

Seven Causal Factors in the Prevention of Underage Drinking

This document is a condensed and adapted review of an extensive literature review from the Pacific Institute for Research and Evaluation (PIRE) that presents causal factors, researched by PIRE staff, for the specific social problem of underage drinking. These factors represent a public health approach to prevention and emphasize prevention effects at the population or the community level. This modified version of PIRE's original literature review is limited to include the seven causal, or contributing, factors targeted by Colorado's SPF SIG communities.

These causal factors can be used to identify possible points of intervention for prevention of the community problem of underage drinking and the selection of particular intervention components or activities that have sufficient strength to affect key intermediate variables.

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Retail Availability of Alcohol to Youth

In the studies that have focused on retail availability of alcohol to youth, aspects of retail availability such as privatization, hours and days of alcohol sales, and outlet density have been associated with changes in alcohol sales to underage youth, shifts in beverage choice to more readily accessible alcoholic beverage types, and drinking behavior (Kelley Baker, Johnson, Voas, & Lange, 2000; Todd, Gruenewald, Grube, Remer, & Banerjee, 2006; Valli, 1998). Among college students—many of whom are under the legal drinking age—outlet density surrounding college campuses has been found to correlate not only with heavy drinking and frequent drinking, but also with drinking-related problems (Weitzman, Folkman, Folkman, & Wechsler, 2003). Retail availability has also been shown to be positively associated with frequency of underage drinking and driving and riding with drinking drivers (Treno, Grube, and Martin, 2003).

A recent study found that perceived compliance and enforcement of underage drinking laws at the community-level was inversely related to individual heavy drinking, drinking at school, and drinking and driving and to use of commercial sources for alcohol by adolescents (Dent et al., 2005). Alcohol purchases are less likely at stores that participate in a Responsible Vendor Program (RVP), when salesclerks asked the decoys for their IDs, and at stores with a posted underage alcohol sale warning sign.

College students exposed to high levels of alcohol availability were at a higher risk for binge drinking than youth where availability was low. Conversely, students exposed to strongly enforced alcohol policy environments were less likely to binge drink than youth in areas with less strongly enforced policies (Weitzman, Chen, & Subramanian, 2005). Similarly, students who attend colleges in states that have more restrictions on underage drinking, high volume consumption, and sales of alcoholic beverages, and devote more resources to enforcing drunk driving laws, report less drinking and driving (Wechsler et al., 2003).

Compliance with underage alcohol sales laws by licensed retail establishments may affect underage alcohol use indirectly, through its effect on underage use of commercial alcohol sources and perceived ease of obtaining alcohol. However, use of social alcohol sources has a stronger relationship to underage drinking than use of commercial alcohol sources and perceived ease of obtaining alcohol (Paschall et al. 2007b).

Measurement

Indicator	Source
Retailer Compliance w/ Licensing Laws	Dept. of Revenue or Local Law Enforcement - Compliance Checks
Retail Sales Availability – Where youth buy or are denied alcohol sales	Youth focus group or survey
Hours & Days of Sale	Intervening Variable Toolkit #2 and #3
Alcohol Outlet Density	ASPIRE

Retail Availability - This larger variable can be measured in a number of ways which reflect the accessibility of alcohol to the general drinking population as well as specific level of access for underage persons, e.g., levels of compliance with state sales laws by alcohol merchants. Retail availability of alcohol can be measured by (a) Retailer Compliance with Licensing Laws, (b) Retail Sales Availability, (c) Hours and Days of Sale, and (d) Alcohol Outlet Density (distance to a retail outlet).

Retailer Compliance with Licensing Laws -- Compliance Checks - This variable is defined as the percentage of times an underage person or a youthful looking person who would appear to be under 21 years old is able to purchase alcohol without having to show age identification.

