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ABSTRACT

This update offers current knowledge about the scope and nature of adolescent drinking. Its goal is to bridge the communications gap between the researcher, the practitioner, and the general population by disseminating research findings in an accessible manner and by providing an introductory review of the significance of these findings. Abstracts are provided for a wide cross-section of 36 studies published since 1990 on adolescent drinking, use correlates and risk factors, and prevention program evaluations. Summarized and assessed are recent survey data, the major sources of the survey data, and trends. The epidemiological literature is reviewed in regard to three related questions: (1) How many primary and secondary school youth are drinking and how much are they consuming? (2) What are the patterns and effects of use? and (3) What are the current trends? In spite of extensive research in this area, gaps and inconsistencies in findings are apparent. Even so, today's youth use alcohol more than illicit drugs and a substantial proportion of high school students are drinking regularly and heavily. As for prevention, results indicate that a prevention curriculum's potential effectiveness is partly a function of the substance addressed and that successful strategies against one drug may not succeed against other drugs. (Contains over 300 references.) (RJM)

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ALCOHOL CONSUMPTION AMONG YOUTH: CURRENT TRENDS AND RESEARCH FINDINGS

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The *Prevention Research Update* series is a current awareness service prepared by the Western Regional Center for Drug-Free Schools and Communities, which summarizes recent research on adolescent drug abuse and its prevention. Each issue abstracts and reviews the prevention implications of new research dealing with a major topic of concern in the field, placing the new information in the context of past findings. The goal is to help bridge the communications gap between the researcher, the practitioner, and the general population, by disseminating research findings in an accessible manner and providing an introductory review of their significance. Abstracts are arranged alphabetically by first author's last name. Preceding the abstracts is an overview discussion in which references to abstracted studies are identified by an asterisk (*). References to all documents cited are located following the abstracts. Copies of the Updates are available from all the Western Center sites, listed on the last page of this issue.

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OVERVIEW

Introduction

In the late 1970s, Walker, Jasinska, and Carnes (1978:52-53) observed that "studies . . . clearly establish evidence that consumption of alcohol is becoming a common habit of contemporary youth." Since then little has changed, but concerns over adolescent use of alcohol have long been overshadowed by concerns over use of illicit drugs. Of late, however, underage alcohol drinking has been attracting increasing attention among both the public and the prevention community. This Update is designed to be a general guide to current knowledge about the scope and nature of adolescent drinking. Abstracts are provided to a wide cross-section of 36 studies published since 1990 on adolescent drinking, use correlates and risk factors, and prevention program evaluations. In the Overview section, we summarize and assess recent survey data and trends, as well as explore the prevention implications of the results.[1] A chart in the Appendix lists drinking rates reported by most of the recent studies cited in the text.[2]

The Overview begins with a discussion of the major sources of survey data and their limitations. We then review the epidemiological literature in regard to three related questions:

- How many primary and secondary school youth are drinking and how much are they consuming?
- What are the patterns and effects of use? and
- What are current trends?

The evidence reveals that considerable uncertainty surrounds these questions. In spite of all the research that has been done in this area, there are striking gaps and inconsistencies in our knowledge, with survey results raising as many questions as they answer. What is clear is that the use of alcohol is far more prevalent among today's youth than that of illicit drugs and that a substantial proportion of high school students are drinking regularly and often heavily. However, most drinking is experimental or occasional, and national survey trend data suggest that adolescent drinking has declined over recent years, although the nature and scale of this decline is cloudy in many respects, and overall, current research suggests prevention efforts need to focus on delaying drinking onset and stopping its continuation and escalation.

Information Sources and Issues

Attempting to gauge the scope and nature of adolescent drinking is an enormous challenge. To begin with, since the 1978 National Adolescent Drinking Survey there have been few large-scale and no national studies specifically on youth alcohol consumption. Therefore, most of the relevant data is derived from general AOD surveys, which do not address in detail many of the important issues unique to alcohol consumption. Furthermore, interpretation and comparison of the data that do exist is extremely difficult because of the wide variety of survey methods, respondent age ranges, and measures that are used to gauge drinking.

Information Sources

Table 1 provides a guide to the most frequently discussed surveys in this review, as well as the abbreviations used and the documents where the findings were reported. The major national and state studies examined were conducted since 1988, most between 1990 and 1991. Two exceptions were the National Adolescent Drinking Surveys conducted in 1974 and 1978, and the 1980 Gallup survey, which provide a national baseline.

Table 1
Abbreviations for Student AOD Surveys and Data Sources

Abbreviation	Title	Information Source
ADAS	American Drug and Alcohol Survey (annual)	Oetting & Beauvais (1989); ADAS Inc.
ALERT	Project ALERT Evaluation Survey (1984-1988)	Ellickson, Hays, & Bell 1992.
ASS	Alaska Student Survey (1988)	Segal 1989, 1992
CSS	California State Student Substance Use Survey (biennial 1985-1991)	Skager & Austin 1993
DATE	California Drug Alcohol Tobacco Education Evaluation Survey (1992)	Southwest Regional Laboratory 1993 & personal communication
Gallup	National Gallup phone survey (1980)	Zucker & Harford 1983
HSS	Hawaii State Survey (biennial 1987-1991)	Gabriel, Einspruch et al. 1992
MTF	Monitoring the Future/National High School Seniors Survey (annual since 1974)	Johnston, O'Malley, & Bachman 1993
NASHA	National Adolescent Student Health Survey (1987)	Windle 1991; Caces et al. 1991
NADS	National Adolescent Drinking Survey (1974, 1978)	Rachal, Maisto et al. 1980, 1982
NCS	North Carolina Student Survey (1987)	Palmer & Ringwalt (1988)
NHS	National Household Drug Abuse Survey (periodic since 1972)	SAMHSA 1993
NYS	New York State Student Survey. Division of Substance Abuse Services (1983, 1990)	Barnes & Welte 1986; Barnes et al. 1992, 1993; New York 1991, 1993
NYS OMH	New York Office of Mental Health Survey (1988)	Kandel & Davies 1991; Kandel, Davies, & Davis 1990
WSS	Washington State Survey (biennial 1988-1992)	Einspruch & Pollard 1993
YRBS	Youth Risk Behavior Survey (1990, 1991)	Kolbe 1990; CDC 1991a, 1991b, 1992

National Surveys

The primary sources of long-term and current national data on drinking are two general AOD surveys: the annual Monitoring the Future Survey (MTF), and the National Household Survey of Drug Abuse (NHS). The MTF has been carried out annually since 1975 on a large sample of the nation's high school seniors (about 16,000 per year) and has been widely known as the National High School Senior Survey. Beginning in 1991, it added representative national samples of 8th and 10-graders (see Johnston, O'Malley, & Bachman [1993] for the most recent report). The National Household Survey is a general population survey, based on household interviews, of Americans age 12 and over that was initiated in 1972 by the then National Commission on Marijuana and Drug Abuse and thereafter conducted by the National Institute on Drug Abuse (NIDA) until taken over by the new Substance Abuse and Mental Health Services Administration (SAMHSA 1993). NHS surveys were repeated every two to three years between 1972 and 1990, and have been carried out annually since 1990.

Another source for national data is the American Drug and Alcohol Survey (ADAS). Unlike the MTF and NHS, which are federally-funded, the ADAS is a commercial survey which school districts and communities purchase and administrate themselves. Its annual statistics for the nation are derived by compiling the data from all the surveys that were conducted across the U.S. over a given school year. Because it is not administered under controlled conditions with a randomly selected, representative sample, its results cannot be considered a valid indication of the nation as a whole. However, because of the large number of schools throughout the nation which use the survey and the quality of the survey instrument, its national findings are useful for comparison to the MTF and NHS. As will be shown, the results are very similar to those of the MTF for the same grade levels.

Two other recent national surveys dealing with health and other problem behaviors have also included alcohol-related items that are valuable for comparison: (a) the 1987 National Adolescent Student Health Survey (NASHS); and (b) the Youth Risk Behavior Survey (YRBS), first conducted in 1990. The NASHS was the first national survey since the 1960s to assess the knowledge, beliefs, and behaviors of adolescent students in regard to major health problems. It provides a means to gauge the extent they may be at risk for these problems and their perceptions of these risks. In addition to the use of tobacco, alcohol, and other drugs, the survey addressed unintentional injuries, fighting and violence, suicide, AIDS and other sexually transmitted diseases, among other health problems. It was given to 11,400 randomly selected classrooms of 8th and 10th graders in 224 schools (with an average of three classrooms per school) in 20 states in the fall of 1987 by trained survey administrators (ASHA 1989; CDC 1989).[3] The results on alcohol have been separately analyzed by Windle (1991) and Caces (1991).

The Youth Risk Behavior Survey, conducted by the Center for Disease Control, is a component of a larger surveillance system of 9-12th graders that periodically measures the prevalence of health risk behaviors similar to those assessed by the NASHS. The YRBS is designed to provide comparable data at the national, state, and local level across six categories of behavior: those resulting in unintentional and intentional injuries; tobacco use; alcohol and other drug use; sexual behaviors; dietary behaviors; and physical activities (Kolbe 1990). The system has two school-based components: a national survey using a three-stage probability design, and state and local surveys conducted by departments of education. The 1990 national YRBS sampled 11,631 9-12th graders in 50 states and 26 state and local sites (CDC 1991a, 1991b). The 1991 survey included 12,272 students nationally and was conducted in 23 states and 10 cities in the spring of 1991 (CDC 1992). This survey is

particularly valuable for determining geographic variations in use.[4]

State Surveys

The national surveys—the MTF and NHS—have consistently demonstrated that youth in the four major Census geographic regions in the USA (Northeast, South, North Central, and West) report different prevalence and levels of use. Thus in comparing national, state, and local surveys, some variation in the results should be expected even when comparable survey methodologies are employed. Indeed, one of the most important challenges which face the field is better determining what factors may account for similarities and differences in consumption across geographic areas. This is beyond our scope, but because sources of national data are so relatively limited, findings from a sample of recent statewide surveys were included in the analysis to help expand and add context to national data. We relied especially on the well-established surveys in New York and the Western states of California, Hawaii, and Washington. These surveys date back to the mid- or late-1980s and were most recently administered in 1991 or later. Two statewide surveys from California are compared: the 1991 California Student Substance Use Survey (CSS) of 7th, 9th, and 11th graders (Skager & Austin 1993); and the 1992 Drug, Alcohol, and Tobacco Education (DATE) Program Evaluation Student Survey, which covers grades 4-12 (SWRL 1993). The CSS has been conducted every two years since 1985. The state surveys in Hawaii and Washington were both conducted by the Northwest Regional Laboratory using similar items, which facilitates comparison of the results. Both are biennial surveys, with the most recent Hawaii results for 1991 and Washington for 1992 (Gabriel, Einspruch et al. 1992; Einspruch & Pollard 1993).

Data for New York is drawn from four surveys: the 1983 and 1990 student surveys conducted by the New York Division of Substance Abuse Services (Barnes & Welte 1986; New York 1991, 1993), the smaller 1983 student survey by the Office of Mental Hygiene (Kandel & Davies 1991), and a 1986 general population telephone survey (Yu & Williford 1992*).

Local Surveys

Finally, these data are supplemented with results from a variety of local or less geographic-specific surveys from different regions of the nation. Among the most notable of these are the ALERT prevention curriculum evaluation survey conducted between 1984 and 1988, for which Ellickson, Hays, and Bell (1992) served as the primary source of data. Murray, Perry et al. (1987) provide data from a large-scale survey of 7th graders in the Minneapolis area in 1983. Dielman, Shope et al. (1986) in Michigan, and Bush and Iannotti (1992, 1993) in Washington DC, are among the few studies specifically dealing with elementary school students. Forney, Estes et al. (1990*) and Kelleher, Rickert et al (1992) conducted surveys in the South. Several studies examined drinking in rural areas or rural/urban differences (Gibbons, Wylie et al. 1986; Sarvela & McClendon 1985; Stevens, Youelles et al. 1991).

Methodological Issues

In attempting to gauge the extent of adolescent drinking from these surveys, one is first confronted with the problem of the lack of consistent use measures, which limits possibilities for comparative analyses. The most common consumption measure is lifetime prevalence (ever use); however, operationally, lifetime use is defined very differently across studies, covering a wide range of drinking experiences (e.g., "ever tried," "ever sipped," "ever drink," ever had a "full drink," ever drinking "without parental knowledge"). This makes the meaning of ever use rates difficult to determine. The next most common prevalence measures are use in the past year (annual prevalence), past six-months, and past month . Reported use in the past twelve and six months often appear to be similar (Skager & Austin 1993). The rate of use in the past month is the most common measure of "current use" and is considered

the best indicator of the number of students who are "at risk." However, many studies do not consistently report these data.

The limitation of overall prevalence rates—particularly those for lifetime use—is that they mask broad ranges in drinking experience, from a couple of sips to regular heavy drinking. Even more problematic is the lack of clear and common measures—or even definitions—of regular, heavy, or problem drinking. Although this is an issue in surveys of adults as well, it is even more so among youth because of the lack of adverse physiological effects to measure. Only a very limited number of youth consume large enough quantities of alcohol long enough to have physiological affects to measure. Alcoholism is rarely found among youths because it take years of develop (Walker, Jasinska, & Carnes 1978:53). There is also no consensus on how to distinguish between alcohol use and misuse or abuse, and serious reservations have been raised about the usefulness of existing instruments designed to do so (Moberg 1983). Many people consider any drinking by youth to be "abuse" solely by virtue of its illegality.

As measures of alcohol involvement, weekly and daily use frequencies are often provided, but frequency rates alone can be misleading because they overstate the drinking of the significant portion of youth who drink often but in small amounts. Various measures have thus been developed that combine quantity and frequency. Rachal, Maisto et al. (1982:62), developed a detailed categorization scheme used in the 1978 NADS based on six quantity-frequency levels that influenced several subsequent studies but has been neglected of late, probably because of the general drug focus of most surveys.

One of the most widely used measures of heavy drinking in recent surveys is the prevalence of drinking five drinks in a row (in a single setting or occasion) in the past two weeks. This is generally referred to as occasional or episodic heavy drinking, or—as in the Monitoring the Future survey—binge drinking. Although the term "binge" is not entirely appropriate, we follow this convention in this review in order to more easily distinguish this from other heavy-use measures.

Another approach has been to ascertain the prevalence of drunkenness based on self-report of ever having been intoxicated on alcohol or having experienced acute adverse effects associated with consuming too much alcohol (blacking out, getting sick). In these measures, respondents interpret for themselves what constitutes intoxication or drunkenness. Such self-perceptions are also fraught with interpretive difficulties, particularly as very little alcohol may produce feelings that are interpreted as drunkenness among some youth.

Methodological differences in the manner in which data is collected can also significantly influence results. For example, the two most widely-cited sources of national information about adolescent alcohol consumption, as well as other drug use—the MTF and NHS—produce widely divergent prevalence estimates. Figure 1 compares for 1991 the NHS rates for 12- through 17-year-olds with MTF's 8th-, 10th-, and 12th grade data averaged together to better approximate the same age spread. The MTF data report roughly 80% "ever" alcohol use (lifetime prevalence); NHS, only 46%. MTF reports 68% "past year" use (annual prevalence); NHS, 40%. And MTF's figure for "past month" is fully double NHS's figure (41% vs. 20%). Even removing 12th graders from the MTF survey—leaving only 8th- and 10th graders and thus reducing the age difference between the two samples—reduces the MTF/NHS disparity only a little (see Figure 2). The effect of removing 12th-graders is relatively small because, as will be shown, incidence rates in consumption usually peak in the 10th and 11th grades.

Figure 1
NHS (Age 12-17) and MTF (Grades 8, 10, & 12) Reported Alcohol Use Levels, 1991 (Ever, Past Year, & Past Month)

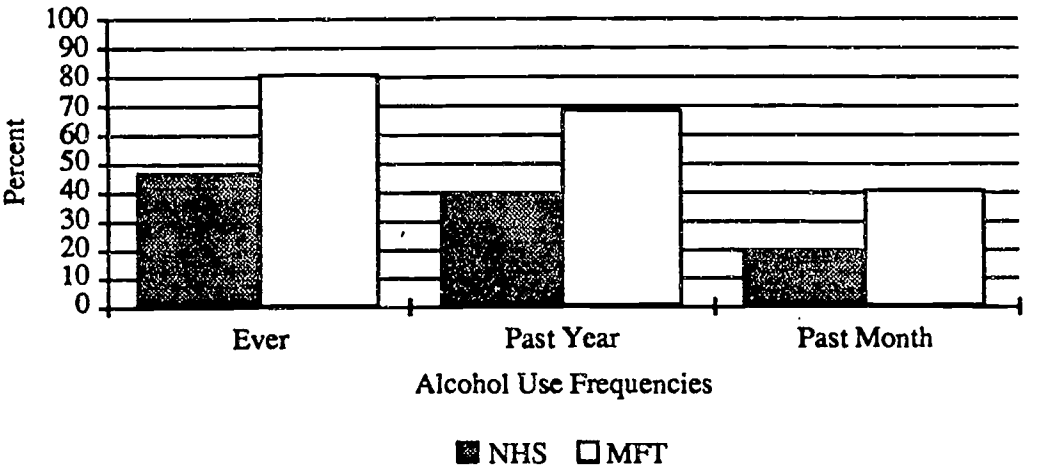
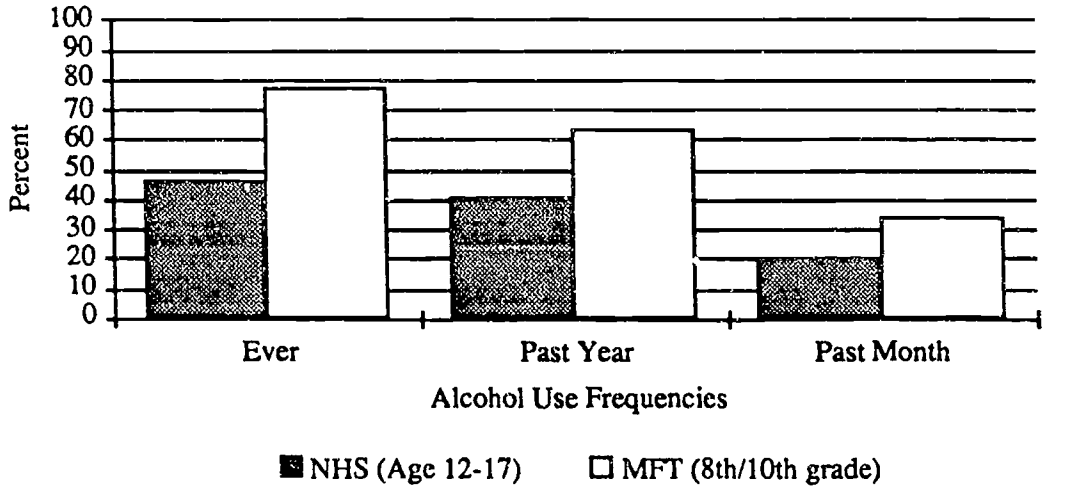


Figure 2
NHS (Age 12-17) and MTF (8th/10th Graders) Reported Alcohol Use Levels, 1991 (Ever, Past Year, & Past Month)



It is doubtful that the difference in the age-range covered by the NHS and MTF samples accounts for the differences in reported results regarding drinking. As will be shown, for the same years, almost all local and state surveys report rates of use higher than those in the NHS for comparative ages. It would appear that the NHS methodology, specifically the use of face-to-face interviews conducted at home and a high nonparticipation rate, results in underestimating the prevalence of adolescent use of AOD (Murray, Perry et al. 1987). Researchers have known for some time that interviews conducted in young respondents' homes generate lower reports of AOD use than do interviews conducted at school (Zanes & Matsoukas 1979; GAO 1993). A variety of plausible reasons have been offered—including that inschool respondents enjoy greater anonymity than inhome respondents, that home-sited interviews are often conducted within earshot of a parent, and that (even when they are not) young respondents anticipate the embarrassing parental interrogative, "What did you say?" (Oetting & Beauvais 1990:387).

Current Consumption

This section of the Overview reviews recent (generally since 1990) evidence on the current prevalence and level of drinking among elementary and secondary school students.

Elementary School

Until recently, almost all we knew about drinking among elementary school-age youth was based on retrospective data collected from secondary school students, the reliability of which is limited by recall problems. This is particularly true for lifetime prevalence. For example, over the four administrations of the California Student Survey, 11th graders consistently reported lower rates of lifetime drinking at age 12 than did 7th graders (Skager & Austin 1993). About a third less MTF seniors report initiating drinking in the 6th grade than do 8th graders. In part because of the spread of prevention programs in elementary schools, the number of surveys of this age group has risen, particularly for 6th grade. Nevertheless, the ADAS is the only source of information on elementary students above the state level and across all surveys we still know little beyond overall prevalence measures. The available evidence does suggest that roughly one-third of today's 6th graders have at least tasted alcohol, that about 10% are current drinkers, and 2% are already heavy or problem drinkers.

Use Prevalence

Looking at lifetime prevalence rates, surveys conducted in the mid- to late 1980s suggested that as many as half of 6th graders may have tried alcohol. In a multiethnic sample of urban 5th graders in Seattle, lifetime drinking in 1985-86 differed markedly across ethnic groups and genders within groups, but the results suggest that almost half the sample had tried it. Male/female rates per ethnic group were 57%/41% for whites (46% of the sample), 37%/43% for blacks, and 26%/8% for Asians (Gillmore, Catalano et al. 1990). In a sample of 943 4th and 6th graders in the Anchorage School District in 1988, lifetime rates ranged from 50% to 67% across ethnic groups, with the two largest groups (Native Alaskans and Whites) reporting a rate of 52% (Segal 1992:302). Lifetime rates in rural New Hampshire in 1987 were higher: rising from 46% of 4th to 71% of 6th (Stevens, Youelles et al. 1991). In Washington, DC, in 1989-90, 60% of male 5th- and 6th-graders, and 52% of females, reported *ever sipping* alcohol (Bush & Iannotti 1992*, 1993).

Most local rural surveys show little difference in lifetime rates compared to urban areas (e.g., Steven, Youelles et al. 1991). Among the mid-Western rural 6th graders surveyed by Sarvela & McClendon (1987), the lifetime drinking rate was 42%. In one exception, when

asked "do you drink alcohol," 5th and 6th graders surveyed by Fournet, Estes et al. (1990*) in rural Texas reported a much lower lifetime rate of only 17%. This may have been due to the wording of the item. Respondents may have interpreted this question as referring to current drinking rather than any ever trying.

Surveys conducted since 1990 suggest that about one-third of 6th graders have tried alcohol. In the 1992-93 ADAS, ever use was reported by 17% of 4th and 33% of 6th graders. In state surveys the rate for ever trying alcohol among 6th graders was 31% in Hawaii and 33% in Washington, and 33% in New York for not just sipping or tasting alcohol. (The rate among New York 5th graders was much lower at 25%.) Among almost 7,000 6th and 7th graders surveyed in 1990 in the greater Miami (Dade County) area, the lifetime rate was 37% for the total sample, with nonHispanic Whites showing the highest prevalence at 48%, followed by Cubans at 41%, other Hispanics at 32%, and Blacks at 25% (Vega, Zimmerman et al. 1993).

Generally, prevalence rates decline when 6th graders are asked about ever drinking beyond just trying alcohol. In the Washington and Hawaii surveys, rates for consuming their first *full drink* were 17% and 18% by age 12, when most were in the 6th grade. For drinking *without parental approval or knowledge*, Bush and Iannotti (1992*) found lifetime prevalence rates among 4th and 5th graders of 19% among males and 11% among females, compared to 59% and 47%, respectively, for ever sipping. In the 1992 California DATE survey of about 6400 4th-6th graders statewide, 15% of 4th, 21% of 5th, and 29% of 6th graders reported having tried alcohol *without their parent's knowledge.*

Data on annual and current use is considerably more limited, but indicate much lower rates. Depending on the alcoholic beverage consumed and treatment group in a prevention program evaluation, Dielman, Shope et al. (1986) estimated that 7% to 13% of 5th & 6th graders at pretest—and 14% to 21% six months later at post-test—had consumed alcohol in the past year. Similarly, for 5th-6th graders in the 1990 NY survey, the six-month rate was 13% and the current-use rate was 8%. For 6th graders only, use in the past month was reported by 13% in both Hawaii and Washington, and 10% in the 1992 ADAS.

Retrospective data from 7th and 8th graders on age of initiation are generally consistent with these self-report data from 6th graders in suggesting lifetime prevalence rates of one-third to one-half. In the 1990 Youth Risk Behavior Survey, 34% of 9-12th graders had first consumed alcohol before age 12 (CDC 1991). In both the 1991 CSS and 1992 DATE surveys in California, about 50% of 7th graders indicated that they had tried alcohol by age 11 (6th grade). Among 8th graders, the rate was 36% in the 1991 MTF and 37% in 1992 (22% before 6th grade in 1991). In Washington state, 31% of 8th graders reported they had had their first *full drink*, by age 11 or 12; in Hawaii, 36%.

Level of Use

The considerable decline in rates from ever use to past month suggests that most drinking is limited to occasional experimentation and does not continue on a regular basis. Data on patterns of use support this. Most 6th graders, it is evident, have had very limited experience with alcohol, although the sources of information are themselves very limited. Few are regular drinkers. Although 37% of 6th/7th graders had tried alcohol in Miami, only 19% had consumed it two or more times (Vega, Zimmerman et al. 1993). In the 1992 Washington state survey, under 2% of 6th graders reported drinking beer, wine, wine coolers, or spirits once a month or more. Only 3% drank any alcohol three or more times in the past month.

Stevens, Youelles et al. (1991*) calculated a monthly ("regular") drinking rate of 6.3% among 4th-6th graders and 10% for 6th graders only. Only 2.3% of the rural mid-Western 6th graders surveyed by Sarvela and McClendon (1987) drank more than once a week (vs.

42% lifetime use). Twenty percent drank once a year; 16%, four or five times.

Whereas 12% of 6th graders in Washington state reported that they usually drank less than one can or glass of beer or wine per occasion, only 4% drank more. Equivalent or lower rates were reported in the Hawaii survey on the same item. In both the Hawaii and Washington surveys, only 1% or less of 6th graders were classified as "high" drinkers based on drinking daily or consuming five drinks in a row at least once a month. Both these surveys reported that about 5% of 6th graders had consumed five drinks in a row in the last two weeks. About 2% reported doing this twice or more, suggesting a pattern of weekly binge drinking, undoubtedly on the weekend.

Drunkenness. Sixth graders in the 1992 ADAS reported a lifetime drunkenness rate of 5% (and a current rate of 1%). Most other surveys suggest a higher rate. In Dielman, Shope et al.'s (1986) survey of 5th and 6th graders, 8-10% reported having been "very drunk" in the past year (vs. 7-8% for ever having a drink of beer, 8-9%, of spirits, and 11-13% of wine). At post-test six-months later, the rates had increased to 9%-13% (average 11%). Consistent with this, 11-13% reported that they had been sick to their stomach after drinking.

In the 1992 California DATE survey, 17% of 6th graders—and 8% of 4th and 10% of 5th—reported having ever been drunk. This is about half the rates for ever having tried alcohol without parental knowledge for grades 4 and 5, and slightly over half for grade 6. Consistent with these findings, 16% of DATE 7th graders had been intoxicated on alcohol by age 11. Across four administrations of the biennial CSS since 1985, roughly 12% of 7th graders have reported being intoxicated on alcohol at least once by age 11 (range 9.5%-12.7%). Among 1992 MTF 8th graders, 8.5% indicated that they had been drunk by the 6th grade; 3.7% by grade 5.

