

A Typology for Campus-Based Alcohol Prevention: Moving toward Environmental Management Strategies*

WILLIAM DEJONG, PH.D.,[†] AND LINDA M. LANGFORD, SC.D.[†]

Department of Social and Behavioral Sciences, Boston University School of Public Health, 715 Albany Street, Boston, Massachusetts 02118

ABSTRACT. *Objective:* This article outlines a typology of programs and policies for preventing and treating campus-based alcohol-related problems, reviews recent case studies showing the promise of campus-based environmental management strategies and reports findings from a national survey of U.S. colleges and universities about available resources for pursuing environmentally focused prevention. *Method:* The typology is grounded in a social ecological framework, which recognizes that health-related behaviors are affected through multiple levels of influence: intrapersonal (individual) factors, interpersonal (group) processes, institutional factors, community factors and public policy. The survey on prevention resources and activities was mailed to senior administrators responsible for their school's institutional response to substance use problems. The study sample was an equal probability sample of 365 2- and 4-year U.S. campuses. The response rate was 76.9%. *Re-*

sults: Recent case studies suggest the value of environmentally focused alcohol prevention approaches on campus, but more rigorous research is needed to establish their effectiveness. The administrators' survey showed that most U.S. colleges have not yet installed the basic infrastructure required for developing, implementing and evaluating environmental management strategies. *Conclusions:* The typology of campus-based prevention options can be used to categorize current efforts and to inform strategic planning of multilevel interventions. Additional colleges and universities should establish a permanent campus task force that reports directly to the president, participate actively in a campus-community coalition that seeks to change the availability of alcohol in the local community and join a state-level association that speaks out on state and federal policy issues. (*J. Stud. Alcohol*, Supplement No. 14: 140-147, 2002)

HIGH-RISK DRINKING has been a long-standing problem on U.S. college campuses. By 1989, a survey of college and university presidents found that 67% rated alcohol misuse to be a "moderate" or "major" problem on their campus (Carnegie Foundation for the Advancement of Teaching, 1990). Recent national surveys of college student alcohol use have confirmed that a sizable minority of students drinks large quantities of alcohol. For example, a 1999 survey conducted by researchers at the Harvard School of Public Health found that approximately two in five students at 4-year institutions engaged in heavy episodic drinking during the 2 weeks prior to the survey, similar to what had been found in both 1993 and 1997 (Wechsler et al., 2000). For men, heavy episodic drinking was defined as having five or more drinks in a row, and for women as having four or more drinks. About half of the heavy drinkers, or about one in five students overall, drank at this level

three or more times during the 2-week period and account for 68% of all alcohol consumption by U.S. college students (Wechsler et al., 1999).

The 1999 Harvard survey showed that heavy episodic drinkers had far greater alcohol-related problems compared with students who consumed lower amounts of alcohol. By their own report, frequent heavy episodic drinkers were several times more likely to do something they regret, miss a class, fall behind in their schoolwork, forget where they were or what they did, engage in unplanned sexual activity, not use protection when having sex, argue with friends, get hurt or injured, damage property and get into trouble with campus or local police (Wechsler et al., 2000). There is also a positive relationship between heavy episodic drinking and driving after drinking (DeJong and Winsten, 1999).

There is also evidence that most students experience widespread problems as a result of *other* students' misuse of alcohol (secondary heavy use effects), including interrupted study and sleep; having to take care of a drunken student; being insulted or humiliated; having a serious argument or quarrel; having property damaged; unwanted sexual advances; being pushed, hit or assaulted; and being a victim of sexual assault or date rape. Secondary heavy use effects are far more common on campuses with large numbers of high-risk drinkers (Wechsler et al., 2000).

Additional evidence makes clear that high-risk drinking has a profound effect on college students, contributing to

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[†]William DeJong may be reached at the above address or via email at: wdejong@bu.edu. Linda M. Langford is with Education Development Center, Newton, MA.

both academic failure and an unsafe campus. Students who drink at high levels have poorer grades (Presley et al., 1996); anecdotal evidence suggests that many students who drop out of colleges and universities have alcohol- and other drug-related problems (Eigen, 1991). Estimates are that between 50% and 80% of violence on campus is alcohol related (Roark, 1993). In a study of women who had been victims of some type of sexual aggression while in college, the respondents reported that 68% of their male assailants had been drinking at the time of the attack (Frintner and Rubinson, 1993).

Progress in reducing high-risk drinking has been slow. One positive note is an increase in the percentage of college students who abstain from drinking. This figure stood at 19.2% in the 1999 Harvard survey, up from 15.4% in 1993 and 18.9% in 1997 (looking at students from the subset of schools that participated in all three surveys). On the other hand, the 1999 Harvard survey found that 22.7% of students were classified as frequent heavy use drinkers compared with 19.8% in 1993 and 20.9% in 1997 (Wechsler et al., 2000).

With relatively modest progress being made, college and university presidents are under pressure to lower high-risk drinking among their students. A key source of pressure has been emerging case law regarding legal liability. Increasingly, U.S. courts are ruling that colleges and universities cannot ignore high-risk alcohol consumption, but instead have an obligation to take reasonable measures to create a safe environment by reducing foreseeable risks (Bickel and Lake, 1999). In 1997, student deaths by alcohol poisoning at Louisiana State University and the Massachusetts Institute of Technology put the issue of student drinking on the national agenda. As a result, Mothers Against Drunk Driving (MADD), College Parents of America, The Century Council and other groups have urged students and their parents to demand stronger prevention measures to ensure student safety.

Institutions of higher education have focused their prevention efforts on educational and intervention strategies oriented to influencing and meeting the needs of individual students (Larimer, this supplement). Such programs are essential, of course, but are only a part of what is necessary to reduce alcohol-related problems on a large scale. Community-based prevention research suggests the need for a broader effort, one that also seeks to reshape the physical, social, economic and legal environment that affects alcohol use (Holder et al., 1997; Perry et al., 1996). Informed by this research, and inspired by the example of the anti-drunk driving movement in the United States, the environmental management approach promoted by the U.S. Department of Education's Higher Education Center for Alcohol and Other Drug Prevention urges campus administrators to adopt a comprehensive approach to prevention that goes beyond individually focused health education programs to include

strategies designed to change the campus and community environment in which students make decisions about alcohol use (DeJong et al., 1998).

This article first describes a social ecological framework commonly used in public health work and its application to the problem of college student drinking. This framework is then expanded to create a full typology of campus-based prevention and treatment options, which can be used by prevention planners to provide a systematic review of current efforts and to inform future strategic planning. Next, the article reviews recent case studies showing the promise of campus-based environmental management strategies. Finally, the article reports findings from a national survey of U.S. colleges and universities about available resources for pursuing environmentally focused prevention. At this time, the majority of U.S. campuses have not yet installed the basic infrastructure required to develop, implement and evaluate a comprehensive approach to prevention that features environmentally focused strategies.

Environmental Management: A Social Ecological Framework

Prevention work in the public health arena has been guided by a social ecological framework, which recognizes that any health-related behavior, including college student drinking, is affected through multiple levels of influence: intrapersonal (individual) factors, interpersonal (group) processes, institutional factors, community factors and public policies (Stokols, 1996). On most campuses, prevention efforts have concentrated on intrapersonal factors, interpersonal processes and a subset of institutional factors. Less attention has been paid to factors in the local community that affect student alcohol use; calls by campus officials for changes in state or federal policy remain rare.

Campus prevention activities focused on intrapersonal or individual factors have been designed to increase student awareness of alcohol-related problems, to change individual attitudes and beliefs, to foster each student's determination to avoid high-risk drinking and to intervene to protect other students whose substance use has put them in danger. Typical among these efforts are freshman orientation, alcohol awareness weeks and other special events and curriculum infusion, where faculty introduce alcohol-related facts and issues into their regular academic courses (Ryan and DeJong, 1998). The assumption behind these approaches is that once students are presented with the facts about alcohol's dangers they will make better-informed and therefore healthier decisions about drinking. Rigorous evaluations of these educational programs are rare, but work in elementary and secondary school-based settings suggests that, although these types of awareness programs are necessary, information alone is usually insufficient to produce behavior change (Ellickson, 1995).

Larimer's (this supplement) literature review suggests there is little evidence that standard awareness and values clarification programs can reduce alcohol consumption by college students. There are new approaches being studied that hold promise, however, including expectancy-challenge procedures (involving alcohol/placebo administration), brief motivational feedback interviews and alcohol skills training. These approaches require further study to determine the most effective combination of program components. The ultimate challenge, however, may be in figuring out how to bring these programs to scale so that the behavior of large numbers of students will be affected, not just a small number of research participants.

Activities focused on interpersonal or group processes have been designed to use peer-to-peer communication to change student social norms about alcohol and other drug use. The largest such program, the BACCHUS/GAMMA Peer Education Network, trains volunteer student leaders to implement a variety of awareness and educational programs and to serve as role models for other students to emulate. Formally structured peer programs are the most common, but some campuses have experimented with more informal approaches. At Dartmouth College, for example, health educators train a large cadre of students to engage other students in dialogue when they overhear them make pro-drinking comments. Because well-structured evaluations of peer education are rare, such programs remain an unproven strategy for reducing student alcohol consumption. The value of these programs, which have limited reach compared with other, less expensive educational strategies, might also be questioned on cost-effectiveness grounds.

Social norms campaigns are another prevention strategy designed to affect interpersonal processes. This approach is grounded in the well-established observation that college students greatly overestimate the number of their peers who drink heavily (Perkins and Wechsler, 1996). Because this misperception drives normative expectations about alcohol use, which in turn influence actual use, a viable prevention strategy is to correct the misperception (Perkins and Berkowitz, 1986). A social norms campaign attempts to do this by using campus-based mass media (e.g., newspaper advertisements, posters, email messages) to provide more accurate information about actual levels of alcohol use on campus. Preliminary studies at Northern Illinois University and other institutions suggest that this approach to changing the social environment has great promise as a prevention strategy (Perkins, this supplement), but more definitive research is still needed to gauge its real impact in reducing student alcohol consumption.

A broader focus on institutional factors, community factors and public policy constitutes the doctrine of environmental management articulated by the Higher Education Center for Alcohol and Other Drug Prevention. The need for environmental change is evident when one considers

the types of mixed messages about high-risk alcohol consumption that are abundant in college communities. In the community, for example, many liquor stores, bars and Greek houses fail to check for proof-of-age identification. Local bars and restaurants offer happy hours and other low-price promotions or serve intoxicated patrons. Where it is allowed, on-campus advertising for beer and other alcoholic beverages "normalizes" alcohol consumption as an inherent part of student life, and an absence of alcohol-free social and recreational options makes high-risk drinking the default option for students seeking spontaneous entertainment. Of critical importance, lax enforcement of campus regulations, local ordinances or state and federal laws teaches students to disregard the law. Until these mixed messages in the campus and community are changed, college officials face an uphill battle in reducing high-risk alcohol consumption and the harm it can cause.

Following the social ecological framework, there are three spheres of action in which environmental change strategies can operate: the institution of higher education, the surrounding community and state and federal laws and regulations. Key to developing and implementing new policies in all three spheres is a participatory process that includes all major sectors of the campus and community, including students.

On campus, an alcohol and other drug task force should conduct a broad-based examination of the college environment, looking not only at alcohol and other drug-related policies and programs, but also the academic program, the academic calendar and the entire college infrastructure. The objective is to identify ways in which the environment can be changed to clarify the college's expectations for its students, better integrate students into the intellectual life of the college, change student norms away from alcohol and other drug misuse or make it easier to identify students in trouble with substance use.

Work in the surrounding community can be accomplished through a campus and community coalition. Community mobilization, involving a coalition of civic, religious and governmental officials, is widely recognized as a key to the successful prevention of alcohol- and other drug-related problems (Hingson and Howland, this supplement). Higher education officials, especially college and university presidents, can take the lead in forming these coalitions and moving them toward an environmental approach to prevention (Presidents Leadership Group, 1997). A chief focus of a campus-community coalition should be to curtail youth access to alcohol and to eliminate irresponsible alcohol sales and marketing practices by local bars, restaurants and liquor outlets.

College officials should also work for policy change at both the state and federal levels. New laws and regulations will affect the community as a whole and can help perpetuate changes in social norms, thereby affecting student alco-

hol use. There are several potentially helpful laws and regulations that can be considered, including distinctive and tamper-proof licenses for drivers under age 21, increased penalties for illegal service to minors, prohibition of happy hours and other reduced-price alcohol promotions, restricted hours of sales, reduced density of retail outlets and increased excise tax rates on alcohol (Toomey and Wagenaar, 1999). A state-level association of colleges and universities can provide the organizational mechanism for college presidents and other top administrators to speak out on these and other issues, while also providing a structure for promoting the simultaneous development of several campus and community coalitions within a state.

A Typology of Campus and Community Interventions

The Higher Education Center’s environmental management framework encourages college presidents and other top administrators to reconceptualize their prevention work to include a comprehensive restructuring of the campus and community environment (DeJong et al., 1998). Recently, the Center has expanded this framework to create a full typology of campus-based prevention and treatment options. This typology can be used to categorize existing efforts, identify missing program elements and guide new strategic planning.

The social ecological framework defines one dimension of the typology, with programs and policies classified into one of five levels: individual, group, institution, community and state and federal public policy. The second dimension of the Center’s typology concerns the key areas of strategic intervention, each of which is linked to a particular definition of the problem of alcohol use in colleges. There are four alternatives to be considered: (1) changing people’s knowledge, attitudes and behavioral intentions regarding alcohol consumption; (2) eliminating or modifying environmental factors that contribute to the problem; (3) protecting students from the short-term consequences of alcohol consumption (“health protection” or “harm reduction” strategies); and (4) intervening with and treating students who are addicted to alcohol or otherwise show evidence of problem drinking.

These two dimensions can be represented as a matrix, as in Table 1. This representation captures the idea that many areas of strategic intervention can be pursued at one or several levels: individual, group, institution, community and state and federal public policy. For example, in the realm of health protection, a local community could decide to establish a “safe rides” program. This community-level program would be strengthened by the addition of complementary efforts at other levels of the social ecological model. For example, at the group level, fraternity and sorority chapters could vote to require members to sign a pledge not to drink and drive and instead to use the safe rides program.

TABLE 1. Typology matrix for mapping campus and community prevention efforts

Areas of strategic intervention	Program and policy levels (social ecological framework)			
	Individual	Group	Institution	Community policy ^a
Knowledge, attitudes, and behavioral intentions				
Environmental change				
Alcohol-free options				
Normative environment				
Alcohol availability				
Alcohol promotion				
Policy/law enforcement				
Health protection				
Intervention and treatment				

^aIn this context, the public policy component of the social ecological framework refers to state and federal policy.

Operating at the individual level, there could be a campus-based media campaign that encourages individual students to utilize the new service.

Consider another example focused on increased observance and enforcement of the minimum drinking age law. At the state level, the alcohol control commission could increase the number of decoy (or “sting”) operations at local bars and restaurants. At the community level, local police could implement a protocol for notifying college officials of all alcohol-related incidents involving students. At the institution itself, the campus pub could require that all alcohol servers complete a training course in responsible beverage service. At the group level, the college might require that residential groups and special event planners provide adequate controls to prevent alcohol service to underage students. Finally, at the individual level, a media campaign could publicize these new policies, the stepped-up enforcement efforts and the consequences of violating the law. Implementing multiple strategies in support of a single strategic objective will increase the likelihood of that objective being achieved.

The typology divides the environmental change category into five subcategories of strategic interventions: (1) offer and promote social, recreational, extracurricular and public service options that do not include alcohol; (2) create a social, academic and residential environment that supports health-promoting norms; (3) limit alcohol availability both on- and off-campus; (4) restrict marketing and promotion of alcoholic beverages both on- and off-campus; and (5) develop and enforce campus policies and local, state and federal laws. Each of these subcategories involves a wide range of possible strategic objectives, as shown in Table 2.

TABLE 2. Strategic objectives focused on environmental change

ALCOHOL-FREE OPTIONS

Problem: Many students, especially at residential colleges, have few adult responsibilities and a great deal of unstructured free time, and there are too few social and recreational options.

Strategic objective: Offer and promote social, recreational, extracurricular and public service options that do not include alcohol and other drugs.

Examples of specific strategies:

- Create new alcohol-free events
- Promote alcohol-free events and activities
- Create student service learning or volunteer opportunities
- Publicize student service learning or volunteer opportunities
- Require community service work as part of the academic curriculum
- Open a student center, coffeehouse or other alcohol-free settings
- Expand hours for student center, gym or other alcohol-free settings
- Promote consumption of nonalcoholic beverages at events

NORMATIVE ENVIRONMENT

Problem: Many people accept drinking and other drug use as a “normal” part of the college experience.

Strategic objective: Create a social, academic and residential environment that supports health-promoting norms.

Examples of specific strategies:

- Change college admissions procedures
- Modify the academic schedule
- Offer substance-free residence options
- Increase academic standards
- Increase faculty-student contact
- Create program to correct student misperceptions of drinking norms

ALCOHOL AVAILABILITY

Problem: Alcohol is abundantly available to students and is inexpensive.

Strategic objective: Limit alcohol availability both on- and off-campus.

Examples of specific strategies:

- Ban or restrict use of alcohol on campus
- Prohibit alcohol use in public places
- Prohibit delivery or use of kegs or other common containers on campus
- Require use of registered and trained alcohol servers
- Institute responsible server-training programs
- Disseminate guidelines for off-campus parties
- Limit number and concentration of alcohol outlets near campus
- Increase costs of alcohol sales licenses
- Limit days or hours of alcohol sales
- Limit container size for alcohol sales
- Limit number of servings per alcohol sale
- Require keg registration
- Increase state alcohol taxes

MARKETING AND PROMOTION OF ALCOHOL

Problem: Bars, restaurants and liquor stores use aggressive promotions to target underage and other college drinkers.

Strategic objective: Restrict marketing and promotion of alcoholic beverages both on- and off-campus.

Examples of specific strategies:

On campus

- Ban or restrict alcohol advertising on campus
- Ban or restrict alcohol industry sponsorship of on-campus events
- Limit content of party or event announcements

Off campus

- Ban or limit alcohol advertising in the vicinity of schools
- Ban alcohol promotions with special appeal to underage drinkers
- Ban alcohol promotions that show drinking in high-risk contexts
- Require pro-health messages to counterbalance alcohol advertising
- Institute cooperative agreement to institute minimum pricing
- Institute cooperative agreement to limit special drink promotions

POLICY DEVELOPMENT AND ENFORCEMENT

Problem: Campus policies and local, state and federal laws are not enforced consistently.