Retail Sales Availability: Sources of Alcohol - The actual sources of alcohol as self reported by adolescents provides a means to measure retail sales availability. This is defined as the frequency of getting alcohol from various sources in the past 30 days as well as the frequency of the adolescent being denied the purchase of alcohol.

Hours and Days of Sale - This variable is typically defined by specific hours of alcohol sales by type of outlet (off premise, such as gas stations, or on premise, such as restaurants) each day or the specific days of sale (independent of the specific day of the week or the total hours of sale each week, i.e., the total hours of sales across all seven days in the week).

Outlet Density - Outlet density is another potential measure of alcohol availability. Measures of outlet density represent the physical availability of alcohol within a defined area, such as a county.

Strategies

Strategies designed to affect access to alcohol from retail sources are not always targeted specifically at young or underage drinkers but have the potential to limit the retail availability of alcohol to all drinkers including youth. These strategies typically increase the opportunity cost to the drinker, e.g., the cost in time and money to actually obtain alcohol from retail sources.

Retail Monopoly of Alcohol Sales --Studies examining policy movements from state monopolization of alcohol sales to privatization generally find an increase in overall consumption following privatization (Holder & Wagenaar, 1990; Wagenaar & Holder, 1995). Alternatively, elimination of a private profit interest typically facilitates the enforcement of rules against selling to minors or the already intoxicated (Her, Giesbrecht, Room, & Rehm, 1999).

Outlet Density Restrictions--Studies find significant relations between outlet densities and alcohol consumption, violence, drinking and driving, and car crashes (Gruenewald, Johnson, & Treno, 2002). In a study focusing on youth (Treno et al., 2003) found that outlet density was positively related to frequency of driving after drinking and riding with drinking drivers among 16 to 20-year-olds. Outlet density surrounding college campuses has also been found to correlate with heavy drinking, frequent drinking, and drinking-related problems among students (Weitzman et al., 2003).

Restrictions on Hours and Days of Alcohol Sales--Quite a large number of studies have indicated that changing either hours or days of alcohol sale can affect alcohol-related crashes and other violent events related to alcohol take place (e.g., Smith, 1988; Ligon & Thyer, 1993). In general, greater restrictions have been associated with decreases in drinking and drinking related problems.

Responsible Beverage Service (RBS) - The focus of RBS programs is to prevent alcohol service to minors and intoxicated patrons and to intervene so that intoxicated patrons do not drive. Efforts to promote RBS consist of the implementation of a combination of outlet policies and training in their implementation. RBS has been found to reduce the number of intoxicated patrons leaving a bar, car crashes, sales to intoxicated patrons, sales to minors, and incidents of violence surrounding outlets (e.g., Wallin,

Norstrom, & Andreasson, 2003). Voluntary programs appear to be less effective than mandatory programs or programs using incentives such as reduced liability.

Compliance of Off-Premise Outlets - Off-premise outlets are important sources of alcohol for underage persons (Harrison, Fulkerson, & Park, 2000; Preusser, Ferguson, Williams, & Farmer, 1995; Schwartz, Farrow, Banks, & Giesel, 1998; Wagenaar et al., 1996). In some cases, these outlets actually benefit economically from sales of alcohol to youth. Purchase surveys show that anywhere from 30% to 90% of outlets sell to underage buyers, depending upon geographical location (e.g., Forster et al., 1994; Forster, Murray, Wolfson, & Wagenaar, 1995; Preusser & Williams, 1992; Grube, 1997b). Voluntary clerk and manager training in off license establishments appear to have a negligible effect on sales to minors without visible and consistent enforcement.

Communities Mobilizing for Change on Alcohol (CMCA) was designed to bring about change in policies regarding access to alcohol by those under 21. CMCA was evaluated in a randomized trial in which 15 Minnesota and Wisconsin communities were randomly assigned to receive or not receive the program. The CMCA communities had lower levels of sales of alcohol to minors in their retail outlets ($p < .05$) and had marginally lower sales to minors at bars and restaurants ($p < .08$). Arrests of 18 to 20 year olds for driving under the influence of alcohol declined significantly more in CMCA communities than in control communities (Wagenaar, Murray, & Toomey, 2000b). The difference for 15 to 17 year olds approached significance. However, the prevalence of heavy drinking among 18 – 20 year olds was not affected, and, there were no significant effects on the drinking behavior of 12th graders (surveyed in school).