Dielman, Shope et al. (1986) developed a three-item overindulgence index that included drinking more than planned, feeling sick after drinking, and getting very drunk. Based on this index, they classified 8-17% of the 5th-6th grade students in their sample as alcohol "misusers" at pretest. These rates were seen as "higher than expected" and indicated that "the probability of encountering an elementary school student with at least occasional alcohol misuse problems is not as rare as one might expect" (p. 278). Given that their sample reported annual prevalence rates of 14% to 21%, depending on the beverage and treatment group, these misuse rates appear surprisingly high. In contrast, only 2-3% of their sample had encountered complaints about their drinking from their parents and/or peers. Stevens, Youelles et al. (1991*) calculated a similar rate of problem drinking (monthly with at least one incidence of drunkenness to the point of being sick) of 2% among 4th to 6th graders and 3.6% for 6th graders only.

Secondary School Students

In contrast to the meager data on elementary school students, there is a wealth of information about secondary students. For simplicity's sake, this discussion will focus on presenting research findings for 7th and 8th graders, at the beginning of secondary school, and then for 11th and 12th graders.

Use Prevalence

Seventh & Eighth Graders (12-14 Years). Initiation of alcohol consumption begins to increase markedly in the 7th and 8th grades. Seventh-grade ever use ranged from 54% in the 1992 ADAS, to around 60% in the 1991 CSS and DATE surveys. For 8th graders, the 1992 ADAS and MTF reported rates of 68% and 69%, respectively; the 1992 DATE, 74%; and the 1988 New York OMH, 78% (66% for 7th graders). Again, the percentages for consuming a full drink were lower: in the 1992 Washington survey, 55%; and in the 1991 Hawaii survey, 56%.

About half of 8th graders appear to have consumed alcohol in the past 6 to 12 months. The annual prevalence rate in 1992 for 8th graders was 54% in the MTF;

52% in the ADAS; and 47% in the 1990 New York survey for 7th and 8th grades combined. A roughly equivalent six-month rate of 45% was reported in the California DATE survey (39% for 7th graders).

At least a quarter of 8th graders appear to be current (past month) drinkers (comparative data for 7th grade is lacking). The current use rate in the 1992 MTF was 26% ; the 1992 ADAS, 27% (17% for 7th grade); the 1992 Washington, 24%; and the 1991 Hawaii, 27%. In their 1983 Minnesota survey, Murray, Perry et al. 1987) reported rates of 28% for 12-year-olds and 29% for 13-year-olds. For 7th-8th graders in the 1987 North Carolina survey, the rate was lower, at 18% (Palmer & Ringwalt 1988).

11th & 12th Graders. Prevalence rates increase with age through the secondary school years, but the rate of increase tapers off markedly in the 11th grade (age 15-16). By this time, almost all youth have tried alcohol. Fournet, Estes et al. (1990*) determined that alcohol initiation rates peaked between the ages of 13 and 15, then sharply declined. As a result, there is usually less difference in ever use rates between 11th and 12th grades than between earlier grades. For example, the lifetime rates of 12th graders in the 1988 New York survey, the 1990 YRBS, and the 1992 ADAS were only about 2-3 points higher than those of 11th graders; and in the 1992 DATE survey, 5 points higher.

Most surveys of seniors indicate lifetime rates from the low 80s (1991 Hawaii, 1992 Washington) or mid-to-high 80s (1991 CSS, 1992 DATE, 1992 MTF), with the 1992 ADAS and 1990 YRBS reporting rates of 91% and 92%, respectively.[5] In the 1991 YRBS, the national lifetime rate was 82% for 9-12th graders (compared to 88% in 1990), with a range among the state and local surveys of 50%-87% (median 77%). This compares with 46% for 7-12-year-olds in the 1991 NHS (39% in 1992), and 69% for age 16-17.

Most surveys report annual or six-month prevalence rates in the 70s or low 80s. For example, the 11th-grade rate in the 1991 CSS rate was 77%; the 1992 DATE, 70%; and the 1992 ADAS, 76%. Among 12th graders, the 1992 MTF rate was 77%; the 1992 ADAS, 81%; the 1990 NYS, 76% for both grades combined, and in the 1988 New York OMH survey, it was 84% for 11th and 87% for 12th.

It appears that at least half of all upper graders are current drinkers (past month), with slightly larger differences between 11th and 12th graders than found for lifetime rates. The current-use rate for seniors nationally was 51% in the 1992 MTF; 55% in the 1992 ADAS; and 66% in the 1990 YRBS (59% for all 9-12th graders). In state surveys, it was 55% in the 1992 WSS and 62% in the 1988 New York survey. For 11th graders, the ADAS rate was 49%; the YRBS, 61%; and the 1988 New York rate, 56%. It was 45% among 11-12th graders in the 1987 North Carolina survey. For 9-12th graders, the rates in the YRBS were 59% in 1990 and 51% in 1991, with a range of 24%-60% (median 46%) in the state and local data for 1991. A comparison of current and lifetime rates within each survey further suggests that over half of those who had ever tried alcohol continued to drink on at least an occasional basis by the upper grades of high school.[6]

Level of Use

In a longitudinal study of the relationship between problem drinking in adolescence and in young adulthood among males, Temple and Fillmore (1985-86) determined that drinking to the point of feeling high rapidly increased between the years of 16 (12%) and 21 (49%), after which it leveled off. Consistent with this, adolescent surveys reveal that drinking levels continue to rise with age even after the increase in ever use tapers off. Measures of regular and heavy drinking are still relatively low in the 7th grade. By the 11th and 12th grades, it appears that almost one-fifth of students are weekly drinkers; at least one quarter have engaged in binge drinking; about two-thirds have

been drunk at least once; and possibly one-third can be classified as heavy drinkers.

Weekly Drinking. Alcohol is the most commonly used drug when students are asked about their frequency of AOD use once a week or more often (weekly use). Rates appear to rise from very low levels in 7th grade to about one-fifth of 11th and 12th graders. In the 1991 CSS, weekly beer drinking in the past six months rose from 3% of 7th graders, to 9% of 9th, and 17% of 11th. Similar results were reported by the 1992 California DATE survey and the ALERT survey (with a minimum of two drinks per week). In Washington in 1992, beer drinking at least weekly *in the last 30 days* was reported by 4% of 8th graders, 9% of 10th, and 17% of 12th.

For combined samples of 7th-12th graders, a weekly rate of 20% was reported by Gibbons, Wylie et al. (1986), and 24% by the 1988 Alaska Student Survey. Of the 17% of 1991 NHS 12-17-year-olds who drank in the past month, only 5% drank on five or more occasions, or 29% of all drinkers. For grades 5-12, a rate of 14% was reported by Fournet, Estes et al. 1990*. Among 12- through 17-year-olds, the 1992 NHS estimated that 4% were weekly drinkers in the past year (vs. 21% occasional drinking). In Kelleher, Rickert et al's (1992) survey of middle school students (grades 6-8) in four different regions of Arkansas, rates for drinking more than once a week varied from 12% to 35% depending on area.

Daily Drinking. Daily drinking among secondary students has always been low, generally reported by no more than 1-3% even for seniors. When comparative data are available, daily marijuana use is generally higher than for beer or other alcoholic beverages (Skager & Austin 1993; Einspruch & Pollard 1993). The daily drinking rates for the 1992 MTF were 1% or less among 8th and 10th graders and 3.4% among 12th. Rates for the same grades in the WSS were all 1% or less, as were those for the 1988 New York survey and 1991 CSS for 9th and 11th graders. Similar results for grades 7-12 were reported by the 1988 Alaska survey and by Fournet, Estes et al. (1990*). In the 1991 Hawaii survey, a category of daily or binge drinking resulted in slightly higher rates, from 4% of 8th graders to 18% of 10th.

Heavy/Problem Drinking. Rachal, Maisto et al. (1982) developed a quantity-frequency drinking level classification scheme which included six categories: (a) "heavier drinkers," who drank at least weekly with large amounts per occasion; (b) "moderate-heavier drinkers," who drink weekly using medium amounts per typical drinking occasion or 3-4 times a month with large amounts per occasion; and (c) moderate drinkers, at least once a week but small amounts; as well as light and infrequent drinkers (only once a month in moderate or light amounts, respectively) and abstainers. For 10-12th graders in 1978, they estimated that 15% were heavier drinkers and 17% were moderate-heavier drinkers. A similar proportion (17%) was classified as moderate drinkers. In short, about a third of 10th-12th graders were at least moderate/heavier drinkers, a third were moderate/light drinkers, and a third fell into either the abstainer or the infrequent drinker categories. Analysis of the 1980 national Gallup phone survey, using this same quantity-frequency index, yielded similar estimates of 10% heavier drinkers and 18% moderate-heavier for 16- to 18-year-olds (Zucker & Harford 1983).

On the basis of Donovan and Jessor's (1978) definition of *problem drinking*, Rachal, Maisto et al. (1982:82-93) also formulated a definition of alcohol *misuse* as drunkenness at least six times in the past year, or negative consequences two or more times in the past year in at least three of five areas, or both. In 1978, 31% of 10th through 12th graders were so classified (17% in 1974), with 17% abstainers and 52% moderate users. Not surprisingly, 85%-88% of the "heavier" drinkers were classified as misusers, depending on gender.[7] Most were so classified on the basis of their frequency of drunkenness.

The National Longitudinal Survey of Labor Market Experience in Youth uses a heavy drinking definition of consuming 6

or more drinks on 2-3 occasions in the past month. This definition yielded heavy drinking rates for 1983 of 50% for 17-year-old *drinkers* and 52% for 18-year-old *drinkers* (Grant, Harford, & Grigson 1988). The 1991 NHS estimated that 2.3% of adolescents (age 12-17) were heavy drinkers, consuming five or more drinks per occasion on 5 or more days in the past 30 days. Among all youth under age 21, 6% were heavy drinkers (vs. 32% any use), a much higher proportion than those over age 21. In addition, Bailey (1992) categorized 26% of 9th-11th graders in 1989-90 as heavy drinkers based on the rather liberal criteria of drinking three or more drinks on a typical occasion in the past year.

Binge Drinking. Reflecting the rise in rates of heavy drinking with age, Table 2 suggests that about 13% of 7th and 8th graders, increasing to a quarter to almost a third (c. 27-30%) of 11th and 12th graders, are current binge drinkers (i.e., consumed five drinks in a row in the past two weeks).[8] (The 1988 NASHA rate was slightly higher at 32% for the combined sample of 8th and 10th graders.) For the most part, rates double across the secondary school years. Furthermore, in the MTF, Hawaii, and Washington surveys, these rates at each grade were about half those reported for drinking in the past month; in other words, about half of current drinkers consumed five drinks in a row in the past two weeks.

For many of these youth, this is not an isolated occurrence. Half or more of binge drinkers (about 15% of all upper graders) may engage in this behavior weekly (twice or more in the past two weeks). This rate rose between 7th and 11th grade from about 7% to 15% in the CSS, and from 8% to 19% in the DATE survey. Between 8th and 12th grades, it rose from 7% to 19% in the MTF and from about 6% to 15% in the Washington and Hawaii surveys. In the New York State surveys, 13% of 7-12th graders in 1983 and 9% in 1990 were classified as heavy drinkers based on being weekly drinkers who consumed at least 5 or more drinks per occasion (Barnes & Welte 1986; Barnes & Farrell 1992; New York 1991). In addition, 16% in 1983 and 11% in 1990 had consumed five or more alcoholic beverages at one time at least once a week. In the Hawaii and Washington surveys, 4-5% of 8th graders, 13-17% of 10th, and 21-26% of 12th graders reported that they *usually* drank five or more drinks at one time—rates only slightly lower than those for current binge drinking.[9]

Surprisingly, no major survey seems to have asked whether youth *ever* consumed five drinks in a row, but as the assessment time-frame widens, the proportion of youth reporting having consumed five drinks in a row does increase. The 1990 national YRBS, rates for the *past month* rose from 28% of 9th graders to 44% of 12th (37% for grades 9-12), roughly two-thirds of all drinkers. Although the state and local YRBS rates ranged from 11% to 47% in 1990, the median was 35%, very similar to the national rate. The same was true for the 1991 survey (state range 12% to 43%, median; national rate 31%).

Table 2
Binge Drinking (5 Drinks in a Row in the Past Two Weeks)

	Grade					
	7	8	9	10	11	12
Study	%	%	%	%	%	%
1991 California	13	—	19	—	26	—
1992 DATE	14	19	21	25	30	31
1991 Hawaii	—	12	—	19	—	23
1992 MTF	—	13	—	23	—	28
1991 Washington	—	11	—	18	—	27

In the 1988 NYS, 25% of 7th graders, 40% of 8th, 68% of 11th, and 71% of 12th reported having five drinks in a row in the *last year*. This was a rise from 38% to 75% of all *drinkers* across these grades. Among 10th and 12th graders, this was about 80% of the rate of annual drinking. In other words, the great majority of all upper graders who drank in the past year had had five drinks in a row at least once. In the ALERT survey, 93% of 8th-grade weekly *drinkers* consumed three or more drinks on a single occasion in the previous month (Ellickson, Hays, & Bell (1992:443). This suggests the great majority of high school drinkers had engaged in this behavior.

Drunkenness. As evident in Table 3, self-reported rates of having been drunk or intoxicated on alcohol at least once rise from almost one-sixth of 7th and over one-quarter of 8th graders, to about two-thirds of 11th and 12th graders. Among 7th and 9th graders, Bloch, Crockett, and Vicary (1991) estimated that 64% had been drunk, and 33% of these at least monthly (13% weekly). In the CSS, the percentage of students who had ever been intoxicated from alcohol rose with each grade level, from 17% of 7th to 57% of 11th graders (29% and 67%, respectively of ever drinkers). The proportional increase in the rate of having been drunk was greater than that for ever having tried alcohol. DATE rates in 1992 for the same grades were slightly higher, from 21% to 64%, and 70% among 12th graders. In the 1992 MTF, rates increased from 27% among 8th graders, to 48% among 10th, and 63% among 12th. ADAS rates were similar at 24%, 49%, and 69%.

In contrast to the case with lifetime prevalence, retrospective data from older adolescence about the age of first intoxication on alcohol appears to be more valid and support self-report data from 7th graders. In the CSS, 11th graders reported rates of intoxication by age 12 similar to those of 7th graders (17% and 16%). It would appear that the experience of first intoxication from alcohol is a more memorable experience than the age of first alcohol consumption. Among the secondary students (grades 7-12) in the 1983 New York State survey, Barnes & Welte (1986a) found that 14% had been drunk or very high at the age of 11 or younger, 28% at age 12 or 13, 35% age 14 or older, and only 23% never.

Table 3
Lifetime and Current Drunkenness or Alcohol Intoxication by Grade Level

	Grade					
	7	8	9	10	11	12
Study	%	%	%	%	%	%
Lifetime						
1992 ADAS	12	24	37	49	59	69
1991 CSS	17	—	36	—	57	—
1992 DATE	21	34	47	59	64	70
1992 MTF	—	27	—	48	—	63
1991 WSS		24				60
Past Year						
1992 MTF		28		37		50
1988 NYS (OMH)	19	31	47	56	66	71
Current						
1992 ADAS	4	8	15	22	28	34
1992 MTF	—	7.5	—	18	—	30

The 1992 ADAS and MTF similarly indicated that about 8% of 8th, a fifth of 9th, and about a third of 12th graders had been drunk at least once in the past month.[10] These rates were slightly less than half of those for ever drunk in 10th and 12th grades and about one-third of 8th. In the MTF, these rates are slightly lower than those for binge drinking in the 8th and 10th grades and slightly higher in the 12th, suggesting that the practice of binge drinking and the experience of drunkenness may be related. In both the ADAS and MTF, it appears that among those who drank in the past month, about a third of 8th graders got drunk at least once during this period, about half of 10th graders, and over half of 12th graders.

In the 1992 MTF, relatively few seniors (less than 10%) reported that they *usually* got very high when drinking and 24% said they usually got "not at all high." Nevertheless, nearly half usually got at least moderately high. Johnston, O'Malley, and Bachman (1993:169) observe: "However, for a given individual we would expect more variability from occasion to occasion in the degree of intoxication achieved with alcohol than with most of the other drugs. Therefore, many drinkers surely get very high at least sometimes, even if that is not 'usually' the case, which is what the question asks."

Substantial numbers of 1991 CSS students had been very drunk or sick from drinking at least once, with rates almost doubling between each of the grade levels, from 12% of 7th, 23% of 9th, to 40% of 11th graders. Not surprisingly, these rates were only slightly lower than those for lifetime drunkenness. Among *drinkers* only, this amounted to almost half of 9th graders (47%) and 61% 11th graders. Although the great majority had been so only once or twice, 12% of 9th- and 20% of 11th grade drinkers had been very drunk/sick three or more times (6% & 13% of total samples).

In the CSS, when asked how they liked to drink, the percentages of youth who reported that they drank only a sip or two were relatively large and stable across grades (29% in 7th and 21% in 11th grade). Relatively few students preferred to drink to get drunk (5% in grade 11). Rates for those who liked to drink to feel it a lot or get drunk were 5%, 13%, and 19%, by ascending grade level.[11] Among *drinkers* only, 22% of 9th and 27% of 11th graders liked to drink to feel it a lot /get drunk. Across grades, the percentages of students reporting liking to drink only a sip or two were similar to the percentages who had never been very drunk/sick, and suggest a relatively stable level of experimentation at about 25%.

To better gauge the proportion of at-risk drinkers, Skager and Austin (1993) developed a summary measure of excessive alcohol use (EAU) for the 1991 CSS. This measure was based on three indicators, any one of which established EAU status:

- having five or more drinks *at least twice* in the previous two weeks, which suggests a pattern of weekly heavy drinking;
- being very drunk or getting sick from drinking three or more times, which suggests a failure to learn avoidance of a major negative consequence of drinking; and
- liking to drink for the purpose of getting drunk.

Based on meeting any one of these three criteria, 19% of CSS 9th and 28% of 11th graders were classified as at high-risk based on their alcohol use. These rates were consistent with the CSS results for current binge drinking. They were also substantially higher than the rate of students categorized as at high-risk based on illicit drug use (11% and 18%, respectively). This suggests that considerably more respondents could be considered at high risk from alcohol use than from other drug use.

Noncontinuation or Cessation

Consistent with the evidence that 30-day prevalence rates indicating among upper graders are generally greater than half those for ever use, the majority of youth who try alcohol continue to drink it

at least occasionally. They are less likely to stop than those who have ever tried an illicit drug. Very few of the lifetime drinkers among the 9th and 11th graders in the 1991 CSS reported that they had tried to quit drinking. Only about 5% of students at both grade levels reported that they had tried alcohol but did not drink any during the past year. Similar percentages (4% in 9th grade and 7% in 11th grade) had stopped for less than a full year, and 3% and 5%, respectively, had stopped but relapsed. In contrast, 41% of 9th and 51% of 11th graders drank and never attempted to stop, about three-quarters of drinkers at each grade level. Cessation rates were proportionally much higher for illicit drugs.

The MTF has consistently reported extremely low rates of "noncontinuation" of drinking—defined by the percentage of 12th graders who had ever consumed alcohol but did not in the twelve months prior to the survey among.[12] In 1992, the noncontinuation rate for seniors was only 12% (88% lifetime vs. 77% past year). In contrast, the rate was 33% for marijuana and 49% for both cocaine and stimulants. For 8th graders, the noncontinuation rate for alcohol was higher (23%), compared to about the same for marijuana (36%). This suggests that as youth age they are less likely to stop drinking once they begin, whereas the likelihood of stopping marijuana use remains about the same.

Using the same method to calculate alcohol noncontinuation rates for other surveys yielded similar rates of 24% and 11% for 8th and 12th graders, respectively, in the 1992 ADAS; 13% for 1991 NHS 7-12th graders; and 13% for 8th plus 10th graders in the 1987 NASHS. The lifetime and six-month prevalence rates in the 1991 CSS yielded noncontinuation rates of 12% for 7th graders and 9% for 11th graders. Thus, the rate of noncontinuation declines across the secondary school years until only about one in ten upper graders who have ever tried alcohol do not drink within the past 6 or 12 months. But even at the beginning of secondary school years, only a little over a fifth of ever drinkers appear to not be drinking.

In addition, Project ALERT determined that 91% of youth who drank in 7th grade also reported past-year drinking during 12th grade, and 70% past-month drinking (Ellickson, Hays, & Bell 1992). In the National Longitudinal Survey of Labor Experiences of Youth (ages 17-24), 87% of current drinkers in 1982 still drank in 1983, and 71% of those who reported heavier drinking in 1982 remained drinking at that level in 1983. In contrast, only 13% of drinkers became abstainers, indicating a general tendency was toward stability and continuity in drinking behavior (Grant, Harford, & Grigson 1988). Similarly, in a sample of rural youth between 1979 and 1982, Winfree (1985) found that early alcohol use was likely to be followed by increasingly higher levels of involvement. Marijuana use differed: Some increased use; some initiated use; and some decreased use, most becoming abstainers. Marijuana appeared to attract "a small but stable core of users over the years and a fluctuating cadre of experimenters" (p. 509).

Discussion

Making sense out of the diverse measures of alcohol use is difficult. Current survey data does make it clear that alcohol is by far the most popular drug, but few definite conclusions can be drawn regarding the prevalence, quantity, and frequency of use. Variations in use measures, sample ages, and survey methodologies make comparison difficult even between national surveys. While state data can help fill gaps, regional variations in use need to be taken into consideration. At best, then, many of the overall estimates that we have attempted to make about the scope and nature of adolescent drinking must be considered only rough estimates. But in the light of more definitive data, they at least provide some guidelines for future research and program development.

Among 6th graders, although the data are limited, the most recent findings suggest that roughly one-third have at least tried alcohol, possibly as many as half if one also takes into consideration studies

conducted in the mid-1980s. However, for the great majority, their experience is limited to occasional experimentation (sipping or tasting), often with parental knowledge. Much of this may be associated with religious rituals or ceremonies, although few studies specifically explore this. Prevalence rates decline in surveys in which 6th graders are asked about drinking without parental knowledge, about having a full drink (to under 20%), or about drinking in the past month (to about 10%). Few appear to drink regularly or consume large amounts when they drink.

Nevertheless, for a small but important minority of 6th graders, something more than just experimentation is occurring. About a tenth (and possibly as many as 15%) may have already been drunk or have misused alcohol (as defined by Dielman) at least once. About 5% may be engaging in monthly or binge drinking; and around 2% may have developed a pattern of heavy drinking based on having been drunk more than once, had five drinks in a row in each of the past two weeks, or encountered trouble because of their drinking.

Based on their estimate that 8-17% of elementary students misuse alcohol, Dielman, Shope et al. (1986:278) caution that "the probability of encountering an elementary school student with at least occasional alcohol misuse problems is not as rare as one might expect." This, however, is a relative statement. They are on surer ground when they emphasize the need to direct attention toward the 1-3% of youth in their sample who encountered complaints about their drinking:

> The percentages in this category are small, but encountering social difficulties due to alcohol misuse in the elementary school years could serve as an early warning signal of future alcohol-dependency problems and alert the clinician to watch for these signs as the adolescent enters the junior high school years, where the opportunities and encouragement to misuse alcohol increase.

Among upper secondary youth, data across local, state, and national surveys shows that experimentation with alcohol consumption is almost universal, suggesting the existence of a "ceiling" effect. Little has changed since Clayton and Ritter (1985:74) observed, based on survey data from 1975-1982, that "These figures could be higher, but only theoretically. Practically speaking, it is not likely that higher proportions could be involved." By the last years of high school, most surveys indicate that alcohol use in the past month or year is equal to the combined use of cigarettes and any illicit drug. Rates of use in the past year are only slightly lower than those for ever use (resulting in relatively low rates of noncontinuation) and almost half of upper graders are current drinkers (drank in the past month).

Much more uncertainty surrounds the level of consumption, but among upper graders it appears that about two-thirds have been drunk at least once. One-quarter, and possibly as many as one-third, might be classified as at least occasional heavy drinkers based on the results across studies for current binge drinking, current drunkenness, and other measures of excessive use. Possibly one-half of current drinkers in the 10th grade and over half of 12th may have been drunk in the past month. Furthermore, around a fifth may be weekly drinkers and possibly 15% engaging in weekly binge drinking (i.e., consuming five drinks in a row at least twice in the past two weeks).

The statistics on binge drinking are particularly disconcerting. Not only was it reported by about one-third of upper graders, but by half of current drinkers and the large majority of those who drank in the past year. As Ellickson, Hays, and Bell (1992:443) observe: "Because of their inexperience with alcohol, young adolescents who have several drinks on one occasion are highly vulnerable to a variety of alcohol-related problems: losing control over their actions, exercising poor judgment, and engaging in high-risk activities such as unprotected sex, driving while intoxicated, or riding with a drunk driver."

Taken as a whole these findings suggest the need to focus less on rates of lifetime (ever) use, the meaning of which is often unclear, and to better clarify levels and patterns of regular and heavy drinking. Given the recall problems surrounding age of first use, it also would appear that age of first intoxication might be a better gauge for monitoring alcohol-use involvement. But self reports of drunkenness must also be viewed with some caution. What is the meaning of drunkenness to youth? Among many youngsters, a small amount of alcohol may produce feelings of drunkenness and it would be interesting to determine how many youth find the experience unsettling and subsequently confine their drinking to small amounts. Considering that the binge drinking item has become one of the more standard measures of heavy use, it is surprising how little attention has been paid to examining the meaning of this behavior and how it relates to other patterns of drinking and acute consequences.

Finally, it is important to keep in mind that all these data refer only to students. They exclude dropouts and underrepresent chronic absentees, both of whom have been shown to be significantly more drug-involved than students (Austin & Horowitz 1993; GAO 1993). This may be one of the sources of inaccuracy attached to both the MTF and the NHS studies.

Use Patterns and Consequences

Even less is known about use patterns and consequences than about overall prevalences, but increasing attention has been directed toward filling this gap in our knowledge. Although a thorough review of this literature is beyond our scope, three issues emerge in the current research that are relevant to prevention. They help place the consumption rates into context and give them meaning:

- What is the relationship of the initiation of alcohol consumption to that of other drugs (the Gateway Theory)?
- What are the effects of early initiation of drinking on subsequent patterns of AOD use?
- What are the long-term consequences of adolescent drinking?

Progression to Other Drug Use: The Gateway Theory

Does the initiation of alcohol use increase the risk for use of other drugs? Since the revolution in teenage AOD use began in the 1960s, it has been apparent that the greater involvement with one drug, any drug, the greater the probability of multiple drug use (Clayton & Ritter 1985:93). In the case of alcohol, for example, 25% of 1991 NHS adolescents who were current drinkers also consumed an illicit drug in the past month, compared with only 2% of those who did not drink in the past month. Among 11th graders in the 1991 CSS, 13% were categorized as both high-risk illicit drug users and excessive alcohol drinkers. Among elementary students (grades 4-6) in rural New Hampshire, only 2.5% of alcohol abstainers had tried two or more drugs, compared to 19% of regular drinkers and 68% of problem drinkers (Stevens, Youelles et al. 1991).

One of the most commonly cited rationales for primary prevention of alcohol use—that is, preventing the onset of drinking among all youth—is the so-called Gateway Theory that alcohol use opens the way to the progression to other illicit drug use. Beginning with the work of Denise Kandel (1975), many studies have demonstrated that virtually all regular illicit drug users first consumed alcohol and that there is a fairly invariant sequence of stages in ATOD use: beginning with alcohol and/or cigarette use (trying beer and wine usually first), followed by use of marijuana, and then of other illicit or

harder drugs (Fleming, Leventhal et al. 1989; Kandel, Kesler, & Margulies 1978; Kandel & Yamaguchi 1985; Welte & Barnes 1986; Yamaguchi & Kandel 1984). Recently, Kandel, Yamaguchi, and Chen (1992*) confirmed the initial stage of alcohol and also showed that it plays a more important role in the progression to illicit drug use among men than among women, for whom either cigarettes or alcohol was a sufficient condition to progress to marijuana (see also Kandel & Yamaguchi 1993; Kandel 1989).