Strategic objective: Develop and enforce campus policies and local, state and federal laws.

Examples of specific strategies:

On campus

- Revise campus alcohol and other drug (AOD) policy
- Disseminate campus AOD policy
- Require on-campus functions to be registered
- Increase ID checks at on-campus functions
- Use decoy operations at campus pubs and on-campus functions
- Increase patrols near on-campus parties
- Increase disciplinary sanctions for violation of campus AOD policies
- Increase criminal prosecution of students for alcohol-related offenses

Off campus

- Change driver's licensing procedures and formats
- Impose driver's license penalties for minors violating alcohol laws
- Educate sellers/servers about potential legal liability
- Increase ID checks at off-campus bars and liquor stores
- Enforce seller penalties for sale of liquor to minors
- Enforce law against buying alcohol for minors
- Enforce penalties for possessing fake ID
- Use decoy operations at retail alcohol outlets
- Increase patrols near off-campus parties
- Increase enforcement of DUI laws
- Pass ordinances to restrict open house assemblies and noise level

One use of the typology matrix is for campus-community coalitions to categorize their current programs and policies. In practice, most coalitions find that the bulk of their efforts are focused on addressing knowledge, attitudes and behavioral intentions regarding alcohol consumption, which is most often attempted through programs designed to reach students as individuals. What environmental change strategies there are tend to be focused at the institutional level. Once gaps are noted, the coalition can use the matrix to explore systematically how to expand or modify their programs and policies. Training and technical assistance services provided by the Higher Education Center for Alcohol and Other Drug Prevention are designed to encourage a

detailed exploration of the five subcategories of environmentally focused strategic interventions.

The typology's matrix structure also leads to a consideration of how a program or policy that operates at one level of strategic intervention (as defined by the social ecological framework) might be complemented by efforts operating at other levels. For example, a social norms campaign, which operates primarily at the group level, could be enhanced by an alcohol screening program that gives individualized feedback to students on their drinking compared with other students on campus (Marlatt et al., 1998). As another example, community leaders might foster the creation of new businesses that can provide recreational op-

tions for students. Simultaneously, college officials might create a center to promote student involvement in service learning projects, while also conducting an awareness campaign to inform students of the career advantages of community volunteer work. The idea is to design programs and policies that work in sync to change the campus and community environment, thereby offering a safer and richer learning experience for students.

Emerging Evidence on Environmental Management Strategies

Very few college-focused alcohol prevention programs have undertaken an evaluation that meets even minimal scientific standards. As a result, to guide future program and policy development, the Higher Education Center for Alcohol and Other Drug Prevention relies on the broader prevention literature, which clearly points to the potential for coalition-driven environmental change strategies (Hingson and Howland, this supplement). The Center's training program for campus and community coalitions, technical assistance services and publications have urged college officials to adopt this broader approach, based on the reasoned expectation that what has been shown to work to reduce alcohol-related problems in the population at large will also work to reduce alcohol-related problems among college students.

Recent case study reports underscore the potential value of an environmental approach to reduce alcohol-related problems among college students. In Albany, New York, for example, a campus-community coalition worked to reduce problems related to off-campus student drinking. Committee initiatives included improving enforcement of local laws and ordinances, sending safety awareness mailings to off-campus students and developing a comprehensive advertising and beverage service agreement with local tavern owners. These initiatives were associated with a decline in the number of alcohol-related problems in the community, as indicated by decreases in the number of off-campus noise ordinance reports filed by police and in the number of calls to a university-maintained hotline for reporting off-campus problems (Gebhardt et al., 2000).

In 1995, the University of Arizona installed and publicized new policies to provide better alcohol control during its annual homecoming event. Systematic observation at pregame tents showed that, compared with 1994, these policies led to a lower percentage of tents selling alcohol, elimination of beer kegs, greater availability of food and nonalcoholic beverages, the presence of hired bartenders to serve alcohol and systems for ID checks. These changes were still in evidence through 1998. In 1995, campus police also saw a downward shift in the number of neighborhood calls for complaints related to homecoming activities, which was maintained through 1998. Statistics on law en-

forcement actions were inconsistent. There was a sharp drop in 1995, but 1996 and 1998 saw enforcement levels similar to what was seen before the new policies (Johannessen et al., 2001).

Researchers at the University of Rhode Island conducted a study to assess the impact of the university's tougher alcohol policies, which were installed in 1991, including prohibitions against underage drinking or alcohol possession, public alcohol consumption and use of kegs or other common alcohol containers. The results suggested that aggressive enforcement of the new policies led to a 60% decrease in more serious alcohol violations (Cohen and Rogers, 1997).

Additional scientifically based research is needed to assess the effectiveness of college-based prevention programs that feature environmentally focused policies and programs. Why have there been so few good program and policy evaluations? In general, the problem is not that program directors are unaware of the need for evaluation, or that they are worried about their program failing to measure up. Rather, it is that, until recently, most foundations and government agencies invested insufficient resources in evaluation research. Good research in this area is expensive. On a promising note, new research initiatives funded by the U.S. Department of Education, the National Institute on Alcohol Abuse and Alcoholism and the Robert Wood Johnson Foundation should soon make it possible for a scientifically based research literature to emerge.

With the promise of environmental management strategies for reducing alcohol-related problems among college students, the question arises as to how many colleges and universities have the resources needed to pursue this approach. Reported next are the results of a national study conducted by the Higher Education Center for Alcohol and Other Drug Prevention to answer that question.

National Survey of Senior Campus Administrators

In 1998, the Higher Education Center conducted its first Survey of American College Campuses to learn more about the types of alcohol and other drug prevention efforts now in place in U.S. institutions of higher education. Of particular interest was the extent to which colleges and universities have installed the infrastructure they need to develop, implement and evaluate a comprehensive program that includes prevention strategies with an environmental management focus.

The study sample was an equal probability sample of 365 two- and four-year colleges and universities, both public and private, drawn from an updated database of U.S. institutions of higher education. All of the selected institutions had undergraduate students and granted an associates degree or higher. A survey was mailed to the senior administrator responsible for coordinating each school's in-

stitutional response to alcohol- and other drug-related problems.

One survey was returned without a forwarding address for the institution, leaving a total sample size of 364. With 280 completed surveys, the response rate was 76.9%. Of those providing this information, 133 were from a 4-year institution (48.0%) and 144 were from a 2-year school (52.0%).

Current funding and staff levels

Fully 81.1% of the respondents reported that "hard money" (nongrant) funding for their institution's alcohol and other drug prevention programs had remained the same during the past 3 years; 9.4% reported that funding had increased, and 9.4% reported that funding had decreased. Results for 4- and 2-year institutions were somewhat different. Roughly equal percentages of respondents said that funding had decreased (4-year schools, 9.2%; 2-year schools, 9.7%); more 4-year schools (16.8%) than 2-year schools (1.8%) had funding increases during the past 3 years.

On average, respondents to the Center's survey stated that 1.2 full-time equivalent (FTE) staff were employed at their institution to develop and implement alcohol and other drug prevention programs and policies. Four-year institutions reported having more staff devoted to this work than did 2-year schools: less than one FTE (4-year schools, 38.5%; 2-year schools, 57.8%), one to less than two FTEs (4-year schools, 40.4%; 2-year schools, 24.8%) and two or more FTEs (4-year schools, 21.1%; 2-year schools, 17.4%).

Prevention infrastructure

Respondents to the survey were also asked questions about their school's infrastructure for developing prevention programs and policies. Only 39.8% of the respondents reported that their institution had a campus-wide task force or committee in place to oversee prevention efforts. Among those with a task force, 70.1% reported participation by the president or the president's designee. Respondents from 4-year schools were far more likely than those from 2-year schools have a campus-wide task force (51.5% vs 29.6%, respectively).

Only 28.5% of the respondents said that their institution was part of a local coalition focused on alcohol and other drug prevention. Again, there was a large difference between 4- and 2-year institutions. Fully 37.9% of respondents from 4-year schools said that they participated in such a coalition compared with 18.9% of those from 2-year schools. In addition, 32.6% of the respondents reported that their institution was part of a state-level association focused on prevention. This was the case for 41.3% of 4-year institutions but only 23.3% of 2-year schools.

Data collection and research

Only 19.8% of the respondents reported that their institution conducts a formal assessment of the implementation and impact of its alcohol and other drug policies and programs. This was the case for 25.2% of 4-year schools and 13.9% of 2-year schools.

Only 37.3% of the respondents said that their institution carries out a formal survey of student alcohol and other drug use, knowledge and attitudes. Again, there were large differences between 4- and 2-year institutions. Such a survey was conducted at 58.3% of 4-year institutions and only 17.7% of 2-year schools.

Two-thirds of the respondents (66.3%) indicated that their institution's prevention effort includes a review of incident reports from campus security. This was the case for 72.1% of 4-year schools and 62.2% of 2-year schools. Only 35.4% of institutions review summary statistics from student health services; this was done at 48.4% of 4-year schools but only 23.1% of 2-year schools.

Conclusions

To prevent alcohol- and other drug-related problems on campus, college and university administrators are being asked to adopt a more comprehensive prevention approach that features environmentally focused strategies. Because this represents a profound shift in how most college and university administrators think about alcohol and other drug prevention, this change in approach will come slowly, a fact reinforced by the results of the 1998 Survey of American College Campuses.

Cultivating and sustaining a campus and community environment in which students are helped to make healthier decisions about substance use requires a long-term financial investment. The Higher Education Center's new typology of campus and community prevention efforts makes clear there is much more involved here than tougher campus policies and stricter enforcement. However, despite recent publicity about college student drinking, approximately 9 in 10 U.S. colleges and universities did not increase their nongrant budget allocation for alcohol and other drug prevention during the 3 years previous to the 1998 Survey of American College Campuses.

In addition, the vast majority of colleges and universities have not yet put in place the basic infrastructure they need to develop, implement or evaluate this comprehensive approach. Progress will be greatly facilitated by constituting a permanent campus task force that reports directly to the president, participating actively in a campus-community coalition that seeks to change the availability of alcohol in the local community and joining a state-level association that speaks out on state and federal policy issues.

Another important role of state-level associations is to facilitate the simultaneous development of multiple campus and community coalitions within a state (Deucher et al., in press). The advantages of this approach to infrastructure development are several. First, having several institutions join together in common effort makes clear that high-risk drinking is not a problem of any one campus, but one that all colleges and universities share in common. Second, a state-level effort will draw media attention, which can be used to reinforce the fact that high-risk drinking is not the social norm on campus and to build the case for environmentally focused solutions. Third, a statewide initiative can attract additional funds for prevention. In various states, funds for a state initiative have been provided by departments of state government, the state alcohol beverage control commission and private foundations.

As noted previously, as colleges and universities continue to experiment with a broader range of environmental strategies, additional research is needed to assess their effectiveness and to build a true science of campus-based prevention. Clearly, an environmental approach to drunk driving prevention has led to great reductions in alcohol-related traffic fatalities in the United States (DeJong and Hingson, 1998). Indeed, it was the success of the anti-drunk driving movement that informed the Higher Education Center's doctrine of environmental management. Ultimately, however, if college and university officials are to continue making the investment that an environmental approach requires, evidence is needed about which strategies work best under particular circumstances and are the most cost effective.

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Identification, Prevention and Treatment: A Review of Individual-Focused Strategies to Reduce Problematic Alcohol Consumption by College Students*

MARY E. LARIMER, PH.D.[†] AND JESSICA M. CRONCE, B.S.[†]

Department of Psychiatry and Behavioral Sciences, Box 356560, University of Washington, Seattle, Washington 98195

ABSTRACT. *Objective:* The purpose of this article is to review and assess the existing body of literature on individually focused prevention and treatment approaches for college student drinking. *Method:* Studies that evaluate the overall efficacy of an approach by measuring behavioral outcomes such as reductions in alcohol use and associated negative consequences were included. All studies discussed utilized at least one outcome measure focused on behavioral change and included a control or comparison condition; however, not all trials were randomized. *Results:* Consistent with the results of previous reviews, little evidence exists for the utility of educational or awareness programs. Cognitive-behavioral skills-based interventions and brief motivational feedback (including mailed graphic feedback) have consistently yielded greater support for their efficacy than have informational interventions. *Conclusions:* There is mixed support for values clarification and non-

native reeducation approaches. Much of the research suffers from serious methodological limitations. The evidence from this review suggests that campuses would best serve the student population by implementing brief, motivational or skills-based interventions, targeting high-risk students identified either through brief screening in health care centers or other campus settings or through membership in an identified risk group (e.g., freshmen, Greek organization members, athletes, mandated students). More research is needed to determine effective strategies for identifying, recruiting and retaining students in efficacious individually focused prevention services, and research on mandated student prevention services is an urgent priority. Integration between campus policies and individually oriented prevention approaches is recommended. (*J. Stud. Alcohol*, Supplement No. 14: 148-163, 2002)

THIS ARTICLE presents a review of the literature on individually focused prevention (including universal, indicated and selective prevention targets) and treatment approaches for college student drinking. Also included is a review of strategies for identifying individuals in need of prevention or treatment services and enhancing recruitment and retention of students in these services. Studies that evaluate overall efficacy of prevention and treatment approaches are included, as well as the available research on the effectiveness of these approaches with identified subgroups of students who are at high risk for problematic alcohol use (including children of alcoholics, fraternity/sorority members, freshmen, judicially mandated students and athletes). The behavioral outcomes used to evaluate program efficacy include reductions in alcohol use (including quantity, frequency and intensity of use), reductions in the negative consequences of use (in conjunction with or independent of use reduction) and/or increased rates of alcohol abstinence.

The relevant literature was identified through online searches of electronic databases, including MEDLINE, PsychInfo and ETOH as well as examining reference sections from previous reviews of prevention literature (Hingson et al., 1997; Maddock, 1999; Moskowitz, 1989; Walters, 2000; Wood, 1998) and the outcome studies identified through these searches. Studies from the 15-year period of 1984-1999 are included. In addition, the *Promising Practices: Campus Alcohol Strategies* sourcebook (Anderson and Milgram, 1997, 1998) was reviewed, and several sources were identified and contacted for information about outcome evaluations of their programs. Finally, authors who were identified through these searches and/or through other contacts within the field (including Fund for the Improvement of Postsecondary Education grant recipients) who are known to conduct research in this area were contacted to request reprints or preprints of their work relevant to this topic. The resulting review thus contains both published and unpublished studies.

It should be noted that, although there is a growing body of literature on prevention of problem drinking among college students, and the majority of approaches have been individually focused, there are still relatively few randomized, controlled trials of these approaches in the published literature. Therefore, although these few trials are heavily weighted in the review, nonrandomized trials were also included. Inclusion criteria were that, at a minimum, studies

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[†]Mary E. Larimer may be reached at the above address or via email at: larimer@u.washington.edu. Jessica M. Cronce is with the Addictive Behaviors Research Center, Department of Psychology, University of Washington.

must have a control or comparison condition, and studies must include at least one outcome measure focused on behavioral change in drinking or consequences (instead of or in addition to typical attitudinal or knowledge-based outcomes alone). Finally, in general, nonrandomized studies were included only if they employed pre- and post-assessments, allowing for statistical control or evaluation of baseline differences between groups. These criteria are similar to those employed by Wood (1998) in his review of this literature.

Prevention and Treatment Strategies

A variety of prevention and treatment approaches have been employed with college student drinkers. Although many of these are multicomponent strategies, for the purposes of this review, prevention programs have been divided, based on content and theory of the approach, into three major categories: (1) educational/awareness, (2) cognitive-behavioral and (3) motivational enhancement techniques. Table 1 lists the prevention programs covered in this review, including design and outcome information.

Educational/awareness programs

In his 1989 review of the literature on effectiveness of alcohol prevention strategies for adolescents, Moskowitz concluded that the majority of prevention approaches utilized with college students were based on weak or nonexistent theory and had virtually no empirical support for their efficacy. At that time, the most common approaches were informational in nature. They were primarily based on the assumption that students misused alcohol or other substances due to a lack of knowledge or awareness of health risks and that an increase in knowledge regarding the negative effects of these substances would lead to a decrease in use. Research evaluations of these approaches have tended to suffer from a number of methodological limitations, particularly small sample sizes, nonrandom samples and often lack of or noncomparability of control or comparison conditions. Despite these weaknesses, informational/educational approaches are still the most commonly utilized techniques for individually focused prevention on college campuses (Ziemelis, 1998).

Three relatively distinct types of educational programs have been evaluated with college students: (1) traditional information or knowledge-based programs; (2) values clarification programs, designed to help students evaluate their goals and incorporate responsible decision making about alcohol into these goals or values; and (3) provision of accurate normative information to students about peer drinking rates and problems as well as modifying students' attitudes about the acceptability to peers and parents of excessive alcohol consumption.

Information/knowledge programs. Seven studies (Darkes and Goldman, 1993; Flynn and Brown, 1991; Garvin et al., 1990; Kivlahan et al., 1990; Meier, 1988; Roush and DeBlasie, 1989; Schall et al., 1991) identified in the literature evaluated informational or knowledge-based approaches and met minimum inclusion criteria. The majority of these studies suffered from methodological limitations, such as high rates of attrition, noncomparability of the control group and nonspecific reporting of methodology and results, which made it difficult to draw meaningful conclusions. Despite these problems, and although several of the studies did demonstrate changes in knowledge or attitudes following these interventions, overall they provide little support for the efficacy of these approaches. Only one (Kivlahan et al., 1990) of the seven studies reported significant reductions in either drinking or negative consequences.

Kivlahan et al. (1990) evaluated an 8-week informational curriculum based on Alcohol Information School (AIS) for DWI offenders compared with an eight-session skills-training curriculum and an assessment-only control group. Results indicated participants in both the AIS and the Alcohol Skills Training Program (ASTP) intervention groups reduced their consumption over time. Participants who received the AIS program reduced their consumption from 19.4 drinks to 12.7 drinks per week at the 12-month follow-up compared with control group participants, who reported a slight *increase* from 15.6 to 16.8 drinks per week. However, neither the participants in the AIS group nor the control group fared as well as the ASTP group (who experienced a reduction from 14.8 to 6.6 drinks per week at the 12-month follow-up).