The Community Trials Project - Holder & Treno (1997) tested a five-component community intervention to reduce alcohol-related harm among people of all ages. It sought to reduce the primary sources of acute injury and harm related to alcohol: drunken-driving injuries and fatalities, injuries and deaths related to violence, and drownings, burns and falls. The effects of the program were evaluated by comparing three communities that received the intervention with matched comparison communities. The Community Trials fielded five intervention components: (1) a "Media and Mobilization" component (2) a "Responsible Beverage Service" component (3) a "Sales to Youth" component to reduce underage access; (4) a

"Drinking And Driving" component to increase local enforcement of driving while intoxicated laws; and (5) an "Access" component to reduce the availability of alcohol. Each of these interventions was shown to affect its target in the communities in which it was implemented.

Of particular interest is the *Underage Drinking Component* (Grube, 1997b), which comprised three intervention strategies: enforcement of underage sales laws, off-premise retail clerk training and policy development for off-premise establishments, and media advocacy. Increased underage sales enforcement activities were implemented by the local police in each community. On posttest, experimental community outlets were about half as likely to sell alcohol to an apparent minor as those in comparison sites. Thus, not only was it possible to enlist local law enforcement to increase enforcement of underage sales laws, but these increased enforcement activities led to significant declines in sales to minors. This was the joint result of special training of clerks and managers to conduct age identification checks, the development of effective off-premise outlet policies, and, especially, the threat of enforcement of laws against sales to minors (Grube, 1997b).

Controls on who is Selling Alcohol - Treno, Gruenewald, Alaniz, Freisthler, and Remer (2000, June 24-29) report that among a community-based sample of alcohol establishments, off-premise sales were more likely from younger than older sales people.

Combating Use of False ID to Obtain Alcohol - Obtaining alcohol by using a fake ID is more common in states with weaker underage drinking laws than in states with strong underage drinking laws. A number of suggestions concerning means to reduce the effective use of illegal identification in alcohol sales to minors include universal checking of ID for all alcohol customers, use of two view or hologram photos on a drivers' license, and requiring two or more different ID cards at the point of purchase, and increased enforcement against stores that fail to identify underage customers.

Visible Enforcement

Visible enforcement against sales to underage persons has been shown to be associated with reductions in such sales (Grube [1997b]; Wagenaar, Toomey, and Erickson [2005b, 2005c].) Young drinkers may be particularly adept at identifying outlets that continue to sell to minors despite enforcement efforts or may shift to alternative social sources for alcohol. Dent, Grube, and Biglan (2005) found that stronger enforcement of MIP laws, as indexed by the student's average perceived level of enforcement in the community, was significantly related to lower levels of use and binge drinking. Community level enforcement of MIP laws was a deterrent for individuals' use of commercial sources to drink in school or to drink and drive. It also deterred the use of friends under 21 from binge drinking, use in general, and the use of parent sources for drinking and driving. On the other hand, communities with higher MIP enforcement also tended to have more reliance on taking alcohol from home without permission for binge drinking, use in general, and more frequent use of friends over 21 as a source while driving.

Wagenaar and Toomey (2002) found a significant inverse relationship between the legal age and alcohol consumption. However, the limited degree to which age 21 policies have been implemented is also shown in several enforcement studies. Such studies have consistently found very low levels of enforcement of the age-21 policy. In general, studies of the effects of increased enforcement, specifically through compliance checks, show it to be a highly effective means to reduce alcohol sales to minors. (Preusser, Williams, & Weinstein, 1994; Lewis et al., 1996; Grube, 1997b). The extent to which visible enforcement of alcohol sales or service to underage persons translates into specific decreases in underage drinking is not as well documented by research studies. However, if lower retail sales to youth are associated with lower consumption, and higher enforcement is associated with lower youth sales, then the association of level of enforcement to youth drinking can be inferred.

