Active in religion	1.098	0.362	3.03	0.003
Not active	–0.742	0.394	–1.88	0.060
Irreligious	–0.356	0.416	–0.85	0.393

Note: Estimates are given only for factors whose effect test was significant at 5%. For dichotomous antecedents, only one effect is shown because the other effect is the same with the opposite sign.

*Mean square error = 27.017.

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