Values clarification programs. Five studies (Barnett et al., 1996; Meacci, 1990; Sammon et al., 1991; Schroeder and Prentice, 1998; Thompson, 1996) included a values clarification condition or included values clarification activities as part of a broader informational approach. Although, of the five studies, two—On Campus Talking About Alcohol (Sammon et al., 1991) and Delts Talking About Alcohol (Thompson, 1996)—reported reductions in drinking rates between baseline and follow-up assessments, insufficient information about the samples, procedures and the comparability of participants in the intervention and control conditions limits the strength of the conclusions drawn from these data. The remaining three studies were constrained by methodological limitations, such as problems with recruitment and retention of participants and noncomparability of control and experimental groups, and provided little support for the efficacy of the programs.

Normative reeducation programs. Two studies (Barnett et al., 1996; Schroeder and Prentice, 1998) incorporated a normative reeducation group in their evaluation. Barnett et al. (1996) utilized peers to provide normative reeducation, either alone or in combination with values clarification

TABLE 1. Summary of study designs and outcomes

Study	Participants	Pretest	Posttest	Follow-up	Intervention conditions	Outcome
Agostinelli et al., 1995	26 moderately heavy-drinking male students	X	6 wks		1. Mailed personal feedback 2. No feedback	Experimental group drank less than control.
Ametrano, 1992	136 freshman, nonrandomly assigned	X	X	2 mo.	1. Information + coping skills 2. No treatment	Not significant.
Aubrey, 1998	77 youth ages 14-20 presenting for outpatient treatment, randomly assigned	X		3 mo.	1. Brief motivational interview 2. Standard care	Significant increase in days abstinent and treatment sessions attended in intervention group.
Baer et al., 1992	132 heavy-drinking young adults	X	3 mo.	6/12/24 mo.	1. Alcohol skills training group (group) 2. Alcohol skills training (self-help) 3. 1-hour feedback only	Significant reductions in drinking in all 3 intervention groups.
Barnett et al., 1996	317 students, nonrandomly assigned	X	X	3 mo.	1. Peer norms 2. Values clarification 3. Peer norms + values clarification 4. No treatment	Norms changed most in Conditions 1 and 3. No significant intervention effects on drinking.
Borsari and Carey, 2000	60 heavy-drinking students, randomly assigned	X		6 wks	1. Brief motivational interview 2. Assessment only	Significant reductions in drinking in the brief motivational interview group as compared with assessment only group.
Cronin, 1996	128 students, randomly assigned		X		1. Diary anticipating alcohol use and problems during spring break 2. Postassessment only	Participants in diary condition reported lower consumption and fewer problems at posttest than did control group.
D'Amico and Fromme, 2000	300 high school students, randomly assigned	X	X		1. Risk skills training program 2. DARE brief group 3. Control	RSTP participants reported decreased alcohol and drug use, driving while intoxicated and riding with intoxicated drivers.
Darkes and Goldman, 1993	50 moderately heavy-drinking male students	X	2 wks		1. Expectancy challenge 2. Education 3. No treatment	Expectancy challenge Group 1 drank less than Group 2 and control.
Darkes and Goldman, 1998	50 moderate/heavy-drinking male students, randomly assigned	X	2 wks	6 wks	1. Social/sexual expectancy challenge intervention 2. Arousal/cognitive expectancy challenge 3. Assessment control group	Both expectancy challenge groups reported decreased consumption.
Dimeff, 1997	41 heavy-drinking students in a college health center, randomly assigned	X		30 days	1. Computerized feedback and physician advice 2. Assessment only	Participants adequately exposed to the intervention reported decreased use and consequences compared with those with less exposure.
Flynn and Brown, 1991	31 students involved in alcohol conduct violations matched with controls	X	X	3 mo.	1. Education + personal evaluation 2. No treatment	Not significant.
Garvin et al., 1990	60 fraternity members, nonrandomly assigned	X	2 wks	5 mo.	1. Self-monitoring + self-management training 2. Self-monitoring + information 3. Self-monitoring only 4. No treatment control	At 5-month follow-up, monitoring-only group drank less than other experimental groups and control. Self-management group also reported decreased consumption, compared with information and control groups.
Jack, 1989	46 nursing students in treatment course compared with 36 students in other courses (nonrandom)	X	X		1. Information and skills 2. Assessment control	No behavior change.
Jones et al., 1995	90 drinking students	X	X	24 days	1. Expectancy information + written essay 2. Expectancy information only 3. Nonalcohol-related information	No significant difference across time by intervention group, but trend favoring Group 1.
Kivlahan et al., 1990	36 moderately heavy-drinking students	X	1 wk	4/8/12 mo.	1. Skills training 2. Information 3. No treatment control	Experimental groups both drank less than control, with skills training most effective.

Continued

TABLE 1. *Continued*

Study	Participants	Pretest	Posttest	Follow-up	Intervention conditions	Outcome
Larimer et al., 2001	296 frat/sorority pledge members, quasirandom assignment	X		1 yr	1. Brief motivational interview 2. Assessment-only control	Male students in the intervention condition significantly reduced consumption.
Marcello et al., 1989	58 varsity athletes	X	X	2 mo.	1. Education + skills training + peer pressure skills 2. Wait-list control	Not significant.
Marlatt et al., 1998	348 heavy-drinking freshmen	X	6 mo.	12/24 mo.	1. Self-monitoring + personalized feedback (Year 1) + mailed feedback (Year 2) 2. No feedback control	Experimental group drank less heavily and had fewer negative consequences than control group.
Meacci, 1990	73 experimental and 63 control subjects, nonrandomly assigned	X	X	3 mo.	1. 15-week values clarification courses 2. Students in other nonaddiction courses	No effect.
Meier, 1988	71 students	X	X		1. Computerized alcohol information 2. Written alcohol information 3. Attention/placebo control	Changes in knowledge in Conditions 1 and 2. No behavior change.
Miller, 1999	547 freshman students, randomly assigned	X	3 mo.	6 mo.	1. 2-session peer-led skills program 2. 2-session peer-led alcohol 101 CD-ROM 3. Repeated assessment only 4. Single assessment only	Participants in Groups 1-3 showed reduced consumption as compared with Group 4.
Monti et al., 1999	94 adolescents in hospital ER for alcohol-related incident, randomly assigned	X	3 mo.	6 mo.	1. Brief motivational interview 2. Standard care	Those who received intervention reported fewer negative consequences, reduced drunk driving and fewer traffic violations.
Murphy et al., 1986	60 heavy-drinking male students	X	X	6 wks	1. Exercise (running) 2. Meditation 3. Assessment control	Participants in the running group reported the greatest reductions in drinking at posttreatment. High compliance meditators showed similar declines.
Rohsenow et al., 1985	36 heavy-drinking male students	X	X	2.5/5.5 mo.	1. Relaxation training 2. No treatment	Experimental group drank less than control at 2.5 mo., but not at 5.5 mo.
Roush and DeBlassie, 1989	24 college student ACOAs	X	X		1. 4-hour information video series on alcoholism 2. Eight, 90-minute informational group counseling sessions	Increase in knowledge in both conditions. Healthier coping attitudes in group counseling; no behavior change.
Sammon et al., 1991	140 dental students at two schools, nonrandomly assigned	X	X	2 mo.	1. OCTAA information/values clarification/risk reduction as part of voluntary addictions course 2. Other dental school curriculum with assessment only	Larger percentage of OCTAA participants had reduced consumption from ≥ 4 to 0-3 per occasion.
Schall et al., 1991	130 students, nonrandomly assigned	X	8 mo.	No	1. Peer-directed alcohol awareness 2. Did not attend	Not significant.
Schroeder and Prentice, 1998	Freshmen college students, quasirandom assignment	X	X	4-6 mo.	1. 1-hour peer-oriented normative intervention 2. 1-hour values clarification/decision making.	Peer-based normative intervention produced reductions in consumption; no change in values clarification condition.
Thompson, 1996	53 DTAA program attendees and 116 control fraternity members, nonrandomly assigned	X	6 mo.	20 mo.	1. Delts Talking About Alcohol 2. Control fraternity assessment only	Greater % of participants in DTAA reported lower-risk consumption at follow-up, as compared with increased % of high-risk drinkers in control fraternity.
Walters et al., 2000	Heavy-drinking students randomized to condition	X		6 wks	1. Mailed feedback 2. Feedback and skills group 3. Assessment control	Mailed feedback superior to group and control.
Walters et al., 1999	Heavy-drinking students, randomized to condition	X		6 wks	1. Mailed feedback 2. Feedback and values clarification 3. No treatment control	Mailed feedback superior to values clarification and control.

information, to students in residence halls and fraternities/sororities. Although there were no differential effects of the interventions on drinking behavior over time, participants who received either of the normative reeducation interventions reported significantly greater changes in their perception of the norms than did participants in the values clarification-only and control groups. Regression analyses indicated changes in norms from baseline to postintervention predicted subsequent reductions in alcohol consumption regardless of prevention condition.

Schroeder and Prentice (1998), in contrast, reported that participants who received a 1-hour peer-delivered normative reeducation program (similar to that utilized in the Barnett et al. 1996 study) did report significant reductions in drinking compared with the alternative values clarification program, but there were no differences in increased accuracy of normative perceptions. Their data suggest that the change in drinking following the normative reeducation intervention was the result of weakened proscriptive strength of the norm (perceiving the norm as less universally adhered to, therefore less powerful), rather than a change in perceptions reflecting a more moderate norm. Participants in the Schroeder and Prentice (1998) study were freshmen residence hall members, as compared with a mixed-age population of residence hall and Greek system members in the Barnett et al. (1996) report, which may be one factor in the discrepancy between the findings of these two studies. It is possible that freshmen students may be more amenable to normative interventions, given that they have had less exposure to the influences of campus norms. Other explanations for the discrepancy in findings may involve differences in the measurement of both norms and drinking behavior between the two studies, as well as attrition in the study conducted by Barnett et al.

In summary, although several outcome studies evaluating traditional informational programs with college students have been conducted in the past 15 years, the majority of these studies have found no effect of the interventions on alcohol use and/or alcohol-related negative consequences. In his recent meta-analysis of the college alcohol prevention literature from 1983-1998, including only those trials with random assignment to condition, Maddock (1999) concluded that typical education/awareness-based programs (including values clarification approaches) produce on average only small effects on behavior ($d = .17$). These findings suggest that continuing to pursue approaches based solely on informative or awareness models is a poor use of resources on college campuses. Values clarification approaches such as On Campus Talking About Alcohol may be efficacious, but have not been evaluated in randomized trials and are time and resource intensive. Educational programs based on normative reeducation approaches are less costly and may hold more promise, but have yet to be widely tested.

Cognitive-behavioral skills-based programs

Cognitive-behavioral skills-training programs are a relatively newer addition to the college drinking prevention repertoire than are educational or awareness approaches. Many cognitive-behavioral programs also incorporate information, values clarification and/or normative reeducation components, but do so within the context of teaching skills to modify beliefs or behaviors associated with high-risk drinking. Cognitive-behavioral programs range from specific alcohol-focused skills training (including expectancy challenge procedures, blood-alcohol discrimination training or self-monitoring/self-assessment of alcohol use or problems) to general life skills training with little or no direct relationship to alcohol (such as stress management training, time management training or general assertiveness skills). The majority of programs are multimodal, including both specific alcohol-focused skills as well as general life skills.

Specific alcohol-focused skills training. Three studies of expectancy challenge procedures that met inclusion criteria, two of which (Darkes and Goldman, 1993, 1998) showed statistically significant positive effects at short-term follow-up. The third (Jones et al., 1995) demonstrated trends in drinking supportive of the expectancy challenge interventions, but did not achieve statistical significance.

Darkes and Goldman (1993) randomly assigned heavy-drinking male participants to receive either alcohol or a placebo. Participants consumed beverages in a social setting that included activities with a social or sexual component and then attempted to guess which participants (including themselves) had consumed alcohol or placebo based on their behavior. In addition, participants received information about placebo effects of alcohol and monitored expectancy-relevant events in their environment throughout the course of the 4-week study. Expectancy challenge procedures were conducted during three 45-minute sessions. In contrast to participants who received traditional alcohol education and to an assessment-only control group, participants in the expectancy challenge group reported a significant decrease in their alcohol use at 2-week follow-up.

Similarly, Darkes and Goldman (1998) randomly assigned 54 heavy-drinking male participants to an assessment-only control condition or one of two expectancy challenge conditions, targeting either sociability or arousal, using the procedures describes above to challenge social expectancies, whereas arousal expectancies were challenged during tasks involving either sedating cues or problem-solving tasks. The study also included a 15-minute passive "booster" session 4 weeks after completion of the expectancy challenge procedures, with an additional follow-up 2 weeks later (6 weeks after the challenge procedure). Results indicated participants in both expectancy challenge conditions significantly reduced their alcohol consumption by 2 weeks posttreatment

as compared with participants in the control group, who demonstrated an increase in consumption. Participants in all three conditions indicated a subsequent decrease in drinking by the 6-week follow-up, with the expectancy conditions demonstrating the largest reductions. Importantly, in both of the Darkes and Goldman (1993, 1998) studies, heavy drinkers showed the largest impact of the expectancy challenge procedures, in contrast to other interventions demonstrating better effects for moderate or light-drinking students.

In contrast to the Darkes and Goldman studies, Jones et al. (1995) evaluated an expectancy challenge procedure incorporating didactic information and discussion about alcohol expectancies, including self-monitoring of expectancies, with or without an expectancy self-challenge procedure (randomly assigned), but without the experiential component of alcohol administration. Twenty-four-day follow-up indicated drinking overall was reduced over time, but changes in drinking over time were not found to vary significantly by condition. However, post hoc analyses indicated only those participants in the expectancy with self-challenge condition significantly decreased their drinking from pretesting to follow-up.

Findings from these three studies suggest that expectancy challenge procedures may have considerable utility for decreasing alcohol use among college males. These findings also suggest that increasing the personalization and experiential component of expectancy information and providing practice in challenging expectancies may be necessary for these programs to be effective. Studies that replicate these findings on a larger scale, with women as well as men, and with a longer-term follow-up are needed to evaluate this prevention approach more fully. In addition, further evaluation of the relative impact of expectancy challenge procedures with and without an alcohol administration component is needed.

Three studies (Cronin, 1996; Garvin et al., 1990; Miller, 1999) evaluating self-monitoring or self-assessment of alcohol use as an intervention were reviewed, all of which indicated significant positive effects of this strategy on either consumption, negative consequences or both.

Cronin (1996) compared student drinking rates and problems assessed at the end of spring break between students who were randomly assigned to complete a diary anticipating alcohol consumption and problems for the upcoming spring break week and those who were assigned to a no-treatment control group. Results indicated those students who completed the diary prior to spring break reported fewer negative consequences at the end of spring break than did those students in the control group.

In their study of fraternity pledge class members, Garvin et al. (1990) trained participants in a self-monitoring-only group to record their daily alcohol consumption during a 7-week period. Participants in this condition received no other intervention. It is interesting to note that, at the 5-month

follow-up, participants in the self-monitoring group reported statistically lower alcohol consumption than did participants in both the no-treatment control group and the alcohol education group.

Miller (1999) compared students who participated in three computerized assessments of their drinking (with no additional intervention during their freshman year) with participants who also received a two-session peer-delivered alcohol skills-training program or a two-session peer-facilitated interactive CD-ROM skills group (the Alcohol 101 CD-ROM, Reis et al., 2000). Participants were 547 students at varying levels of risk for alcohol-related problems, randomly assigned to one of these three conditions or a single-assessment-only control group, who completed the alcohol assessment only at the end of their freshman year. Although some outcome measures favored the two intervention groups as compared with the repeated assessment condition, on average students in the repeated assessment group reported decreases in drinking and consequences at the 6-month follow-up similar to those in the two experimental conditions. Importantly, participants in the single-assessment-only group were drinking more and experiencing more problems than those in any of the other three groups by the end of the freshman year, despite having been randomly assigned to condition at the beginning of the year. These results suggest that the opportunity to respond to questions about drinking and negative consequences in the absence of any additional feedback served as an intervention for those participants in the repeated assessment group. One limitation of this study is that there was a low initial response rate to recruitment efforts (approximately 25%), and all conditions included a fairly high percentage of abstainers and light drinkers (41% and 32%, respectively).

Despite limitations, each of these three studies not only provides support for the role of assessment in promoting change, but also has implications for the conclusions drawn from other longitudinal studies including repeated assessment control groups. Inclusion of single-assessment control groups in randomized longitudinal designs may be necessary to assess program outcome more accurately.

Multicomponent alcohol skills training. The majority of studies evaluating cognitive-behavioral prevention approaches include a multicomponent skills-training condition. Seven studies (Ametrano, 1992; Baer et al., 1992; Garvin et al., 1990; Jack, 1989; Kivlahan et al., 1990; Marcello et al., 1989; Miller, 1999) evaluating a total of 10 multicomponent skills-based interventions were identified in the literature. Of these, three interventions (Ametrano, 1992; Jack, 1989; Marcello et al., 1989) indicated no positive effect on alcohol use or consequences, whereas seven interventions (Baer et al., 1992; Garvin et al., 1990; Kivlahan et al., 1990; Miller, 1999) were found to have at least some effects on alcohol consumption, problems or both.

Baer et al. (1992) compared three formats of a similar ASTP to evaluate whether intensity or format of the inter-

vention would affect the magnitude of change. Participants were heavy-drinking volunteers randomly assigned to receive either a six-session version of the ASTP, a single individual session incorporating risk feedback and advice to change or a self-help manual incorporating the ASTP content. Results indicated participants in all three conditions who completed the intervention showed significant change from baseline to follow-up in drinking rates and problems. However, there was substantial attrition in the self-help condition, such that this condition was eliminated from recruitment midway through the study.

Garvin et al. (1990) included a skills-training group as one condition in their study of fraternity pledge classes. The program consisted of four 45-minute sessions designed to teach moderate drinking skills, blood alcohol concentration discrimination and assertiveness skills (including drink refusal). Participants in this condition also self-monitored their alcohol consumption for 7 weeks. Results indicated significant reductions in average weekly alcohol consumption for participants who received the skills-training intervention, which appear comparable in magnitude with those reported in the monitoring-only condition.