Measurement

Indicator	Source
Enforcement of Youth Access Sales Laws	Dept. of Revenue or Local Law Enforcement – Compliance Checks
Enforcement of Laws Prohibiting Third-Party Provision of Alcohol to	“Shoulder Tap” program data

Minors	
Party Patrol Results	Local Law Enforcement
Perceived Enforcement of Underage Drinking Laws	Youth focus group or survey

Enforcement of Youth Access/Alcohol Sales Laws - Compliance checks involve the use of underage buyers working as confederates of law enforcement agents to test alcohol retailers' practices concerning alcohol sales to minors.

Enforcement of Laws Prohibiting Third-Party Provision of Alcohol to Minors - Shoulder tap programs utilize underage adolescents who, working as confederates of local law enforcement, invite adults outside retail outlets to buy alcohol for them, in return for a financial incentive or an offer to share with them some of the alcohol purchased.

Party Patrols Results - Party patrols use law enforcement officers to (a) enforce laws prohibiting adult provision of alcohol to minors and underage drinking at private parties and (b) disrupt one of the highest risk settings for alcohol availability and misuse, i.e., private drinking parties by conducting weekend patrols of areas known to be regular drinking locations. Party patrols increase law enforcement's responsiveness to reports of teenage drinking parties by community members.

Youth Surveys: Perceived Enforcement of Underage Drinking Laws - In addition to actual enforcement efforts, youths' perceptions of the risks of detection and punishment for alcohol violations may be measured. Assessments may be obtained of the perceived likelihood of (a) police breaking up a party where youth are drinking, (b) getting caught by police at a party where youth are drinking, (c) getting caught by police when trying to purchase alcohol, and (d) having ID checked when trying to purchase alcohol. Source: Youth focus group or survey.

Strategies

Enforcement of Youth Access/Alcohol Sales Laws - Dent, Grube, and Biglan (2005) concluded that communities with high levels of enforcement of minimum age of drinking tended to have lower community levels of binge drinking and drinking in general. These effects are consistent with the notion that perceived negative consequences (being caught by the police), if broad and severe enough, could be a deterrent to behavior.

Compliance Checks - Compliance checks are the systematic checking by law enforcement of whether a licensed establishment actually sells alcohol to underage persons or “underage looking persons”. Studies indicate regular compliance checks substantially reduce illegal alcohol sales (Grube, 1997b; Preusser et al., 1994). However, these checks primarily affect the specific establishments targeted with limited diffusion, and any effects on sales may decay relatively quickly (Wagenaar et al., 2005b, 2005c).

Random Breath Testing - Random Breath Testing (RBT) involves extensive and continuous random stops of drivers who are required to take a breath test to establish their blood alcohol level. RBTs have been shown to reduce car crashes (Homel, 1986, 1990; Mercer, 1985; Ross, 1988a , 1988b).

Sobriety Checkpoints - A limited version of RBT, sobriety checkpoints, are often implemented in individual U.S. states under proscribed circumstances often involving pre-notification about when and where they will be implemented. Even under these restricted circumstances there is some evidence that they reduce drinking and driving and related traffic crashes (Lacey, Jones, & Smith, 1999). Surprisingly, the degree of success of the programs was the same regardless of low or high staffing levels or whether mobile units or stationary checkpoints were used. Public awareness and publicity, however, were identified as important mediators of effectiveness. No studies have evaluated the effects of these strategies on youth drinking and driving but there is no reason to believe that this age group of drinking drivers would not be affected by such policies.