Kandel's original model focused almost exclusively on the temporal ordering of entry into the *use* of different drug categories. Less is known about how escalation of drinking fits into the sequence. A number of recent research studies have indicated, however, that regular, heavy, or problem drinking is an important stage in itself, which generally follows onset of marijuana use and precedes use of other illicit drugs. In a reanalysis of 1974 and 1978 NADS data, Donovan and Jessor (1983) showed that "problem" drinking (as defined in these surveys) tended to follow the onset of use of marijuana and precede the onset of use of pills and hallucinogenic drugs, which, in turn, preceded use of cocaine or heroin. Similarly, the Project ALERT evaluation revealed that over a four-years span (beginning in 7th grade) weekly drinking (at least two drinks per week) constituted an important step in the transition from marijuana to hard drug use.[13] Increasing levels of drinking provided a useful indicator of risk for using drugs, whereas knowing whether alcohol had been ever used revealed little about future likelihood (Ellickson, Hays, & Bell 1992; Ellickson & Hays 1991). Finally, among the 9th through 11th graders studied by Bailey (1992*), heavy alcohol use (three or more drinks on a typical occasion) also increased the risk of initiation of illicit drug use. Even more important than the level of use was whether youth were increasing their drinking frequency.[14]

These findings suggest that heavy alcohol use may be taken as a sign of potential marijuana use and that the Gateway Theory needs to be further explored to ascertain possible interaction between marijuana and alcohol. In this regard, Andrews (1991:182) postulates: "What may be the real public health danger of marijuana use is not in its boundary-crossing effects resulting from involvement with other more scarce drugs, but rather in its influence upon the increased use of the licit and readily available alcohol and tobacco."

The gateway imagery implies a one-way progression, that once one passes through the "gate" of alcohol use, one can never go back. Viewing alcohol as a "gateway" drug further suggests that even if adolescent alcohol use, per se, is not viewed with great concern, its potential to lead to illicit drug use should heighten concern. Adolescent drinking is afforded a slippery-slope image in which one must reckon not only its immediate perils but potential longer-term risks that use may serve to initiate the adolescent, that it will likely lead to something worse. Of course, many youth do not escalate from use of alcohol to use of other drugs, a fact often overlooked: The progression from onset of drinking to onset of other drug use is not inevitable. Alcohol drinking does not *cause* the use of other drugs. Kandel, Yamaguchi, and Chen (1992:453) emphasize that clear sequential patterns exist, but:

> use at a particular stage does not invariably lead to the use of other drugs higher up in the sequence. Many youth stop at a particular stage and do not progress further. The notion of stages in drug behavior does not imply that these stages are either obligatory or universal such that all adolescents must progress through each in turn.

Rather, they characterize the stages as "facilitative." Mills and Noyes (1984) make a similar observation and note that only a small percentage of youth progress to hard drug use and that they appear to be a distinct group from those who use licit drugs and marijuana.[15]

Illustrative of this, the 1991 CSS indicates that a fairly stable proportion of 36%-41% of 7th, 9th, and 11th graders

limited their AOD experimentation to alcohol only. Among 847 adolescents surveyed over five years by Maddahian, Newcomb, and Bentler (1985), 60% were multiple users of two or more types of substances, one of which was generally alcohol. However, alcohol proved to be an important category by itself. Single alcohol users consistently represented a relatively large proportion of the sample (more than 20%). In addition, in a study of stages of drug use over an eight-year period from early adolescence into young adulthood, Newcomb and Bentler (1986) found evidence that the importance of alcohol as a gateway substance relative to cigarettes has been exaggerated. Early alcohol use did have an influence on later marijuana and hard drug use in models that did not include cigarettes, but the role of alcohol dissipated when cigarettes were considered. By late adolescence alcohol consumption seemed to become fairly established as a stable, independent behavior without a direct influence on cannabis or hard drug use. The authors conclude that "alcohol use is not the major gateway drug that was supposed, but rather, seems to become a fairly stable and enduring behavior unto itself, with little cross-influence on other drugs . . . Clearly, cigarettes are the true gateway drug facilitating increased involved in hard drugs, without the direct impact of alcohol" (p. 118).

Even some heavy alcohol users appear avoid illicit drug use. Bailey (1992) reports that, whereas 26% of her sample were heavy drinkers, 8.5% were heavy drinkers who did not use either tobacco or illicit drugs. Although 13% of 11th graders in the 1991 CSS were at high risk from both alcohol and illicit drug use, about two thirds of all of those classified as excessive alcohol users did not meet the criteria of high-risk users of illicit drugs. This amounted to 10% of 9th and 15% of 11th graders.

Early Initiation

Early use of alcohol appears to be a strong predictor of subsequent use of alcohol and other drugs. Early onset of drinking has been related to persistence of alcohol use over time, heavier drinking, more frequent relapse, and more negative outcomes. It appears that the earlier the initiation, the less likely it is that use will be discontinued and the more likely it is that use will escalate into regular, heavy drinking patterns. Chou and Pickering (1992) found that drinking onset at age 15 or earlier was associated with increasing numbers of alcohol-related problems, and that delaying use onset until age 20 or 21 significantly reduced lifetime risk of these problems. In the 1987 NASHS, heavier drinkers had an earlier onset of alcohol use than did nonheavy drinkers. This confirms the findings of Cahalan & Room (1974) that drinking problems were more prevalent among men aged 20-25 who had begun to drink in earlier adolescence. In the 1974 and 1978 NADS, alcohol "misusers" reported that they had had their first drink at younger ages than did other users. Over half of the "misusers" had had their first drink by age 13 (Rachal, Maisto et al. 1982:87).

The evidence is even stronger that having been *drunk* at an early age is a common characteristic of adolescent heavy drinkers. Barnes & Welte (1986, 1986a) found that the second best predictor of current drinking level was the age at which the respondent first became drunk, with consumption increasing as the age of first intoxication decreased. Those who became drunk or very high by 11 years or younger reported a current consumption score of 1.98 oz absolute alcohol (c. 4 drinks per day) compared to 0.89 among those who were first drunk at age 12 or 13, 0.62 oz. at 14 years or older, and only .09 for those who had never been drunk.

The age of drinking onset has also been found to strongly predict substance use in general among older adolescents. The later youth initiate alcohol use, the lower their later involvement with drugs and the greater likelihood of their discontinuing use (Robins & Przybeck 1985:191; Kandel & Yamaguchi 1985; Newcomb, Maddahian, & Bentler 1986:527). Yu and Williford (1992*) report data from the 1986 New York State Alcohol Survey of 16 to 24-year-olds, that early onset of drinking also increased the

use of other drugs, especially when initiation occurred between the ages of 13 and 16. The earlier the initiation of alcohol "the more intensified the current drug use [i.e., marijuana & cigarettes] behaviors." In the 1987 NASHS, earlier onset of drinking was also associated with current polydrug use.

Long-Term Consequences

The most thorough study of the long-term consequences of adolescent AOD use indicates that the frequency of such use is related to the occurrence of later problems in young adulthood, but that those youth who limit their experience to alcohol experimentation tend to have far fewer long-term adverse consequences than among users who do not. Newcomb and Bentler (1988) conducted a longitudinal study of 739 teenagers beginning in early and late adolescence (junior high school) to evaluate resultant problems when they were young adults. General drug use (the tendency to use many different drugs, including alcohol) as an adolescent increased later AOD, health, and family problems. Teenage drug use, and especially cigarettes and hard drugs, produced at least some impairment in physical, social, and emotional functioning, and there was a linear relationship between the amount of drug use and the amount of drug damage. The observed negative effects of teenage drug use were not the result of very occasional or infrequent used, yet heavy drug use impaired nearly every aspect of personal, social, and career development (relationships, jobs, education, physical, and mental health).

Alcohol use per se, in contrast, had no specific negative effects and, in fact, had some positive effects: reduced loneliness in romantic relationships, self-derogation, and family problems. Several factors may contribute to this. Because alcohol is legal and may even be condoned within families, family relations may improve if teenager uses alcohol only to the exclusion of illicit drugs. Its ability to reduce social inhibitions may explain the other beneficial effects. Newcomb and Bentler (1988:72-73) caution, however, "that alcohol use is one indicator of our General Drug Use factor, which has some definite negative outcomes. Thus, we cannot conclude that alcohol use is always positive, because when it is used in conjunction with other drugs it becomes a negative influence toward health, family, and developing drug and alcohol problems."

Discussion

Most alcohol prevention efforts are targeted at stopping the onset of any use. In conjunction with the evidence regarding use prevalence and levels, the findings reviewed here suggest that we need to devote more attention toward preventing the continuation and escalation of drinking. Alcohol experimentation remains normative. Many youth who do try alcohol do not progress to regular or heavy drinking or to use of other drugs, and do not suffer serious long-term adverse effects compared to those who progress beyond this level. Thus, Newcomb and Bentler (1988*) observe that, given the widespread experimentation with drugs among teenagers and the nature of adolescence, it can be argued that not at least trying tobacco, alcohol, and cannabis as an adolescent can be considered unusual and deviate behavior. Therefore, "it would seem that [completely] eliminating the trial use of drugs among teenagers is neither an easy nor a high priority goal."

On the other hand, these findings underscore the need to expand efforts aimed at identifying and intervening with regular uses and those youth most prone to progress to problem drinking. More, emphasis should be placed not simply on thwarting first-time use but also on reducing abuse, regular use, and misuse. Efforts need to be directed towards, in the words of Newcomb and Bentler, "those teenagers who develop a lifestyle of drug use to relieve emotional distress and other life stresses." It is these youth who "will suffer long-term, negative consequences of their use."[16]

Indeed, regular/heavy drinking appears to represent a level of drug involvement greater than marijuana use. As Ellickson, Hays, and Bell (1992:447) conclude, although less than a quarter of their sample progressed to weekly drinking by grade 10, "it is from this group that the pool of hard drug initiates is most likely to be drawn." These results suggest that adolescents are likely to have been involved in a history of licit substance use characterized by increasing levels of use before progressing to and maintaining the use of other substances. Increasing frequencies of alcohol and cigarette use, therefore, may be markers for more serious patterns of substance use (Bailey 1992).

Finally, if totally eliminating alcohol experimentation is not feasible or even necessary, these findings illustrate the importance of delaying use onset as long as possible. At least half of current 7th graders (12- to 13-year-olds) and three-quarters of 9th graders (14- to 15-year-olds) have initiated drinking. Yet early onset of drinking is one clear marker of risk of AOD involvement in later adolescence. The earlier the onset of drinking (particularly before age 14), the greater the likelihood of heavier involvement with alcohol, as well as with other drugs.

Trends

The review so far has focused on describing the prevalence and patterns of current use. As illustrated in Figure 3, within the general population per capita alcohol consumption in the United States—after almost two decades of increase from 1962 to 1980—has of late been in a long, slow period of decline. Consumption has fallen almost continuously since 1981, though its rate of fall has been quite modest (averaging less than a 1% per year). This decline is also by substantiated by the National Household Survey and the National Health Interview Surveys (Williams & DeBakey 1992). Has youthful alcohol consumption in the U.S. been declining apace with total consumption over the same period?

To explore this question, three data sources were examined: (a) per capita alcohol consumption statistics; (b) national and state surveys; and (c) indirect indicators. These sources of information harbor intriguing clues, but also noteworthy pitfalls, relating to current consumption trends among American youth. National surveys that provide long-term trend data suggest that inroads have relatively recently been made in reducing alcohol consumption. Not all the other data are consistent with this and it is not clear whether these reductions are the result of rising rates of abstinence, delays in the onset of alcohol use, or reductions in the amount youth drink.

Per Capita Consumption Statistics

Per capita alcohol consumption statistics—which derive from tax data—cannot alone indicate changes in youthful drinking behavior in the national population. However, recent statistics do harbor at least one intriguing suggestion that youthful drinking may not be following the downward trend of total consumption. Most of the recent decline has occurred in distilled spirits use (see Figure 4). Between 1980 and 1990, spirits consumption fell from 1.04 to 0.78 gallons absolute alcohol (per capita, Drinking Age Population [DAP]), fully a 25% decline. Net declines in beer and wine were much smaller: beer declined from 1.38 to 1.34 gallons (a 3% drop) and wine declined from 0.34 to 0.33 gallons (also a 3% drop). In other words, the nation's decline in spirits consumption has contributed 2.6 (or 87%) of the three-tenths-of-a-gallon that total consumption has fallen between 1980 and 1990.[17]

Figure 3
U.S. Apparent Per Capita Alcohol Consumption (Drinking Age) Every Two Years, 1955-1989. (Source: AEDS Surveillance Report #23, 1992)

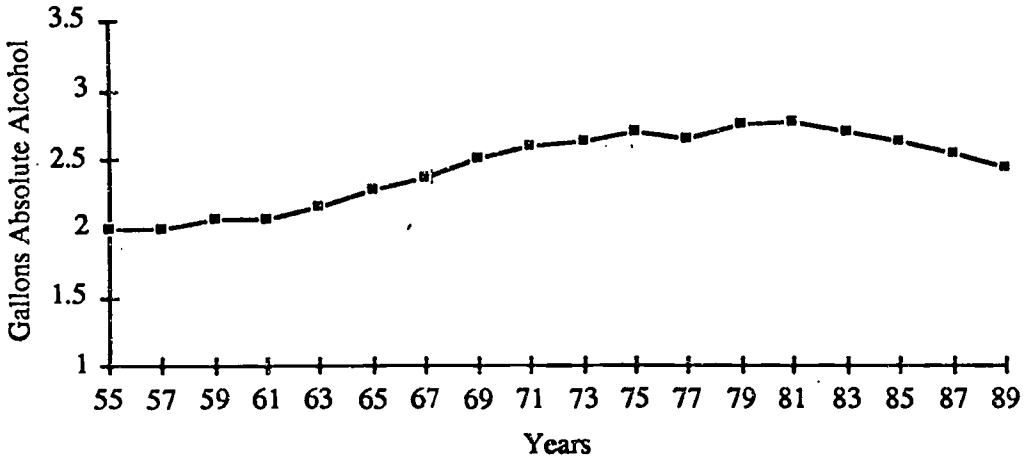
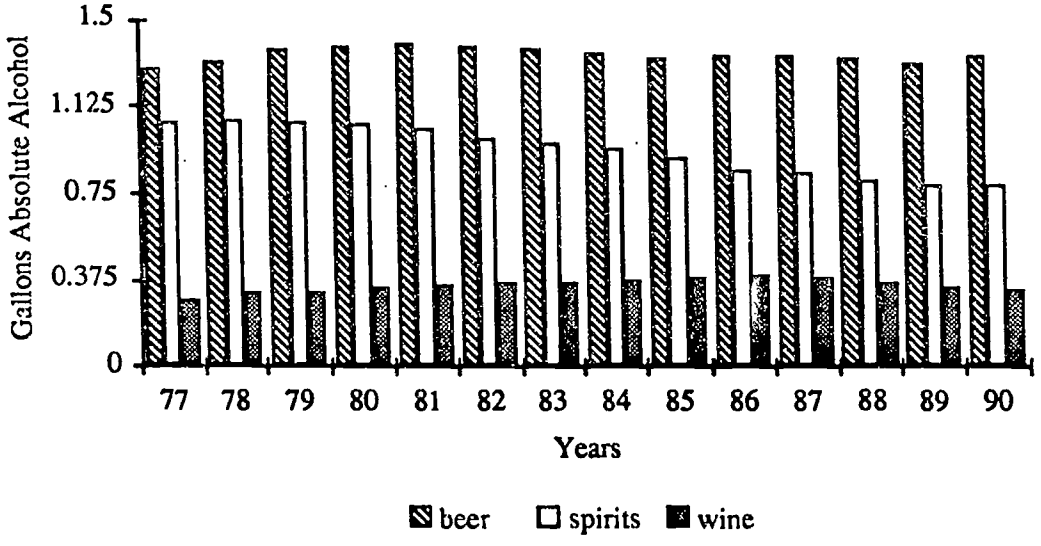


Figure 4
Annual Beer, Spirits and Wine Consumption in the U.S. Drinking-Age Population (14+), 1977-1990. (Source: AEDS Surveillance Report #23, 1992)



We do not have detailed data on the beverage preferences of American youth. With a few exceptions, such as the California and Washington surveys, most adolescent surveys have paid little attention to consumption of specific alcoholic beverages. However, beer appears to be the most frequently consumed beverage and spirits drinking is much less common. If so, then youthful drinking may not have declined apace with national consumption. Then again, beer's relative constancy may comprise a decline in beer consumption among youth that is compensated by increasing beer drinking elsewhere in the population.

Survey Data

National Surveys

National survey data on youthful drinking suggest a significant decline in youthful drinking since 1979.[18] Although the prevalence rates in the MTF (conducted since 1975) and the NHS (conducted since 1972) have always varied within a given year—and despite the potentially substantial impact of undercoverage and nonresponse in surveys—such factors need not necessarily trouble the analyst of trends in alcohol consumption. So long as such biasing factors remain more or less unchanged from year to year, trend data can still perform reasonably well in telling us what direction and even how much change is occurring. It is when the biasing factors themselves are subject to change from year to year that trend data become imperiled.

Both major national longitudinal surveys suggest that since the mid-1980s significant decreases in youthful drinking have occurred. However, there are significant differences in the two studies' images of reduced drinking. Positive responses to all five of the alcohol consumption measures on these two surveys (lifetime, annual, past month, current daily, and episodic heavy drinking) declined from 1977 to 1991. However, some measures declined relatively much more than others.

Monitoring the Future. Between 1975 and 1979, annual, monthly, and daily prevalence rates all rose among MTF seniors. Since then there has been a slight decrease in lifetime prevalence and a more pronounced drop for current prevalence and heavy drinking. Figure 5 plots MTF's 1975-1992 time-series for all five measures, with each measure percentaged against its 1979 level. Plotting the data in this way clearly illuminates that two measures of higher levels of alcohol consumption—daily frequency and occasional heavy drinking (i.e., five drinks in a row in the past two weeks)—have fallen more sharply than the measures of lower or less frequent consumption measures since 1979. By 1992, ever use had declined to 95% of its 1979 value (from 93% to 88%). Annual prevalence declined slightly more, to 88% of its 1979 value (from 88% to 77%). As a result, the rate of drinking noncontinuation—the percentage of seniors who ever used alcohol who did not use in the past year—more than doubled between 1979 and 1992, rising from 5.3% to 12.2%. However, the greatest declines were in current use and the heavy drinking measures. Drinking in the past month declined to 71% of its value (from 72% to 51%); occasional heavy (binge) drinking, to 68% of it (from 41% to 28%), and daily drinking to half of it (from 6.9% to 3.4%).[19] This suggests that little change has occurred in experimentation with alcohol but that high school seniors have become less likely to continue drinking on as regular or heavy a basis than they were a decade or so ago.

National Household Survey. Figure 6 plots trends in three major NHS prevalence measures (lifetime, annual, and current) against their respective 1979 levels. The NHS survey series also reports that all drinking measures peaked in 1979 and that relatively great declines in drinking behavior occurred by 1992 among the broader youth category of age 12-17. However, NHS data do not replicate MTF's pattern of a much greater decline for measures of recent use than for lifetime consumption. The chart shows steep and relatively consistent declines across all three drinking measures.

Figure 5
Trends in Alcohol Use, High School Seniors, 1975-1992 Percentaged Against 1979 Use Levels. (Source: Johnston, O'Malley, & Bachman 1993)

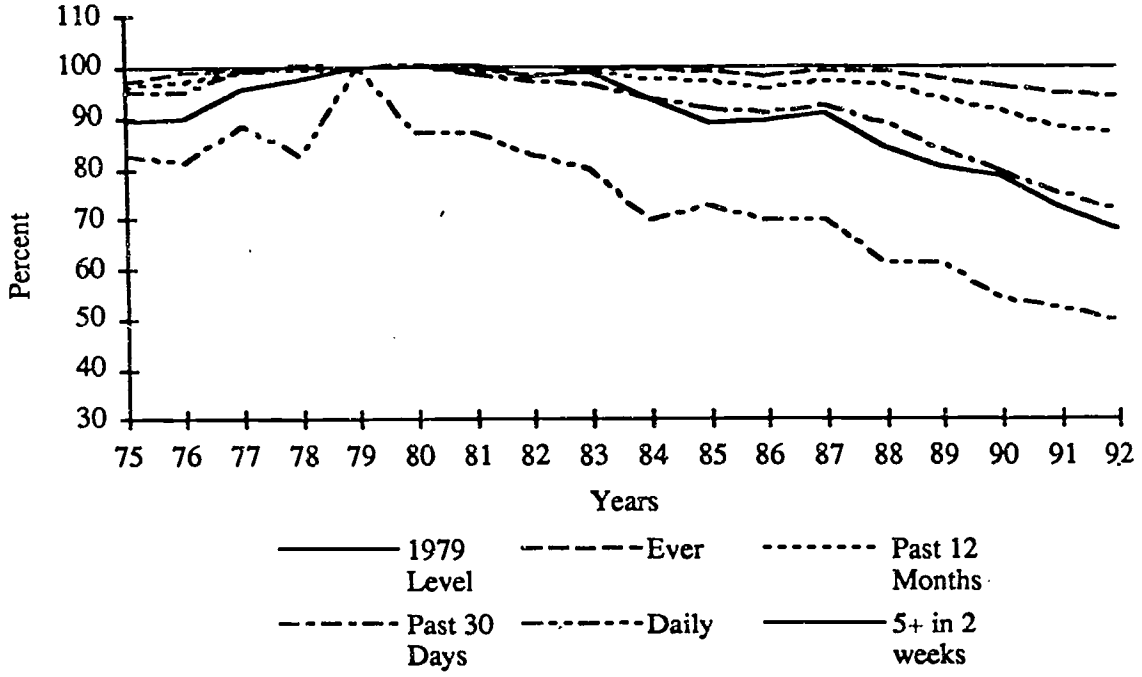
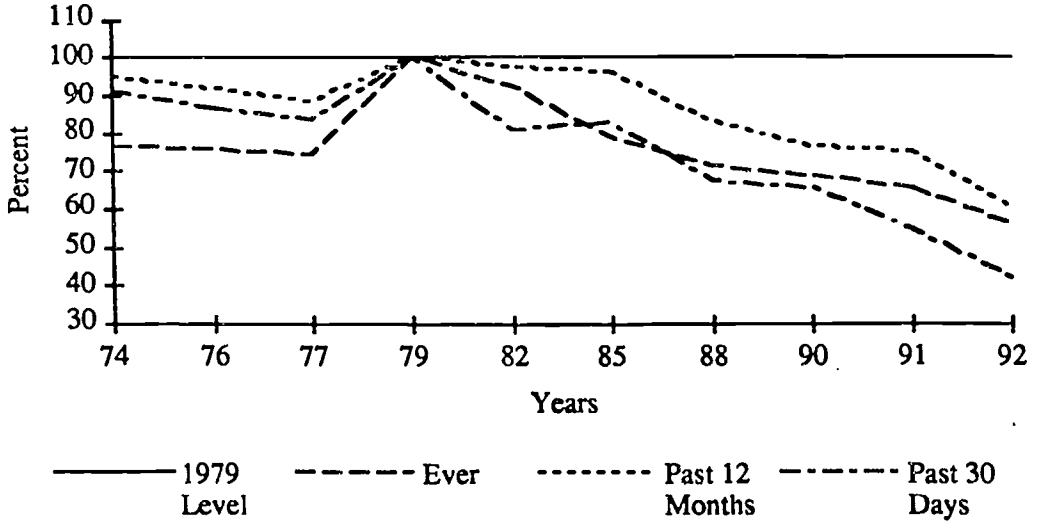


Figure 6
Trends in Alcohol Use, National Household Survey of Drug Abuse, Population Aged 12-17, 1974-1992, Percentaged Against 1979 Use Levels. (Source: SAMHSA 1993)



Whereas MTF's trend lines indicated relatively little change in "ever" drinking, NHS's trend line suggests that "ever" drinking has fallen off substantially since 1979, although still not as much as current use. Ever drinking declined from 70% to 39%, annual from 54% to 33%, and current from 37% to 16%. These represent declines to 56%, 61%, and 43%, respectively of their 1979 values. These rates are markedly lower than those of the 1974 and 1978 National Adolescent Drinking Surveys (see Appendix).

Figure 6 does not include rates for frequency or quantity of drinking because, unfortunately, they date back only to 1985 and for daily and heavy drinking they are so low for this age group that little change can occur. However, between 1985 and 1991, there was little change in drinking at least once a month or once a week in the past year. Only the preliminary data for 1992 suggests the first substantial changes, with a one-year decline from 26% to 21% for monthly drinking and from 5.3% to 4.1% for weekly.

Interestingly, contrary to MTF trends, the NHS drinking noncontinuation rate actually declined from 23% in 1979 (70% lifetime vs. 54% annual) to 13% in 1991 (46% vs. 40%) and 1992 (39% vs. 33%), because NHS lifetime rates declined more than did annual rates. This might suggest that, although abstinence rates were increasing, those who did initiate drinking were becoming more likely to continue drinking. However, NHS current-use rates did decline substantially (much more than annual rates). Therefore the NHS supports the MTF in indicating a moderating trend of youth becoming less prone to continue drinking, but it shows two apparently contradictory differences from the MTF—suggesting, on the one hand, that the number trying alcohol has also declined but, on the other hand, that heavy use has not, as measured by frequency of monthly and weekly drinking since 1985. Only between 1991 and 1992 was there any reduction in use frequency evident.

American Drug and Alcohol Survey. Although for a shorter period, ADAS results for 1988-89 and 1992-98 are consistent with those from MTF in indicating a steeper decline for heavy use than overall prevalence among the upper grades. Looking at 12th graders, lifetime prevalence declined very little over this four-year period, from 93% to 91%, and annual prevalence declined only slightly from 86% to 81%. The noncontinuation rate thus rose 3 points. There were greater reductions in current drinking and in drunkenness measures. Drinking in the past month in 1992 was 86% of its 1988 value (a decline from 64% to 55%), lifetime drunkenness was 82% of it (from 75% to 69%), and current drunkenness was 79% of it (from 42% to 34%.) A similar pattern was evident for 10th graders. On all measures, there were even greater declines among the younger grades. Among 8th graders, lifetime drinking was 88% of its 1988 value (a decline from 77% to 68%; annual, 84% (from 62% to 52%); current, 79% (from 34% to 27%); lifetime drunkenness. 72% (from 33% to 24%); and current drunkenness, 61% (from 13% to 8%). This may indicate that all youth are reducing their level of drinking and that the younger are also becoming more abstinent.

State Surveys

Most state surveys are relatively new, but the California, Hawaii, New York, and Washington surveys do provide trend data back to the mid- or -late 1980s, the period in which the national surveys indicate declines in use have occurred. They provide no indication that consumption has increased, but evidence is mixed as to whether any substantial declines have occurred.

New York. The 1990 statewide survey conducted by the New York State Division of Substance Abuse Services (DSAS) was based on a 1983 survey. During this period, reductions were evident in prevalence and level of drinking among secondary school students, roughly the same 12- to 17-year-old range as in the NHS. Annual prevalence declined from 71% to 60%; binge drinking at least once a week from 16% to 11%; and heavy drinking (weekly drinking with 5 plus

drinks per occasion) from 13% to 9% . These were reductions of 85%, 69%, and 69%, respectively, of their 1983 values. Reductions of similar proportions were found for each grade level (Barnes, Welte, & Dintcheff 1993; New York 1991). These reductions, furthermore, may have been relatively recent. The smaller survey conducted by the New York Office of Mental Hygiene in 1988 provided comparable data. It revealed sizable declines compared to the 1983 survey of at least 50% in the use of almost every illicit drug, but the lifetime prevalence for alcohol use had not changed (Kandel & Davies 1991). Unfortunately ever use data were not reported in 1983 and 1990.