Kivlahan et al. (1990) evaluated an 8-week multicomponent ASTP, including assertive drink refusal skills, relaxation and general lifestyle balance skills and alcohol-specific skills such as drink pacing, limit setting and blood-alcohol discrimination training. Results indicated that the participants who received the skills-training intervention showed significant reductions in alcohol use and consequences throughout a 2-year follow-up as compared with students who received the alcohol information school program or assessment only.

Miller (1999) compared a two-session, peer-delivered ASTP with two-session computerized information/skills-training via Alcohol 101 CD-ROM (Reis et al., 2000) and with a repeated assessment-only control group and a single-assessment control group. Both skills-based interventions included information on accurate norms for alcohol consumption, blood alcohol concentration effects and blood alcohol estimation as well as myths and placebo effects of alcohol. Differences favoring the two skills-based interventions were noted within drinking subgroups of participants, including increases in knowledge and motivation to change. In addition, light-moderate drinking students who received either of the skills-based interventions reported significantly reduced negative consequences of drinking as compared with those in the repeated assessment-only condition; abstainers and heavy drinkers in the sample did not appear to differentially benefit from the interventions as compared with repeated assessment only. Participant satisfaction was significantly higher in the ASTP groups than in the CD-ROM group, suggesting students on average preferred the more interactive ASTP approach.

General life skills training/lifestyle balance. Two studies (Murphy et al., 1986; Rohsenow et al., 1985) in the college student population evaluated the outcome on drinking behavior of general lifestyle skills/lifestyle balance. Both indicated at least short-term benefits on drinking rates.

Murphy et al. (1986) randomly assigned 60 heavy-drinking male students to 8 weeks of exercise, meditation or assessment only. Results indicated participants in the exercise condition significantly reduced their mean weekly ethanol consumption as compared with participants in the control group (60% reduction from baseline to week 10), despite the fact that alcohol use reduction was not a specified goal of the intervention. Reductions in use were largely maintained in the exercise group (6 weeks) even after cessation of the active intervention. Participants in the meditation condition were less likely to have been compliant with meditating; however, those who did meditate showed reductions in drinking similar to those in the exercise group.

Rohsenow et al. (1985) randomly assigned 36 heavy-drinking students to a general stress-management course or an assessment-only control condition. Results indicated participants who received the intervention reported decreased alcohol consumption at 2.5-month follow-up as compared with participants in the control group. However, by 5-month follow-up, these results were no longer significant.

In summary, several cognitive-behavioral interventions including specific, global or multicomponent skills-training approaches have been associated with behavioral changes in drinking. The magnitude of these effects varies depending on the interventions and the populations studied, but generally support the efficacy of these approaches for universal, indicated and selective prevention. Research designs evaluating these approaches have generally been stronger than those utilized with educational programs, but methodological limitations are still evident in this research primarily due to small sample sizes and relatively high attrition rates in some samples.

Motivational/feedback-based approaches

Brief motivational interventions. Eight studies (Aubrey, 1998; Baer et al., 1992; Borsari and Carey, 2000; D'Amico and Fromme, 2000; Dimeff, 1997; Larimer et al., 2001; Marlatt et al., 1998; Monti et al., 1999) were reviewed that met inclusion criteria and evaluated the efficacy of brief (one or two session) individual or group motivational enhancement approaches, typically incorporating alcohol information, skills-training information and personalized feedback designed to increase motivation to change drinking. Of these, four were conducted with college student samples (Baer et al., 1992; Borsari and Carey, 2000; Larimer et al., 2001; Marlatt et al., 1998), three were conducted with college-age samples in medical/mental health settings (Aubrey, 1998; Dimeff, 1997; Monti et al., 1999) and one

was conducted with high school students but was directly relevant to the topic of this article due to similar age groups and similar prevention materials (D'Amico and Fromme, 2000). Each of these interventions demonstrated significant effects on drinking behavior, consequences or both.

As mentioned, Baer et al. (1992) compared three formats of the ASTP and found a single session of brief advice was comparable to a 6-session ASTP group and a 6-session correspondence course in reducing alcohol use. Marlatt et al. (1998) extended these findings through randomly assigning 348 high-risk freshman students to receive or not receive a brief (45-minute) in-person motivational feedback session. Feedback included personal drinking behavior and negative consequences, accurate normative information and comparison of personal drinking to the actual campus norms and advice/information regarding drinking reduction techniques (Dimeff et al., 1999). This approach is thus a hybrid of skills training, information, normative reeducation and brief motivational enhancement. Results indicated participants in the intervention group reduced their consumption and negative consequences significantly and maintained those reductions through a 2-year follow-up.

Borsari and Carey (2000) replicated the Baer et al. (1992) and Marlatt et al. (1998) studies at a large northeastern university utilizing a student population screened from an introductory psychology course. Sixty participants who reported having consumed five or more drinks (four or more drinks for women) two or more times in the previous month were recruited. Students were randomized into a brief motivational interview condition ($n = 29$) that was modeled after the intervention described in Dimeff et al. (1999) or into an assessment-only control group ($n = 31$). At 6-week follow-up, participants in the brief motivational interview condition demonstrated significant reductions in both quantity and frequency of alcohol consumption as well as a decline in the number of reported heavy episodic drinking events as compared with control participants. However, neither intervention nor control participants showed reductions in alcohol-related consequences, as measured by the Rutgers Alcohol Problem Index (White and Labouvie, 1989). Interestingly, changes in perceived norms mediated the relationship between intervention and drinking reductions, suggesting that the normative feedback component of the Dimeff et al. intervention is a critical component.

Larimer and colleagues (Anderson et al., 1998; Larimer et al., 2001) also replicated the Marlatt et al. (1998) study, implemented with first-year members of intact fraternities and sororities. Participants were 296 members of 12 fraternities and 6 sororities randomly assigned by house to either the brief individualized feedback program or an assessment-only control condition. At 1-year follow-up, fraternity members who received the intervention reported a decrease in consumption from 15.5 to 12 standard drinks per week compared with an increase in the control group from 14.5 to 17

drinks per week. Participants in the intervention group also reported a decrease in estimated peak blood alcohol concentration from .12% to .08% as compared with participants in the control group, who reported no change in peak blood alcohol concentration over time. Sorority women did not differ in alcohol use over time as a function of condition, although this result may be attributable to a smaller than expected original sample.

Aubrey (1998) utilized brief motivational interventions with 77 adolescents (ages 14-20, with a mean age of 17) presenting for outpatient substance abuse treatment. Following intake assessment, youth participants were randomly assigned to standard care ($n = 39$) or to receive two brief motivational feedback interviews utilizing the assessment results ($n = 38$). Results at 3-month follow-up indicated participants who received the intervention reported a greater percentage of days abstinent (70% vs 43%), as well as increased treatment attendance (17 vs 6 sessions attended) and decreased negative consequences of alcohol.

Dimeff (1997) conducted a computerized assessment of alcohol use and problems in a college health center waiting room and randomly assigned high-risk participants to receive the assessment only ($n = 24$) or a computerized, personalized graphic feedback regarding alcohol risks and suggestions for reduced risk, which was reviewed with their primary care provider ($n = 17$). Although limited by small sample size, moderate-to-large treatment effects for both drinking ($d = .81$) and consequences ($d = .54$) were observed in the intervention group. These findings suggest that use of computer-generated feedback in a health care setting may be a viable option for prevention of alcohol misuse.

Monti et al. (1999) utilized a brief motivational intervention to reduce alcohol use and consequences among 94 adolescents ages 18-19 who were seen in the emergency room following an alcohol-related event. Participants were randomized to receive the intervention or the usual emergency room care. Results at 3-month follow-up indicated participants who received the intervention had significantly lower incidence of drinking and driving, traffic violations, injuries and alcohol-related problems than did patients who received the usual care intervention. However, participants in both conditions reported reductions in consumption.

D'Amico and Fromme (2000) randomly assigned 300 high school students to participate in a Risk Skills Training Group ($n = 73$), including both skills training and personalized motivational feedback; a brief version of the DARE program ($n = 77$); or a no-treatment control group ($n = 150$). Results indicated that, at posttreatment assessment, participants in the Risk Skills Training Group significantly reduced the frequency with which they drank heavily, drove after drinking, rode with an intoxicated driver and used drugs.

Taken together, these studies provide strong support for the efficacy of brief, personalized motivational enhancement techniques, delivered individually or in combination

with risk skills-training information delivered in small groups. In addition, studies of brief motivational enhancement approaches have generally been methodologically superior to earlier studies, including randomization to condition, standardized assessment of outcome, manualized and/or well-described interventions and relatively large sample sizes. Longer-term follow-up of these interventions is warranted.

Mailed feedback. Interestingly, three recent studies (Agostinelli et al., 1995; Walters et al., 1999, 2000) suggest the efficacy of brief motivational enhancement approaches may not depend on the individual or interpersonal component, but might instead be a result of the feedback employed in these approaches.

Agostinelli et al. (1995) randomly assigned 24 heavy-drinking students identified through a mass-testing procedure to either receive mailed graphic feedback or no treatment. Results indicated that, at 6-week follow-up, participants who received the mailed feedback reported reductions in consumption of nearly eight drinks per week as compared with control participants, who remained unchanged.

Similarly, Walters (2000) described two trials (Walters et al., 1999, 2000) of mailed graphic feedback as compared with a group skills plus feedback condition and a no-treatment control group. In each case, mailed graphic feedback was significantly more effective alone than in combination with skills-training information. Participants in the first study ($n = 37$) were moderate- to heavy-drinking students randomized to condition. At 6-week follow-up, feedback participants indicated a reduction of nearly 14 drinks per week as compared with 6 drinks per week among group participants and less than 1 drink in the control group. In the second study (Walters et al., 1999), 34 participants were assigned to feedback only, assessment only or a modified group consisting of values clarification activities with a review of the feedback along with mailed feedback. Results again favored the feedback-only condition (6.6 drinks per week reduction compared with .35 drinks per week in group intervention and 2.75 drinks per week in the control group).

Each of these studies is limited by relatively short-term follow-up and by the potential for selection bias due to the relatively small sample sizes and lack of information about the samples. Despite these limitations, findings regarding the efficacy of direct-mail feedback are encouraging, and larger-scale studies of this approach are warranted. In particular, additional trials of the efficacy of motivational enhancement approaches and personalized graphic feedback alone and in combination may aid in identifying the effective components of these interventions.

Intensive treatment and medication

No treatment studies were identified that met minimum study inclusion criteria, primarily due to a lack of control

or comparison conditions in these studies. Two studies (Bennett et al., 1996; Keller et al., 1994) reported pre- and postoutcome results that compare very favorably with other treatment outcome studies, suggesting incorporation of a residential or intensive outpatient component into on-campus treatment services may be an effective means of maintaining academic connections for students with more serious alcohol-related problems.

One study (Davidson et al., 1996) evaluated the impact of naltrexone as opposed to placebo on latency to drink alcohol and overall amount of alcohol consumed by social-drinking college students in a laboratory setting. Results indicated naltrexone was effective in increasing latency to drink and in reducing overall consumption. This finding suggests that opioid blockers may be a useful adjunct to treatment for college students wishing to moderate consumption.

Intervening with High-Risk Subpopulations

Within the college student population some groups of students have traditionally been viewed as being at increased risk for alcohol-related problems. These include Adult Children of Alcoholics, members of Greek letter organizations (fraternities/sororities), student athletes, freshmen (Canterbury et al., 1992; Dielman, 1990; Klein, 1989; Meilman et al., 1990; Pope et al., 1990) and students referred for conduct violations involving alcohol (mandated students).

Here we summarize the results of preventive interventions that have been evaluated with these special populations. Because each of the efficacious interventions is described in more detail in the preceding sections, only general conclusions and citations for relevant studies are provided here.

Adult Children of Alcoholics

Although descriptive studies abound (Bosworth and Burke, 1994; Havey and Dodd, 1993; Rodney, 1996; Sher and Descutner, 1986; Sher et al., 1991, 2001), only one study identified between 1984 and 1999 specifically evaluated a prevention program for Adult Children of Alcoholics in the college population (Roush and DeBlasie, 1989). This study compared two informational/educational approaches and found no effect of either intervention on behavior. However, Adult Children of Alcoholics appear comparable with those without a parental family history of alcoholism regarding response to interventions utilized with the general college student population. Specifically, Marlatt et al. (1998) found students with a parental family history of alcoholism showed similar response to a brief motivational interview as did their peers without such a family history. In addition, Sammon et al. (1991) and Jack (1989) both indicated a trend toward students with parental family

history responding more positively to their informational/values clarification/risk-reduction interventions than did those students without a parental family history of alcoholism. Although both the Sammon et al. and Jack studies are limited due to nonrandom assignment to condition and small sample size, these results warrant further investigation.

Programs for fraternity/sorority members

Several studies evaluated prevention programs for fraternity/sorority members or included Greek members in the evaluation of programs for general college student populations. Five of these approaches indicated positive effects on behavior of fraternity and/or sorority members. Of these, two incorporated brief motivational feedback (Larimer et al., 2001; Marlatt et al., 1998), two were skills-based (the alcohol monitoring and behavioral skills-training conditions evaluated by Garvin et al. [1990]), and one involved information in conjunction with values clarification and risk-reduction guidelines (Delts Talking About Alcohol; Thompson, 1996). Only Marlatt et al. (1998) utilized a true experimental design with randomization at the level of the individual, and this study is also the only study that included (sufficient) sorority women to assess effects of the intervention on women's drinking. Of note, even after reducing their drinking through participation in these efficacious prevention programs, fraternity members, on the average, continued to drink heavily and remained at substantial (although reduced relative to baseline) risk for negative consequences. Other prevention programs sponsored by the National Inter-fraternity Conference or Panhellenic, including such promising interventions as Our Chapter, Our Choice, have yet to be rigorously evaluated.

Programs for athletes

Several articles describing drinking behavior of athletes or evaluating the effectiveness of training programs for athletic department personnel in the implementation of policies and prevention programs targeting alcohol consumption by college athletes are available in the literature (Grossman and Smiley, 1999). In contrast, only one published prevention outcome study with college student athletes meeting minimum inclusion criteria was identified in this review (Marcello et al., 1989). This study failed to find an effect of a multicomponent skills-training intervention with student athletes. Clearly, additional outcome research with this population is needed.

Freshmen

Several outcome studies identified in this review focused exclusively or primarily on freshmen students (Larimer et

al., 2001; Marlatt et al., 1998; Miller, 1999; Schroeder and Prentice, 1998). In general, brief motivational enhancement approaches, skills-training approaches (including self-assessment of alcohol use) and peer-based normative re-education approaches have all been shown to be successful at reducing alcohol use and/or negative consequences among freshmen. Although freshmen represent a segment of the college population at increased risk for heavy drinking and alcohol-related negative consequences (Pope et al., 1990), these studies suggest that they are nonetheless quite responsive to alcohol prevention programs that are non-judgmental, include a normative reeducation component and emphasize skills and personal responsibility for change.

Mandated students

Finally, only one study identified in this review specifically evaluated a prevention program for judicially mandated college students. Flynn and Brown (1991) failed to find an effect of the Alcohol Information School curriculum with this population. This lack of research on mandated students is particularly problematic given that some students may violate campus conduct policies in isolated instances (being in the wrong place at the wrong time), whereas other students may be exhibiting a more chronic pattern of heavy drinking coupled with policy violations. Clearly, evaluating the effectiveness of prevention programs provided to mandated students is both an urgent research priority and an ethical necessity.

Identification, Referral and Recruitment Strategies

In contrast to the state of the field when Moskowitz (1989) published his discouraging review, there is now a growing body of evidence that several types of prevention approaches "work"; that is, students who (voluntarily) participate in these interventions show reductions in alcohol use and/or consequences. This literature also indicates some types of interventions are associated with larger reductions in use or consequences than are others (Maddock, 1999).

Despite the advances made in developing and testing efficacious prevention approaches, another difficulty is often present in the college setting, which limits the utility of individually focused prevention efforts. Specifically, many students do not participate in these programs, and those students who most need them appear to be least likely to utilize them (Black and Coster, 1996). For example, Black and Coster (1996) found 46.2% of male drinkers and 39.6% of female drinkers had no interest in participating in even a minimal intervention involving informational brochures and flyers. In this section, we review some suggestions (with support from the literature) for increasing identification, recruitment and retention of students into individually focused prevention/treatment programs.

Marketing and outreach efforts

One consideration in solving the problem of low attendance at alcohol prevention services is to remember that students are *consumers* of these services. Attending to the lessons learned in the advertising and marketing fields is therefore an important step in designing and providing alcohol prevention services. In particular, social marketing techniques have been utilized recently to promote increased accuracy of normative perceptions and decreased alcohol consumption on college campuses (Berkowitz, 1997; Haines, 1996; Haines and Spear, 1996). Research suggests social marketing techniques might also increase recruitment into campus alcohol prevention services (Black and Coster, 1996; Black and Smith, 1994; Gries et al., 1995).

Gries et al. (1995) conducted focus groups and interviews with residence hall students to develop and revise marketing and recruitment materials for a 1-hour alcohol education program. Results indicated significantly more students attended the program in the intervention hall ($n = 17$) than in the control hall ($n = 0$) or the combined average of the three historical halls ($n = 5$). Although even the rates of attendance in the intervention hall are low (i.e., more than 700 residents were eligible to attend), more than half of those students who attended were moderate to heavy drinkers. Black and Smith (1994) conducted survey research using Social Marketing Theory to evaluate factors that might increase recruitment into alcohol prevention or education programs. In both studies, students reported that convenience of the program (location, timing and time commitment required), an emphasis on what students could gain by participating (e.g., helping a friend, learning new information about alcohol) and by reducing consumption and the use of incentives for participation (e.g., a refund of student fees, university credit for attendance, food, prizes) were ranked as important factors for attendance. In addition, Black and Smith found students were more likely to attend if their friends could participate at the same time and that participants judged physicians and parents to be the most influential sources for communicating risk-reduction messages.

Incorporating treatment outreach services or program reminder contacts may also be effective in increasing recruitment of heavier drinkers or those in need of treatment (Black and Smith, 1994; Gottheil et al., 1997). Black and Smith (1994) found heavy drinkers, compared with the general population, rated reminder contacts as a more important strategy for increasing attendance at programs. Similarly, Gottheil et al. (1997) found that calling adult individuals who missed their first scheduled outpatient substance abuse treatment appointment resulted in increased treatment entry. In addition, participants recruited through these outreach efforts subsequently participated in and benefited from the treatment program as much as did those participants who had not missed their first appointment.