Per se Laws - Per se laws specify the blood-alcohol level or concentration at which a driver is considered legally impaired, (i.e., the level at which a driver can be arrested and charged with drinking and driving). Reductions in the allowable levels of driver impairment have been associated with reduced crash levels (Liben, Vingilis, & Blefgen, 1987; Ross, 1982; Zador et al., 1989).

Administrative License Revocation - Laws permitting the withdrawal of driving privileges without court action have been adopted by 38 states to prevent traffic crashes caused by unsafe driving practices, including driving with a BAC over the legal limit (Hingson et al., 1996). These laws were associated with a 5%-9% decline in nighttime fatal crashes in some studies

(Hingson, 1993; Zador et al., 1989). License revocation is one type of punishment that has been shown to be effective in reducing repeated incidents of drinking and driving and as a major deterrent to youthful drinkers who drive (Ross & Gilliland, 1991). This strategy is considered to be especially relevant to youth since the possession of a driving permit is a high status and valuable possession for young people.

Graduated Licenses - Graduated licensing places special limits on new or young drivers. For example it restricts nighttime driving and/or prohibits driving with other adolescents. Graduated licensing can decrease crash involvement among the youngest drivers (Ulmer, Ferguson, Williams, & Preusser, 2000).

Automobile Ignition Interlock Devices - Automobile ignition interlocks are devices that prevent drivers from starting their cars if their blood alcohol level is above a preset limit. This device has been discussed as a potential means to reduce all drinking and driving but has been used in the United States primarily as a means to prevent a multiple drinking and driving offender from starting his/her auto after drinking (Voas, 1988).

Punishment and Sanctions - For several reasons, law enforcement officials generally believe that fines are not an effective deterrent to underage drinking. First, parents often pay these nominal fines for the youth (Wolfson, Wagenaar, & Hornseth, 1995). Second, many teens are employed, so a \$50 fine, for example, may be a relatively small amount of money to them (American Savings Education Council, 1999; Teenage Research Unlimited, 2001, January 25). Finally, many fines go uncollected and there is often no mechanism to collect on the debts. Unfortunately, empirical evidence regarding the effectiveness of fines in deterring underage drinking is lacking (Grube & Nygaard, 2005).

Community service is widely viewed as an effective sanction to impose on youth. Unfortunately, there is little direct evidence on the effectiveness of community service as a deterrent to underage drinking (NHTSA & NIAAA, 1999, September), and many communities lack the resources to manage the community placements (Canadian Cancer Society, 2001, September).

An increasingly common response by legislatures is to suspend or revoke an offender's driver's license (NHTSA & NIAAA, 1999, September). Some states have expanded the grounds for which driver's licenses may be

suspended or revoked to encompass underage drinking offenses that do not involve the operation of a motor vehicle (Alcohol Policy Information System (APIS), 2007). Law enforcement personnel strongly believe that the possibility of license revocation is an effective deterrent because a driver's license is important to most youth. There is some concern, however, that because the threat of detection of driving without a license is so low, youth will simply drive without a license (Canadian Cancer Society, 2001, September). However, this has not been empirically demonstrated nor has the belief that license revocation is an effective deterrent to underage drinking in general.

Another available sanction is required attendance at an alcohol educational program (PIRE, 1999). These classes are designed to deal with alcohol-related issues and to inform youth of the consequences of their behavior (NHTSA & NIAAA, 1999, September). However, it is doubtful whether education alone will be an effective deterrent (e.g., Gottfredson, 1997).

Some state laws require that law enforcement and schools collaborate in responding to underage drinking cases (Pacific Institute for Research and Evaluation, 1989). The impact of this type of collaboration has not been evaluated. However, it is arguable that such an approach provides greater monitoring of the offender and therefore may help to change behavior.

Case dispositions may include commitment to a residential facility (e.g., training schools, camps, ranches) for delinquents or status offenders (NHTSA & NIAAA, 1999, September; OJJDP, 2002). The deterrent effect of this is unknown.