California. In the course of the four administrations of the biennial California Student Survey (1985, 1987, 1989, and 1991), most measures of illicit drug use steadily declined. Indeed, the 1991 CSS witnessed often substantial reductions in some of the most important indicators of heavy or risky illicit drug use, including cocaine use, poly drug use, and the number of youth categorized as high-risk illicit drug users (but not marijuana or LSD). This, however, was not the case with alcohol. Although almost all measures of alcohol consumption declined for the first time between 1987 and 1989, in the 1991 survey most measures had returned to levels close to those of 1985.[20] Lifetime alcohol consumption among 11th graders returned to the 1985 level of 85% after steadily declining throughout this period. A similar trend was evident among 7th and 9th graders. Furthermore, the differential trends in per capita beer and spirits consumption nationally are not evident among California students. For consumption of both beverages in the past six months, rates increased in 1991 in all grades, although they were still somewhat lower than in 1985. Among 11th graders, beer consumption was only three percentage points lower (69% vs. 66%) and spirits 2 points lower (53% vs. 51%). Similarly, weekly consumption of each of these beverages increased in 1991 but remained lower than in 1985. For example, 17% of 11th graders reported drinking beer at least once a week compared to 20% in 1985 and 16% in 1989. In retrospect, it would appear that the relatively large declines in consumption found between 1987 and 1989 may have been an anomaly, as the rates found in 1991 were little different from those in the first two surveys (Skager & Austin 1993).

Hawaii. The biennial Hawaii State Survey, conducted in 1987, 1989, and 1991, showed a decline over this period in lifetime rates in grades 6 (from 46% to 31%), but in grades 8, 10, and 12 there were only slight lifetime declines between 1987 and 1989, which then leveled off in 1991. Furthermore, there was no evidence of a declining trend in the percentage of regular drinkers, high frequency users, or binge drinking in any grade. For these heavier-use measures, there was a very slight decline between 1987 and 1989, but in 1991 rates slightly rose or were unchanged among the upper grades. Current use data was available only for 1989 and 1991 and showed no change (Gabriel, Einspruch et al. 1992).

Washington. Results between 1988 and 1992 for the biennial Washington survey are very mixed. There were fairly consistent declines in lifetime consumption among 6th (51% to 33%), 8th (from 70% to 55%), and 10th graders (from 84% to 70%). Regular beer drinking (at least six times in the past year) declined from 3% to 2% among 6th graders, from 14% to 10% among 8th graders, and from 29% to 23% among 10th. However, although binge drinking declined from 25% to 11% among 8th graders, it rose from 15% to 18% among 10th, and remained stable among 6th. For 12th graders, data are available for only 1990 and 1992 and indicate a slight decline in ever use (from 83% to 80%); regular beer drinking declined from 33% to 23%, and binge drinking was stable (Einspruch & Pollard 1993).

Indirect Indicators

The various disparities and weaknesses associated with surveys monitoring youthful drinking in the U.S. may well incline us to look elsewhere for estimates that are, somehow, independent of the

respondent's self-report. Indirect indicators have traditionally provided that alternative. An indirect indicator is a phenomenon that is associated with another phenomenon in such a way that it may be counted in lieu of counting the other phenomenon. In the alcohol field, for example, motor vehicle fatalities and liver cirrhosis mortality have long been thought to be associated with alcohol consumption and have been used to monitor alcohol-related trends. In fact, alcohol is thought to be associated with a great many categories of mortality, illness, and injury. Therefore, when alcohol consumption changes, we ought to expect commensurate changes in those problematic phenomena too—depending, of course, on how strongly the indirect indicator is associated with alcohol consumption. Such changes in indirect indicators may serve two valuable purposes: (a) they may vouchsafe that drinking is in fact declining; and (b) they may suggest the degree and manner of relation between alcohol consumption and the indirect indicator in question. Yet, and alas, using indirect indicators to track shifts in youthful alcohol consumption harbors no fewer pitfalls and dilemmas than survey studies harbored.

The recent decline in U.S. *per capita* alcohol consumption has turned some researchers' attentions to recent changes in alcohol-related mortality. Stinson and DeBakey (1992) recently examined alcohol-related mortality causes for trends between 1979 and 1988 (see Sutocky et al. [1993] for a similar undertaking). Stinson and DeBakey (1992) divided mortality causes into three groups: (CLASS I) those directly attributable to alcohol (in which 100% of deaths were coded as alcohol-caused); (CLASS II) "deaths from diseases indirectly attributable to alcohol (in which a proportion of death from a given disease was attributed to alcohol—proportions shifted from low to high depending on the best available estimates); and, finally, (CLASS III) "deaths from injuries and adverse effects indirectly attributable to alcohol" (once again, a proportion of death from a given "injury or adverse effect" is attributed to alcohol and proportions varied with category of injury/adverse effect). So, for example, all deaths from alcoholic psychoses were attributed to alcohol (CLASS I), as were 60% of deaths from chronic pancreatitis (CLASS II), and 38% of drownings (CLASS III).

Stinson and DeBakey (1992) calculated societal changes in alcohol-related mortality between 1979 and 1988 by multiplying any change in a mortality category by the fraction of mortality attributable to alcohol (Figure 9). So, for example, if a CLASS I mortality category declined by 20%, then all 20% of that decline was attributed to alcohol. If a CLASS II or III mortality category declined by 20%, on the other hand, then the proportion of that mortality attributable to alcohol defines would be counted as the decline in alcohol-related mortality. According to Stinson and DeBakey's (1992) calculations, alcohol-related mortality accounted for about 5% of all mortality in the U.S. in 1988.

Alcohol-related mortality declined overall by 17.4% of its 1979 rate by 1988—from an age-adjusted mortality rate (per 100,000) of 43.1 in 1979 to 35.6 in 1988. The age-adjusted mortality rate for causes directly attributable to alcohol declined 14.6% (from 8.2 in 1979 to 7.0 in 1988); the rate for illnesses indirectly attributable to alcohol declined 16.9% (from 12.4 in 1979 to 10.3 in 1988); and the rate for injuries or adverse effects indirectly attributable to alcohol declined 18.7% (from 22.5 in 1979 to 18.3 in 1988). According to Stinson and DeBakey's figures, alcohol-related mortality among persons under 25-years-old declined by 20.6% of its 1979 rate by 1988—from 18.9 (per 100,000) in 1979 to 15.0 in 1988. Death from causes directly attributable to alcohol are extremely rare in this age category—these declined from 0.2 in 1979 to 0.1 in 1988. Death from illnesses indirectly attributable to alcohol are also extremely rare, and were not calculated for this age group. Death from injuries or adverse effects indirectly attributable to alcohol declined by 20.5%, from 18.7 in 1979 to 14.9 in 1988.

Figure 9
Age Adjusted Mortality Rates for Alcohol-Related Mortality in the U.S., 1979 and 1988. (Source: Stinson & DeBakey 1992:781)

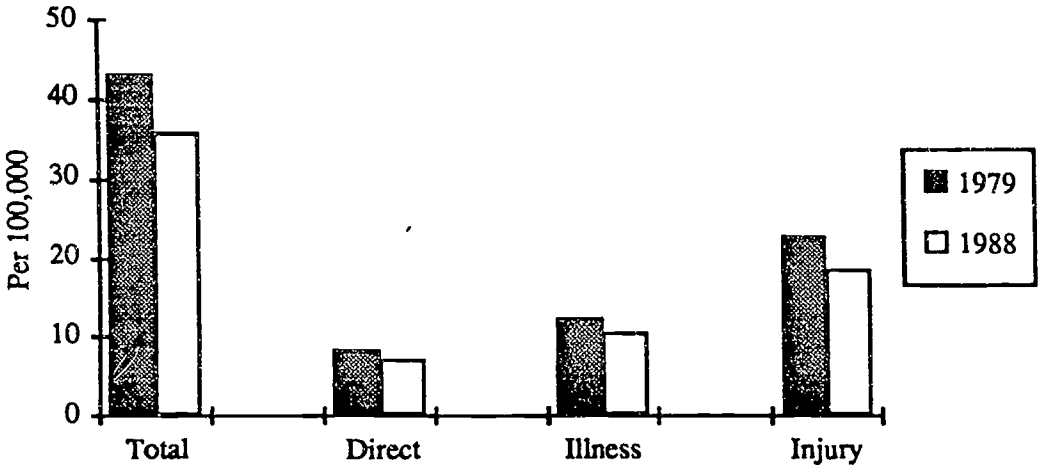
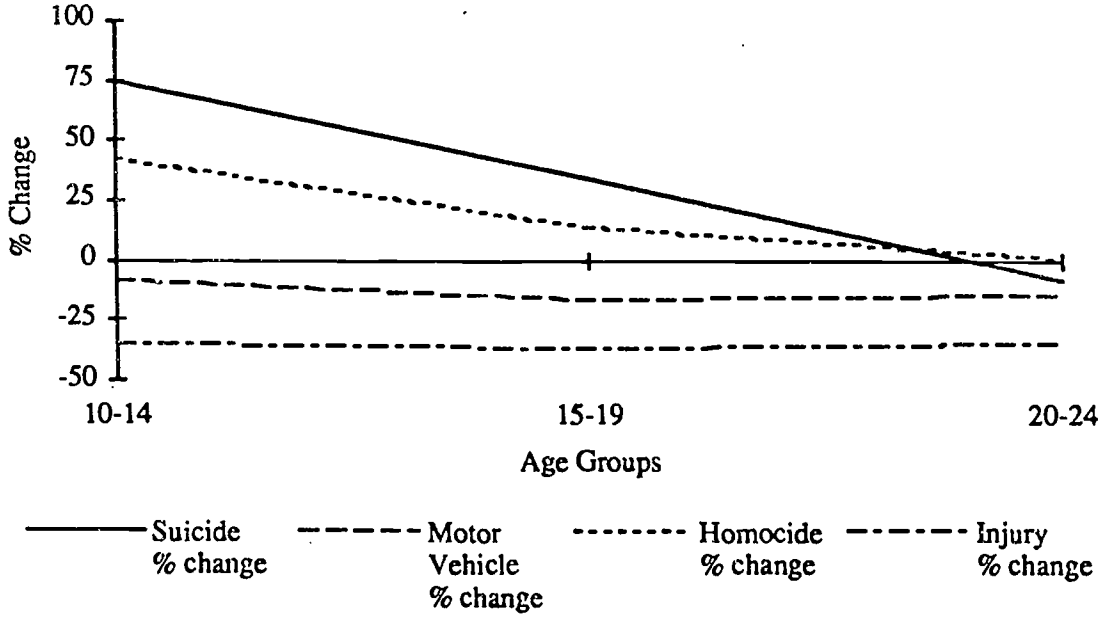


Figure 10
Percentage Change in Four Major Causes of Death, 1979-1988 by Age Group. (Source: CDC 1993)



Stinson and DeBakey's (1992) analysis might be read, then, to suggest that the nation's overall decline in alcohol consumption between 1979 and 1988 has occasioned significant declines in alcohol-related mortality, both for the population as a whole and for a youthful population younger than 25. But does this analysis really support that inference? Probably not. Their analysis takes for granted that a fixed proportion of a causal category's mortalities are "alcohol-related." Therefore, if the mortality rate in that causal category goes down between one year and another, then ipso facto fewer alcohol-related deaths occurred. It follows that the overall decline in alcohol-related mortalities that Stinson and DeBakey reported is simply a corollary of an overall decline in the mortality categories they elected to examine. Of course, even the mere fact of declining mortality rates in causal categories thought to be associated with alcohol may suggest that declining alcohol consumption is bringing declining alcohol-related mortality in its wake. But even that seemingly sensible inference is not wholly unproblematic.

As Stinson and DeBakey's figures showed, deaths from injuries constitute virtually all alcohol-related mortality in the under 25-years-old age group. Accidents accounted for over 40% of mortality among 5- to 14 -and 15- to 24-year-olds in 1990 (see Table 4). In both age groups vehicular accidents accounted for more deaths than nonvehicular accidents, but the preponderance was much greater among 15-24-year-olds (78% of accidental deaths were vehicular) than among 5- to 14-year-olds (56% vehicular). Homicide and suicide also account for significant fractions of mortality in both age groups. The impact of declining alcohol consumption on mortality in youth is most likely to be discerned in declining accidental mortality (vehicular and non-vehicular), suicide, and homicide.

Researchers at CDC's Division of Adolescent and School Health (DASH) recently examined youthful mortality rates for these four major causes—for years 1979 and 1988 (CDC 1993a). They examined changes in mortality rates for three age groups: 10-14, 15-19, and 20-24 years. Mortality from all four causes across all three age groups declined by 11.7% from 1979 to 1988, from 89.6 (per 100,000) in 1979 to 79.1 in 1988. Only vehicular and nonvehicular accidental death rates declined, however (see Table 5 and Figure 10), by 15.5% and by 35.7%, respectively. Both suicide and homicide mortality rates increased between 1979 and 1988, suicide by 7.9% and homicide by 6.7%. Only the greater declines and greater rates of vehicular and nonvehicular accidental deaths over suicide and homicide made for a net decline in this group of four major causes of death.

Neither suicide's nor homicide's increases were uniform across the CDC's youth age categories. For both suicide and homicide, 10-14-year-olds showed the greatest increases, 15-19-year-olds the next greatest, and 20-24-year-olds were nearly unchanged or slightly decreased. The sharp contrast between accidental mortality causes (vehicular and non-vehicular accidents) and mortality causes involving some measure of intention (suicide and homicide) suggests that the contemporaneous decline in drinking—if it had any relationship to these changes in mortality—had a more direct relationship with mortality due to clumsiness than mortality involving deliberation.

But there is a deeper conceptual dilemma beneath these conflicting trends. How can we regard a fixed percentages of suicides and another fixed percentage of homicides to be "alcohol-related" when recent trend data indicate that alcohol consumption may be declining as suicide and homicide rates increase? This conundrum should remind us that the terms "drinking" or "alcohol-related" may comprehend a great variety of referents. So, for example, the kind of drinking associated with, say, homicide may not be declining the way "alcohol consumption" on the whole is. Or, declines in alcohol-related suicide or homicide may be masked by even greater increases in non-alcohol-related suicide or homicide rates—thus creating net increases in these phenomena. The possibilities, of course, are legion.

Table 4
Six Leading Causes of Death Among 5-14-year-olds and 15-24-year-olds, 1990

	5-14-year-olds		15-24 year-olds	
	Number	% of all deaths	Number	% of all deaths
Cause of death				
Accidents	3,650	43.3	16,241	44.2
Vehicular	2,059	24.4	12,607	34.3
Non-vehicular	1,591	18.9	3,634	9.9
Cancer	1,094	13	1,819	5
Homicide & legal interventions	512	6.1	7,354	20
Congenital	468	5.5	—	—
Heart diseases	308	3.7	917	2.5
HIV	—	—	541	1.5
Suicide	264	3.1	4,869	13.3
Other	2,140	25.4	4,992	13.6
All causes	8,436	100	36,733	100

Table 5
Death Rates for U.S. Adolescents and Young Adults Aged 10-24, by Cause of Death and Age Group, 1979 and 1988

	Percentage in each age group			
	10-14 (%)	15-19 (%)	20-24 (%)	Total (%)
Cause of death				
Motor-vehicle crash				
1979	8.2	44.6	46.7	34.3
1988	7.5	37.2	39.7	29
% Change	-8.5	-16.6	-15	-15.5
Other injury				
1979	8	14.8	19.1	14.3
1988	5.2	9.4	12.4	9.2
% Change	-35	-36.5	-35.1	-35.7
Suicide				
1979	0.8	8.4	16.4	8.9
1988	1.4	11.3	15	9.6
% Change	75	34.5	-8.5	7.9
Homicide				
1979	1.2	10.3	18.8	10.5
1988	1.7	11.7	19	11.2
% Change	41.7	13.6	1.1	6.7
Overall				
1979	31.8	98.8	131	89.6
1988	27.5	88	115.4	79.1
% Change	-13.5	-10.9	-11.9	-11.7

Adapted from Table 1, Mortality trends and leading causes of death among adolescents and young adults—United States, 1979-1988, *MMWR* 42(18):359-362, 18 June) 1993.

We can draw a somewhat closer empirical bead on the relation between alcohol trends and indirect indicator trends by examining trends in motor vehicle fatalities. Motor vehicles pose the single greatest mortality threat to American youth, and alcohol is, of course, commonly regarded one of the chief causes of traffic crashes. Vehicular crashes are also closely monitored and reported, and thus provide perhaps the best place to look for a more detailed understanding of alcohol's relationship to an alcohol-related casualty.

According to the available survey data, American youth are often exposed to the risk of alcohol-related traffic crashes. In the Centers for Disease Control's 1991 national Youth Risk Behavior Survey approximately 40% of the nation's 9th-12th graders rode in a vehicle being driven be someone who had been drinking alcohol in the past 30 days (CDC 1993b:6). The 1988 National Adolescent Student Health Survey reported similar rates for the nation's 8th and 10th graders—32% among 8th graders and 44% among 10th graders (ASHA 1989:20). In Williams, Lund, and Preusser's (1986) survey of students with drivers licenses in seven locales around the country, 44-51% of male and 30-37% of female 17-year-olds reported driving after drinking within the past month; 21-29% of male and 6-12% of females 17-year-olds reported driving after drinking "once a week or more" often.

There were a total of 46,814 motor vehicular deaths in the U.S. in 1990—equivalent to a mortality rate of 18.8 per 100,000 population (National Center for Health Statistics 1993:20). The fatality rate has fallen approximately 20% since 1979. Interestingly, the fatality rate fell sharply from 1979 to 1982 and then remained more or less stable at a new lower level to 1990 (see Figure 11). This reveals that the traffic fatalities curve does not correspond in shape with the long, slow decline in U.S. per capita alcohol consumption that commenced after 1981. The steepest decline in the fatalities curve occurs between 1981 and 1982, and the curve bottoms-out in 1983—rather before the nation's per capita consumption has declined more than marginally (2.76 gallons in 1981, 2.72 in 1982, and 2.69 in 1983).

Both alcohol-related and non-alcohol-related traffic fatalities declined over this period. The distinction, as it is operationalized by the U.S. Department of Transportation's Fatal Accident Reporting System (FARS), is a crude one.[21] Plotted separately, alcohol-related and non-alcohol-related fatality curves reveal that both exhibit roughly the same over-time pattern, with most of each's decline occurring in the early 1980s (see Figure 12). A similar pattern appears in the trend-lines for youthful drivers (aged 16-24) in alcohol-related and non-alcohol-related crashes (see Figure 13). Both trend-lines—which make roughly equal contributions to youthful driver mortality—follow very similar courses across the 1980s with, if anything, a more marked decline in non-alcohol-related fatalities in the early 1980s.

If traffic fatalities among youth had declined because of declining alcohol consumption and all else had remained unchanged, then these data should have shown a constant or unchanging trend in non-alcohol-related fatalities and a declining trend in alcohol-related fatalities. The ratio of alcohol-related fatalities to non-alcohol-related fatalities should decline. But the data show that both alcohol-related and non-alcohol-related fatalities have followed similarly declining trends over time; the ratio of alcohol-related fatalities to non-alcohol-related fatalities has remained constant. Many causal scenarios might be occurring—including (1) alcohol-related and non-alcohol-related fatality rates may be subject to change forces that apply equally to both (e.g., the spread of seat-belt use or improvements in treatment of head trauma) and (2) alcohol-related fatalities may be declining because of declining alcohol consumption and non-alcohol-related fatalities may be declining for other reasons.

Figure 11
U.S. Total Traffic Fatality Rate per 100,000 Population 1979-1990. (Source: Zobeck, Stinson, & Bertolucci 1992)

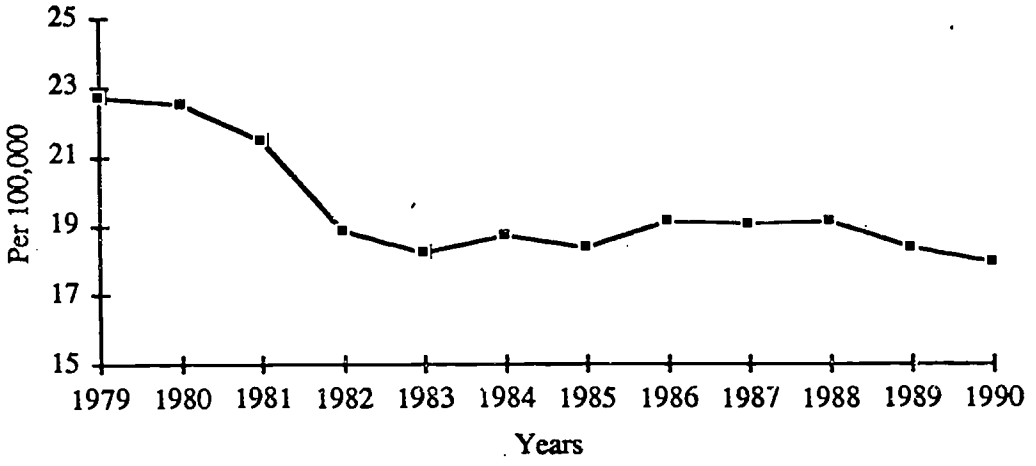


Figure 12
U.S. Alcohol-Related and Non-Alcohol Related Traffic Fatalities Per 100,000 Population, 1979-1990. (Source: Zobeck, Stinson, & Bertolucci 1992)

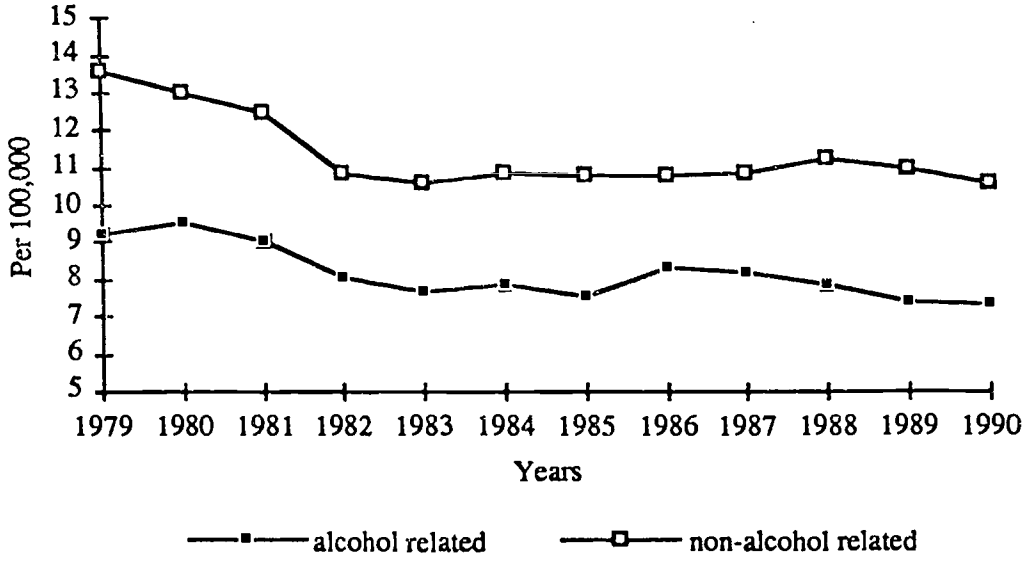


Figure 13
U.S. Number of Fatalities Among Young Non-Drinking Drivers and Young Drinking Drivers, 1979-1990. (Source: Zobeck, Stinson, & Bertolucci 1992)

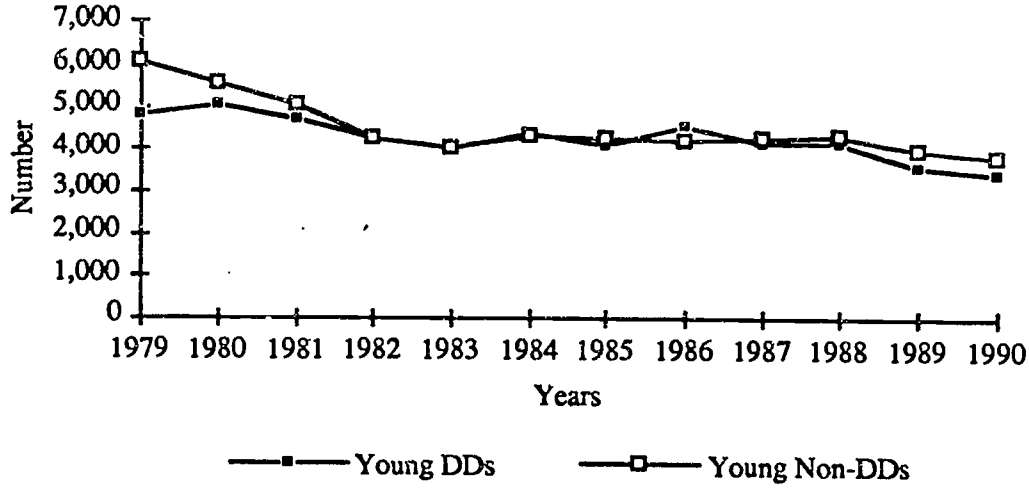
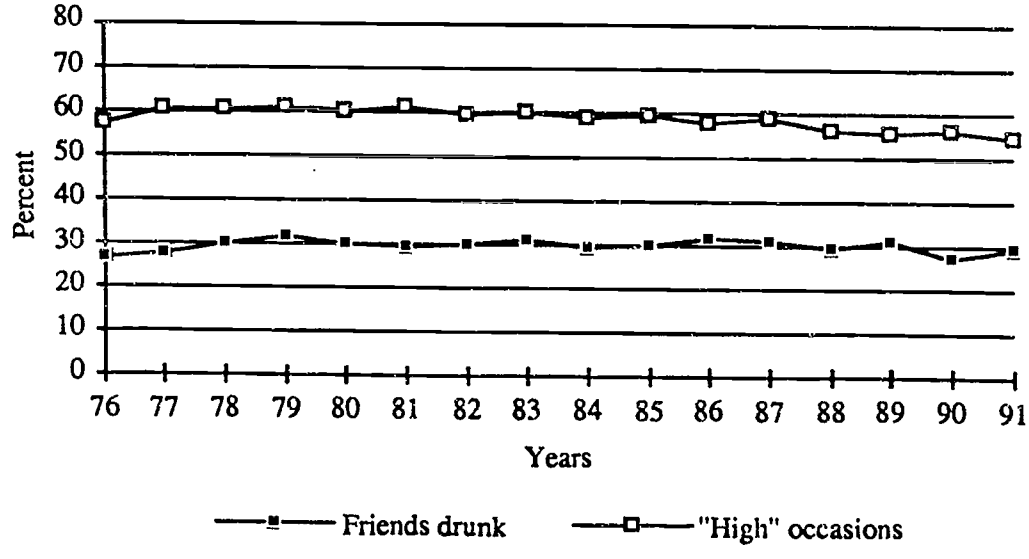


Figure 14
Trends in Reports of Friends' Drinking Behavior, MTF 1976-1991 Percent Who Reported Using Alcohol Ever, Past 12 Months, & Past 30 Days. (Source: Johnston, O'Malley, & Bachman 1992)



Whatever the reasons, the shape of the declining traffic fatality trend over time (with its concentration in the early 1980s and leveling-off in the later 1980s), and the parallel trends in alcohol-related and non-alcohol-related fatalities, both suggest that due caution should be exercised before attributing recent declines in traffic fatalities to declining alcohol use or—more to the present essay's point—using declines in youthful traffic fatalities to vouchsafe contemporaneous declines in youthful drinking.

Discussion

Apparent per capita alcohol consumption has been falling in the U.S. since the early 1980s. Although the per capita decline is mostly in the use of distilled spirits, whereas youthful drinking is mostly of beer, national trend data drawn from long-term survey studies of youthful drinking show that youthful drinking has also declined substantially since 1979. State survey data since the mid- to late 1980s are mixed in this regard. The New York survey reported consistent declines, but in California and Hawaii this was not evident, and in Washington there were declines in some measures but stability or increases in others.