Use of standardized screening instruments

Routine screening of college students for alcohol misuse or problems may be another mechanism for increasing identification and referral of students to services. Identifying students at risk for alcohol-related problems early in their college career, and offering brief intervention to reduce these risks, has been shown to be an effective indicated prevention strategy (Marlatt et al., 1998). Incorporating brief alcohol screening measures into other standard contacts with undergraduates may minimize reactivity to these questions and increase participation rates compared with advertising voluntary "alcohol screening," which students may view as pejorative. Despite these potential advantages to routine screening, there are both practical and ethical considerations in implementing this strategy that would need to be addressed. These include choosing appropriate screening instruments, cost and use of the information once collected. Although choice of instruments is reviewed here, it is important for campuses considering routine screening to consider who will collect the information, what safeguards there are to protect confidentiality of students, what procedures are in place for referring students for services once a need is identified and who (besides the referral source) will have access to the information once it is collected.

Regarding choice of screening instruments, there are a variety of screening and assessment tools available for evaluating and diagnosing alcohol-related problems. Unfortunately, many of these, such as the CAGE (Heck, 1991; Heck and Williams, 1995; Nyström et al., 1993; O'Hare and Tran, 1997; Smith et al., 1987; Werner and Greene, 1992; Werner et al., 1996) and the Michigan Alcoholism Screening Test (Martin et al., 1990; Nyström et al., 1993; Otto and Hall, 1988; Silber et al., 1985; Smith et al., 1987; Svikis et al., 1991), were developed using adult conceptualizations of alcohol-related problems, with a particular emphasis on the disease model of alcoholism and identification of chronic alcohol dependence. These instruments are limited by the fact that they may not be adequately sensitive to accurately identify individuals suffering from short-term problems. They also may not be adequately specific to separate those with short-term problems resulting from heavy episodic drinking from those with more serious alcohol-related problems. Some health centers or other referral sources on campus may choose to utilize these common adult screening measures despite limitations, as their brevity and familiarity make them easy to use. In this case, it is important for those using the measures to complete more detailed assessment following screening to better evaluate and meet the needs of the individual student. In addition, diagnosis of alcohol dependence on the basis of these assessments is *not* warranted.

An additional complication of screening and assessment with college students is the fact that alcohol diagnoses, in-

cluding the diagnosis of alcohol dependence, tend to be relatively unstable during the adolescent and young adult years (Grant, 1997). Only about 30% of students with an alcohol misuse or dependence diagnosis in college will continue to meet criteria into the later adult years (Fillmore and Midanik, 1984; Grant, 1997; Kilbey et al., 1998; Temple and Fillmore, 1985). Therefore, utilizing screening or diagnostic assessments in college to predict later adult adjustment or problems is a difficult endeavor, and one best avoided.

In contrast to adult measures, there are several assessments of alcohol use and alcohol-related negative consequences that have been developed specifically for college student populations. These include the Rutgers Alcohol Problem Index (White and Labouvie, 1989), the Young Adult Alcohol Problem Severity Test (Hurlbut and Sher, 1992) and the College Alcohol Problem Scale (O'Hare, 1997). Each of these is weighted toward identifying consequences common to the adolescent or young adult experience, thus increasing sensitivity to detect problems. The measures vary regarding specificity, but each provides considerable information regarding different types of negative consequences, which is valuable for prevention or treatment planning purposes. Assessment of quantity, frequency and pattern of use is also important for adequate prevention or treatment planning.

Health center and emergency room screening

One potential method for increasing participation in prevention and treatment services on campus while minimizing cost and increasing protections for individual students may be to incorporate screening for and, in some cases, the intervention itself into standard practice at campus health centers and emergency rooms. Two outcome studies identified in this review (Dimeff, 1997; Monti et al., 1999) incorporated brief motivational enhancement procedures, including assessment, into these health care settings. In both cases, motivational interviews delivered in a health care setting resulted in decreases in consumption and problems for college-age participants. In the Dimeff (1997) study, both assessment and feedback were generated using an interactive computer program available in the clinic waiting room, suggesting students with little to do while they wait might access and complete the intervention on their own with little staff involvement. Similarly, several computerized versions of alcohol screening measures have been developed for the college student population (Anderson, 1987; Miller, 1999; Rathbun, 1993). Incorporating routine screening of alcohol consumption and problems into standard health care practices in college clinics and either training medical/nursing/support staff to deliver motivational feedback or providing for computer-generated feedback without staff intervention may serve to increase participation in these programs.

Brief interventions to increase service entry and retention

In addition to utilizing brief motivational interventions for risk reduction, these approaches might be effective in increasing motivation for and retention in longer-term prevention or intervention programs. Aubrey (1998) found motivational feedback improved outcome for adolescents presenting for outpatient treatment. It is possible that mailed motivational feedback, such as that evaluated by Agostinelli et al. (1995), may have similar effects on recruitment and retention in more intensive services, but this has yet to be evaluated. Evaluating low-cost mailed or large-group brief interventions as universal prevention approaches designed both to reduce risky behavior and to increase participation in additional services may be a viable strategy.

Peer training for identification, referral and provision of services

The use of peers to deliver prevention services, as well as to assist with identification and referral of students in need of services, has a long history in the college student setting (Caron, 1993; D'Andrea and Salovey, 1998; Ender and Winston, 1984; Grossberg et al., 1993; Hatcher, 1995; Sloane and Zimmer, 1993). However, few studies have systematically evaluated the effectiveness of peers as either providers of service or as referral sources.

In the current review, nine of the individually oriented prevention approaches reviewed in the first section were delivered by peer providers (Barnett et al., 1996; Larimer et al., 2001; Miller, 1999; Schall et al., 1991; Schroeder and Prentice, 1998). Of these, only four demonstrated efficacy in reducing consumption or reducing consequences, including a normative reeducation approach (Schroeder and Prentice, 1998), a motivational feedback approach (Larimer et al., 2001) and two skills-based approaches (Miller, 1999). Although these results have led some to conclude that peers are not effective in delivering prevention services, in fact peers have *not* typically been systematically compared with professional providers. Therefore, lack of efficacy of the approaches evaluated cannot be clearly determined to be the result of the program, the peer providers or some combination of both. In one study that included random assignment of peer or professional providers (Larimer et al., 2001), preliminary data suggest peers are at least as effective at promoting change in drinking behavior among fraternity pledges using a brief motivational intervention as professional-level staff. However, more research is needed to evaluate carefully the efficacy and cost effectiveness of peer-delivered as compared with professionally delivered services.

Several programs also exist to train peers in identifying and intervening with their peers to promote less risky behavior as well as to increase utilization of available alcohol

prevention services. One area where data support this as a useful intervention strategy involves studies of naturalistic interventions in potential drunk driving incidents. Several survey research projects have indicated that, when there is intervention to stop an intoxicated individual from driving, peers are most often the ones to intervene, and the majority of these interventions are successful (Hernandez and Rabow, 1987; Newcomb et al., 1997).

Police/judicial referrals

The use of campus police and campus judicial officers to increase referrals to and completion of substance abuse prevention or treatment services is becoming a common practice (Stone and Lucas, 1994). There is growing evidence that students who violate campus alcohol or conduct policies are on average at increased risk for heavy drinking and related negative consequences (Flynn and Brown, 1991; O'Hare, 1997). These findings suggest that campus police and judicial officers may be valuable referral sources and should be knowledgeable about campus services to facilitate referral. Referral of policy violators to alcohol education, prevention or treatment services instead of or in addition to other legal sanctions is viewed as one means of reducing recidivism and promoting individual behavior change. Unfortunately, as described above, there are sparse data available regarding the effectiveness of this strategy on the college campus, either in terms of entry/retention of mandated students into services or the outcome of such services when provided. Research in the area of drunk driving in the general population suggests "diversion" programs are less effective when they are used in place of other sanctions (Hingson, 1996; Wells-Parker et al., 1995), but can be effective in combination with other swift and certain consequences of drunk driving (like license revocation or vehicle impoundment). In addition, the strength of the mandate (i.e., the consequences for failure to complete the program) is an important determinant of actual entry and retention in mandated services. Considerably more research is needed to evaluate whether, for whom and under what circumstances referral to prevention or treatment programs as a sanction strategy is effective on college campuses.

Conclusion and Summary of Research Priorities

This review of the literature covered individually focused prevention and treatment strategies evaluated between 1984 and 1999. Conclusions regarding efficacy of existing prevention and treatment programs are similar to those of previous reviews, in that little evidence exists for the utility of educational or awareness programs, including informational-based and values clarification approaches. One exception to this may be the Prime for Life program (formerly called On Campus Talking About Alcohol) (Sammon

et al., 1991; Thompson, 1996), which has some evidence of efficacy. The Prime for Life program includes risk-reduction guidelines based on personal risk factors in addition to general information, which may contribute to increased efficacy. However, evaluations of this program available to date have been limited due to nonrandom assignment of participants and/or lack of a comparison group. Peer-based normative reeducation programs also show some support, but have similarly not been adequately tested. Therefore, randomized trials of these interventions with sufficient methodological rigor and adequate sample size to detect differences would be of value. To evaluate relative efficacy and cost effectiveness, these approaches should be evaluated in comparison to existing efficacious brief interventions.

Skills-based interventions have consistently yielded greater support for their efficacy than have informational interventions. Recently, several minimal skills-based interventions have been shown to result in decreases in alcohol consumption, including both self-monitoring/self-assessment of alcohol consumption as well as expectancy-challenge procedures involving alcohol/placebo administration. In addition, brief motivational feedback interviews have been demonstrated to be efficacious in a variety of contexts, including emergency rooms, outpatient counseling centers, fraternity organizations, high school classrooms and with randomly selected high-risk college freshman. Finally, mailed graphic feedback has been shown in three studies to result in decreases in alcohol consumption equivalent to or superior to skills-based groups combined with feedback. Several research priorities emerge from reviews of these studies. First, additional research is needed evaluating the role of self-assessment in drinking reductions and methods for facilitating this effect. Second, further research evaluating the conditions under which expectancy challenge procedures are effective is needed, particularly studies designed to disentangle the informational and experiential components of expectancy challenge procedures. Inclusion of longer-term follow-up is also needed. Similarly, additional studies that disentangle the effects of graphic feedback alone from skills training alone and in combination with feedback are needed. In general, replication of each of these techniques in larger-scale studies by investigators not involved in the development of the techniques is warranted. In particular, larger samples allowing for evaluation of gender, ethnicity, residence-type, athlete status and family history effects on response to these interventions would yield valuable information.

Studies evaluating on-campus treatment programs are also lacking in the literature, as are studies evaluating the effects of any of these interventions with students mandated to comply. Given the ethical concerns inherent in mandated treatment, evaluation of services for mandated students is an urgent priority.

In addition to effectiveness or efficacy trials of interventions already available on campus, this review suggests the field could benefit from additional research regarding service delivery systems, including the most effective means for screening, identifying, recruiting, referring and retaining students in alcohol prevention services. Systematic evaluation of marketing and recruitment techniques, as well as training for police, faculty, staff and medical/mental health personnel, is needed.

The evidence from this review suggests campus personnel searching for effective individually oriented practices to implement on their campus right now would be best served by implementing brief, motivational or skills-based interventions, targeting high-risk students identified either through brief screening in health care or other campus settings (indicated prevention) or through membership in an identified risk group. Careful attention to the marketing of these services and the provision of incentives for participation is also recommended. Focus groups with students on each campus to develop materials and marketing strategies may help maximize recruitment and retention of students. Partnering with psychology, sociology, public policy, public health, education or social work departments or institutional research offices on campus to obtain technical assistance in conducting and evaluating these efforts may be one viable strategy for accomplishing these aims. Finally, understanding that individually oriented prevention and treatment services are only one piece of the puzzle is important. Fostering a campus climate supportive of prevention efforts through collaborations with policy-makers, judicial and disciplinary officers, law enforcement personnel, student affairs staff, health care staff and other stakeholders, to best support prevention efforts, is necessary.

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Social Norms and the Prevention of Alcohol Misuse in Collegiate Contexts

H. WESLEY PERKINS, PH.D.[†]

Department of Anthropology and Sociology, Hobart and William Smith Colleges, Geneva, New York 14456

ABSTRACT. *Objective:* This article provides a review of conceptual and empirical studies on the role of social norms in college student alcohol use and in prevention strategies to counter misuse. The normative influences of various constituencies serving as reference groups for students are examined as possible factors influencing students' drinking behavior. *Method:* A review of English language studies was conducted. *Results:* Parental norms have only modest impact on students once they enter college beyond the residual effects of previously instilled drinking attitudes and religious traditions. Faculty could theoretically provide a positive influence on student drinking behavior, but there is little evidence in the literature that faculty norms and expectations about avoiding alcohol misuse are effectively communicated to students. Although the norms of resident advisers (RAs) should ideally provide a restraint on student alcohol misuse, the positive influence of RAs is lim-

ited by their negotiated compromises with students whom they oversee and by their misperceptions of student norms. Research reveals student peer norms to be the strongest influence on students' personal drinking behavior, with the more socially integrated students typically drinking most heavily. The widespread prevalence among students of dramatic misperceptions of peer norms regarding drinking attitudes and behaviors is also a consistent finding. Permissiveness and problem behaviors among peers are overestimated, even in environments where problem drinking rates are relatively high in actuality. These misperceived norms, in turn, have a significant negative effect promoting and exacerbating problem drinking. *Conclusions:* Interventions to reduce these misperceptions have revealed a substantial positive effect in several pilot studies and campus experiments. (*J. Stud. Alcohol*, Supplement No. 14: 164-172, 2002)

NORMS ARE fundamental to understanding social order as well as variation in human behavior (Campbell, 1964; Durkheim, 1951). Group norms reflected in the dominant or most typical attitudes, expectations and behaviors not only characterize these groups but also regulate group members' actions to perpetuate the collective norm. Indeed, norms can be powerful agents of control as "choices" of behavior are framed by these norms and as the course of behavior most commonly taken is typically in accordance with normative directives of "reference groups" that are most important to the individual. Although many persons think of themselves as individuals, the strong tendency of people to conform to group patterns and expectations is consistently documented in laboratory experiments, social surveys and participant observation of cultural contexts. Social psychologists have long argued that people tend to adopt group attitudes and act in accordance with group expectations and behaviors based on affiliation needs and social comparison processes (Festinger, 1954), social pressures toward group conformity (Asch, 1951, 1952) and the formation and acquisition of reference group norms (Newcomb, 1943; Newcomb and Wilson, 1966; Sherif, 1936, 1972). Thus one can think of a group norm in this sense as the cause of much belief and action in addition to a descriptive characterization of the status quo, as a power-

ful independent variable accounting for or determining individual behavior.

Studies of norms influencing drinking among adolescents have produced a large research literature documenting the influence of social group norms (e.g., those of family, friends, schools, neighborhoods and religious/ethnic groups). Although not as prevalent as studies of normative influence among adolescents in general, studies among college students in late adolescence and young adulthood have also produced a sizable literature on norms. Such studies date back to the 1950s with Gusfield's (1961) research on drinking among college men in a 1955 sample where parental norms, religious traditions and fraternity affiliation were all found to be important normative influences. Classic comprehensive studies of drinking in college (Maddox, 1970; Straus and Bacon, 1953), likewise, reflected these concerns.

This article first provides an updated review of theoretical and empirical studies on college student adherence to social norms about alcohol use. It draws most evidence from empirical studies conducted within the last two decades. The second purpose of this article is to recast the discussion about norms as a determinant of student drinking into a prevention framework by considering how and to what extent certain norms can potentially function or be more effectively invoked to reduce alcohol misuse in college contexts.

It is important that two different but related types of norms are both considered. One type, attitudinal norms,

[†]The author may be reached at the above address or via email at: perkins@hws.edu.

refers to widely shared beliefs or expectations in a social group about how people in general or members of the group ought to behave in various circumstances. This notion focuses on what the majority of group members typically think is morally correct or conventionally acceptable behavior. The other type, behavioral norms, refers to the most common actions actually exhibited in a social group, be it the modal category or statistical average representing what is most typical behavior of group members. Both types of norms are relevant for the prevention field in higher education in that both can be independent variables having an impact on the individual. How most other community members believe everyone should behave and what behavior is most common may be correlated, of course, but each component may also be somewhat distinct and play a part in prevention initiatives.

Reference Group Normative Influences on Students

Several constituencies have relationships and sufficient contact with college students so that they may act as reference groups establishing and communicating norms. The extent and results of research vary considerably, however, with regard to impact of these normative groups.

Parents

Parents may serve as one reference group for students making the transition to adulthood as they enter college and begin to take on adult roles. Certainly parents can, and sometimes do, communicate their expectations for their sons and daughters going off to college. These moral/behavioral guidelines may range from expected abstinence to expectations of consumption facilitated by parents playing the role of alcohol suppliers to underage students. Parental norms may be communicated directly in discussions with offspring or assimilated through observation of parents' styles or levels of drinking behavior.

Studies of the power (or lack thereof) of parental norms on student drinking in college are limited. Research to date, however, has demonstrated relatively little direct impact of parental values and behavior on college students. There is some evidence of a connection between problematic drinking behavior of students and problematic parental drinking (see Bradley et al., 1992; Karwacki and Bradley, 1996; Perkins and Berkowitz, 1991). This may be viewed to some degree as the impact of family norms or collective parental values and expectations, but in the cases of children of alcoholics (which can represent about one-fifth of students on most campuses), it is also likely to reflect a combination of biological influence and modeled behavior from an individual alcoholic parent (Sher, 1991). Most research on parental influence in general, however, typically shows a declining impact of parents as youth grow older and as

peers become more important determinants of their behavior. Indeed, as demonstrated in research on high school students (Beck and Treiman, 1996), only a relatively small normative influence of parents has been noted in years immediately preceding college. Thus, by the time most students go to college, parents' ability to directly influence students' drinking style may have waned considerably, especially if students have moved out to attend a residential college.