Incarceration is the most severe form of sanction and appears to be used far less frequently for underage drinking offenses than other sanctions. Unfortunately, as is true of underage drinking sanctions in general, there are no data available on the impact of incarceration on underage drinking, including whether youth are aware that this is a possible sanction and, if they are aware, whether its availability deters this behavior (Yu, 2000).

Teen courts utilize a number of sanctions including future participation as a teen court juror, in-house detention, writing a letter of apology or an extensive essay, and sanctions targeting the parent(s) of the youth (Johnson & Rosman, 1997). Additional sanctions typically used by JDCs include imposition of or an increase in curfew conditions, an increase in

frequency of court contacts, intensive probation, a lecture from the court, a loss of sobriety time, home detention, and a change of school placement (National Council of Juvenile and Family Court Judges, 2001). Teen courts often focus on providing incentives, such as gifts or praise, for positive behavior change. However, the effectiveness of these individual sanctions and incentives have not been evaluated.

Compliance appears to be critical for enhancing the deterrent effects of sanctions. In juvenile court, compliance with sanctions is usually monitored by the probation department. Probation places youth under informal or formal supervision and provides a mechanism for ensuring that these sanctions are satisfied. It can also provide a means to monitor the behavior of the youth and to ensure a swift reengagement with the courts should the youth violate probation. The effectiveness of probation to deter underage drinking has not been studied (Grube & Nygaard, 2005).

The National Highway Traffic Safety Administration (NHTSA, 1997) recommends parental notification as a response to underage drinking. This approach has been recommended because it is believed to engage parents in addressing the problem by allowing them to handle it with disciplinary means that they have found effective, rather than interjecting the courts into a family environment. No evaluations of this approach have been conducted.

Social Availability of Alcohol to Youth

Research indicates that parties, friends, and adult purchasers are the most common sources of alcohol among adolescents (Harrison et al., 2000; Preusser et al., 1995; Schwartz et al., 1998). Wagenaar et al. (1996) found that parties, where older adolescents or young adults introduce their younger peers to drinking, constitute the major source of alcohol for high school students and commercial outlets were the second most important source of alcohol. In the same study 70% of 8th grader drinkers and 73% of 11th grader drinkers reported using social sources, predominately adult and underage friends. These sources include parents, parents of friends, friends, acquaintances, co-workers, siblings, and even strangers.

"Shoulder-tapping" occurs when an underage person approaches a stranger outside of an alcohol establishment and asks this person to purchase alcohol for him or her. A recent study (Toomey, Fabian, Erickson, & Lenk, 2007) found that 19% of young males over the age of 21 were willing to purchase alcohol for youth who appeared to be underage when "shoulder-tapped" outside of a convenience or liquor store. In contrast, only 8% of the general adult population entering alcohol establishments was willing to purchase the alcohol. The study also found that adults approached at a city convenience or liquor store rather than one located in a suburb were nine times more likely to make the purchase.

A major opportunity that underage drinkers use to gain access to alcohol is at parties. In one study, 32% of 6th graders, 56% of 9th graders, and 60% of 12th graders reported obtaining alcohol at parties (Harrison et al., 2000). Underage drinking parties frequently involve large groups and are commonly held in a home, an outdoor area, or other location such as a hotel room. Further focus groups have also indicated that underage youth typically procure alcohol from commercial sources and adults, or at parties where parents and other adults are not present (Jones-Webb et al., 1997a; Wagenaar et al., 1993). Beer is the primary beverage of choice of the underage and a major source of beer is at social events where beer is available via a keg (Erickson, Toomey, & Wagenaar, 2001). In this case there is an enhanced effect of social context, party, and low cost per drink of alcohol.

Given the fact that young people use multiple sources for alcohol, social availability is a significant means for underage youth to obtain access to alcohol beyond commercial access.