Under closer examination, in both state and national surveys, there is uncertainty as to what types of drinking behavior may be declining: whether youth are becoming more abstinent or just moderating their drinking. All three national surveys suggest that students in various age categories are becoming less and less likely to continue drinking after they try it. The MTF and ADAS, the two sources that provide the most substantial data on level of drinking, further indicate that current drinkers are moderating their habits. However, this is not as evident in the NHS. The NHS also diverged in the trend in lifetime prevalence. MTF and ADAS trend data suggest that current and higher levels of drinking have declined relatively more sharply than ever use, at least among upper graders. This resulted in an increase in MTF noncontinuation rates over time. However, NHS data show equivalent declines across "ever," "yearly," and "monthly" drinking; indeed, their lifetime drinking rates declined much more than annual prevalence, resulting in an increase in noncontinuation rates. Hence, whether recent trends reflect a greater prevalence of youthful abstinence or youthful moderation depends on whether one relies on the MTF's or the NHS's trend lines.

The state trend data across grades was of little value in clarifying these issues. In New York annual prevalence and heavy drinking both declined, but no data were available for lifetime use. In California, lifetime, six-month, and weekly drinking showed similar trends but no indication of any substantial decline. In Hawaii, there was no change in lifetime prevalence, quantity, or frequency of drinking, except in a reduction in ever use among 6th graders. In Washington, lifetime prevalence and regular beer drinking declined in all grades, but trends in binge drinking were divergent.

Some of the differences in lifetime prevalence trends may be related to age factors. A recent reduction in lifetime prevalence (that is, a growth in overall abstinence) would be less evident among older than among younger students. We would except to see any changes evident in the NHS general adolescent sample before the MTF seniors. Consistent with this, the ADAS data indicated greater declines in ever use among younger students than among older students, suggesting that initiation among younger students is falling. Ever use also declined among the 6th and 7th graders in California, Hawaii, and Washington surveys. Another indication of this may be that lifetime prevalence rates reported in local surveys of 6th graders conducted in the 1990s were generally lower than those in the 1980s.

Another window on youthful drinking trends is provided by indirect indicators. While at first these data appeared to support a declining trend, a closer examination of these data added another layer of questions. Stinson and DeBakey's (1992) analysis revealed a considerable drop in alcohol-related mortality between 1979 and 1988. The reported decline in

mortality among youth (ages 0-24)—roughly 20%—is on a par or even exceeds the U.S. population's overall decline. Thus—and if these declines indeed reflect and flow from declining alcohol consumption—it might be concluded that alcohol consumption among youth may be declining at roughly the same rate as the total population. But a look behind both the methodology and the constituent mortality rates shows that such an inference is far from certain. Most alcohol-related deaths among youth derive from traffic accidents, nonvehicular accidents, suicide, and homicide. Though youthful mortality from vehicular and nonvehicular accidents declined between 1979 and 1988, suicide and homicide increased. The shape of the decline in motor vehicle fatalities did not correspond to the nation's long, slow decline in alcohol consumption. Moreover, the parallel declines in alcohol-related and non-alcohol-related fatality curves suggests that any inference that recent declines in traffic fatalities among youth are due to declining alcohol consumption will have to fend off other and equally plausible interpretations that do not necessarily rely on declining alcohol consumption.

Trend Influences

In the absence of better data, how might we account for the declines that have been observed and the lack of consistency in the trend evidence from state to state? While an exploration of these questions is beyond our scope, attention does need to be directed to the potential effects of changing norms and laws.

The Role of Changing Sentiment. Bachman, O'Malley, and Johnston (1989, 1990) have argued that the nation's declining trends in marijuana and cocaine use among youth and young adults are due substantially to increases in perceived risks and disapproving attitudes toward use. A similar phenomenon may be occurring now with alcohol. The MTF survey includes several measures of sentiment toward drinking, including interview questions about: (a) "a close friend's" reaction to the respondent drinking at three hypothetical levels; (b) attitudes toward the prohibition of public drunkenness; (c) attitudes toward the prohibition of private drunkenness; (d) disapproval of persons 18-years-old and older [i.e., an adult] drinking at three hypothetical levels ; and (e) "perceived harmfulness" of five hypothetical drinking levels (Johnston, O'Malley, & Bachman 1992:168, 171, 178). These reveal interesting but inconsistent patterns. There was little or no change in three measures of sentiment involving public drinking, heavy drinking by adults, and friend's reactions to respondent's heavy drinking (a, b, d). Approximately 90% of seniors disapproved of an adult drinking "four or five drinks nearly daily" in 1975, and disapproval remained at a 90% level for the entire period to 1991. Between 1980 and 1991, 86-88% of students reported that their close friends would disapprove of their own drinking at the same hypothetical level. Students' judgments about the prohibition of drunkenness in public places were nearly as stable—56% supported the prohibition in 1975, support dropped to about 50% from 1976 to 1982, rose slightly after 1982, ending at 54% in 1991.

Disapproval of heavy drinking may have changed little, because rates were already so high that a ceiling effect has occurred. In contrast, the two indicators of private drunkenness and perceived harmfulness of drinking revealed significant drifts toward less permissiveness toward alcohol. Support for prohibiting drunkenness in private setting increased from 14% in 1976 to 22% in 1991. The proportion of students attaching "great risk" to drinking "one or two drinks nearly every day" rose from 22% to 32%, 1975-1991—the rising portion of the curve occurs after 1983. Three other hypothetical drinking levels also grew in the proportion of students attributing "great risk." Disapproval of weekend binge drinking rose from 56% in 1980 to a high of 71% in 1992. The proportion of seniors who disapprove of even trying alcohol has doubled, from a low of 16% in 1980 to 33% in 1992.

Although these findings indicate changes in the frequency of disapproving responses without at the same time indicating the intensity of disapproval, it may well be that the declines in use that have been observed have been in response to these changes in attitudes. These attitude changes among youth, in turn, may be reflecting the influences of the decline in per capita consumption, the rise of the "neo-temperance" perspective among adults, and the spread of AOD prevention programs throughout the country since the mid-1980s. However, this currently can only be considered speculative and it may well be that less permissive attitudes have affected drinking behavior less than the willingness of youth to admit to drinking.

Shifts in popular sentiment toward alcohol or other drugs can also be a particularly important biasing factor in self report behavior. AOD surveys do not monitor behavior directly but through the medium of young respondents' self-reports. As attitudes towards them become more critical, a respondents' willingness or candor in reporting use may be dampened, as recently emphasized by the GAO (1993) in regard to illicit drug use. Shifts toward increasingly negative sentiment from year to year may deflect reporting behavior as much or more than actual drinking behavior, thus significantly overstating actual behavior change. In interpreting these results, the possibility must be considered that the observed declines in use may not reflect actual changes in behavior so much as changes in the willingness to self report use because attitudes toward drinking have become more critical. Are changes in reporting behavior unduly contributing to the apparent changes in drinking behavior that national time-series surveys report?

The MTF data offer some interesting data in relation to these possibilities. First, MTF asks about the drinking behavior of the respondent's friends. If students are less diffident about reporting the drinking of others than their own, then the time-series trends for friends' drinking should show less change than self-reported drinking. Figure 4 plots trend lines for high school seniors' responses to two questions about their friends' drinking: (a) "How many of your friends would you estimate get drunk at least once a week?" (responses charted: "most or all"); and (b) "During the LAST 12 MONTHS how often have you been around people who were taking each of the following to get high or for 'kicks'?" (response charted: "alcoholic beverages, often"). This graph shows that reports of friends' drunkenness evidence no consistent change, with minor variations around a 30% positive response rate over the entire 1976-1991 period. However, there was a modest decline among those who were often "around" friends using alcohol for intoxicating effects—from about 60% to 55% since the mid-1980s. The difference in trends may reflect a difference in the two questions. Item (b) concerns types of social occasions at which the respondent has been present. Item (a) asks for an assessment of friends' conduct only, and may be subject to the impact of increasing sentiment-related diffidence more so than item. Regardless, this figure shows less change than the measures of self-reported drinking.[22]

In short, the MTF findings, though they illuminate something of the variability of changing sentiment, alone cannot resolve whether observed shifts in reported drinking owe more to changing behavior or increasing diffidence in self-reports. Support for both possibilities exists. It may well be that the declines observed in some surveys reflect a change in behavior rooted in a rise of more critical sentiments toward drinking, but it may be that drinking behavior has changed less than self-report behavior.

Minimum Drinking Age Laws. During the middle to late 1970s, the minimum drinking age ranged from 18 to 21 years. As a result of the Federal Uniform Drinking Age Act, by 1988 all 50 states prohibited purchase of alcoholic beverages of any kind by anyone under 21 years of age. Studies indicate that raising the minimum drinking age has reduced alcohol-related traffic injuries and deaths among young people affected by the law (U.S. GAO 1987). This has also been offered as an explanation for the declines

in drinking prevalence that have been observed nationally (NIDA 1991; Johnston, O'Malley, & Bachman 1991) as well as in New York (Barnes, Welte, & Dintcheff 1993). In an analysis of MTF data from 43 states, DiNardo and Lemieux (1992) concluded that in those states that did raise their minimum drinking age, the change contributed to reductions in use, and also brought about a substitution away from alcohol and toward marijuana. Johnston, O'Malley, and Bachman (1993:206) suggest that these declines in behavior occurred because raising the minimum drinking age affected attitudes: "It is likely that the increased minimum drinking age in many states, which occurred primarily between 1981 and 1987, is contributing to these changes in attitudes about abstention, since most seniors today grew up under the higher minimum drinking age. If so, this illustrates the considerable capacity of laws to influence informal norms." This might also explain why there is less evidence of any decline in consumption in California and Washington, which had a 21-year-old minimum drinking age throughout this period.

This connection between changes in drinking age laws and changes in attitudes and behavior among adolescents—for whom drinking has always been illegal—remains to be proven. Data provided by the NHS on drinking among respondents under and over age 21 since 1988 raises doubts about it. If the new drinking age laws did have an impact on drinking behavior, one would expect it to be evident in declines in drinking among those under age 21. However, in both age categories there is little evidence of any change in rates except for a *increase* in heavy drinking among youth under 21 between 1990 and 1991.

Declining drinking among adults, an expansion in prevention efforts, and an increase in the minimum drinking age may all have combined to engender among youth nationally less permissive attitudes towards drinking and, consequently, to reduce drinking itself since its recent peak at the end of the 1970s. Differences in state trends since the mid-1980s may be due to variations in these factors, especially in whether drinking age laws changed or not.[23] However, many questions remain about the strength and nature of the observed national decline that warrant further exploration. Even where declines have been recorded, it is not clear whether youth are becoming more abstinent or moderate. Furthermore, it cannot be discounted that the observed declines reflect not only—or even not so much—a change in actual drinking behavior but a change in self-reports. The changing sentiment toward alcohol since 1979 is perhaps the most worrisome common source of bias from a trend analyst's point of view. Growing negative sentiment around alcohol may cause self-reports of drinking to decline more sharply than drinking behavior itself. The combination of declining behavior and declining self-report may in turn account for the steepness of the fall in drinking reported in survey studies. An examination of data that may shed light on the importance of changing sentiment in understanding recent trends in drinking proved equivocal. Student reports of the drinking of friends—where disinclination to report candidly about one's own drinking may be avoided somewhat—suggested mixed results: one indicator has held remarkably constant since 1976 and the other indicator has modestly declined since the mid-1980s. Neither indicator, however, suggests the rate of decline evident in MTF self-reports of drinking.

Conclusion

The first theme that emerges from this review is that our ability to draw conclusions about the scope and nature of current alcohol consumption and trends is severely restricted by the gaps in our knowledge and the inconsistencies and uncertainties surrounding the existing data. A recent GAO (1993) evaluation of the MTF and NHS studies focused particularly on problems and inconsistencies in national cocaine and heroin use data and trends. This Update suggests that the MTF and NHS studies, among other sources, are also problematic for the monitoring of youthful alcohol use. Among the problems encountered in assessing youthful drinking across surveys are the differences in age categories, surveyed methods, and the drinking measures that are employed. This is compounded by the difficulty in interpreting the meaning and significance of youth having tried alcohol, which is normative, compared to having tried an illicit drug, which is not, as well as by the lack of clear and common definitions of what constitutes regular, heavy, or problem use, misuse, or abuse. Finally, what we do know is largely limited to school-based surveys of students. In many communities with high rates of school absenteeism and dropping out, which have been shown to be correlated with higher rates of AOD consumption, the "picture" of youthful drinking might be very different. Addressing these data limitations is a fundamental first step for providing the information needed to guide policy and prevention efforts.

Despite these limitations, there are signs that reductions in alcohol use among students are occurring. The prevention community has long recognized that alcohol education—reducing adolescent alcohol consumption—presents special difficulties (Austin 1988; Hansen 1988; Ellickson & Bell 1990:1304; Wallack & Corbett 1988). Of all drugs, alcohol has been the least consistently affected. As a result, criticism of school-based programs has been even more intense in regard to alcohol than other drugs (e.g., Moskowitz 1989; Mauss, Hopkins et al. 1988; Ellickson & Bell 1990.). Indeed, the large body of criticism of school-based drug prevention programs in general has been largely supported by the lack of effectiveness of traditional alcohol education programs (Braucht & Braucht 1984; Kinder et al. 1980; Polich, Ellickson et al. 1984; Staulcup et al. 1979; Bruvold 1988).

Although results have been more encouraging with the new generation of behavioral psychosocial programs developed from antismoking programs, even they have been far less effective with alcohol than tobacco. Only a few field studies have demonstrated any reductions in the onset of alcohol use (Graham, Johnson et al. 1990; and Hansen, Johnson et al. 1988, for SMART; Hansen, Johnson et al. 1988, Pentz, Dwyer et al. 1989 for STAR; Botvin, Baker et al. 1984a; Williams, DiCicco, & Unterberger 1968). For example, in their one-year evaluation of AAPT (Alcohol Abuse Prevention Training) program for 7th graders, Hansen and Graham (1991) reported the normative education component significantly deterred the onset of use of alcohol, as well as marijuana and cigarettes. Botvin, Baker et al.'s (1990a) one-year follow-up of Life Skills Training suggested that the strategy, when implemented by peer leaders in the 7th grade with booster sessions during the 8th, can reduce alcohol use in general (as well as marijuana and tobacco). However, in Botvin, Baker et al.'s (1990b) three-year evaluation of the program, significant prevention effects were found only for immoderate alcohol use or drunkenness. Previous findings of program efficacy for alcohol use in general were not supported.

It would appear that the potential effectiveness of any prevention curriculum is partly a function of the substance addressed and that the strategies that may be successful against one drug may not necessarily succeed against other drugs (U.S. DHHS 1987:49; U.S. GAO 1987:43; Moskowitz 1989). It has also been

suggested that the successes found for tobacco prevention programs may have been misinterpreted, that it was not so much the programs that brought about reductions in adolescent smoking but changing attitudes and norms of the larger community (Mauss, Hopkins et al. 1988; Hawkins, Lishner, & Catalano 1985:99; Lohrman & Fors 1986; Moskowitz 1983). Concomitantly, the lack of success found in alcohol education program has been attributed, in large part, to the widespread acceptance of drinking in America and the inconsistent messages youth receive about it. In the words of MacKinnon, Weber, and Pentz (1989:138): "The successful prevention of cigarette use may be the result of this particular time in history. If so, it would follow that dramatic changes in perceived harmfulness of alcohol at the society level are needed before substantial decreases in prevalence are noted." Similarly, Ellickson and Bell (1990:1304) attribute the erosion over time in the ALERT program effects on alcohol drinking to "the widespread prevalence of alcohol use, in society at large, as well as in the schools that participated in our experiment, [which] undermined curriculum messages about resisting pressures to drink." Success with alcohol may await changes in social climate in which a greater consensus against drinking emerges (Austin 1988; Ellickson & Bell 1990; Moskowitz 1989; Polich et al. 1984; U.S. DHHS 1987:49; Wallack & Corbett 1988).

That we are seeing a national decline in per capita consumption, and evidence in some surveys that youth drinking is declining and that attitudes toward alcohol use are becoming less permissive, may signal such a shift in the social climate. Unfortunately, this can only be a tentative suggestion for further study. Not all indicators support the finding of a broad decline among youth. Particular attention needs to be directed toward the reasons for differences in trends between states. Nor is it clear whether youth may be becoming more abstinent or more moderate in their drinking, which could have important implications for developing prevention programs for the future. Most problematic, it cannot be discounted that the reported declines in drinking may reflect to some degree a decrease in willingness to self-report consumption as attitudes have become more critical. The influence of changes in self-report bias need to be added to the research agenda. Nevertheless, overall, current signs suggest that youth are in the process of moderating their drinking.

Thus, some caution is warranted in interpreting the scope and meaning of the reported declines. Regardless, there is no reason to be sanguine about current levels of drinking. Among upper graders, heavy drinking rates are disturbingly high. It appears that about a fifth are drinking weekly, a quarter have recently engaged in binge drinking, and a third are heavy drinkers. If some alcohol experimentation can be expected among youth, something more than this is still certainly occurring.

How can we improve our prevention efforts to address this situation? This review raises several fundamental questions about what should be the goals and objectives of alcohol prevention. Where should we focus our efforts; what can we realistically expect to achieve; and how can we go about achieving it? Most prevention programs are focused on preventing the onset of drinking itself and promoting absolute abstinence. But it is not clear that this goal is attainable, nor that it should be the highest priority. Alcohol experimentation remains almost universal, reported by at least 85% of students). Some adolescent alcohol experimentation appears inevitable. Furthermore, research shows that many youth limit their use to occasional consumption of moderate amounts and many do not progress to consumption of other drugs. For these youth, there is little evidence that their alcohol consumption has any significant long-term adverse effects and may even have some benefits.

On the other hand, data reviewed here underscore the importance of delaying initiation as far as possible, and of intervening to prevent the continuation or escalation of drinking and to reduce the prevalence of heavy, regular drinking. The later youth try alcohol, the less likely

they are to subsequently engage in regular, heavy drinking or to progress to other drug use. Clearly, too, the escalation of drinking needs to be prevented and the harm associated with it reduced. More attention needs to be directed toward communicating the dangers of regular, heavy drinking and the circumstances in which youth place themselves most at risk from their consumption. Equally important is identifying and helping those youth who are most at risk for becoming regular, heavy drinkers and consequently are at greatest risk for initiating illicit drug use and experience long term harm from their AOD use.

Given that alcohol is the most commonly used psychoactive substance among the nation's youth, and that alcohol use is increasingly the focus of prevention-related efforts, it is perhaps a little surprising that these windows on youthful drinking are as cloudy as they appear to be. One important factor in this is doubtless that the MTF, NHS, and almost all the other studies reviewed here are addressed primarily to illicit drug use and hence do not incorporate the sort of detailed questioning about drinking that would be found in a specifically alcohol-focused survey. A greater effort to resolve the weaknesses and inconsistencies in data collection specific to alcohol, particularly on a national basis, is required to guide future prevention efforts.

Notes

[1]For previous literature reviews, see: Andrews 1991; Blane & Hewitt 1977; Braucht 1977; Bucholz 1990; Czechowicz 1988; Moskowitz 1989; U.S. OSAP 1987; Wallack & Corbett 1990; and Walker, Jasinska, & Carnes 1978. Differences involving gender and ethnicity have been treated in previous Updates (e.g., Bodinger-de Uriarte & Austin 1991; Austin & Pollard 1993).

[2]The Prevention Research Updates are produced at the Southwest Regional Laboratory. Robert G. Sieber served as general editor of this Update, and prepared the abstracts. Kelly L. Andersen provided clerical assistance. Special thanks are due to Eric Einspruch of Northwest Regional Laboratory, and Andrea Mitchell of the Alcohol Research Group, for their assistance.

[3]The survey was sponsored by the American School Health Association, the Association for the Advancement of Health Education, and the Society for Public Health Education. The questions on heavy drinking were given to only about a third of the total sample.

[4]The intention is to repeat the national survey every other spring during the decade (Kolbe 1990). Caution is advised in comparing the state and local data because of the varying quality of the samples (CDC 1991a). In 1991, only 17 state and local sites had adequate school- and student-response rates to allow computation of weighted results of known precision (CDC 1992).

[5]As did the 1978 Maryland State Survey (Mills & Noyes 1984). The 1980 Gallup survey results showed drinking rising to 92% among boys and 73% among girls by age 18.

[6] For example, the comparative past month vs. ever use rates for seniors in the 1992 ADAS were 55% vs. 91%; the 1992 MTF, 51% vs. 88%; the 1990 YRBS, 66% vs. 92%; and the 1991 NHS (for ages 16-17), 38% vs. 67%. Similarly, for the combined 8th- and 10th-graders in the NASHS, the rates were 44% vs. 84%.

[7]Results were consistent with research showing differences between users and misusers in a variety of drinking behaviors and that a considerable proportion of drinkers apparently engage in drink-related high-risk behaviors.

[8]Consistent with this rise, Murray, Perry et al. (1987) reported binge-drinking rates in 1983 of 10% for 12-year-olds and 13% for 13-year-olds, even though there was no age gradient for moderate alcohol use.

[9]In assessing usual drinking level, Gibbons, Wylie et al. (1986, 1986a) reported that 24% of rural drinkers in secondary school had five or more drinks per occasion in 1983.

[10]Drunkenness in the past year in the MTF was reported by 28% of 8th-graders, 37% of 10th, and 50% of 12th. n addition, among the *drinkers* age 13-18 in the 1980 Gallup phone survey, 69% had been drunk, 62% had been drunk in the past year, 22% on at least a monthly basis. While differences between those aged 13-15 and 16-18 were not great for females, the rate of heavy drinking increased greatly among the older males, with 39% of drinking males age 16-18 reporting lifetime drunkenness, 31% at least once a month, and 8% weekly (Zucker & Harford 1983).

[11]The percentages who at least liked to drink to feel the effects of alcohol increased from 15% to 49%.

[12]Johnston, O'Malley, & Bachman (1993:50) note the inherent problem in this statistic is that students who initiate use in the past year cannot be noncontinuers. Thus, it tends to understate noncontinuation rates for drugs that are initiated late in the school career (which tend to be drugs other than alcohol), rather then early. They also stress the differences between noncontinuation and "discontinuation," which would imply ending an established pattern of use, whereas noncontinuation includes experimental users as well as established users.

[13]This applied to all ethnic groups except Asians.

[14]One way in which increased drinking may increase the risk of initiating other drug use is through alcohol's disinhibiting effects. Over four administrations, the California Student Survey has consistently shown that the majority of respondents who had ever tried another drug were drinking before they first tried it. In the 1991 CSS, the rates for prior drinking were 75% of 7th-, 59% of 9th-, and 54% of 11th-grade drug users. The younger the respondent, the more likely that this occurred (Skager & Austin 1993).

[15]Mills and Noyes (1984) also emphasize that the progression is not just sequential but cumulative—new drugs are added to previous drug repertoire.

[16]Newcomb & Bentler (1988) further criticize prevention efforts that rely heavily on peer pressure resistance and a "just say no" approach because peer influences are only one of many etiological factors and further tend to motivate nonproblematic experimental use.

[17]Patterns of change in per capita consumption across the three beverages differ too. Spirits consumption peaked in 1969 and the early 1970s, and has been declining more or less continuously since 1976; beer consumption peaked in 1982, and has declined between 1982 and 1990; wine consumption, peaked in 1986 at 0.39 gallons, and declined a little more steeply (between 8 and 9%) between 1986 and 1990.

[18]According to survey evidence, youthful illicit drug use patterns also appear to have peaked in 1979 and declined thereafter—see Harrison (1992).

[19]More specifically, between 1979 and 1985, annual prevalence fell from 88% to 86%, monthly prevanece from 72% to 66%, and daily prevalence from 6.9% to 5.0%. All rates remained fairly level from about 1985 and 1987 and then showed further declines. A similar pattern was observed for occasional heavy (binge) drinking. Rates peaked in 1979 (at 41%) and then remained stable until declining in 1984 and 1985. After two more years of stablity, it declined to 28% in 1992, nearly one-third of the 1979 rate.

[20]Between 1989 and 1991, increases in drinking in the prior six months occurred at each grade level for beer, wine, and spirits, at times between 3-6 percentage points higher, depending on beverage and grade. For example, beer drinking increased four to six percentage points (to 41% for 7th-, 55% for 9th-, and 66% for 11th-graders). Distilled spirits similarly showed increases of three to five points (to 20%, 38%, and 51%, respectively). Use of any alcohol in the past six months increased five percentage points among 9th-graders (to 67%) and two points among 11th (to 77%).

[21]A fatality resulting from a vehicular crash is considered to be "alcohol-related" if any one of three criteria is satisfied: (a) the investigating officer's judgment that alcohol was present (added in 1977); (b) the victim's blood tested positive for alcohol (added in 1978); or (c) a citation for Driving Under the Influence (DUI) was issued to to a driver involved in the crash (added in 1982) (see Zobeck et al., 1992:2). Evans (1990) has argued that despite all the interest and effort the question has attracted, the literature offers no satisfactory definition or means for measuring an "alcohol-related" crash—though Evans also braves to assert that changes in alcohol use between 1982 and 1987 reduced traffic fatalities by 12% (or 6,400 deaths).

[22]It should also be noted that in the California, Hawaii, and Washington state surveys, in which there is no, or only mixed, evidence for any decline in drinking, the proportion of friends who are perceived as alcohol users have, for the most part, not changed over the survey periods.

[23]Kandel & Davies (1992:1065-1066) discuss in regard to trends in illicit drug use a cohort size factor that might play a role in alcohol consumption as well. They observe note that the decline in use in illicit drugs from 1980 to 1988 parallels the decline in the ratio of youths (age 15-24) to the parental generation (aged 34-44) and the upward trend from 1960 to 1980 paralleled the upward trend in ratio of youths to adults. "Fewer members in one's age cohort and smaller relative cohort size will reduce opportunities for social interactions with one's peers, a most important factor in drug use initiation, and increase social control by the older generation." (Kandel & Davies 1991:1066). Areas of high prevalence would show more rapid decline than areas with low prevalence, where the pool of existing and potential users would include individuals more committed to drugs.

ABSTRACTS

Guide to Abstracts

BAILEY, SUSAN L. 1992. Adolescents' multisubstance use patterns: The role of heavy alcohol and cigarette use. ***American Journal of Public Health*** **82(9):1220-1224.**

Knowledge about the roles that heavy alcohol and cigarette use play in patterns of concurrent substance use among adolescents is lacking despite studies showing that adolescent substance users are typically multisubstance users and that alcohol and cigarettes are commonly used heavily by those who use illicit substances. The roles of increasing use and heavy first-time use of alcohol and cigarettes in multisubstance use patterns were examined in a cohort of 4,192 students who were surveyed three times during the years 1985-1990, beginning while they were in middle school (grades 6-8), in a single county of the southeastern U.S. There was about 25% attrition between each round, and attrition analyses indicated that many students identified as users and heavy users at Time 1 were lost before subsequent rounds.

Students who smoked cigarettes at a rate of one pack per day to a rate of half a pack per week were coded as heavy users. Those who smoked less than half a pack per week were coded as light users. Those who drank three or more drinks on a typical occasion of alcohol use and had had more than one drinking occasion in the past year were coded as heavy drinkers. Those who reported only one drinking occasion in the previous year or drank only one or two drinks on typical occasions were coded as light drinkers. Use in the past year, compared with no past-year use, was also measured for inhalants and illicit drugs.

Results. Several common patterns of substance use emerged. The most commonly reported pattern at all three rounds, for both males and females, was abstention from both alcohol and cigarettes. The percentage of abstainers did decline, however, from 53.5% at Time 1 (T1) to 30.8% at Time 2 (T2). Another pattern, heavy use of alcohol, with no use of any other substance, showed the most consistent gender difference, with males more likely than females at all three rounds to report this pattern. Heavy alcohol use in combination with other substances showed no consistent difference by gender. Heavy tobacco use most commonly accompanied heavy alcohol use and some use of other substances as well.