Even with reduced contact, however, parental norms may remain as a residual influence on students' drinking through internalized parental attitudes and modeled behavior. In a nationwide survey of college students (Wechsler et al., 1995), whether or not a parent was an abstainer and if the family approved or disapproved of alcohol use each had a modest impact on reducing the chances of the student being a high-risk drinker. Family view of alcohol was dropped out of the final equation for most efficient predictors in this study, however, leaving only parents' abstention as a contributing factor. In a survey of first-year students in a southern university, Lo (1995) found a modest effect of parental norms, which was stronger for female than male students. Parents' normative influence on drinking may be primarily exerted through the effect of religious beliefs and traditions passed down from parents to the offspring that influence drinking (Perkins, 1985, 1987). Among students attending a northeastern college, Perkins (1985) found very little influence of parental attitudes on student drinking once the student's religious tradition and strength of religious commitment were controlled.

Faculty

Most discussion and research on faculty contributions to misuse of alcohol have come under the rubric of "curriculum infusion" and have largely concentrated on educational strategies that impart pharmacological and risk knowledge to students. Evaluation studies of this approach suggest that the strategy, while making students more knowledgeable about characteristics of alcohol, rarely produces any notable benefit in terms of reductions in problem drinking (Duitsman and Cychoz, 1997; Robinson et al., 1993b). Furthermore, voluntary education offered specifically on risks and dangers of drinking, whether delivered by faculty or health/peer counseling staff, is likely to reach only the least problematic students due to self-selection into these programs (Scott et al., 1997). Nevertheless, in their roles as teachers and mentors, faculty are presumed to be an important reference group for students. Very little scientific research has been conducted to examine faculty impact on student alcohol use in this capacity, but there is a good deal of speculation about the positive or negative influence of faculty norms in terms of course instruction, role model behavior and personal values communicated to students.

Research has demonstrated not only large differences between faculty and student consumption patterns, but also differences in what is thought to be indicative of problem drinking where faculty are more conservative in their judgments about consumption levels, frequency of intoxication and inappropriate drinking times, even after controlling for the differences in personal consumption levels (Leavy and Dunlosky, 1989). Indeed, many faculty view student alcohol misuse as a significant problem, are quite interested in the welfare of their students and are concerned about the impact of drinking on academic work; yet relatively few are actively involved in prevention efforts or speaking out on campus (Ryan and DeJong, 1998). Thus faculty teaching an expanded array of topics and issues about drinking across the curriculum (Gonzalez, 1988) and incorporating discussions of both student and faculty values, attitudes and behaviors in this type of broader curriculum infusion may be key to effectiveness as faculty norms are given greater visibility. This type of curriculum infusion might be promoted in first-year general education, sociology, psychology, ethics, philosophy and gender-related courses, for example. In addition to achieving a more comprehensive exposure to issues of alcohol use, this kind of teaching might help make students more aware of faculty norms (and vice versa) as an additional normative influence on students.

Faculty norms concerning academic class expectations in general may be an important component of prevention, if collectively acknowledged and practiced in teaching. Maintaining deadlines and standards and giving concrete and immediate feedback to students about academic performance will help reveal (and possibly curtail) emerging drinking problems among specific students more quickly as these problems often take a toll on academic work (Perkins, this supplement; Ryan and DeJong, 1998). Faculty may also be important normative agents if willing to compassionately confront and refer students who are perceived to have a drinking problem (Margolis, 1992). Although one study suggests that faculty are more likely to take action to assist or confront a student than to do so with a colleague, they are still hesitant or ambivalent in many cases about intervening individually (Scott and Stevens, 1998). Thus the contribution of faculty in deterring student alcohol misuse might be strengthened if they *collectively* encourage each other to intervene, making the practice a community standard. Faculty initiatives as well as research data to assess this approach are woefully lacking, however.

Resident advisers

In colleges and universities with residential living facilities, the residential advisers (RAs) are another potential reference group providing normative standards for students.

Indeed, for beginning first-year students, these older undergraduates or graduate students are often the first students representing both institutional and student culture that are encountered. Thus RAs may be watched and listened to closely and may be very important in communicating norms through their initial verbal contacts and personal behavior when interacting with new students. What little research there is on RA norms suggests they are quite similar to average student characteristics with regard to alcohol use (Andrews, 1987; Berkowitz and Perkins, 1986), although variation among RAs as individuals may tend to be less extreme and thus more representative of relative moderation (Berkowitz and Perkins, 1986).

Dealing with student alcohol misuse is among the most frequent issues RAs note they must face, a consistent finding over decades (Schuh et al., 1988). Over the course of the academic year, RAs may compromise to some degree with the normative standards of their student residents as they come to informal mutual agreements about how, when and to what degree rules will be enforced. They may even teach residents how to break drinking rules by talking to them about using discretion and showing them how to break these rules under circumstances of social control. Based on interview research with RAs, Rubington (1990) concluded that they promoted a norm in their words and actions that had less to do with moderating or limiting amounts of alcohol than with residents drinking behind closed doors, minding their own business and keeping their noise levels down, so that they would not disturb their neighbors and force the RA to act as an official rule enforcer.

Peer norms

Most research in general has found that by late adolescence peers are typically the strongest influence on personal behavior, especially with regard to alcohol and substance use (Kandel, 1980, 1985), and traditional-age college students appear to be no exception in this regard. For example, Lo's (1995) study of first-year students at a southern university found that peer norms were stronger predictors of level of intoxication than were parental norms, with peer influence being greatest for men. Likewise, Perkins' (1985) study of a cross-section of undergraduates at a north-eastern college found peer influences (perceived friends' drinking norm and fraternity membership) to be much stronger predictors of alcohol consumption than other background factors including religion, gender and parents' attitudes. The strength of peer influence may be key to understanding findings where students will exhibit drinking behaviors on occasion that they oppose in terms of their personal attitudes (Robinson et al., 1993a). Furthermore, peer norms may be of particular importance in "peer-intensive" college contexts, for example, undergraduate and residential institutions where students lack frequent contact with parents,

siblings and other reference groups such as religious communities and full-time employment.

Given the relative strength of peer influence and assuming that students' drinking norms are more permissive than the norms of other constituencies that may influence an individual student's behavior in most colleges, then findings showing the more socially integrated students as heavier drinkers make sense. For example, in a nationwide college survey (Wechsler et al., 1995), measures reflecting intensive peer exposure—having five or more close student friends, socializing with friends more than 2 hours per day and living in a fraternity or sorority—predicted significantly higher levels of heavy drinking after controlling for demographic factors and other student activities. In another study of college students nationwide (Leichliter et al., 1998), athletes consumed significantly more alcohol and experienced more drinking problems than nonathletes. Leaders among these athletes were not more responsible with regard to drinking. In fact, male athletic leaders consumed more alcohol and suffered more consequences than did the other male team members. In research on undergraduates at one state university, Orcutt (1991) found that although students who were generally light drinkers did not increase their drinking in the presence of close friends, students disposed to drink heavily did so among friends. The latter type of student may have viewed the presence of peers, presumably perceived to be of like mind, as encouragement or normative support for them to act on their drinking preferences. Martin and Hoffman (1993), studying undergraduates at an eastern university, found that peer influence in terms of the number of college and noncollege friends who drank was a significant predictor of personal consumption even after controlling for the individual's living environment and positive expectancies associated with alcohol use.

Misperceptions of Peer Norms

Although peer norms, which are typically more permissive than other group norms, appear quite influential, research has also clearly documented pervasive differences between what students believe to be their peer norms and what are the actual norms. This finding applies to both types of norms (commonly held attitudes about correct behavior and the most commonly exhibited behaviors concerning alcohol use). Most students tend to think that their peers are, on average, more permissive in personal drinking attitudes than is the case, and likewise that peers consume more frequently and more heavily, on average, than is really the norm. In an initial study identifying and examining this phenomenon in one undergraduate college population, Perkins and Berkowitz (1986) found that more than three-quarters of students believed that one should never drink to intoxication or that intoxication was acceptable only in limited circumstances. Yet almost two-thirds of these

same students thought their peers believed that frequent intoxication or intoxication that did interfere with academics and other responsibilities was acceptable. This gross misperception of peer attitudes was not simply the result of a particular historical situation momentarily distorting students' perceptions. Surveys conducted over several years consistently demonstrated misperceptions of similar magnitude (Berkowitz and Perkins, 1986; Perkins, 1994).

Subsequent research on this phenomenon identified misperceptions of peer norms at other schools as well. For example, students at a New England state university (Burrell, 1990) described their friends as heavier drinkers than themselves. Among students attending a large western university (Baer and Carney, 1993; Baer et al., 1991), misperceptions of peer drinking norms were found to persist across gender and housing types. Prentice and Miller (1993) found misperceptions of peers' attitudinal norms about drinking among students at an Ivy League university. In research that included faculty and staff as well as students on two southwestern university campuses, heavy drinking and drunk driving in the university population as a whole was substantially overestimated compared with actual rates at both schools (Agostinelli and Miller, 1994). Among students attending a university in the Northwest, Page et al. (1999) found that both males and females overestimated the extent of heavy episodic drinking among their peers of the same and opposite gender.

In research conducted on nationwide data from institutions that have participated in the Core Institute Survey on Alcohol and Drugs (Perkins et al., 1999), it was found that at every one of the 100 colleges and universities in the study, most students perceived much more frequent use of alcohol among their peers than actually occurred at their school. This pattern was the result at each particular institution, regardless of the actual norm for the frequency of use. Thus exaggerated misperceptions of alcohol norms are commonly entrenched at schools across the country, in private and public schools of every size and in every region. These patterns of exaggerated perceptions have been found to appear consistently for all other types of drugs too in substance use research (Perkins, 1994; Perkins et al., 1999). Misperceived norms also exist across subpopulations categorized by gender, ethnic group, residential circumstances and Greek affiliation (see Baer and Carney, 1993; Baer et al., 1991; Borsari and Carey, 1999). They may have different levels of actual use but the misperceptions are widely held across most subpopulations in college. Furthermore, these misperceived norms are not unique to college populations; they can also be found in high school contexts (Beck and Treiman, 1996) and in statewide populations of young adults (Linkenbach, 1999).

Theoretical explanation of the causes of these misperceptions (Perkins, 1997) points to phenomena operating at the psychological, social and cultural levels. At a cognitive

level, psychologists have demonstrated that humans are prone to error in overly attributing actions of other people to their dispositions rather than to environmental contexts in which the behaviors occur because the observers lack the information to make accurate attributions about the cause of other people's behavior. Thus, when students observe a peer in an intoxicated state, they tend to attribute the drunken state to that student's typical lifestyle or disposition in order to account for it if the behavior cannot be contextualized as an unfortunate and atypical occurrence. Without the information needed to contextualize occasional problem drinking behavior by other students, this behavior becomes perceived as more common or typical of them than is actually the case as the observer's mind continually attempts to account for peer behavior. Added to this phenomenon is the fact that public intoxicated behavior is often quite vivid as observed by others in social situations. When a student does get drunk, it may be quite entertaining as he or she acts out in a comical way. It may be sad or disgusting when a student gets sick or vomits in front of other students or passes out in a public setting. It may be frightening if a student belligerently attacks others in an intoxicated state. Yet no matter whether the affective experience is positive or negative for the observer, these occurrences involving student drinking are easily remembered and frequently talked about in subsequent social conversations with peers. Students, like most people, do not undertake an assessment to get an accurate accounting of all behavior in social situations. They simply retain what is most memorable and give it disproportionate weight in subsequent estimates of what is typical and in social conversations, which further exaggerate the perceived drinking norm among students. Lastly, at the cultural level, the popular entertainment media contribute heavily to the production and reinforcement of misperceptions through films, television shows and advertisements that disproportionately and unrealistically emphasize heavy drinking as part of youth culture.

Once established in the minds of most students, these exaggerated perceptions of student drinking norms are likely to have substantial consequences on personal use as students wish to or feel pressured to conform to erroneously perceived expectations of peers (Perkins, 1997). Several studies on college students at large and small schools in various regions support this claim by showing that perceived social norms are significantly correlated with students' personal drinking behavior (Clapp and McDonnell, 2000; Nagoshi, 1999; Page et al., 1999; Perkins and Berkowitz, 1986; Perkins and Wechsler, 1996; Wood et al., 1992). It is a sociological dictum that if situations are perceived as real, they are real in their consequences; perceptions of reality can ultimately produce behaviors leading to a "self-fulfilling prophecy" (Merton, 1957). Alcohol use and misuse may actually increase as students behave,

at least in part, in accordance with their misperceptions of peer expectations regarding drinking, thus producing at least a partially self-fulfilling prophecy. That is, actual drinking norms are pulled higher by these misperceptions than would otherwise be the case, which, in turn, helps to extend the exaggerated perceptions even more in a vicious cycle. The process is limited only by the fact that a large number of students enter and leave the college community each year.

Furthermore, misperceptions of the norm discourage the more responsible students from publicly expressing opposition to heavy drinking and from intervening in potential situations of peer alcohol misuse (Perkins, 1997). Prentice and Miller (1993) demonstrated that when students with moderate or more conservative attitudes about alcohol use mistakenly believed their position was quite discrepant from the norm, they felt more alienated from the university and student peers. What appears then to be a lack of opposition to heavy drinking further extends and reinforces the misperceived peer norm about what is acceptable behavior.

Thus students with the most permissive personal attitudes and who exhibit the most extreme drinking behavior are bolstered by the misperceptions they (and others) hold and articulate, which make them believe they are in a comfortable, albeit fictitious, majority. In contrast, students who are at the highest risk in terms of their own permissive attitudes and yet happen to have a more moderate (i.e., more realistic) perception of their peers' norm for alcohol use are in a more cognitively dissonant circumstance, which makes it more difficult for them to act on their attitudes and drink heavily (Perkins and Berkowitz, 1986). Perkins and Wechsler's (1996) research based on nationwide data from 17,592 students attending 140 institutions found that, even after controlling for the actual norm on the student's campus and his or her personal attitude, differing personal perceptions of the local campus drinking culture as more or less permissive had a significant impact on students' own use and drinking problems. Moreover, the effect of these perceptions was strongest in accentuating or constraining alcohol misuse by those students with the most permissive personal attitudes. This study, furthermore, demonstrated a stronger influence of perceived norms in comparison with sociodemographic and contextual variables that are often found to correlate with alcohol misuse such as gender, race, fraternity/sorority membership and type of campus housing.

Some groups such as fraternities and sororities may actually have a stake in maintaining a normative perception among students of high alcohol use as it may also connect to other perceived norms and beliefs about social group popularity (Larimer et al., 1997). RAs, although typically moderate or responsible in their own drinking behavior, have been found to hold misperceptions of student norms that were distorted as much in an exaggerated direction as those of student peers (Berkowitz and Perkins, 1986). Thus

RAs as “carriers” of these misperceived peer norms may have a negative impact on new students as the RAs pass along in conversation the common notions about student drinking, thereby inadvertently encouraging moderate students to drink more and giving erroneous normative license to students with the most permissive personal dispositions about drinking. Likewise, faculty and staff who are also “carriers” of the misperception may inadvertently add to the problem by reinforcing students’ notions that most students drink much more heavily than is the case as they communicate this misperception in casual conversation or in traditional prevention programs on campus.

Norms Research Implications for Prevention Programs

Reducing student misperceptions of peer norms

Given the pervasiveness of exaggerated perceptions of peer drinking norms and the research suggesting that these misperceptions facilitate alcohol misuse, some prevention researchers and program specialists have introduced a variety of interventions to reduce these misperceptions. The strategy of communicating actual student norms to dispel myths, increasingly referred to as the “social norms approach,” has begun to receive significant attention for its simplicity, cost efficiency and effect (Berkowitz, 1997; Haines, 1996; Johannessen et al., 1999; Perkins, 1997). The basic idea is simply to communicate the truth about peer norms in terms of what the majority of students actually think and do concerning alcohol consumption. Thus the message to students is a positive one—that the norm is one of safety, responsibility and moderation because that is what the majority of students think and do in most student populations. In some instances, the actual norms in terms of average consumption levels or the predominant attitude about drinking on a campus or within a particular student constituency may be far from ideal, but the actual norms are substantially less problematic than what students believe the norms to be. Therefore, communicating the truth about student norms becomes a constraining intervention on problem drinking no matter what the actual norms are. As students begin to adhere to more accurately perceived norms that are relatively moderate, the actual norms become even more moderate as the process of misperception leading to misuse is reversed.

Interventions can publicize data about actual drinking norms in orientation programs, student newspaper ads and articles, radio programs, lectures, campus poster campaigns and other public venues to address high-risk students’ misperceptions as well as those of students at large (Berkowitz and Perkins, 1987; Haines, 1996; Johannessen et al., 1999; Perkins, 1997; Perkins and Craig, forthcoming). Such publicity can help reduce students’ false impressions about alcohol and other drug use. Disseminating

information as widely as possible is especially important because, as previously noted, all types of students may be “carriers” of the misperceptions even if they themselves do not misuse alcohol. Although most prevention programs on campuses have not employed electronic media to supplement interpersonal and print communications (Werch et al., 1996), the opportunities for using such media with a social norms approach are clear (Perkins and Craig, forthcoming).

Initial results of program interventions that have adopted an intensive social norms approach are quite promising. Several institutions with programs that have intensively and persistently communicated accurate norms about healthy majorities of students have experienced significant reductions in high-risk or heavy episodic drinking rates (as much as 20% declines) in relatively short time periods (see Berkowitz, 1997; Haines, 1996, 1998; Haines and Spear, 1996; Jeffrey, 2000; Johannessen et al., 1999; Perkins and Craig, forthcoming). Taken together, these findings provide remarkably strong support for the potential impact of the social norms approach. Although any of the case studies in this literature might be challenged or criticized as imperfect on some methodological criterion, each study with different strengths and weaknesses conducted at different times produces remarkably similar results with sizable declines in high-risk drinking (DeJong and Linkenbach, 1999). These findings revealing reductions in heavy drinking from schools employing a social norms approach are further strengthened by the fact that the same or similar measures of high-risk drinking among college students nationwide have not shown any decline over the last decade (Johnston et al., 1997; Wechsler et al., 2000). Moreover, the positive impact of social norms interventions is noted at demographically diverse institutions from across the country. The findings of these programs are also particularly valuable because they are longitudinal studies using equivalent pre- and postintervention measures in student samples, some with multiple follow-ups across several years.