Measurement

Indicator	Source
Youth Perceived Ease of Obtaining Alcohol	HKCS Middle School question 57; HKCS High School question 60
Parental Attitudes Toward Providing Alcohol to Youth	Parent focus group or survey
Presence of Social Host Liability Law	Alcohol Policy Information System (APIS) – http://www.alcoholpolicy.niaaa.nih.gov/
Enforcement of Laws Prohibiting Third-Party Provision of Alcohol to Minors	“Shoulder Tap” program data
Party Patrol Results	Local Law Enforcement
Frequency of Getting Alcohol from Various Sources in the Past 30 Days	Youth focus group or survey

Strategies

Curfews for Youth - Curfews establish a time when children and young people below certain ages must be home. While this policy was not initially considered an alcohol-problem prevention strategy, research has shown positive effects. The strategy reduces the availability of alcohol to youth through social sources and reduces the convenience of obtaining alcohol at gatherings of youth. In those states that established such curfews, alcohol-involved traffic crashes for young people below the curfew age have declined (Preusser, Williams, Zador, & Blomberg, 1984; Williams, Lund, & Preusser, 1984).

Enacting Social Host Liability Laws - Social Host Liability laws as applied to underage drinking allow for criminal prosecution of the host who provides alcohol to those under 21 years of age and/or allow the use of alcohol by those under 21 while on property owned or controlled by the host. The purpose of this type of law is to discourage the provision of alcohol to underage persons. There is very little research on the effectiveness of social host liability laws and what evidence exists is conflicting. The conflicting findings may reflect the lack of a comprehensive program that insures that social hosts are aware of their potential liability. Although social host liability may send a powerful message, that message must be effectively disseminated before it can have a deterrent effect.

Restricting Access to Alcohol at Social Events - This strategy involves restricting the flow of alcohol at parties and other events on and off college campuses to reduce overall social availability of alcohol. Policies for preventing underage access to alcohol at parties can also be used to decrease the amount of drinking among older students. Overlapping community policies include banning beer kegs and prohibiting home deliveries of large quantities of alcohol. Overlapping policies for campus events include limiting the quantity of alcohol per person and monitoring or serving alcohol rather than allowing self-service. At one fraternity party, Geller and Kalsher (1990) found that attendees who obtained beer through self-service consumed more beer than those who got alcohol from a bartender. Event and party planners could also be required to serve food and offer a large selection of alcohol-free beverages. Another strategy is to serve low-alcohol content beverages (see below).

Reducing Social and Third Party Access to Alcohol - As described previously a substantial portion of alcohol obtained by underage persons is

from social sources. The study by Toomey et al. (2007) concerning the willingness of males of legal purchase age to obtain alcohol for underage persons confirms that efforts to limit alcohol access from these sources most likely remains a significant challenge for youth drinking prevention.

The Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice, has created a guide for reducing alcohol access by youth (OJJDP, 1999). The highest priorities recommended by OJJDP is a compendium of environmental strategies including "shoulder taps" and Compliance Checks (described previously). The utilization of strategies addressing shoulder taps is a potentially promising strategy to reduce third party sources of alcohol to minors.

Party Patrols - Party patrols involve police entering locations where parties are in progress. Parties are frequently cited as one of the settings at highest risk for youth alcohol consumption and related problems, and have been linked to impaired driving, sexual assaults, violence, property damage, and to the initiation of alcohol use of younger adolescents by older adolescents (Mayer, Forster, Murray, & Wagenaar, 1998; Schwartz & Little, 1997; Wagenaar et al., 1993). The police can use noise or nuisance ordinances as a basis for entering a party to observe if underage drinking is taking place. In party patrol strategies, police are enlisted, as a part of their regular patrol duties, to routinely: (a) enter premises where parties that may involve underage drinking are underway, (b) respond to complaints from the public about noisy teenage parties where alcohol use is suspected, and (c) check, as part of regular weekend patrols, open areas and other venues where teen parties are known to occur. When underage drinking is discovered, the drinkers can be cited as well as the person who supplied the alcohol. Even when it is not possible to cite the person who supplied the alcohol, awareness of increased police activity in this regard can act as a deterrent and can express community norms regarding the unacceptability of providing alcohol to minors. As with other environmental interventions, public awareness and media attention is important to increase the deterrence effect of this strategy. There is some evidence that this technique is effective. Without these special patrols law enforcement agencies sometimes do not have enough manpower to thoroughly investigate underage drinking parties. They cannot always trace who provided the alcohol or other drugs to minors.