Six types of transitions in alcohol and tobacco use were measured as well: initiation of light use of alcohol or tobacco, initiation of heavy use; and increase from light to heavy use. For subjects exhibiting these transitions between Time 1 and Time 2, subsequent (Time 3) prevalence of other types of substance use was measured. Generally, students who increased alcohol use, from light to heavy, were more likely than those who went through other transitions subsequently to initiate use of other substances. Those who increased from light to heavy use were least likely to quit other substance use, and those who initiated light use were most likely to quit other substance use.

Conclusions. These results suggest that adolescents are likely to have been involved in a history of licit substance use characterized by increasing levels of use before progressing to and maintaining the use of other substances. Results indicated further that it was less the level of alcohol and tobacco use which predicted subsequent multiple substance use than the progression to increased levels of use.

BAILEY, SUSAN L.; FLEWELLING, R.L.; & RACHAL, J.V. 1992. The characterization of inconsistencies in self-reports of alcohol and marijuana use in a longitudinal study of adolescents. ***Journal of Studies on Alcohol*** **53:636-647.**

The reliability of self-reported measures remains an important issue for research on adolescent alcohol and drug use. This study explores the consistency of self-reports of frequency of use and age of first use of alcohol and marijuana in a sample of 5,770 secondary school students in a southeastern U.S. county. Two waves of data were collected between 1985 and 1988 using state-of-the-art data collection procedures and self-administered instruments. Consistency of reports was examined by comparing reports at Time 1 and Time 2, approximately one year apart.

Results. Results showed that when consistent nonusers were dropped from the analysis, consistency rates of lifetime frequency of use dropped from 82.7% to 74.7% for alcohol, and from 95.6% to 83.2% for marijuana. Reports were more consistent for lifetime marijuana use than for alcohol use, but these results must be interpreted with caution given differences in the measures for the two substances. Reliability for reported age of first use was very low for both substances. When consistent nonusers were dropped from the

analysis, only 27.8% of respondents made consistent estimates of their age at first alcohol use and 34.4% for their age at first marijuana use.

BARNES, GRACE M., & FARRELL, M.P. 1992. Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviors. *Journal of Marriage and the Family* 54:763-776.

Among a representative general population sample of 699 adolescents and their families, solicited through a random-digit-dialing telephone survey, the effects were examined of parenting practices, particularly support and control, on the development of adolescent drinking delinquency, and other problem behaviors. Black families were oversampled (n = 211) to permit meaningful analyses.

Results. The findings confirmed that parental support and monitoring were important predictors of adolescent outcomes even after taking into account critical demographic/family factors, including socioeconomic indicators, age, gender, and race of the adolescent, family structure, and family history of alcohol abuse. In addition, peer orientation remained a significant predictor of drinking behavior and deviance and interacted with aspects of parenting. The present study gives strong evidence that high parental support and high parental monitoring are key socialization factors in the prevention of adolescent alcohol abuse and more generalized deviance. After controlling for socioeconomic status, age, gender, race, family history of alcohol abuse, and family structure, parental support and monitoring remain highly significant factors in predicting adolescent problem outcomes. However, after controlling for race, family structure does not predict regular drinking or deviance.

Conclusions. Thus, being in a single-parent versus a traditional two-parent family may not be as critical a factor for adolescent outcomes as are parenting practices per se, particularly support and monitoring. Future studies should not only assess family structure, but should also take into account measures of parenting practices. From these findings, it is clear that the peer group remains an important agent of socialization during the period of adolescence even after the effects of parenting have been taken into account. Peer influences interact with family influences in their relationships to the development of adolescent drinking, deviance, and related behaviors. Where parent-child interaction is problematic, adolescents are likely to withdraw from the family and rely more heavily on influence of peer subcultures.

BECHTEL, LORI J., & SWISHER, J.D. 1992. An analysis of the relationships among selected attitudinal, demographic, and behavioral variables and the self-reported alcohol use behaviors of Pennsylvania adolescents. *Journal of Alcohol and Drug Education* 37(2):83-93.

The relationships were evaluated among attitudinal, demographic, and behavioral variables and the self-reported alcohol use behaviors of adolescents. The subjects (N = 7,799) comprised a representative sample of male and female students, grades 6 through 12, from 26 school districts throughout Pennsylvania during the 1983-84 and 1984-85 academic years. Data were analyzed using the multiple correlation-regression procedure which incorporated self-reported use of alcohol as the dependent variable. Independent variables included: behavioral intention; attitude toward school; school misconduct; time spent on sports activities, extracurricular activities, religious activities, and academic activities; grade average; gender; and grade level.

Results. Alcohol use was highly correlated with the composite effects of the variables tested. Intention to use alcoholic beverages correlated positively with self-reported actual use, measured separately, of beer, wine, and liquor, as did school misconduct. Grade level correlated positively with self-reported use of beer and wine. Time spent on religious activities showed a weak negative correlation with alcohol use, as did grade average and time spent on academic activities.

Conclusions. It is concluded that adolescents' alcohol use behavior is best explained on a multifactorial basis: it is the aggregate effects of various attitudinal, behavioral, and demographic variables which were most highly related to self-reported alcohol use. Thus, effective prevention and treatment will require a comprehensive understanding of the various correlates, and of

factors leading to adolescent drinking, as each individual is influenced by a unique combination of variables. Planners should especially consider behavioral intentions, school misconduct, and time spent in formal group activities when developing alcohol education programs.

BECK, KENNETH H.; SUMMONS, T.G.; & MATTHEWS, M.P. 1991. Monitoring parent concerns about teenage drinking and driving: A focus group interview approach. *Journal of Alcohol and Drug Education* 37(1):46-57.

A series of four qualitative focus group interviews was conducted in 1988 with parents of high school students in Bowie, Maryland, a middle-class suburb of Washington. The parents were recruited through a newspaper announcement, and in a flyer regularly sent home to parents. Parents were offered $25 per hour for their participation in a discussion of issues concerning high school students. Each group consisted of 8-12 parents, and the discussions lasted about one hour, exploring alcohol use, influences, and interventions. The purpose was to explore their in-depth perceptions of the alcohol consumption patterns of their children, as well as the influences on their consumption and appropriate interventions.

Results. Respondents generally reported awareness of significant amounts of teenage drinking, but were divided on willingness to permit their children to attend parties where alcohol was available. The great majority of participating parents were not concerned about their own child having a drinking problem, but were concerned about their child being injured by an impaired driver. The majority of respondents indicated that their teenager's peer group was the most important influence on his or her drinking behavior, but opinions were mixed as to whether the parents' own drinking influenced their children. Most parents also reported feeling powerless to control their teenagers' behavior, and all agreed that a parent-support group, or sharing information among parents might help them cope better with their children. While the participating parents indicated that they were willing to participate in such a group, they were pessimistic about other parents' willingness.

Conclusions. The results indicated: (a) low levels of parental awareness about the true extent of teen drinking, especially among their own children; (b) low levels of parental control or empowerment over teen drinking; (c) feelings of detachment or isolation from other parents who may share similar concerns; (d) considerable receptivity to receiving skill training in the area of DWI and other substance abuse prevention issues; and (e) feelings of resistance to such programs that may require substantial time commitments of them, but more favorable disposition toward mass mediated delivery systems of this material.

BLOCH, LINDA P.; CROCKETT, L.J.; & VICARY, J.R. 1991. Antecedents of rural adolescent alcohol use: A risk factor approach. *Journal of Drug Education* 21(4):361-377.

The association between risk factors and alcohol use was examined in a sample of 463 junior high school students in a rural Pennsylvania community. Data was analyzed from the first and third years of a five-year longitudinal study, when the students were in grades 7-9 and 9-11, respectively.

Results. Prevalence of alcohol use was found to be high: 62% of the respondents reported having been drunk at least once in year three, 20% reported getting drunk monthly, and 13% weekly. The students were classified as either: abstainers (36%), who were never drunk; experimental users (31%), who were drunk a few times or less in a year; and regular users (33%), who were drunk more than a few times. The three user groups were associated significantly with levels of use of both beer and liquor.

Six variables—family relations, family structure, marks in school, participation in academic activities, frequency of church attendance, and deviant behavior—were found to be significantly associated with alcohol use two years later. No gender or age differences were found in these predictors of alcohol use.

These six risk variables were combined to form a risk index. A 3x2x2 ANOVA (User group by Gender by Grade) was used to examine the association between the risk index score at Year 1 and level of alcohol use at Year 3. Only the main effect for User group was significant. Thus, the number of risk factors at Year 1 was predictive of alcohol use at Year 3,

suggesting that risk factors operated additively. The risk index also predicted frequency of alcohol use in a replication sample.

Contrary to expectations, self-esteem and emotional tone did not significantly predict future level of alcohol consumption. Commitment to school, to family, and to religion, however, did appear to deter adolescent alcohol involvement.

Conclusions. These results suggest that the model which views risk-factors as additive, so that an adolescent's sum or total of risk factors is related to frequency of AOD use, is applicable to rural as well as urban youth.' This model implies that prevention efforts focussed on single-risk factors is likely to be in effective. However, there may be some differences between the risk factors operating among rural and urban adolescents. Drinking alcohol apparently was not seen as deviant behavior. The failure to find significant grade or gender differences suggest that the identified risk factors operated in the same way for males and females, and for 7th- and 9th-graders. Accordingly, it is proposed that prevention programs for both genders and various grades should target similar domains, recognizing the importance of various risk factors, and normative versus problem use.

BRANNOCK, JOANN C.; SCHANDLER, S.L.; & ONCLEY Jr., P.R. 1990. Cross cultural and cognitive factors examined in groups of adolescent drinkers. *Journal of Drug Issues* 20(3):427-442.

A sample of 194 White, Black, and Hispanic students from two high schools and one college was surveyed to examine the relationship between ethnicity, cognitive level, gender, drug use, and adolescent alcohol abuse. Subjects included 64 freshmen and 99 seniors from one public and one parochial high schools, along with 31 freshmen at a private college in southern California (71 males and 121 females; 96 Whites, 55 Hispanics, 22 Blacks, and 9 others; 2 subjects did not indicate gender, and 12 did not indicate race). Cognitive development was assessed with paper and pencil problems based on Piagetian theory, and drinking behavior with the Youth Diagnostic Screening Test.

Results. Among those who reported drinking, Whites reported drinking more often; using alcohol more often to relieve tension, and experiencing more peer influence to drink than Blacks or Hispanics. There was a significant correlation between cognitive development and degree of alcohol abuse for females, but not for males. There was no difference between high school seniors and college freshmen on drinking behavior or drinking due to stress, but there were differences between these students and high school freshmen. Peer pressure to drink was significantly greater for high school seniors than for college freshmen.

Conclusions. Results indicate that high school seniors and college freshmen use alcohol to relieve stress associated with critical decision-making points in their lives. Treatment should include teaching constructive coping techniques, leading to building self-confidence in the clients: therapists must consider in treatment the individual needs of each adolescent.

BUSH, PATRICIA J., & IANNOTTI, R.J. 1993. Alcohol, cigarette, and marijuana use among fourth-grade urban schoolchildren in 1988/89 and 1990/91. *American Journal of Public Health* 83(1):111-114.

A public-school-based epidemiological survey of AOD use among 4th-grade students in Washington, DC, was performed in 1988-89 (n = 4,675) and 1990-91 (n = 4,678).

Results. Comparisons of data for the two periods revealed that the lifetime prevalence of self-reported alcohol use, alcohol use without parental knowledge, and smoking more than a puff of cigarettes had declined. The prevalence of any alcohol use had decreased from 51.4% in 1988-89 to 42.6% in 1990-91. Marijuana use and cigarette experimentation had not declined.

Decreases were also observed in perceived peer pressure to use; seeing a family member/friend selling drugs; and being offered alcohol, cigarettes, or marijuana by peers. No decrease was observed in family use, perceived friends' use, being bothered a lot if best friends use, or seeing someone else selling drugs.

Conclusions. The decrease in alcohol use measured among 4th-graders, while small, is consistent with declines reported among high school seniors, although self-reports may have been influenced by the changing social acceptability of use. The association of environmental factors to use suggests the need

for early intervention directed at preadolescents and their families.

BUSH, PATRICIA J., & IANNOTTI, R.J. 1992. Elementary schoolchildren's use of alcohol, cigarettes and marijuana and classmates' attribution of socialization. *Drug and Alcohol Dependence* 30:275-287.

In 1988 and 1989, beginning in the 4th and 5th grades, 1,904 Washington, DC, public elementary school students completed surveys about abusable substance use and health-promoting behaviors and completed an instrument that permitted each child to have a socialization score attributed by classmates. A factor weighted 12-item scale was developed from 15 items in three domains (personal, interpersonal and school).

Results. In Year 1 (grades 4 and 5), 58% of boys and 47% of girls reported having tried alcohol (at least a sip), and in Year 2 (grades 5 and 6) slightly more, 60% and 52%, respectively. Prevalence rates for drinking without parental permission showed larger increases, especially among girls (from 19% to 20% for males, 11% to 15% for females). The scale was positively correlated over the 2 years and positively correlated with a healthful activities scale in both years. Conditional multiple logistic regression, matching on school classroom, indicated that socialization was negatively associated with use of alcohol without parental permission and cigarettes in both years, and with use of marijuana in year 1. Socialization measured in year 1 was negatively associated with cigarette use in year 2 and with onset of use from year 1 to year 2. Shyness, a non-socialization scale item was negatively associated with use of cigarettes in both years and with use of alcohol without permission and use of marijuana in year 2. Being "good at sports" was an attribute positively associated with alcohol use without permission and cigarette use in year 2.

Conclusions. The results suggest that elementary school students can ascribe social characteristics to their classmates that are associated with and predict health related behaviors. Since early initiation has been associated with later problem use, the 15-20% of 5th- and 6th-graders who reported drinking without parental permission may be at risk of later becoming problem drinkers.

CACES, M. FE; STINSON, F.S.; & HARFORD, T.C. 1991. Alcohol use and physically risky behavior among adolescents. *Alcohol Health & Research World* 15(3):228-233.

The relationship between alcohol use and physically risky behavior was examined in a national sample of 8th- and 10th-grade students ($N = 3,789$), weighted to reflect a nationally representative gender and grade distribution. The sample was surveyed as part of the National Adolescent Student Health Survey, between November 1987 and January 1988.

Initially, four separate measures of alcohol use—lifetime, past year, past month, and recent binge drinking (five or more drinks on a single occasion within the previous two weeks)—were examined in relation to physically risky behavior. While each measure showed a similar outcome (i.e., risk-taking behaviors were most prevalent among those reporting more frequent drinking), past month use of alcohol and risky behavior showed the most clear-cut associations. Accordingly, data presented pertain specifically to reported past month drinking behavior, although similar results can be expected with the other categories of alcohol use. Physically risky behaviors were examined in three separate respondent groups, defined according to whether and to what extent respondents had used alcohol: *abstainers; less frequent drinkers*—those who had used alcohol one to two times in the past month; and *more frequent drinkers*—those who had used alcohol three or more times in the past month.

Results. More than four out of five respondents (84%) reported using alcohol at least once in their lifetime; almost three out of four (73%) reported using alcohol in the past year; more than two out of five (44%) reported using alcohol in the past month; and about one in three (32%) reported having had five or more drinks on any one occasion over the past 2 weeks.

The most commonly reported physically risky behaviors were walking outside alone late at night and going to places known to be dangerous. Nearly three out of four respondents (74%) reported that they had walked alone late at night at least once in the past year, and nearly two out of three (63%) had gone to a dangerous place. More than one-third of respondents had been in a physical fight at least once in the past year (39%), and a similar proportion had let people see how much

money they were carrying (38%) or walked alone through unsafe neighborhoods (37%). More than one in four (28%) had gone out alone to sell items door-to-door, and more than one-fifth (22%) had talked to strangers who tried to keep them from going on their way. One in five (20%) had gone on a blind date with someone they hardly knew; about one in seven (14%) had carried a knife at school; about one in eight (12%) had ridden empty buses or trains; one in ten (10%) had hitch-hiked; and about one in twelve (8%) had carried a weapon, other than a knife or a handgun, at school. Less than 2% reported having carried a handgun at school.

In general, a gradient was observed in the levels of reported frequency of alcohol use and the percentage of respondents who reported specific physically risky behaviors. Increasing frequency of drinking was accompanied by a greater tendency to engage in risky behavior. For instance, among abstainers, less than one-third of respondents (31%) reported engaging in a physical fight in the past year, whereas among less frequent drinkers, two out of five (42%) had engaged in a physical fight. The largest proportion of respondents who had engaged in a physical fight—54%—was found among the more frequent drinkers.

Overall, males were more likely to report engaging in a physical fight, carrying weapons, going on a blind date, walking in unsafe areas, and walking alone late at night. Females were more likely to be report being detained by strangers and letting people see how much money they were carrying. In any case, more frequent drinkers reported higher levels of risky behaviors, a pattern seen with every risky behavior except selling door-to-door alone. Among males, abstainers were generally the least likely to have engaged in physically risky behavior; this was also the case among females. In general, 8th-grade abstainers tended to report lower levels of risky behavior than 10th-grade abstainers. However, the more frequent drinkers in the 8th grade tended to exceed the reported risk behavior levels of more frequent drinkers in the 10th grade.

Conclusions. For all risky behaviors surveyed, differences in levels reported by males and females and by 8th- and 10th-graders were observed; however, the basic pattern of a greater number reporting physically risky behavior with greater alcohol use persisted for each sex or grade level. In effect, the relationship of physically risky behavior to alcohol use was found to be steeper among 8th-graders, who showed greater differences between abstainers, less frequent drinkers, and more frequent drinkers in the proportion who reported engaging in risky behavior. Also noteworthy were the higher levels of physical fighting and selling door-to-door alone among 8th-graders, as compared with 10th-graders, for each category of alcohol use.

CHOU, S. PATRICIA, & PICKERING, R.P. 1992. Early onset of drinking as a risk factor for lifetime alcohol-related problems. *British Journal of Addiction* 87(1199-104).

Heavy drinking among students as been a major public health concern over the past decade. The National Health Interview Survey, a nationally representative 1988 survey on drinking practices and related problems, examined the effect of age of onset of drinking on lifetime alcohol-related problems. Analyses of data from 29,950 adult (age 18 and older) respondents compared current drinkers (having had at least 12 drinks in the preceding 12 months) and former drinkers (having had at least 12 drinks during a prior one-year period of their lives, but not during the immediately preceding 12 months). The interviews also measured any incidence of nine symptoms or alcohol-related problems (respondents giving positive responses for three of the nine problems were labelled alcohol dependent). Early drinking onset was defined as age 15 or younger.

Results. Of the total sample, 12% reported drinking initiation at age 15 or earlier. At interview, 42.4% said they had experienced three or more alcohol-related problems and were classified as alcohol dependent. Respondent's age at interview seemed to be positively correlated with age of first use, and females tended to have later age of onset than males. With the exception of nonWhite females in the two oldest age groups, all subgroups showed elevated risk for experiencing three or more lifetime alcohol problems among respondents who initiated alcohol-drinking at age 15 or earlier. The proportion of respondents who reported three or more alcohol problems decreased as age of first drink increased.

Conclusions. Present findings indicate that early drinking onset poses an increased risk

for lifetime alcohol problems, and that age of first drink negatively relates to incidence of alcohol problems in adulthood. It is concluded that delaying drinking onset until age 20-21 years reduced the likelihood of developing alcohol-related problems.

DIELMAN, T. E.; BUTCHART, A.T.; SHOPE, J.T.; & MILLER, M. 1991. Environmental correlates of adolescent substance use and misuse: Implications for prevention programs. *International Journal of the Addictions* 25(7A and 8A):855-880.

A cross-sectional pilot study was conducted during the 1988-89 school year with 1,335 students in grades 6 through 12. The students were from junior high and high schools in one school district in southeastern Michigan. The sample, which consisted of 49% girls and 51% boys, was predominantly Caucasian (96.5%), and 19% were receiving the junior high school free and reduced lunch program. The measures employed in the study were selected on the studies of intrapersonal correlates of adolescent alcohol use and misuse. The students were asked questions regarding their alcohol use and misuse; several intrapersonal variables including deviant self-image, family adjustment, school adjustment, and susceptibility to peer pressure, and their perceptions of parental norms, parental alcohol use, parental permissiveness, parental monitoring, parental nurturing, sibling norms, sibling alcohol use, peer norms, and peer alcohol use.

Results. The three predictors which stood out as most highly related to both alcohol use and misuse were peer alcohol use, peer norms regarding alcohol use, and susceptibility to peer pressure. These results confirmed and extended the results of the earlier studies, indicating that peer alcohol use and peer norms regarding alcohol use, in combination with the intrapersonal construct of susceptibility to peer pressure, made the greatest contributions to the accountable criterion variance in adolescent alcohol use and misuse. After these three predictors were entered, some combination of parental monitoring, parental norms, parental nurturing, and sibling alcohol use provided statistically significant, but small additions to the accountable variance.

Conclusions. The results of the research reviewed confirm the need to continue to focus prevention efforts on the reduction of conformity to deviant peer norms and pressures to use alcohol and other drugs, but do not contradict the importance of continuing to develop prevention programs that include parental norms and behaviors as foci. The possibility should not be ignored that early parental norms and behavior may influence adolescents' attitudes and thus their later attraction to a particular peer group.

DIELMAN, T. E.; SHOPE, J.T.; BUTCHART, A.T.; CAMPANELLI, P.C.; & CASPAR, R.A. 1989. Covariance structure model test of antecedents of adolescent alcohol misuse and a prevention effort. *Journal of Drug Education* 19(4):337-361.

An elementary school social skills/peer pressure resistance curriculum for the prevention of alcohol misuse was evaluated with a randomized pre-post, experimental-control design on students from 213 5th- and 6th-grade classrooms in 49 schools in southeastern Michigan. The students were assigned randomly by school building to one of three experimental conditions (treatment, treatment plus booster (5th-graders only), control). The study group included schools that were randomly assigned to curriculum and control groups, with students tested prior to intervention (in 1985) and 2, 14, and 26 months following intervention. Care was taken during the implementation and evaluation phases to ensure that any differences found between treatment and control groups could be attributed to effects of the prevention program. Schools were matched on socioeconomic, ethnic, and achievement variables prior to random assignment to treatment conditions. The analyses were conducted on the questionnaires administered to 4,157 students at the second posttest (Spring 1986, 14 months postintervention). The questionnaires assessed the students' level of alcohol misuse, exposure to peer use and misuse of alcohol, susceptibility to peer pressure, internal health locus of control, and self-esteem. A conceptual model of the antecedents of adolescent alcohol misuse and the effectiveness of a prevention effort was tested using covariance structure modeling techniques.

Results. The factor loadings for the model were all moderate to high, indicating that the observed variables served well as measurement instruments for the latent variables. The hypothesized structural relationships among the latent variables of alcohol misuse, exposure to peer use and misuse of alcohol, susceptibility to peer pressure, internal health locus of control, and self-esteem were supported by the data. The full model explained 45% of the variance in alcohol misuse in the analysis based on the total sample. The strongest direct effect on alcohol misuse was susceptibility to peer pressure, followed by the direct effects of exposure to peer use and misuse, self-esteem, and the intervention.

For the total sample and for the low susceptibility to peer pressure subgroup, the effects of the intervention, although in the expected direction, were all quite small, although the estimated direct effect of the intervention on alcohol misuse was statistically significant in the hypothesized direction. There were no significant intervention effects for the high peer susceptibility subgroup. Observed differences in the significance of the parameter estimates between the high and low susceptibility to peer pressure subgroups suggest that different approaches to the design and evaluation of substance abuse prevention programs may be necessary for different subgroups of students.

In addition, grade level (age) was positively related to exposure to peer use and misuse of alcohol; exposure to peer use and misuse was positively related to one's own alcohol misuse; and internal health locus of control was positively related to self-esteem. The hypothesized negative relationship between self-esteem and misuse was significant in the total sample and in the low susceptibility to peer pressure subgroup, but not in the high susceptibility subgroup. This suggests the intervention may be differentially effective in various subgroups.

Conclusions. Results indicate that certain constructs can be identified as meaningful in the prediction of adolescent alcohol misuse. In particularly, susceptibility to peer pressure had an effect that was significant, positive, and larger than any other construct's total effects. The weak significant correlation between self-esteem and misuse confirm previous work on this variable and indicate that other variables might be more important to include in future models.

The failure to substantiate the hypothesized effect on the intervention on susceptibility to peer pressure could be due to the failure of the intervention to achieve the desired effect, or the failure to incorporate items in the measurement of susceptibility to peer pressure which were sensitive to the intervention effects, or both. Alternatively, it may not be necessary to alter susceptibility to peer pressure in order to achieve the desired effect on alcohol misuse, although this seems unlikely in view of the large direct effect observed.

DIELMAN, T. E.; SHOPE, J.T.; LEECH, S.L.; & BUTCHART, A.T. 1989. Differential effectiveness of an Elementary School-based Alcohol Misuse Prevention program. *Journal of School Health* 59(6):255-263.

An elementary school social skills/peer pressure resistance curriculum for the prevention of alcohol misuse was developed, implemented, and evaluated. The 49 participating schools were randomly assigned to experimental conditions as treatment, treatment plus booster, or control. In each grade and treatment condition, classrooms (213 total) were randomly assigned to pretest and no pretest conditions, in order to test for effect of pretesting and for pretest-treatment interaction on self-reports. All students were posttested at the end of the first year in which the program was presented, and at the end of the two subsequent years. Analyses were conducted on data from the 791 5th-grade and 714 6th-grade students who were pretested and who were present at all four testing occasions.

Results. The number of students with no prior drinking experience and only supervised drinking experience was four to five times larger than the number with unsupervised as well as supervised prior experience, which is not to be expected in a primary prevention program for this age group.

The prevalence of alcohol use and misuse increased with successive testing occasions, and students with unsupervised as well as supervised prior drinking experience exhibited higher levels of alcohol use and misuse across occasions than did students who were abstainers or those with only supervised experience. All interactions between type of

prior drinking experience and occasion were significant.

No significant ($p > 0.05$) main effects were found for the treatment. Only the "alcohol frequency-quantity" index out of four analyses of covariance yielded a significant treatment by type of prior drinking experience interaction, with control group 6th-graders reporting significantly higher scores.

Thus, at relatively low levels of prior experience with alcohol, students in the 5th and 6th grades who had both unsupervised and supervised drinking experience at pretest showed the greatest post-treatment reduction in the rate of increase of alcohol use and misuse, relative to control group students with equivalent prior experience. Both treatment and control group students with no prior drinking experience or only supervised drinking experience showed very slight increase in alcohol use and misuse, which served to markedly attenuate the differences between the two groups when considered as a whole because the no-or-supervised experience group was four-to-five times larger.

Conclusions. The findings that a higher percentage of students who reported prior supervised use of alcohol also reported unsupervised use, compared to students who reported no prior supervised use, suggests that alcohol use in settings supervised by parents or other adults may predispose adolescents to subsequent unsupervised use of alcohol. This suggests that parents who allow supervised drinking may be doing their children a disservice rather than teaching them "responsible drinking" and warrants further longitudinal investigation. The addition of a parental component to future prevention programs that makes parents aware of the nature of this relationship seems advisable.

These results support the use of school-based alcohol prevention programs to reduce alcohol misuse among school children, particularly those who have already begun to experiment with alcohol use. Such programs should also include a component to persuade parents not to introduce alcohol use to children even in supervised settings.

The lack of significant treatment by occasion or three-way interaction effects for 5th-graders could be due to differential grade-level effects or the failure to follow them beyond the conclusion of 7th grade. It may be that future intervention efforts should not be initiated until the 6th grade. It might also be enhanced by adding boosters, parental component. The results further emphasize the importance of adequate follow-ups. Interactions were not statistically detectable until the third posttest, at which time students who entered the study in the 6th grade were completing the 8th grade.

ELLICKSON, PHYLLIS L., & HAYS, R.D. 1991. Antecedents of drinking among young adolescents with different alcohol use histories. *Journal of Studies on Alcohol* 52(5):398-408.

Testing separate path analytic models for 7th-grade users and nonusers, the impact of cognitive, social influence and behavioral antecedents on adolescent drinking 3 and 12 months later were assessed in a sample of 1,966 students in the California control schools for the Project ALERT study.