Programs can also target specific problem-prone groups (e.g., first-year students, fraternity or sorority members, particular residential units, athletes or individuals identified as high-risk or heavy drinkers) for special attention. Workshops or brief counseling interventions can help these students confront their own misperceptions of peer use and can facilitate discussion about student norms identified in group assessments and campus-wide studies (Barnett et al., 1996; Berkowitz and Perkins, 1987; Borsari and Carey, 2000; Steffian, 1999). Marlatt et al. (1995), for example, targeted entire fraternities and sororities for programming and included accurate group feedback regarding drinking practices within a larger framework of motivational enhancement strategies. Using a sample of college students identified as heavy drinkers at a southwestern university, Agostinelli et al. (1995) reported an experiment that randomly assigned these students to two groups, one receiving

mail feedback about personal use compared with actual population norms and a control group receiving no feedback. The results of this experiment demonstrated a significant reduction in alcohol consumption in the group that received normative feedback and no change in the control group after 6 weeks. In another applied experiment at an eastern university (Schroeder and Prentice, 1998), first-year students were invited to participate in alcohol education discussions in small residential groupings as part of their initial orientation program. Half of the groups that agreed to participate were randomly assigned to a presentation of data revealing students' misperceptions of their peers' comfort with campus drinking practices, while the other (control) group participated in a discussion of how to make responsible personal drinking decisions. Students in the experimental groups that had been introduced to actual and perceived norms at the beginning of the year consumed significantly less alcohol on a weekly basis in the follow-up data collected 4 to 6 months later.

Prospects for other normative influences

Research to date does not suggest that families will play a large role as normative forces beyond what they have instilled in students through modeling drinking behavior and through religious traditions handed down to offspring. Although they may be able to take a more active role in organizations or in punitive control of sons or daughters who have been identified as a problem, it does not appear likely that they will be able to significantly change student behavior by simply continuing to articulate or make more evident their family norms about drinking. Anecdotal comment and news reports have appeared in recent years on the normative influences of graduates, including discussions of the potential negative impact of drunken behavior among alumni and alumnae at athletic events and reunion weekends and the potential positive effects of graduate norms in communicating opposition to alcohol misuse. The value of graduate norms in prevention initiatives remains an open question, however, without any research evidence.

Research about faculty contributions to prevention is quite limited, but what evidence exists clearly suggests the need to move beyond specialized teaching about pharmacological effects and risks of drinking if faculty are to make a contribution. Given the extent of interaction many faculty have with students at some schools, the opportunity exists for faculty to exert a stronger collective voice about their norms and standards regarding drinking. This may take place by raising issues of social values and concerns about consumption and by highlighting positive normative values that already exist among students and faculty both in a variety of course contexts and in informal interaction (Leavy and Dunlosky, 1989).

RAs as a normative influence exist in an inherent position of role conflict as they simultaneously play the part of friend, counselor and older sibling to new students as well as official institutional representative in living environments. Limited research suggests that they personally model reasonable behavior and informally negotiate compromises of drinking violations on the part of residents, if drinking is done with discretion to minimize problems with relationships both inside and outside the residence. The potential for improving prevention through RAs from a normative vantage point may lie in two areas related to misperceived norms. First, RAs can be trained not to be "carriers" of the misperception by talking about accurate norms rather than false stereotypes with new students. Second, they can work with residents to identify the actual levels of student support for residential policies regarding alcohol because the residence hall community is likely to perceive that there is less support for policies than is actually the case. By raising student consciousness of the actual normative support that does exist for limitations on drinking, policies may be easier to enforce. If RAs and student residents can more accurately perceive less opposition to drinking regulations than they initially thought, then both RAs and student residents can more easily demand adherence to the policies. Then, strengthened by a growing realization of support for policies that promote healthy environments, students and RAs, along with administrators, can more effectively call for further policy reforms on campus (DeJong and Linkenbach, 1999).

To conclude, there is significant potential for engaging norms to serve in prevention efforts to reduce problem drinking among students. Work on correcting misperceived student norms to constrain problem drinkers and empower responsible students, in particular, holds great promise based on theory and research to date. Although the normative power of constituencies other than student peers appears to be more limited, much more research is needed to explore these domains and suggest ways in which positive social norms provided by faculty, graduates and residence life staff can be more salient in students' lives.

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Alcohol Advertising and Youth

HENRY SAFFER, PH.D.[†]

National Bureau of Economic Research, 365 Fifth Avenue, 5th floor, New York, New York 10016-4309

ABSTRACT. *Objective:* The question addressed in this review is whether aggregate alcohol advertising increases alcohol consumption among college students. Both the level of alcohol-related problems on college campuses and the level of alcohol advertising are high. Some researchers have concluded that the cultural myths and symbols used in alcohol advertisements have powerful meanings for college students and affect intentions to drink. There is, however, very little empirical evidence that alcohol advertising has any effect on actual alcohol consumption. *Method:* The methods used in this review include a theoretical framework for evaluating the effects of advertising. This theory suggests that the marginal effect of advertising diminishes at high levels of advertising. Many prior empirical studies measured the effect of advertising at high levels of advertising and found no effect. Those studies that measure advertising at lower, more disaggregated levels have found an effect on consumption. *Results:* The results of this review sug-

gest that advertising does increase consumption. However, advertising cannot be reduced with limited bans, which are likely to result in substitution to other available media. Comprehensive bans on all forms of advertising and promotion can eliminate options for substitution and be potentially more effective in reducing consumption. In addition, there is an increasing body of literature that suggests that alcohol counteradvertising is effective in reducing the alcohol consumption of teenagers and young adults. *Conclusions:* These findings indicate that increased counteradvertising, rather than new advertising bans, appears to be the better choice for public policy. It is doubtful that the comprehensive advertising bans required to reduce advertising would ever receive much public support. New limited bans on alcohol advertising might also result in less alcohol counteradvertising. An important topic for future research is to identify the counteradvertising themes that are most effective with youth. (*J. Stud. Alcohol*, Supplement No. 14: 173-181, 2002)

ALCOHOL REMAINS popular with American college students, as indicated by the Core Institute Survey (1998). In 1997, 84.2% of college students reported drinking alcohol, an increase of 2% over the prior year. For comparison, there were similar increases in the prevalence of tobacco and marijuana use. Moderate to heavy drinking also increased with corresponding reductions in abstinence and light drinking. Nationwide, students reported consuming an average of 5.64 drinks per week in 1997, up about 7% over 1996. The Core Institute also reported that 45.5% of students had consumed five or more drinks in one sitting in the previous 2 weeks. More than 21% of the students reported three or more episodes of this kind of high-risk drinking in the previous 2 weeks. Finally, more than 90% of American college students reported that drinking is a central part of campus social life.

According to Competitive Media Reporting, more than \$1.2 billion was spent in 1998 on alcohol advertising in measured media (i.e., print media, outdoor advertising, radio and television). An additional two-thirds billion dollars was spent on other forms of promotion, including sponsorships, couponing and direct mail. Alcohol advertising had decreased from 1987 to 1996 by 34%, in real terms. However, since 1997, alcohol advertising has been increasing. Part of the recent increase includes the use of cable television by spirits advertisers.

Both the level of alcohol misuse on college campuses and the level of alcohol advertising are high. A recent report by the Federal Trade Commission (1999) concluded that underage individuals have significant exposure to alcohol advertising. However, evidence of exposure does not prove that alcohol advertising induces more alcohol consumption by young people. A number of studies have examined the relationship between alcohol advertising and attitudes about alcohol held by young people. Some believe that cultural myths and symbols used in alcohol advertisements have powerful meanings for college students. Others have concluded that alcohol advertising affects knowledge, attitudes and intentions to drink, which in turn are believed to affect drinking. This type of inquiry has led some public health groups to conclude that there is a positive link between advertising and alcohol consumption. For instance, the Robert Wood Johnson Foundation (1999) maintains that alcohol advertising and marketing are factors in the environment that help create problems of underage drinking and college high-risk drinking. There is, however, very little empirical evidence that alcohol advertising has any effect on actual alcohol consumption (e.g., see Fisher, 1993; Nelson, 1999). This review article will try to resolve these conflicting conclusions and provide some guidance for public policy directed at campus alcohol misuse.

Alcohol Advertising and Alcohol Demand

Competition through advertising, rather than price, is often preferred in industries that are highly concentrated, such

[†]Henry Saffer may be reached at the above address or via email at: hsaffer@gc.cuny.edu.

as the alcohol industry. A highly concentrated industry is characterized by a small number of relatively large firms. Schmalensee (1972) showed that firms competing with a small number of rivals are likely to advertise more than a similar firm in a monopoly situation. The advertising-to-sales ratio for the alcohol industry is about 9%, in comparison with the average industry advertising-to-sales ratio, which is about 3% (Advertising Age, 1999).

The theory of brand capital explains the process by which advertising affects demand and can also explain alcohol advertising effects on knowledge, attitudes and intentions to drink. Brand capital is defined as the collective positive associations that individuals have about a brand. Firms with higher levels of brand capital will have higher sales because they provide consumers with higher levels of utility. Brand capital can depreciate over time, accompanied by decreases in sales. Firms can attempt to offset decreases in sales by creating additional brand capital. Depending on the relative marginal costs and marginal benefits, the addition to brand capital will be either in the form of new brands or in the form of changes in the type and level of advertising for existing brands.

The creation of a new brand involves three steps: (1) market segmentation, (2) the creation of a branded product and (3) the creation of new advertising for the brand, with content targeted at the intended market segment. Changes in the type and level of advertising for existing brands involve steps one and three only.

Market segmentation can be based on geography (e.g., region, size of community), demographics (e.g., age, gender, race, religion), behavior (e.g., frequency of purchase, occasion of purchase, readiness to purchase) or psychographics (e.g., values, attitudes, personality, lifestyle). Market segments can also be defined with combinations of these categories. For an existing brand, the market segment to be targeted may be redefined.

The creation of branded products consists of producing distinguishable products with unique packaging or with unique product features. Branding can be accomplished with individual brand names, such as Miller and Red Dog, which have no obvious association with each other, or by creating brand families. The brands in a family all have the same name but have different attributes, such as lite beer, ice beer and genuine draft beer, or different packaging attributes, such as glass bottles, extra large size containers or long necked bottles.

Targeted advertising refers to the specific imagery used to create the "personality" for a brand. Targeting also requires choosing media that will expose the intended market segment to the advertising. Product personalities are designed to appeal to specific market segments. For example, in targeting young people, Coors beer is associated with an unspoiled wilderness, whereas Budweiser is associated with athletic success. Use of these products connects the young person's fantasies to these fantasy images. For an existing brand, the personality and media may be changed.

Product price provides information about intended product quality. If the brand has been defined as a premium product, brand capital will be decreased by frequent discounting or a permanent decrease in product price. These would signal a decrease in perceived product quality, thus reducing the brand capital that has been created by investing in advertising. Although the price of various brand categories tends to be the same for all firms, price variation across markets is created by state taxes, transportation costs and local cost factors. Variations in the level of advertising also exist across markets because of local cost factors.

Products with higher levels of brand capital provide increased utility to individuals in a specific market segment and are more likely to be purchased than products that have less brand capital. A company with more brand capital can achieve a larger market share than a company with less. Increases in brand capital may result from the creation of additional brands or more increases in capital per brand. The introduction of a new brand may shift customers from an existing brand, but it can also attract new consumers into the market. Therefore, a firm that increases its brand capital in this way will increase its market share and may also increase the size of the market. The economic feasibility of this strategy is limited by several factors. The market must be large enough so there are enough potential customers and revenue to balance the costs of creating the new product and packaging and of effectively creating and placing the advertising. The process also depends critically on the availability of media where advertising can be placed. That is, if all alcohol advertising were banned from all media, the possibility of market expansion through the process of brand proliferation would be quite limited.

Advertising and other marketing techniques are one potential source of information for young people about the costs and benefits of alcohol. Advertising creates the impression that, for a relatively small expenditure, young people can psychologically connect to the positive fantasy places, lifestyle and personality characteristics that it portrays. Advertising-supplied information can result in more positive expectancies about alcohol, which can change actual or intended consumption behavior. In addition, for a bounded community of youth, such as a college campus, alcohol advertising can increase alcohol consumption by the whole community. If this happens, then the social norms of that campus have been changed, and this can have a strong effect on drinking decisions by individual students. In effect, the new social norms provide new information about costs and benefits of drinking, especially social costs and benefits.

Methodological Issues in Advertising Studies

The theory of brand capital can explain why advertising increases positive alcohol expectancies, but does not explain why econometric studies of alcohol consumption often find

no effect from advertising. An examination of some of the methodological issues in econometric studies will help to resolve this discrepancy and provide some important insights into how studies of alcohol advertising and market level consumption should be conducted. The most important concept in economic theory is diminishing marginal product, which states that the continued increments of an input to a process will at some point lead to ever smaller increments in output. This concept is the basis of the advertising response function that is used in brand level research to illustrate the effect of advertising on consumption at various levels of advertising. Economic theory suggests that due to diminishing marginal product, advertising response functions flatten out at some point. That is, after a certain point consumption becomes ever less responsive to increases in advertising. Ultimately consumption is completely unresponsive to additional advertising. Brand level empirical work on beer advertising clearly supports this model (Ackoff and Emshoff, 1975; Rao and Miller, 1975). One important implication of diminishing marginal product is that, since media are not perfect substitutes for one another, media diversification is necessary to maximize the effect of a given advertising budget.

The same model that describes the brand level advertising response function can be applied at the product level, defined as all products produced in an industry. For example, the product level for alcohol would include all brands and variations of beer, wine and spirits. The product level and brand level advertising response functions are similar and are illustrated in Figures 1a and 1b. The vertical axis measures product level consumption (or brand level consumption), and the horizontal axis measures product level (or brand level) advertising. The product level response function differs from the brand level response function in that advertising induced sales must come at the expense of sales of products from other industries, assuming individuals' spending remains constant. Increases in consumption come from new consumers or from increases by existing consumers. New consumers are often adolescents who are uninformed about the true costs and benefits of alcohol consumption. Earlier initiation is associated with increased alcohol-related problems in adolescence and adulthood and with increased lifetime risk for alcohol-related injury (Grant and Dawson, 1997; Hawkins et al., 1997; Hingson et al., 2000; Zucker and Fitzgerald, 1991).

Counteradvertising, which is the use of media to promote public health, is subject to the same law of diminishing marginal product as advertising. Figure 2 illustrates the effect of counteradvertising on consumption. The vertical axis measures consumption, and the horizontal axis measures counteradvertising. The response function is downward sloping, indicating that increases in counteradvertising reduce consumption. Again, the response function flattens out at high levels of counteradvertising due to diminishing marginal product.

A second important aspect of advertising is that its effects linger over time. That is, advertising in Period 1 will have a lingering, although smaller, effect in Period 2. Although the rate of decline over time remains an arguable issue, research such as that of Boyd and Seldon (1990) finds that advertising fully depreciates within a year. The lingering but declining effect of advertising is the basis for a widely used advertising technique known as pulsing. Pulses, or bursts of advertising in a specific market that last for short time periods, are separated by periods of no advertising. The length and intensity of pulses vary according to a variety of factors, including media used, specific advertisers and advertising costs in the designated market.

Econometric studies of advertising and total consumption generally use one of four basic approaches: (1) studies that use annual or quarterly national aggregate expenditures as the measure of advertising, (2) studies that use cross-sectional measures of advertising, (3) studies of advertising bans and (4) studies of counteradvertising. The two response functions represented in Figures 1a and 1b illustrate the likely outcome of alternative methods of measuring advertising.

Consider first studies that use annual national expenditures as the measure of advertising. These are the yearly total of all alcohol advertising expenditures, for all advertisers, in all media, for all geographic market areas. This is a high level of aggregation of advertising data, and as a result the data have very little variation over time. Because alcohol is heavily advertised, the marginal product of advertising may be very low or zero. In Figure 1a, this is equivalent to measuring advertising in a small range around A_1 . The loss of variance due to aggregation leaves little to correlate with consumption; because the advertising occurs at a level where the marginal effect is small, it is not likely that any effect of advertising will be found.

Consider next studies that use cross-sectional data as the measure of alcohol advertising. Although there are exceptions, this type of data is typically local level, such as a Metropolitan Statistical Area, for periods of less than a year. It can have greater variation than national level data for several reasons, including pulsing. The pattern of pulses varies across local areas. In addition, the cost of advertising varies across local areas, which also contributes to differences in advertising levels. This is illustrated in Figure 1b by the three data points A_{m1} , A_{m2} and A_{m3} . An econometric study that uses monthly or quarterly local level data would potentially detect larger variation in advertising levels and in consumption. When data are measured over a relatively larger range, there is a greater probability of being in the upward sloping portion of the response function. Local level advertising data are thus more likely to find a positive relationship between advertising and consumption.

Consider next studies of alcohol advertising bans. The potential effect of a ban on certain media is shown as a

downward shift of the response function in Figures 1a and 1b. An advertising ban may not reduce the total level of advertising but will reduce the effectiveness of the remaining nonbanned media. This occurs because a ban on one or more media will result in substitution into the remaining media. However, each medium is subject to diminishing marginal product so the increased use of the nonbanned media will result in a lower average product for these media. This shifts the response function downward. Firms may

or may not respond to this decrease in effectiveness of their advertising expenditures. They may try to compensate with more advertising, which would be illustrated by moving to a higher level of advertising on a lower advertising response function; or they might increase the use of other marketing techniques such as promotional allowances to retailers.