Results. Among those students who had not tried alcohol by grade 7 (23%), it was found that social influence factors—exposure to peers who drink or use marijuana and to adults who drink—fostered more frequent alcohol use and binge drinking (measured as the number of days in the previous month on which the subject consumed three or more drinks in a row) in the near future (3 months later). The key peer influences on binge drinking were marijuana-specific. After 12 months, the child's own drinking experience during grade 7 and peer and parental attitudes toward drugs emerged as important explanatory variables.

For children who had already started drinking by grade 7, cognitive—as well as social and behavioral factors—affected near- and longer-term alcohol involvement. While the child's prior drinking habits had the strongest impact, baseline expectations of using alcohol also predicted frequency of alcohol use and binge drinking after 3 and 12 months. Believing that alcohol use is harmful helped hold down increases in frequency of use (but not excessive use) as long as 12 months later. Engaging in deviant behavior or doing poorly in school did not predict future drinking among baseline nonusers, but did foretell which of the 7th-grade initiates were most likely to engage in binge drinking during grade 8.

Conclusions. Social influences to use one particular drug were found to foster other drug use as well: it is suggested, therefore, that resistance skills taught for one particular drug

will increase resistance ability in general. However, binge drinking was also fostered by other attributes (deviant behavior and poor academic performance) that are particularly resistant to short-term improvement programs and may require more concentrated efforts on at-risk youth. The results indicated that the paths to alcohol use and abuse are complex. Beliefs about drinking consequences and expectations of future drinking appear to affect later use only after drinking has started, providing concrete experience on which to base those cognitions. It is further suggested that prevention programs targeting a single risk factor are unlikely to have significant impact, and that what are needed are programs which address multiple risk factors.

ELLICKSON, PHYLLIS L.; HAYS, R.D.; & BELL, R.M. 1992. Stepping through the drug use sequence: Longitudinal scalogram analysis of initiation and regular use. *Journal of Abnormal Psychology* 101(3):441-51.

Using a new technique for tracing the sequence of use over time, this study examined the pattern of drug involvement among 4,145 students (72% White, 10% Asian, 8% Hispanic, 7% Black) at the 30 West Coast secondary schools participating in Project ALERT over the 4-year span from Grades 7-10, during the mid- to late-1980s.

Results. Weekly alcohol use (3% in grade 7, 22% in grade 10) followed marijuana use (14% in grade 7, 44% in grade 10) and preceded use of all other illicit drugs for Hispanic, White, and Black youth. However, it followed use of hard drugs for Asians. Weekly smoking formed a distinct stage between initial use of pills and other hard drugs for non-Hispanic Whites. Longitudinal scaling by ethnicity suggested that Asian, Black, and Hispanic students may follow different pathways than Whites. For Blacks, an alternative pathway in which increased involvement with cigarettes followed hard drug use fit the data just as well as the main model. For Asians, the predominant sequence placed regular smoking and drinking after initial use of pills and other hard drugs, with increased drinking last. For Hispanics, weekly cigarette use also tended to follow hard drug use.

Conclusions. The findings support the view of regular alcohol use and smoking as separate stages in the sequence, and indicated that their position in the sequence may vary with ethnicity. Heavy drinking (average of two or more drinks per week) seems to provide a useful indicator of risk for future hard-drug use; whereas any lifetime alcohol use reveals little.

No evidence was found that cocaine had become a gateway drug. However, the data provided some support for treating cocaine initiation as a separate stage that preceded the onset of hard drugs other than pills. The analysis also showed that increased involvement with legal drugs constituted an important step in the transition to hard drug use for most adolescents. The results underscored the importance of prevention efforts aimed at curbing the transition to regular use of alcohol and cigarettes, as well as their initial use. It is concluded that the present survey does not support the tailoring of prevention strategies to different ethnic groups: the differences observed emerged at later stages. The similarity in the gateway stages is consistent with findings that prevention programs targeted at gateway drugs gave similar effects across ethnic groups. Further research should attempt to separate the factors that only foster substance initiation from those that promote abuse.

FISHER, LYNN A., & BAUMAN, K.E. 1988. Influence and selection in the friend-adolescent relationship: Findings from studies of adolescent smoking and drinking. *Journal of Applied Social Psychology* 18(4), 289-314.

Research has demonstrated high degrees of similarity between ATOD use behaviors of friends, and it has frequently been inferred from this that the similarity reflects the importance of friends' influence. This similarity could also be caused by a selection process, where friends are chosen and kept according to behavior similarities. Sociometric data from longitudinal research on smoking and drinking by adolescents permitted separation of selection and influence processes, and provided some support for the influence model, but indicated greater importance for the selection process.

Data were taken from two separate, but similar, longitudinal studies conducted simultaneously in the Guilford County school system. One study examined smoking

behavior in 9th-grade subjects, and the other was on alcohol-consumption among 7th-graders. Initial data collection for both studies took place in the summer and fall of 1980, with follow-up one year later. Data collection procedures were the same for both studies. Data was gathered in subjects' homes, and subjects were asked to name their three best friends, in order of closeness, who were close to them in age, and not their own siblings. Friends' names were kept separate from questionnaires, and those eligible for the same study were identified only by number on the questionnaires. Analyses used data for the friend ranked highest in closeness who also completed a questionnaire. Almost 95% of respondents named at least one friend who also participated in the study. Respondents were asked to report their friends' lifetime use of alcohol or frequency of cigarettes use, in the respective studies, as well as their own. The tobacco study also used carbon monoxide measure of participants breath to validate self-report data.

Results. Positive associations were consistently found between subject and friend behavior. These associations were stronger in the tobacco study than in the alcohol study, and in the alcohol study the association showed greater significance for beer than for liquor. Subject's report of friend's behavior showed greater correlation with subject's self-reported behavior than did friend's self-report. First round associations differed very little from second round.

In order to test the influence hypothesis, a subsample of only those subjects from each study who kept the same best friend from Time 1 to Time 2, in order to minimize the impact of selection. Using subject reports of friend's behavior, it was clear that nonusers with user friends at Time 1 were more likely to initiate use before Time 2 than were nonusers with nonuser friends. However, using friends' own self-reports, this was clear only for the alcohol study and not for the smoking study.

To investigate the selection hypothesis, analysis focused on the relationship between the behavior of subject and that of any friends acquired during the study. This hypothesis would also suggest that the relationship between subject's behavior and friend's behavior at Time 1 would predict whether the friend would be retained until Time 2. When subject's report of friend's behavior is used, there was strong support for the selection model: 97% of round 1 nonsmokers reported a new nonsmoking friend at round 2, as did only 37% of round 1 smokers; 93% of round 1 nondrinkers of beer and 48% of round 1 beer drinkers reported new non-beer-user friends; and 93% of round 1 nondrinkers of liquor, and 57% of round 1 liquor drinkers, reported new non-liquor using friends. But when friend's own self-report was used, significant associations were found only in the cigarette study, with 99% of nonsmoking subjects reporting new nonsmoking friends, and 68% of smokers.

Analysis of deselection was examined among only those subjects whose use behavior was constant at Time 1 and Time 2, in order to minimize the possibility of influence effects. A friend was considered to be deselected if she or he was the best available friend at round 1 and not included on the list of three friends at round 2. Significant associations were found only for the deselection of smoking friends.

Conclusions. Results indicated that peer homogeneity derives from both selection and influence processes, and provide substantial evidence that peer influence effects cannot be automatically deduced from correlations indicating homogeneity.

FORNEY, PAUL D.; FORNEY, M.A.; & RIPLEY, W.K. 1988. Profile of an adolescent problem drinker. *Journal of Family Practice* 27(1) 65-70.

A number of studies indicate that young men drink more than young women, whites more than minorities, and older adolescents more than young students. Parental and peer influences have also contributed to problem drinking among adolescents. Twenty schools in six school districts in Georgia and South Carolina participated in a study involving 3,017 students to determine what sociocultural and demographic variables can be used to identify potential problem drinkers among adolescents in middle and high schools. Significant relationships were found between sex, student drinking behavior, race, age, mother's drinking behavior, father's drinking behavior, and best friend's drinking habits.

Results. Eighty percent of the sample had tried alcohol at some time in their life; more than one third (39.2%) had done so when they were younger than 11 years old. Over one half (51.2%) took their first drink in their own

home under parental supervision. The number of abstainers decreased as the students got older. The number of heavy drinkers increased dramatically at age 12 to 14.4% of those 12 to 13 years of age. The majority of drinking students under 12 years of age usually drank with parents or other adults (71.4%), but after the age of 13 years, this trend changed, with an ever-increasing percentage indicating that they drank with friends their own age: 50.5% among those aged 14 to 15 years; 69.2% among those aged 16 and 17 years; and 72.8% of those over age 17 years. Most did not perceive peer pressure to drink (69.1%). An overwhelming number (90.7%) indicated that they did not exert pressure on others to drink.

The student most likely to be self-classified as a heavy drinker was male, White, aged between 14 and 15 years, and had parents and best friends who were heavy drinkers. He had begun drinking early (before age 12), first drank outside the home, and prefers spirits over beer and wine.

Findings between mother's drinking behavior and that of the subjects were consistent for both sexes and races. Female students, minority students, and respondents younger than 12 years or between 12 and 13 years seemed to be more profoundly affected by the mother's heavy drinking than were male students, White students, and students in the older age groups. Student abstainers are more likely to have nondrinking mothers. These findings were consistent across categories of sex, race, and age.

As with the mother who is a heavy drinker, female and minority students seemed to be affected more adversely by the heavy drinking behavior of the father, than were the male and White students.

The relationship between drinking habits of the student and his friends was strong. Students tended to identify their drinking behaviors more with both parents at a younger age. Students perceived their best friend to have the same drinking behavior as their own. This effect was evident across categories of race, sex, and age.

The more liberal students' drinking habits, the more knowledge that students had about the nature and effects of alcohol. The student heavy drinker had more liberal attitudes toward acceptable uses of alcohol than either the light drinker or the abstainer, such as drinking with the family at meal time, drinking for religious purposes, or drinking on special occasions such as birthdays or weddings. These findings were not found to differ by age, race, or sex.

Conclusion. These results can be used for early recognition of problem drinkers and intervening to reduce the alarming number of adolescents struggling with alcohol problems.

FOURNET, GLENN P.; ESTES, R.E.; MARTIN, G.L.; & ROBERTSON, E.D. 1990. Drug and alcohol attitudes and usage among elementary and secondary students. *Journal of Alcohol and Drug Education* 35:81-92.

Students (N = 2,290, grades 5-12) from four rural school districts in northeast Texas responded to a questionnaire measuring incidences and attitudes towards drug and alcohol use. The study population was gender-balanced, and 83.2% White, 6.9% Black, 4.1% Mexican American, 1.2% Asian American, and 4.6% other.

Results. More than one third of the students indicated that someone in their home regularly used alcohol, even though most of the region covered in the study was under local prohibition. Someone in the respondent's home having problems due to drinking in the home was reported by between 10% (6th grade) and 16% (5th and 12th grade) in each grade. Perceived parental approval of respondent drinking increased from 9% in grade 6 to 27% in grade 12.

Alcohol use prevalence ranged from 17% for grades 5 and 6 to 76% for grade 12 (53% for total sample). Drinking weekly or more often was reported by 13.5% and drinking daily by 2.5%).

Conclusions. It is suggested that the results indicate that social learning theory is a viable theory for explaining drug involvement in the young, and that intervention with drug and alcohol education programs should begin prior to the onset of adolescence.

GRAHAM, JOHN W.; MARKS, G.; & HANSEN, W.B. 1991. Social influence processes affecting adolescent substance use. *Journal of Applied Psychology* 76(2):291-298.

Social influence is central to models of adolescent substance use. Nonetheless, researchers fail to delineate the various forms of

social influence. A framework that distinguishes between active (explicit drug offers) and passive (social modeling and overestimation of friends' use) social pressure was tested. The effect of these processes on alcohol and cigarette use was examined with 526 7th-graders taking part in an alcohol prevention program. Hierarchical regression analyses demonstrated that pretest measures of alcohol use, offers, modeling, and overestimation each accounted for unique variance in posttest alcohol use. Similar results were obtained for cigarette smoking. The general model was not significantly different for boys and girls, or for prior users and prior nonusers, supporting the generalizability of the framework. It is suggested that prevention programs emphasize resistance skills training, and correcting misperceptions related to overestimation of friends' and others' use.

HARFORD, THOMAS C., & GRANT, B.F. 1987. Psychosocial factors in adolescent drinking contexts. *Journal of Studies on Alcohol* 48 (6):327-341.

Data from the 1978 National Survey of Adolescent Drinking among senior high school students were analyzed to examine alcohol use among American teenagers and the environmental and personal characteristics scales related to drinking. The sample comprised 4,918 students in grades 10-12 at 74 senior high schools. Predictive variables, analyzed using canonical correlations, included environmental context measures, positive drinking functions, perceived environmental drinking models, personal attitudes, and values.

Results. The strongest relationship was defined by the perceived normative support for drinking, accounting for 58% and 55% of the variance in drinking context items for females and males, respectively.

Female and male students residing in larger communities with higher per capita consumption were characterized as drinking in adult contexts, but not in contexts involving driving or sitting in cars and drinking. In the analyses of perceived normative support, the most important combination of drinking context variables among females and males was the frequency of drinking at teenage parties, at teenage hangouts, and to a lessor degree, at adult parties, during school activities and while driving around in cars.

Unlike other canonical solutions, personal attitude and value variables produced somewhat different solutions for females and males. For both females and males, a relationship exists among low religiosity, low expectations, high peer compatibility, and frequent drinking in peer contexts, at adult parties, and while driving around in cars. In addition, for females, but not for males, low values placed on academic achievement and high values for independence were strongly related to the frequency of drinking in identical contexts. Small but significant variance in drinking contexts was also accounted for by a second canonical correlation in which, among females, low religiosity and high academic expectations were related to drinking at home at mealtimes, and on special occasions, drinking at adult parties, but not drinking in cars. For males, low religiosity, high academic expectations, good personal adjustment, and parental compatibility were associated only with drinking at home at mealtimes and on special occasions.

For females, driving in cars made the least negative contribution to the drinking context variate, but the greatest for males. The strong negative contribution of driving in cars for males may reflect different access to automobiles between females and males, irrespective of city size.

Conclusions. The finding that high values on independence and a low value for academic achievement, were related to peer drinking context for females and not males suggest that for females, unlike males, both relaxation of personal control (low religiosity) and personal instigation influence the selective entrée into peer drinking context. An independence-achievement disjunction may lead to the repudiation of academic achievement as a goal in favor of more accessible goal of peer group recognition for drinking.

Drinking for conformity and status transformation functions were not found to relate to any drinking context variable. Several surveys on adolescent drinking that measured the extent to which teenage drinking was a function of perceived pressure from drinking companions have found that drinking to conform is not a major factor in student's drinking behavior. However, status information, characterized by anticipatory socialization functions of adolescent drinking,

has been consistently found to be an important explanatory reason for teenage drinking. The discrepancy between results and literature with respect to status information, may reflect the declining importance of role models in adolescent culture.

HUGHES, SHERYL O.; POWER, T.G.; & FRANCIS, D.J. 1992. **Defining patterns of drinking in adolescence: A cluster analytic approach.** ***Journal of Studies on Alcohol*** **53(1):40-47.**

Most empirical approaches to defining patterns of adolescent alcohol consumption focus on frequency of drunkenness, avoiding the difficult problem of distinguishing between alcohol use and misuse in adolescence. Where attempts have been made at such a distinction, estimates of problem drinking prevalence have ranged from 2% to 35% of adolescent drinkers. While much has been written on the problem of defining adolescent alcohol misuse, there is little consensus on resolving it.

In an attempt to define patterns of drinking in a more comprehensive way, social context, as well as frequency and quantity of alcohol use, were assessed in a sample of 189 White high school seniors (104 females and 85 males), who reported drinking alcohol in the previous year. Subjects' scores on frequency, quantity, and five social context variables were cluster-analyzed separately for males and females.

Results. The participating students were grouped according to cluster analysis on frequency, quantity, and social context measures of alcohol use. The cluster analyses produced seven patterns of alcohol use, including four "socially appropriate" drinking patterns for both sexes: light drinkers, light party drinkers, and dating drinkers. Three problem drinking patterns by gender were also found: school drinkers and solitary/stranger drinkers for males, and solitary/school drinkers for females. The seven patterns were defined by cluster analysis. Male respondents were divided as follows: 8 light drinkers; 8 school drinkers; 13 light party drinkers; 22 dating drinkers; 17 family drinkers; 17 solitary/stranger drinkers. Female respondents were divided as: 19 light drinkers; 8 solitary/school drinkers; 29 light party drinkers; 26 dating drinkers; and 22 family drinkers.

These groups of subjects showed significant differences on reasons for drinking and on drinking consequences even after differences due to frequency and quantity were statistically controlled.

Conclusions. These patterns reflect more than differences in the frequency and quantity of alcohol use alone. Although some of the more physiological aspects of alcohol consumption (e.g., blackouts) were closely related to frequency and quantity, the remaining reasons and consequences were not. Moreover, one group of "socially appropriate" drinkers (male family drinkers) showed relatively high levels of alcohol consumption without the corresponding reasons and consequences found in the problem groups. It is concluded that the socially appropriate patterns of drinking may involve contexts for alcohol use which reflect normal adolescent experimentation and rebellion. On the other hand, the problem drinking patterns differ little from adult problem drinking. Future investigators, then, should not rely on indices that weigh too heavily on frequency or quantity of consumption in defining adolescent problem drinking. The results suggest also that the label "problem drinker" might best be reserved for a relatively small percentage of adolescents.

IANNOTTI, RONALD J., & BUSH, P.J. 1992. **Perceived vs. actual friends' use of alcohol, cigarettes, marijuana, and cocaine: Which has the most influence?** ***Journal of Youth and Adolescence*** **21(3):375-389.**

Determinants of the use of alcohol, alcohol without parental knowledge, cigarettes, marijuana, and crack were assessed among 2,078 4th-graders and 1,082 5th-graders in 81 schools (90% Black, and 51% female). Each subject identified three best friends.

Results. Alcohol had been tried by a majority of these elementary school children and a small percentage had tried marijuana or crack, and 14.9% indicated they had used alcohol without their mothers knowledge. Logistic and least-square regression analyses indicated that children's perceptions of friends' use, perception of family use, and actual use of classmates were better predictors of substance use than friends' actual use. The pattern of predictors suggested that peer behaviors and attitudes were more influential for children's

socially-censured behaviors (e.g., using alcohol without parental permission) than for more socially-approved behaviors (e.g., using alcohol with parental permission).

The most notable first-order correlation was between the perceived substance use of friends and the substance use of the target student. Other variables found to be significant and to account for more than 6% of the variance included: (a) perceived substance use of family members; and (b) the use reported by the child's classmates. Personal variables associated with substance use included male gender, higher SES, and older age. Logistic regressions with reported use of alcohol, alcohol without parental knowledge, cigarettes, and marijuana as outcome measures, and least-square regression with number of substances used including crack cocaine as the outcome measure were performed to test each of the hypotheses.

Conclusions. The cross-sectional results suggested that the child's perception of friends' use was more important that actual friends' behavior. Contrary to predictions, classroom use, the reported use of the members of the class without the subject, was a much better predictor of substance use than the use of the child's friends. The importance of perceived friends' use as compared to friends' actual use supports Behavioral Intention Theory and Cognitive Developmental Theory, while the importance of classroom use supports Social Learning Theory or may reflect social and environmental conditions including neighborhood availability of drugs and neighborhood values regarding substance use.

KANDEL, DENISE B., & YAMAGUCHI, K. 1993. From beer to crack: Developmental patterns of drug involvement. ***American Journal of Public Health*** 83(6):851-855.

Prior research had identified developmental stages in drug use in adolescence, from substances that are legal for adults to illicit drugs. The position of crack in patterns of drug involvement remains to be established. The analyses are based on a sample (N = 1,108) representative of 12th-graders attending New York state public and private schools. From reported ages of first use of five classes of drugs (alcoholic beverages, cigarettes, marijuana, cocaine but not crack, crack), alternate models of progression were tested for their goodness of fit through log-linear models. The sequence involves at the earliest stage the use of at least one licit drug, alcohol or cigarettes. Subsequent stages involve marijuana and cocaine; crack is the last drug in the sequence.

Results. The great majority of students who had initiated AOD use, initiated alcohol drinking and cigarette smoking before any use of illicit drugs. Of the 789 students who had used both alcohol and cigarettes, 47.2% used alcohol before cigarettes, 27.9% used cigarettes before alcohol, and 24.9% initiated both at the same age. Of the 578 students who had used both alcohol and marijuana, 80.3% used alcohol before marijuana, while only 4.7% used marijuana before alcohol, and 15% initiated use of alcohol and marijuana at the same age. Of the 118 students who had used both alcohol and crack, 96.1% had used alcohol before crack, and only 3.9% used crack before alcohol.

Age of AOD initiation was shown to be an important factor. Students who had used crack (and, to a lesser extent, other forms of cocaine) had initiated alcohol, cigarette, or marijuana 2 years earlier, on average, than those who had not used cocaine.

Analysis by gender showed that different models provided best fits for male and for female high school seniors. The best-fitting for males was as follows: (a) alcohol before marijuana; (b) marijuana and cigarettes before cocaine and crack; and (c) cocaine before crack. For females, the best fitting-model was: (a) both alcohol and cigarettes before marijuana; (b) marijuana before cocaine or crack; and (c) cocaine before crack.

Conclusions. While the order of initiation of alcohol and of cigarettes is not clear, the findings clearly indicate that the initiation of illicit drugs tends to follow use of either alcohol or marijuana or both. The results confirmed the more important role of alcohol among males and cigarettes among females in the progression into various drug classes. Age of first AOD use at a lower stage is a strong predictor of further progression. The developmental pattern of drug involvement identified in the early 1970s still characterizes adolescent pathways of drug involvement in the late 1980s.

KANDEL, DENISE B.; YAMAGUCHI, K.; & CHEN, K. 1992. Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol* 53:447-457.

Sequential stages of involvement in alcohol and/or cigarettes, marijuana, other illicit drugs and medically prescribed pychoactive drugs from adolescence to adulthood are investigated in a longitudinal cohort that has been followed from ages 15 to 35. Data was taken, via 1.5 hour structured interviews, from a 1990 followup of a cohort of 1,160 young adults representative of the sample surveyed in grades 10 and 11 at New York State public high schools in 1971-72. Information was collected on history of use of 12 drug classes, including alcohol, cigarettes, marijuana, psychedelics, cocaine, heroin, methadone, tranquilizers, sedatives, stimulants, and antidepressives, including both medical and nonmedical use. Age of initiation was elicited for use of each drug, and detailed retrospective histories for all drugs used 10 times or more in subject's lifetime.

Results. Prevalence of use 10 times or more was measured as follows: alcohol, 98% of men and 97% of women; marijuana, 67% and 54%; other illicits, 37% and 24%; medically prescribed drugs, 17% and 15%. Alternative models of progression were tested for their goodness of fit. Four stages were identified: that of (a) legal drugs, alcohol or cigarettes; (b) marijuana; ; (c) illicit drugs other than marijuana; and (d) medically prescribed drugs. Whereas progression to illicit drugs among men is dependent upon prior use of alcohol, among women either cigarettes or alcohol is a sufficient condition for progression to marijuana. Two factors in individuals' drug use histories were found to be important predictors of progression to the next stage of drug use were strong predictors of further progression: (a) age of initiation at the lower stage of drug use; and (b) extent of use at the lower stage.

Conclusions. The findings confirmed clear sequential patterns of drug involvement. Still, it must be remembered that although developmental sequence of drug involvement has been identified, use at one stage does not invariably lead to the next stage: many youths stop at a particular stage and progress no farther. Furthermore, the notion of a sequence of stages does not imply that all of these stages are obligatory, nor universal.

It is suggested that isolating populations at risk for progression from one stage to the next may make it possible to identify factors which affect these transitions. Furthermore, the importance of early initiation as a predictor of progression indicates that delaying initiation at the lower stages of drug use may reduce the likelihood of progression to the higher stages.

KELLEHER, KELLY J.; RICKERT, V.I.; HARDIN, B.H.; POPE, S.K.; & FARMER, F.L. 1992. Rurality and gender: Effects on early adolescent alcohol use. *American Journal of Dependent Children* 146:317-322.

Previous studies of adolescent alcohol use have focused almost exclusively on urban and suburban youth, although alcohol is the most important drug of abuse among rural adolescents. The effects of rurality and gender on early adolescent alcohol use were studied among Arkansas students in grades 6-8, aged 11-14 years (N = 1,601, 54.3% female, 24.3% Black), from urban, suburban, and two different rural areas (delta and highland). All subjects responded to a questionnaire designed to evaluate adolescent health behaviors, which asked about health-compromising behaviors, such as alcohol use. Only self-reported use of a given substance more than three times in respondent's life was coded.

Results. Alcohol use was reported by 38.5% of respondents, the highest prevalence for any of the measured substances. Of the four regions, alcohol use was highest (43%) in the urban region, and lowest (28%) in the delta. The delta region had the largest gender difference, and was the only one where it was statistically significant, in alcohol use with 38% of males and 20% of females reported as drinkers. Gender differences were not significant across the four regions together; nor did parental substance use behaviors, including smoking and drinking, differ significantly across the four regions. Females in the highland rural area were less likely to report family-influenced alcohol consumption and more likely to report symptoms of alcohol abuse than girls from other areas, while females from the delta region reported the least access to alcohol, the lowest prevalence of use, and the fewest symptoms of alcohol abuse. Delta

females were most likely, of all gender-region groups, to drink only, or first with their families, and least likely to drink with peers.

Conclusions. These findings show that alcohol use patterns and gender differences can differ widely across geographical regions, and that regional differences are markedly greater among females than among males.

MARKS, GARY; GRAHAM, J.W.; & HANSEN, W.B. 1992. Social projection and social conformity in adolescent alcohol use: A longitudinal analysis. *Personality and Social Psychology Bulletin* 18(1):96-101.

Social projection is differentiated from social conformity as mechanisms underlying the false consensus effect in a longitudinal investigation in the context of adolescent alcohol use. Self-reported alcohol consumption and estimates of the prevalence of peer alcohol use were collected at two time points separated by approximately 1 year in a sample of 378 7th- and 8th-grade boys and girls.

Results. Cross-sectional analyses showed significant positive correlations, at time 1 and at time 2, between respondents' self-reported alcohol use and estimates of peer alcohol use. Longitudinal analyses were performed in effort to differentiate between the effects of social projection and of social conformity. With respect to conformity, regression analysis revealed that prevalence estimates at Time 1 predicted level of own use of alcohol at Time 2, after controlling for own use at Time 1. Similar results were obtained when onset of drinking was the critical measure. Social projection was demonstrated by the finding that level of own alcohol use at Time 1 predicted prevalence estimates at Time 2, after controlling for estimates at Time 1 Implications for research on the false consensus effect are discussed.

Conclusions. Results indicated that both conformity and social projection had occurred in the studied sample, and to underlie the false consensus effect. The conformity effect was found to be stronger for girls than for boys.

MILLER, PARIS M.; SMITH, G.T.; & GOLDMAN, M.S. 1990. Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol* 51(4):343-349.

Previous investigations with adolescents have shown alcohol-related expectancies to develop in childhood prior to significant drinking experience and to covary directly with drinking behavior. To chart the development of alcohol expectancies in children as young as age 6, a procedure was developed to be as independent as possible of age-related variation in reading and language development. This instrument was administered to 114 middle-class elementary school students (82% White, 66 females and 48 males), distributed across grades 1 to 5. Psychometric analysis provided evidence of the test's reliability and validity. Students were tested in 8 groups of 8-13, by being shown a hand puppet which they were told had drunk "some whiskey" before they entered the room. They were then asked to circle yes or no in response to questions about what they thought happens to the puppet when it drinks whiskey.

Results. Most respondents did not endorse any items indicating that alcohol improved cognitive or behavioral function; on the contrary, many endorsed items indicating expectations of complete cognitive and behavioral debilitation after ingestion of alcohol. No significant gender difference in scores was found except in 2nd grade. Evaluation of the developmental pattern produced two primary findings: (1) there was an overall trend of increasingly positive expectancies with age; and (2) strikingly, the bulk of the increase was observed in the 3rd and 4th grades, at the same time as maturational changes which may be related.

Conclusions. Children's expectancies may be less differentiated than adolescent or adult expectancies. These findings suggest that the precursors for later alcohol use and abuse are formed in childhood and that prevention efforts may need to begin as early as 3rd grade.

O'MALLEY, PATRICK M., & WAGENAAR, A.C. 1991. Effects of minimum drinking age laws on alcohol use, related behaviors, and traffic crash involvement among American youth: 1976-1987. *Journal of Studies on Alcohol* 52(5):478-491.

Existing data, was used to accomplish two tasks: (a) to delineate cross sectional differences among U.S. high school seniors and young adults that may be due to variations in recent years in state level minimum drinking age laws; and (b) to examine the effects of recent changes in minimum drinking age laws on alcohol consumption and other relevant attitudes and behaviors. The data were taken from the Monitoring The Future Project (the National High School Seniors Survey), an ongoing study involving annual, nationally representative surveys of high school seniors and annual follow-up surveys by mail of recent graduates. A separate, coordinated study used time-series analyses of official reports to examine effects of increases in the minimum drinking age in several states on rates of fatal crashes. Time-series results were compared with findings from self-report data.

Results. Higher minimum drinking ages were associated with lower levels of alcohol use among high school seniors and recent high school graduates, even after multivariate controls. Lower levels of alcohol use were observed across a number of demographic variables. The lower levels of use persisted into the early twenties, even after all respondents were of legal age. Moreover, lower involvement in alcohol-related fatal crashes among drivers under 21 appeared to be due to lower alcohol consumption rates, particularly less drinking in bars or taverns.

Conclusions. It is concluded that minimum legal age of 21 for the consumption of alcohol, as compared to a legal age of 18, does affect the behavior of high school seniors, that it in fact leads to lower alcohol consumption. It is further suggested that the lower rates of drinking appear to continue, at least through the early twenties, and are not compensated for by higher rates of consumption after alcohol becomes legally available.

PENDORF, JAMES E. 1992. Leisure time use and academic correlates of alcohol abuse among high school students. *Journal of Alcohol and Drug Education* 37(2):103-110.

Male and female students in grade 10 ($n = 115$) and grade 12 ($n = 107$) at a rural Pennsylvania high school were surveyed to examine correlates between leisure time and abuse of alcohol. Participants were predominately white, ranged in age from 15 to 19, and included students in general, college preparatory, and vocational curricula. neither racial nor gender differences were assessed. Data on alcohol behavior, attitudes, and values, leisure activities, attitudes toward school and teachers, hobbies, and GPA were collected with Swisher's Primary Prevention Awareness, Attitude, and Usage Scales, Form 7. A phony drug was included in the schedule of drugs from which respondents were to indicate any use, in order to catch false responses. Students reporting any use of this drug were excluded from data analysis, and students reporting any use of any alcoholic beverage weekly or more often were classified as heavy users and abusers.

Results. Heavy (weekly or more often) use of alcohol correlated with participation in social activities such as dating and going to movies and parties (for liquor ($r = 0.37$ for hard liquor, lower for beer and wine) and vocational activities ($r = 0.22$ for beer, less for hard liquor and wine). Working or looking for work correlated with heavy use ($r = 0.22$ for beer, less for liquor and wine). Learning social skills, self-discovery, and entry into vocational activity—tasks critical to healthy development—were not apparently affected by heavy alcohol use. There was no correlation between sports and heavy use of beer, wine, or liquor. Heavy use correlated negatively with enjoyment of school ($r = 0.21$ for hard liquor, less for beer and wine) and school subjects, had greater potential for conflicts with teachers, and received lower grades.

Conclusions. These results demonstrated that weekly alcohol use bore a relationship to aspects of social and vocational behaviors and attitudes required for healthy and positive adolescent development. These findings cloud the presumed generalized detrimental effects from high school students' heavy use of alcohol, since heavy users were socially- and vocationally-oriented, although not as well-applied in school as low users.

SELLERS, CHRISTINE S., & WINFREE JR., L.T. 1990. Differential associations and definitions: A panel study of youthful drinking behavior. *International Journal of the Addictions* 25(7):755-771.

Selected elements of social learning theory were tested using a panel of public school students residing in a small southwestern city. Specifically, the drinking habits of 675 middle and high school students (59% female, and 41% make; 86% White, 8% Hispanic, and 5% Black) were examined at Time 1 (October 1981) and Time 2 (April 1982), along with changes in their attitudes, orientations, and patterns of drinking.

Results. The results were largely consistent with the principles of social learning, although the drug-related messages conveyed by both parents and significant other adults played only minor roles in the process for either group. In particular, youths who associated with peers who used alcohol, held positive views of drugs, and with whom they discussed drugs were more likely to drink or to increase their drinking from Time 1 to Time 2. Furthermore, increases in pro-drug discussions with peers, increases in peer alcohol use, and increases in personal approval of drugs, all correlated with drinking and increases in drinking.

Conclusions. The notion that the process of learning to drink is not uniform throughout the secondary school experience was supported. Personal pro-drug or anti-drug orientations, acquired through social learning and from peers, seem to be more important to predicting actual use than learning to "just say no." Learning to "say no" may not be effective in prevention if the youth has personal prodrug orientations.

It is suggested that drug education programs might be more effective for youths who have yet to form personal orientations towards drugs. Findings indicates that adults' influence on youths' orientation is at best inconsistent, so further study is merited. Increased emphasis on the use of peer counselors rather than adults in drug education might also prove fruitful.

STEVENS, M.; YOUELLES, F.; WHALEY, R.; & LINSEY, S. 1991. Prevalence and correlates of alcohol use in a survey of rural elementary school students: The New Hampshire study. *Journal of Drug Education* 21(4):333-347.

Alcohol use by 1,190 students in grades 4-6 was assessed during the Spring of 1987, in a survey of four rural New Hampshire school districts.

Results. One half of the students surveyed (50%, $n = 596$) drank, but not regularly; 5% ($n = 59$) were regular drinkers, and an additional 2% ($n = 19$) had experienced drinking problems (passing out or vomiting) at least once. Reported alcohol use increased with both grade and age, and males drank more than females. Among males, the percentage who had ever drunk alcohol rose from 45% in grade 4 to 71% in grade 6. The child's attitude toward drinking, perceived family attitudes towards drinking, the number of drinking friends, and self-perceived wrongdoing by the child were four factors strongly related to alcohol use. Increased alcohol use was also associated with experimental and current use of cigarettes, marijuana, and smokeless tobacco.

The students in the sample who had drunk alcohol were much more likely than abstainers to have tried tobacco and other drugs. Increased exposure to alcohol was significantly associated ($p < .001$) with experimenting with cigarettes, smokeless tobacco, inhalants, and marijuana. For monthly and problem drinkers, sense of being a wrongdoer was also significant.

Conclusions. These findings suggest that alcohol use among rural elementary school students is a serious problem. In the sample studied, a large percentage appear to be at risk for adolescent and adult AOD-related morbidity or mortality. Analyses show that among both male and female children, the child's attitude, child's perception of family attitudes and of peer behavior, consistently correlated with the child's own level of alcohol use.

STRUNIN, LEE, & HINGSON, R. 1992. Alcohol, drugs, and adolescent sexual behavior. *International Journal of the Addictions* 27(2):129-146.

A 1990 Massachusetts random digit-dial telephone survey of 16-19 year olds (N = 1,152) assessed knowledge about HIV transmission, number and gender of sexual partners, condom use after drinking, using drugs, and when sober. Females comprised 58% of the sample, which was 89% White, 4 Black, 3% Hispanic, 1% Asian, and 3% other.

Results. Of all respondents, 82% reported drinking alcohol in the previous year, and 7% reported having five or more drinks daily. Of sexually active adolescents (66% of the total sample), 83% reported alcohol use in the preceding year, and 64% reported having sex after drinking alcohol. Of respondents who were both sexually active and past-year drinkers, 72% reported sex after drinking. While 61% of sexually active adolescents reported the belief that sex is less pleasurable after drinking, 49% said they were more likely to have sex if either they or someone in whom they were sexually interested had been drinking. Whites, males, those respondents more involved with alcohol and drug use, and those who engaged in risky sexual behaviors, were all more likely to have intercourse if they and someone in whom they were sexually interested had been drinking.

Conclusions. It is concluded that since so few adolescents consistently use condoms, the greatest risk for HIV, sexually transmitted diseases, and unwanted pregnancy is the increased likelihood of having sex after drinking or drug use, rather than the decreased likelihood of condom use after drinking and drug use.

WEBB, JOHN A.; BAER, P.E.; FRANCIS, D.J.; & CAID, C.D. 1993. Relationship among social and intrapersonal risk, alcohol expectancies, and alcohol usage among early adolescents. *Addictive Behaviors* 18:127-134.

Numerous studies have shown that adolescents' expectancies about the effects of alcohol influence usage. Expectancies are described as mediators between social influences (such as peer and parental influences) and alcohol use. The present study examined the relationship between social risk factors (peer influence and parental approval), intrapersonal risk factors (tolerance of deviance and sensation seeking), alcohol expectancies, and alcohol usage in a cohort of 1,244 7th-graders (53% female, 88% White) from a suburban school district near Houston, Texas. It was hypothesized that social risk factors affected alcohol usage indirectly through expectancies, while intrapersonal risk factors influenced usage both directly and directly. Structural modeling was used to examine the hypothesized relationships between these four constructs. Results indicated that the hypothesis that expectancies mediate social influences was not supported, and that social influences exerted a direct influence on usage independent of expectancies. Results suggested that the view that expectancies mediate social risk factors may need modification. Suggestions for future research in this area include the need to examine the relationships among these constructs longitudinally and with adolescents over a broader age range.

WINDLE, MICHAEL. 1991. Alcohol use and abuse: Some findings from the National Adolescent Student Health Survey. *Alcohol Health & Research World* 15(1):5-10.

Data is reported from the 1987 National Adolescent Student Health Survey of 11,400 students, in 8th and 10th grades, from 224 schools in 20 states. Survey questions pertained to various features of adolescent health, including alcohol and other drug use. Not all questions were asked of all students, in order to allow as wide as possible a range of issues related to adolescent health to be included in the questionnaire. A core set of 11 questions, concerning, for example, demographic and general alcohol-use information, was presented to all students. Other questions, such as those related to heavy drinking, were administered to only one-third of the sample.

Results. The results indicated that many adolescents (75.9% of 8th-graders and 87.3% of 10th-graders) have used alcohol in their lifetime. More 10th-grade students reported consuming alcohol than 8th-grade students. This was reflected by the decrease in the percentage of abstaining students in 10th grade,

the relatively stable percentage of infrequent drinkers in both 8th and 10th grades, and the approximate doubling of the number of 10th-graders who said they drink occasionally or frequently. More 10th-grade students than 8th-grade students had consumed five or more consecutive drinks on at least one occasion during the past 2 weeks.

The numbers of male and female students who had used alcohol during their lifetime were similar for the two grade levels. Gender differences in the numbers of students who drink dwindled, but, more male adolescents fell into the frequent-drinking category.

Racial and ethnic group comparisons across grade levels consistently indicated that fewer Black students have used alcohol than White or Hispanic students. Black students represent the largest percentage of abstainers both across grade levels and gender groups, and had the lowest overall rates of alcohol consumption. Tenth-grade White and Hispanic students represented the largest percentage of adolescents falling into the category of frequent drinking. Among racial and ethnic groups, the numbers of students who had engaged in heavy drinking during the past 2 weeks paralleled the findings for frequencies of drinking. That is, White and Hispanic adolescents were much more likely to have consumed five or more consecutive drinks in the past 2 weeks than were Black adolescents.

Conclusions. Additional research is required to establish the prevalence of drinking behavior among ethnic groups, including Native American and Asian students. Among 10th-grade males, heavy drinkers, relative to nonheavy drinkers, had an earlier onset of first alcohol use. Between students in 8th-grade and those in 10th-grade, there were clear trends toward increasing levels of alcohol involvement. Not only were more 10th-grade students drinking, but a greater proportion of those who consumed alcohol were drinking much more frequently. The discrepancy between the numbers of male and female students who consumed alcohol was small, but males were more highly represented in the more frequent and heavier drinking categories. A large percentage (approximately 15% to 20%) of adolescents reported high levels of alcohol use and polydrug use, meriting increased attention from researchers and health care professionals.

YU, JIANG, & WILLIFORD, W.R. 1992. The age of alcohol onset and alcohol, cigarette, and marijuana use patterns: An analysis of drug use progression of young adults in New York State. *International Journal of the Addictions* 27(11):1313-1323.

To extend the gateway theory, the relationship between the onset age of alcohol and the progression of drug use (alcohol, cigarettes, and marijuana) among 16-24 year-olds in 11 New York counties. The 3,000 respondents (mean age was 19.7 years; 51.3% females, 48.7% males) were surveyed by telephone as part of the 1986 New York State Youth Alcohol Survey. While respondents were asked how many times in the previous 28 days they had drunk alcohol, how many cigarettes they smoked on a typical day, and whether or not they had used marijuana in the previous 28 days, analyses were based on binary variables—yes or no—for use of the three substances. Guttman scales were used to examine sequential progression.

Results. Mean age of first alcohol use was 15.1 years, among the 2,296 (76.5%) respondents who had used alcohol. Of the 2,138 respondents for whom sufficient information was obtained for analysis, 15.6% were using none of the three substances (18.6% of the 1,058 females and 12.7% of the 1,080 males), 50.0% (45.7% of females, 54.2% of males) were using alcohol only, 26.1% (29.4% of females, 22.9% of males) were using alcohol and cigarettes but not marijuana, and 8.3% (6.3% of females, 10.3% of males) were using all three. Logit analyses indicated that alcohol onset between the ages of 13 and 16 increased relatively significantly the odds of current alcohol use. The odds of a male smoking cigarettes were increased by alcohol onset before age 11, and the odds of a female smoking cigarettes were increased by onset of alcohol at about 13 and 16. The odds of marijuana use were highest for those who initiated alcohol use between the ages of 13 and 16.

Conclusions. Alcohol initiation in the critical period of ages 13 to 16 seems to have more influence on use of other substances than initiation at other times. Strategies to prevent hard drug use should encompass attempts to reduce alcohol and cigarette use in this age range.

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Note: This reference list includes not only studies abstracted and or discussed in this report but also other recent studies related to alcohol which are considered of interest.
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APPENDIX

Summary of Recent Survey Findings on Adolescent Alcohol Use

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Rw	Other Levels
ADAS[1]	1988-89	4 g	791	23	16	6	3		1% drunk past month
Oetting & Beauv. 1990		5 g	1531	34	22	8	4		1% "
		6 g	80	40	31	12	10		4% "
		7 g	11175	66	49	23	20		7% "
		8 g	26587	77	62	34	33		13% "
		9 g	13693	83	70	42	45		21% "
		10 g	14529	87	77	50	57		28% "
		11 g	10369	92	82	56	68		35% "
		12 g	26720	93	86	64	75		42% "
	1992-3	4 g	2798	17	12	4	2		1% "
		5 g	5304	22	16	6	3		1% "
		6 g	2118	23	25	10	5		1% "
		7 g	10248	54	37	17	12		4% "
		8 g	16350	68	52	27	24		8% "
		9 g	7676	78	63	37	37		15% "
		10 g	8473	84	71	43	49		22% "
		11 g	6275	88	76	49	59		28% "
		12 g	11166	91	81	55	69		34% "
Alaska State Survey	AL	4 g	420	49					
Segal 1989, 1992	statewide	6 g	533	56					
	1988	7-12 g	4129	75[2]					24 % weekly 1.4% daily
		7 g		46					
		8 g		61					
		9 g		76					
		10 g		85					
		11 g		86					
		12 g		90					
ALERT	CA, OR								
Ellickson et al 1992	1984	7 g	4145	76					3% weekly (2 + drinks)
	1986	8 g							9% weekly[3]
	1988	10 g		94					22% weekly

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Rw	Other Levels
Bloch et al 1991*	PA 1987	7 & 9 g	463				64 (of users)		31% experimental users[4] 33% regular users[5] 20% drunk monthly 13% drunk weekly
Bush & Iannotti 1992, 1993*	WDC 1990	4 g	4675	51[6]					
			4678	43[7]					
	WDC 1988-89	4-5 g	5761	59 m 47 f[8]					
		5-6 g		60 m 52 f[9]					
California State Survey *Skager & Austin 1993*	CA statewide 1991	7-11 g 12-16 yr	8084						
		7 g	2517	60	53[a]		17	13	2.6% weekly beer[a]
		9 g	2589	74	67[a]		36	19	8.9% weekly beer 1% daily 19% excessive users
		11 g	2729	85	77[a]	32 beer[a] (monthly)	57	26	17% weekly beer 2% daily 28% excessive users
DATE *SWRL 1993*	CA statewide 1992	4 g	2507	16	n.a.		8	14	
		5 g	2301	19	n.a.		10		
		6 g	1590	29	n.a.		17		
		7 g	902	58	39[a]		21		6.7% weekly beer[a]
		8 g	826	67	45[a]		34	19	7.3% weekly beer
		9 g	632	76	58[a]		47	21	12.0% weekly beer
		10 g	563		62[a]		56	25	14.9% weekly beer
		11 g	539	83	70[a]		64	30	21.9% weekly beer
		12 g	383	88	71[a]		70	31	22.4% weekly beer
Dielman et al. 1986*	MI 1984-85	5-6 g	2280		7-17 beer[10] 11-21 wine 7-14 spirits		8-13		
Forney et al. 1988* 1988a	GA, SC 1986		3017	80					heavy[11]

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Rw	Other Levels
Fournet et al. 1990*	TX date n.s.	5-12 g	2290	17 g 5-6 76 g 12					2.5% daily, grades 7-12
Gallup Household *Zucker & Harford 1983*	national 1980	13-18 yr	965	60[12]					12% mod-heavier 6% heavier[13]
		16-18 yr	509	73					18% mod-heavier 10% heavier
Hawaii State Survey *Gabriel et al 1992*	1991	6 g		31		13		5 (1.5% 2+)	regular[14]: 1% heavy[15]: 0.3
		8 g		56		27		12 (6% 2+)	regular: 11% heavy: 4%
		10 g		73		40		19 (11% 2+)	regular: 29% heavy: 11%
		12 g		80		45		23 (14% 2+)	regular: 42% heavy: 18%
Kelleher et al. 1992*	AR	6-8 g 11-14 y	1601	39[16]					more than once week: 12-35% across areas
Kim et al. 1983	NC 1983	5 g		28					
		6 g		36					
		7 g		52					
Monitoring the Future *Johnston et al. 1993*	national 1991	8th	17500	70	54	25	27 (8 mth; 18 yr)	13 (7% 2+)	<1% daily
		10th	14800	84	72	43	50 (21 mth; 40 yr)	23 (13% 2+)	1% daily
		12th	15000	88	78	54	65 (30 month; 53 yr)	30 (20% 2 +)	3.6% daily
	1992	8th	18600	69	54	26	8 month 18 yr 27 life	13 7% 2+)	<1% daily
		10th	14800	82	70	40	48 (18 mth; 37 yr)	21 (12% 2+)	1% daily
		12th	15800	88	77	51	63 (32 month; 50 yr)	28 (19% 2+)	3.4% daily

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Rw	Other Levels
Murray et al. 1987	MN 1983	7 g	4599			28 (12 yrs) 29 (13 yrs)		10 (12 yrs) 13 (13 yrs)	
National Adolescent Drinking Survey	national 1978	10-12 g	4918	87	81				17% mod-heav & 15% heavier 30% misusers[17]
Rachal et al. 1980	national 1974	7-12 g	13000	80	73				14% mod-heavier & 11% heavier[18]
		10-12 g		89	81				19% mod-heavy, 15% heavier
	national 1987	8	5859	76	32		24		7% occasional 5% frequent
Windle 1991		10	5560	87	52		37		13% occasional 13% frequent
		8 & 10 g	3789	84	73	44		32	
National Household Drug Abuse Survey	national 1988	12-17 yr		50	45	25			6% weekly[19] 1.6% past month heavy
SAMHSA 1993		12-13 yr	925	22	16	7			
		14-15 yr	1060	49	44	23			
		16-17 yr	1110	74	68	42			
	1990	12-17 yr	2177	48	41	25%			5% weekly 2.3% past month heavy
		12-13 yr		26	20	8.4			
		14-15 yr		49	42	26			
		16-17 yr		67	59	38			
	1991	12-17 yr	8005	46	40	20			5% weekly 1.6 % past month heavy
		12-13 yr	2632	23	18	7			
		14-15 yr	2659	47	40	19			
		16-17 yr	2714	69	62	35			
	1992	12-17 yr		39	33	16			21% occasional[20] 11% monthly[21] 4% weekly 1.3% past month heavy

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Rw	Other Levels
New York State DASA *Barnes & Welte 1986;*	statewide 1983	7-12 g	27.335		71			16[d] (weekly)	13% heavy[22] av. 4.3 intox/month
Barnes et al 1992. 1993 New York 1991, 1993		7 g			45				3% heavy
		8 g			60				6%
		9 g			72				11%
		10 g			80				15%
		11 g			85				20%
		12 g			90				26%
	1990	5-6 g	5500	31	13[a]				
		7-12	2500	75	59[a]			11[d] (weekly)	9% heavy
		7 g			32				2%
		8 g			47				3%
		9 g			59				6%
		10 g			71				12%
		11 g			74				12%
		12 g			80				17%
New York State OMH *Kandel & Davies 1991*	1988	7-12	7611	84	72	43	49 (last yr)	53 (last yr)	
		7	1210	66	48	18	19	25	
		8	1249	78	63	35	31	40	
		9	1387	85	71	40	47	53	
		10	1361	89	77	48	56	60	
		11	1348	93	84	56	66	68	
		12	1156	95	87	62	71	71	
Newcomb & Bentler 1986	LA, CA	7-9 g 6-yr flwp	654	88 (yr 1)		82 yr 5; 90 yr 8			
Newcomb et al. 1987	Ventura CA 1985	7, 9, 11 g	2926	77					
North Carolina State *Palmer & Ringwalt 1988*	statewide 1987	7-12 g	10259	60		33			
		7-8 g		39		18			
		9-10 g		64		34			
		11-12 g		77		45			
Sarvela & McClendon 1985	MI, WI rural	6 g			42				

Summary of Recent Survey Findings on Adolescent Alcohol Use

Study	Yr	Age/Gr	Size	% Life	% Yr	% Month	% Ever Drunk	% 5 Drks/Row	Other Levels
Stevens et al. 1991*	NH 1987	4-6 g	1190	56%					6.3% regular drnkr[23] 1.6% problem drnkr[24]
		4	240	46[25]					6.1% m, 2.2% f regular <1% m & f problem
		5	174	56[26]					5.9% m, 2% f regular 3.5% m, 0% f problem
		6	102	71[27]					10% m, 4.4% f regular 3.6% m, 2% f problem
Strunin & Hingson 1992*	MA 1990	16-19 yrs	1152		84				7% 5+ drinks daily
Youth Risk Behavior Survey *CDC 1991, 1992*	national 1990	9-12 g	11,631	88		59		37[b]	
		9 g		83		50		28[b]	
		11 g		90		61		40[b]	
		12 g		92		66		44[b]	
	1991	9-12 g		82		51		31[b]	
Washington State *Billings et al 1992*	statewide 1991	6 g		33		13		5 (1.8 2+)	high 0.7%
		8 g		55		24		11 (5.5 2+)	high 4.7%
		10 g		70		40		18 (9.7 2+)	high 15%
		12 g		80		52		27 (15 2+)	high 25%
Yu & Willford 1992*	NY[28] 1986	16-24 yr	3000	77[29]					

[a]refers to use in the past six months; calculated from data on use of specific alcoholic beverages
[b]five drinks in a row in the past month
[c]ever drunk without parents knowledge
[d]consumption of five or more drinks of beer or wine/wine cooler or liquor at one time at least once a week

Notes to Summary Table

[1]For recent findings, contact American Drug and Alcohol Survey, RMBSI, Inc., 2100 West Drake Road, Suite 144, Ft. Collins, CO 80526
[2]range 58%-88% by ethnic group)
[3]of whom 93% consumed 3+ on single occasion in past month
[4]got drunk few times a year or less
[5]got drunk at least monthly
[6]15% w/out parents knowledge
[7]13% w/out parents knowledge
[8]drink w/out approval: 19% m & 11% f
[9]drink w/out approval: 20% m & 15% f
[10]range in results covers both treatment and comparison groups at pretest adn post-test 6 months later
[11]drinks at least once a week in medium to high amount: 2.3% age 11, 14% age 12-13. Heavy drinkers were generally white, 14-15yrs, male, heavy drinking parents & friends, initiative before age 12, prefers spirits)
[12]range from 30m/22f at age 13 to 92m/73f at age 18
[13]heavier 20% m & 6% f, age 18. Of drinkers, 62% drunk in past yr; 22% drunk at least once mth & 31% of males 16-18
[14] moderate and high use levels
[15]daily or regular binge drinking (i.e. 5 or more drinks in a row in the past 2 weeks)
[16] range 28%-43% across four urban and rural geographic areas
[17]based on frequency of drunkenness and adverse consequecnes
[18]heavy: at least weekly with large amounts per occasion; mod-heavy—weekly with small amounts
[19]past year
[20]past year but not monthly
[21]over past year
[22]drink weekly & consume 5+drinkers/occasion
[23]drank once a month but never drunk
[24]regular drinkers (drank at least once a month) who had been drunk to the point of falling down or vomiting at least once
[25]49% m; 42% f
[26]65% m; 47% f
[27]73% m; 68% f
[28]telephone survey
[29]mean onset 15.1 yrs; 50% alcohol only; 26% alc & cigs only 8% alc, cigs, mj

Prevention Research Updates

Gregory Austin, Editor
Western Regional Center for Drug-Free School and Communities
Southwest Regional Laboratory

1. ***Prevention Goals, Methods, and Outcomes.*** Gregory Austin. Fall 1988.
2. ***Substance Abuse Among Minority Youth: Native Americans.*** Gregory Austin. Winter 1988. (Out of print, replaced by Update 11).
3. ***Substance Abuse Among Latino Youth.*** Gregory Austin and M. Jean Gilbert. Spring 1989.
4. ***Substance Abuse Among Black Youth.*** Michael Prendergast, Gregory Austin, Ken Maton, and Ralph Baker. Fall 1989.
5. ***Substance Abuse Among Asian Youth.*** Gregory Austin, Michael Prendergast, and Harvey Lee. Winter 1989.
6. ***Substance Abuse Among Juvenile Delinquents and Gang Members.*** John A. Pollard and Gregory Austin. Spring 1990.
7. ***Substance Abuse Among Youth with Disabilities.*** Michael Prendergast, Gregory Austin, and John de Miranda. Summer 1990.
8. ***Young Children of Substance Abusers.*** Gregory Austin and Michael Prendergast. Winter 1991.
9. ***Substance Abuse Among Adolescent Females.*** Cristina Bodinger-de Uriarte and Gregory Austin. Summer 1991.
10. ***Ethnicity and Substance Abuse: Recent Research Findings.*** Gregory Austin and John A. Pollard. Summer 1993.
11. ***Substance Abuse Among Native American Youth.*** Gregory Austin, E.R. Oetting, and Fred Beauvais. Summer 1993.
12. ***Alcohol Consumption Among Youth: Current Trends and Research Findings.*** Gregory Austin and Ron Roizen. Winter 1993.