Finally, consider counteradvertising. The amount of counteradvertising is low and irregular over time. Thus, there is variation in the data even when aggregated to the

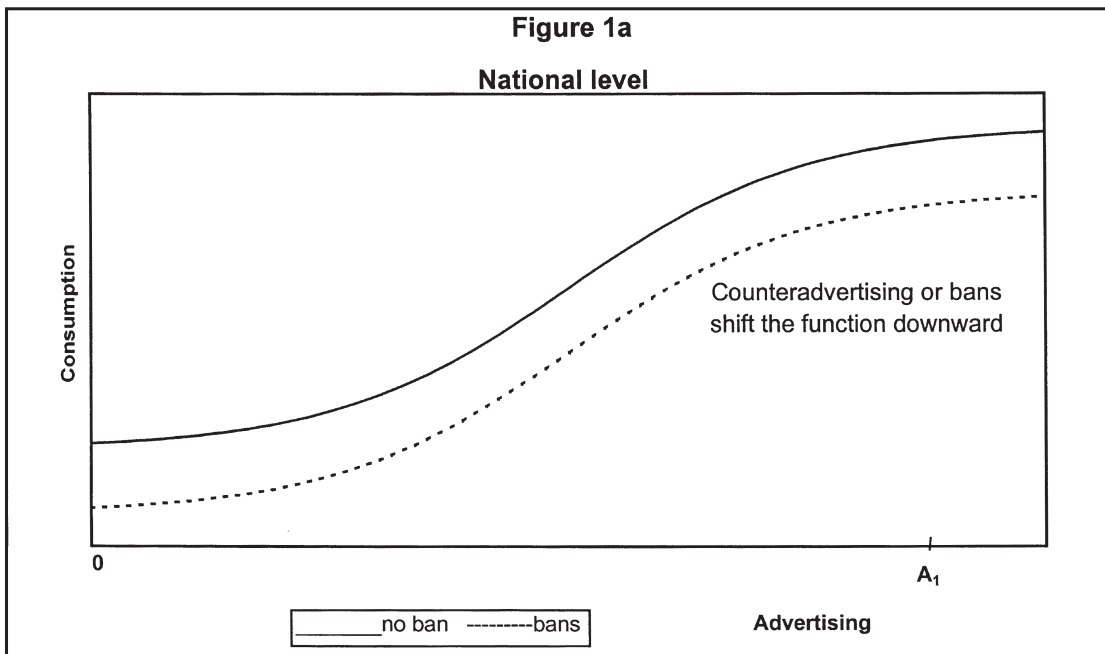


FIGURE 1a. Advertising response function: National level data

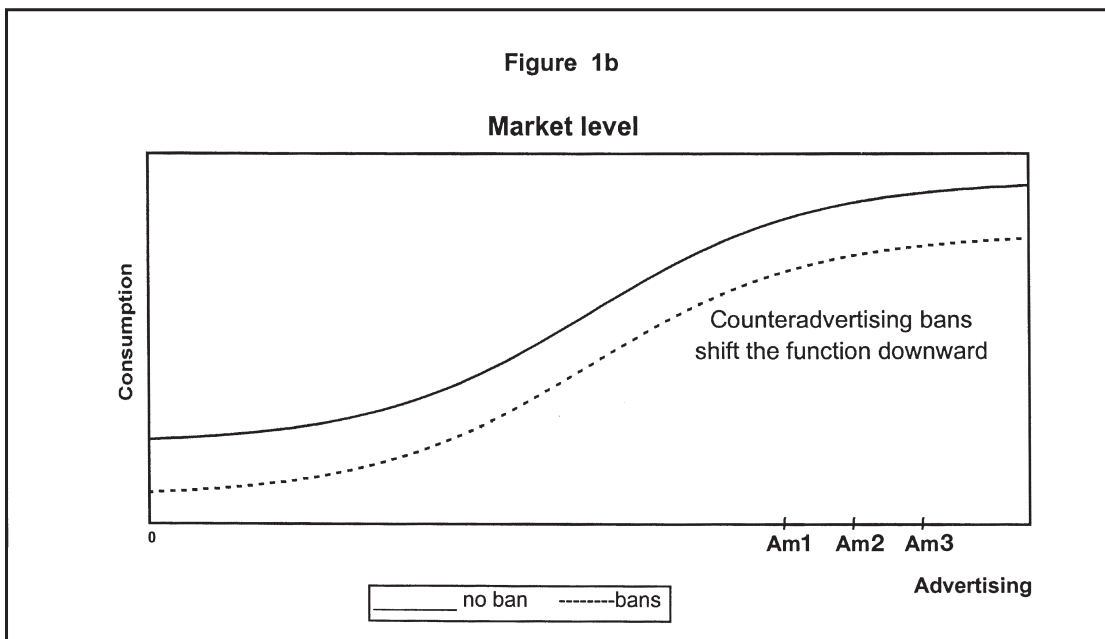


FIGURE 1b. Advertising response function: Market level data

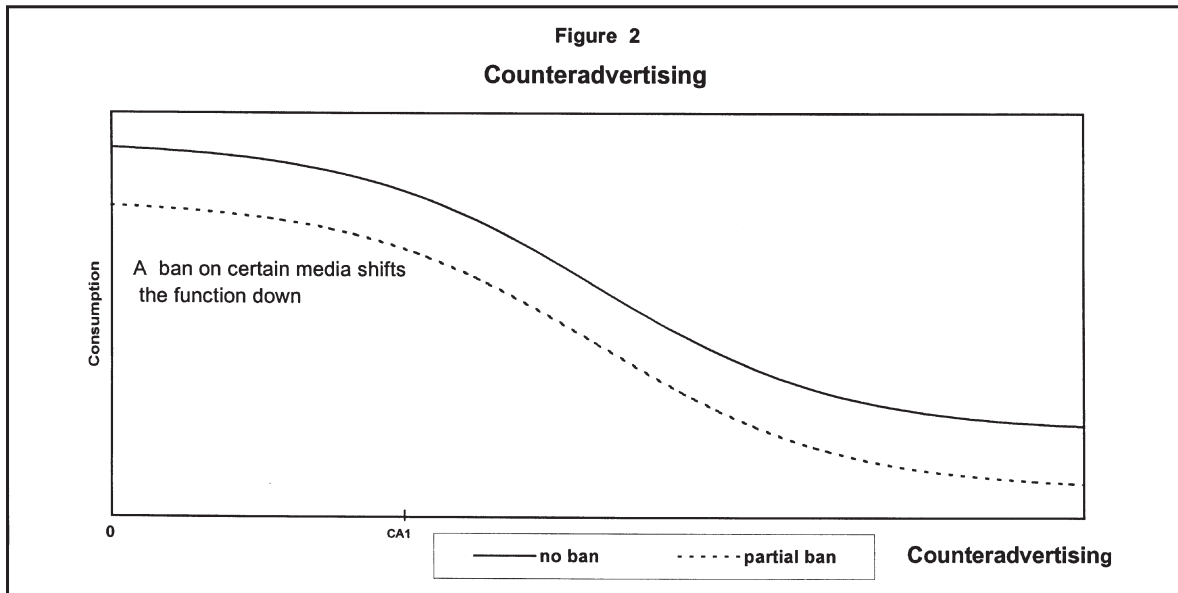


FIGURE 2. Counteradvertising response function

national level. Counteradvertising is therefore measured over a range in which the function is decreasing (see Figure 2). It is likely that a negative relationship between counteradvertising and consumption will be found.

Empirical Studies of Advertising and Youth

Empirical studies of alcohol advertising and youth fall into three categories. First, targeting studies attempt to document that advertising targets youth by examining media placement and advertising content. These studies examine advertisements for consumer information, brand symbolism and lifestyle portrayals that appeal to youth, but do not correlate advertising exposure to consumer behavior. Second, attitudinal studies attempt to correlate various attitudinal data with alcohol advertising. These studies may examine how small groups, in controlled environments, react to controlled exposures to alcohol advertisements. Another approach uses in-depth interviews to collect data on what media people have recently been exposed to and measures of alcohol use or beliefs. The advertising exposure data are then correlated with data on beliefs about alcohol or intentions to use alcohol. Third, econometric studies employ data from existing large-scale surveys of individuals and aggregate statistics for various communities. These studies examine the effects of alcohol advertising on market share and total alcohol consumption.

The first category of studies provides some evidence that alcohol advertising is targeted at youth. A study by Breed et al. (1990) found that alcohol advertising in college newspapers far exceeded all other product advertisements. The researchers concluded that alcohol advertising

originating locally encouraged irresponsible and heavy drinking. Because their sample period predated the national 21-year-old minimum purchase age law, they could examine the relative frequency of college alcohol advertising in states with and without the 21-year-old minimum. They found that the 21-year-old minimum age law had no effect on the frequency of campus alcohol advertising. Grube (1993) also found evidence of targeting: 2.4 alcohol commercials per hour were placed in professional sports programs and 1.2 per hour in college sports programming. This compares with only .25 per hour in prime time fictional programming. Grube also concluded that as children age they become more aware of alcohol advertising.

The Center for Media Education (1998) also found evidence of youth targeting in alcohol advertising on the Internet. They monitored alcohol promotion websites for the period of August 18 through October 13, 1998. They found that 62% of the 77 alcohol sites examined used marketing techniques that appealed to youth. It would be useful to continue to explore the effect of Internet advertising and promotion of alcohol.

Attitudinal studies find evidence that alcohol advertising increases intentions to drink by adolescents. Grube (1993) reviewed a series of studies that concluded that adolescents more heavily exposed to advertising are more likely to have positive attitudes toward drinking. Some studies reviewed did not find an association between alcohol advertising and alcohol use by young people. Grube noted that correlational studies of this type have difficulty demonstrating causality or its direction. Grube and Wallack (1994) tried to correct for this weakness by using nonrecursive statistical modeling techniques to test an

information processing model of advertising effects on knowledge, attitudes and intentions. They also distinguished between awareness of alcohol advertising and mere exposure to advertising. In one group of grade school children, those more aware of alcohol advertising were more affected by it. They also found that awareness is not predisposed by prior drinking intentions. Because alcohol advertising increases awareness, they concluded that alcohol advertising increases drinking intentions for the grade school students studied.

Another small group study by Parker (1998) examined how alcohol advertisements are perceived by college students. A meaning-based model of advertising incorporating students' life themes, personal conflicts, view of self and view of others was used to explore the role of alcohol advertising. Students were asked questions about their interpretation of the advertisements, and these responses were compared with their own life experiences and independently identified content themes. The study concluded that the meanings of advertising messages are derived from individuals' experiences. The study also found that college students were able to identify cultural myths in the advertisements, but did not always believe them. Themes most appealing to college students were those involving danger and mystery. Econometric studies, the third category, find little evidence of an effect of alcohol advertising due to the methodological problems described earlier. Studies that use national aggregate advertising data as the measure of advertising expenditures are the least likely to find an effect. This type of data measures advertising in a range around A_1 in Figure 1a and, according to the economic model presented earlier, is not likely to find an advertising effect. Studies by Duffy (1987), Selvanathan (1989) and Nelson and Moran (1995) are representative. Although they were important efforts to estimate the effects of alcohol advertising, results were weak and inconsistent. There were some methodological improvements in subsequent studies. Duffy (1991), Franke and Wilcox (1987) and Nelson (1999) used quarterly rather than annual data. Bourgeois and Barnes (1979) used cross-sectional data, and a study by Blake and Nied (1997) added a number of new variables. The results from all five studies, however, do not provide much support for the hypothesis that advertising increases industry demand.

Only two alcohol advertising studies have used cross-sectional data. Goel and Morey (1995) used a U.S. data set with 779 observations for the period 1959 to 1982 that have both time and geographic variation. They found some evidence that alcohol advertising has a significant positive effect on consumption. A second study by Saffer (1997) examined the effect of alcohol advertising on highway fatalities. This study used 4 years of quarterly data from 75 local level cross-sectional aggregates with a total of 1,200 observations. He concluded that alcohol advertising increases highway fatalities.

Another group of studies examined the effect of advertising bans on consumption. The potential effect of a ban on certain media is a downward shift of the response function. Firms may try to compensate with more advertising or with other marketing techniques, such as promotional allowances to retailers. The effects of advertising bans have been studied with interrupted time series techniques and regression models.

Smart and Cutler (1976), Ogborne and Smart (1980) and Makowsky and Whitehead (1991) examined the effect of alcohol advertising bans in British Columbia, Manitoba and Saskatchewan, respectively. All three studies failed to find an effect of advertising bans on alcohol consumption. However, these studies could not account for cross-border alcohol advertising. These provincial bans may not have resulted in a significant reduction in total advertising exposure because the provinces receive a considerable amount of television programming from the United States. These results may also indicate that longer time periods are necessary to observe changes in alcohol consumption in a single province or country.

Ornstein and Hanssens (1985) examined the effects of bans on outdoor advertising, bans on consumer novelties and bans on price advertising on beer and spirits consumption in the United States using state data for the period 1974 to 1978. States that allowed price advertising and consumer novelties were found to have higher spirits consumption.

Saffer (1991) provided the first set of estimates of the effect of television advertising bans on alcohol misuse. Time series data from 17 countries for the period 1970 to 1990 were pooled. Alcohol misuse was estimated using alcohol consumption, liver cirrhosis mortality rates and motor vehicle mortality rates. Cultural factors that influence alcohol use were measured by alcohol production variables, and a set of country dummy variables were used in the analysis. The results indicated that both alcohol advertising bans and alcohol price can have a significant effect in reducing alcohol misuse.

Counteradvertising studies are likely to find effects on consumption because counteradvertising is measured in a range where the response function has a negative slope (Figure 2). Some evidence for effectiveness of counteradvertising comes from studies of anti-drunk driving public service announcements (PSAs). A review by Wallack and DeJong (1995) concluded that PSAs can increase awareness but may have little effect on behavior. However, Ognianova and Thorson (1997) found that, for adults in Missouri, PSAs can reduce drunk driving. This study did not find an effect of PSAs on youth ages 15 to 20.

Additional evidence on the effectiveness of counteradvertising comes from the tobacco literature. The anti-smoking publicity events in 1953 and 1964 and the Fairness Doctrine period from 1967 to 1970 provide good data for

econometric studies of counteradvertising. During the Fairness Doctrine period, broadcasters in the United States were required to donate air time to counteradvertising. At its peak, the ratio of counteradvertising to advertising was one to three. A number of studies found that counteradvertising reduced cigarette consumption. Warner (1981), Lewit et al. (1981), Schneider et al. (1981) and Baltagi and Levin (1986) included measures of counteradvertising, and they all concluded that counteradvertising was effective in reducing cigarette consumption.

A series of local counteradvertising campaigns have also been analyzed. Pierce et al. (1990) found that counteradvertising reduced smoking in two Australian cities. Hu et al. (1995) found that counteradvertising reduced smoking in California. Goldman and Glantz (1998) found effects from counteradvertising in California and Massachusetts. Flay (1987) reviewed the results of local counteradvertising campaigns in Finland, Greece, the United Kingdom, Norway, Israel, Austria and Canada and also concluded that counteradvertising was effective in reducing cigarette consumption.

Counteradvertising has been an important part of California's new tobacco control program. An interesting study by Goldman and Glantz (1998) analyzed the effectiveness of different counteradvertising messages and found that messages that depicted tobacco executives as deceitful, manipulative, dishonest and greedy were most effective. According to the authors, this type of advertising helps adults change their self-image as smokers from "guilty addict" to "innocent victim." The least effective counteradvertising portrayed smoking as unhealthy and unromantic. The health messages did not convey any new information and, for people with only a dim view of the future, were meaningless. The romantic rejection themes did not work because people believed that an individual's smoking status could be overlooked if they were otherwise desirable.

Conclusions

Critics of alcohol advertising want to reduce the social and medical problems associated with the misuse of alcohol, and they often argue for a ban on alcohol advertising. This policy choice is based on the assumptions that alcohol advertising increases alcohol misuse and that bans eliminate or reduce advertising. Although there is enough evidence to conclude that advertising increases total alcohol consumption and alcohol misuse, advertising bans reduce advertising only under certain conditions. A ban on one or two media, such as television and radio, will result in substitution to available alternative media. It can be argued that television and radio reach so many people that bans on their use will surely have an effect. However, media that can reach more people charge proportionally higher prices, and, per dollar spent, television and radio are no more ef-

fective than other mass media. It is possible that bans on campus alcohol advertising could have an additional effect by acting as a signal of administrative intolerance. The direction and magnitude of the effects of such a policy, if any, would be an interesting topic for future study.

The theory outlined earlier in the section on methodological issues explains that a ban on use of a given medium will result in substitution to other available media. This does not reduce total expenditures on alcohol advertising, and there is no reason to expect that a ban in a given medium will have an effect on alcohol consumption. However, forcing the expenditure into fewer media reduces the effectiveness of the total outlay due to diminishing marginal product, as described by the industry response function. In a perfectly competitive market, a factor whose price has risen or whose effectiveness has fallen would be employed less extensively. However, the alcohol industry is not a perfectly competitive industry and is better characterized by a response-to-rivals model. Alcohol companies may seek to compensate for loss of sales by increasing total outlays on advertising of existing brands or by advertising new brands. They may also seek to compensate with other forms of promotion, such as retailer discounting or couponing. The only way to reduce total advertising is to legislate comprehensive advertising bans, including all forms of promotion, and display of the product's name, the product and product logos.

Because alcohol advertising bans have been fairly limited, the experience with tobacco advertising bans provides some empirical support for the theory presented above. In the United States, immediately after tobacco advertising was banned from radio and television in 1970, tobacco advertising expenditures fell. However, within a few years, advertising expenditures were back at their former level (Eckard, 1991). Similarly, data from the Federal Trade Commission (1998) indicate that during the past 20 years the tobacco companies have shifted from advertising to other promotional activities. This shift may have been in anticipation of new restrictions, such as those included in the recent master tobacco settlement between the industry and the states. From 1986 to 1996 real spending on advertising decreased by 40%; real spending on other promotional activities increased by 45%. On balance, total promotional spending has increased by 18%. Saffer and Chaloupka (2000) and Saffer (2000) provide evidence that comprehensive advertising bans reduce tobacco use and limited bans have no effect.

Alcohol, unlike tobacco, has a historic place in social custom. Of those who drink, 90% do so safely. For tobacco, there is no safe level of consumption. Alcohol use and misuse have also been trending downward over the past few years. Given this history, it does not seem likely that the type of advertising bans required to reduce alcohol consumption would ever receive strong public support.

Although surveys show that the public supports the idea of alcohol advertising bans, the recent entrance of spirits advertisers in the cable television market has not generated any public concern. Five Organization for Economic Cooperation and Development countries recently rescinded bans on alcohol advertising. Alternatively, there is an increasing body of literature that demonstrates that alcohol counter-advertising is effective with teenagers and young adults (Atkin, 1993). New restrictions on alcohol advertising might also result in less alcohol counteradvertising. Given these trade-offs, increased counteradvertising, rather than new advertising bans, appears to be the better choice for public policy.

Although alcohol counteradvertising may be a good choice for reducing youth alcohol misuse, there is still much to learn about the most effective content and placement. The message content that was found to be effective against tobacco industry manipulation may not be appropriate for alcohol. Alcohol is widely accepted as part of social life, generally consumed safely and recommended by the Surgeon General. Message content that vilifies the industry is not likely to produce the desired reaction. An important area for future research is to identify the message content that would be effective with youth. Also, the media mix that would be most effective in bringing the message to young people is not well understood. This is particularly true for the Internet.

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