Keg Registration - Keg registration is seen primarily as a tool for prosecuting adults who supply alcohol to young people at parties and even establishments which rent filler beer kegs to underage persons (Hammond, 1991). Beer kegs are often a main source of alcohol at teenage parties and may encourage drinking greater quantities of beer, increasing the risk of driving under the influence of alcohol and other alcohol-related problems. When police arrive at underage keg parties, people often scatter. Without keg tagging, there is no way to trace who purchased the keg. As a result, beer key registration is one strategy directed at social events where beer can be provided without restrictions. Keg registration laws require the purchaser of a keg of beer to complete a form that links their name to a number on the keg. In this way, if a beer keg is present in a drinking setting where young people are consuming alcohol, then the person who purchased the keg can be identified and held responsible.

Keg registration laws are associated with a significant decrease in traffic fatalities. However, there are no controlled longitudinal studies of the passage of a beer keg registration and its specific effects on alcohol-involved traffic crashes by underage persons or other alcohol problems.

Restrictions on Drinking Locations and Possession of Alcohol - Specifying locations where drinking cannot occur is a policy that has been implemented with laws about public drinking and/or public intoxication, as well as those prohibiting drinking in parks or recreational locations, or at the workplace. These restrictions have real potential for affecting the drinking of youth since youth often prefer recreational venues for drinking, and limiting drinking in such locations also holds the potential for reducing social access of alcohol provided by others. These policies have been employed in a number of forms throughout the world, but have not been systematically evaluated for the specific effects on access to alcohol by underage persons.

Social Norms

Family Influence

Many studies examining environmental factors related to youth drinking have focused on peer and parental influence (Baumrind, 1985, 1991; Brook, Brook, Gordon, Whiteman, & Cohen, 1990; Chassin, Pillow, Curran, Molina, & Barrera, 1993; Downs, 1987; Dishion & Loeber, 1985). These studies have shown that parents and peers influence youth drinking even after controlling for numerous individual-level characteristics.

Studies of family-focused interventions designed to improve parenting practices (e.g., communicate clear norms against substance use, proactively manage families, reduce family conflict, etc.) have shown positive outcomes in terms of substance use and specifically youth alcohol consumption, which suggests that family process factors have relevance to youth drinking. Compared to control group participants, youth in family intervention groups have reported lower levels of initiation of substance use both in middle school and high school (Bauman et al., 2002; Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002; Park et al., 2000; Spoth, Lopez Reyes, Redmond, & Shin, 1999a; Spoth, Redmond, & Lepper, 1999b; Spoth, Redmond, & Shin, 2001; Spoth, Redmond, Trudeau, & Shin, 2002).

Parental monitoring and supervision are critical for drug abuse prevention. These skills can be enhanced with training on rule-setting; techniques for monitoring activities; praise for appropriate behavior; and moderate, consistent discipline that enforces defined family rules (Kosterman, Hawkins, Haggerty, Spoth, & Redmond, 2001). Drug education and information for parents or caregivers reinforces what children are learning about the harmful effects of drugs and opens opportunities for family discussions about the abuse of legal and illegal substances (Bauman et al., 2001). Brief, family-focused interventions for the general population can positively change specific parenting behavior that can reduce later risks of drug abuse (Spoth et al., 2002). Family-based prevention programs should enhance family bonding and relationships and include parenting skills; practice in developing, discussing, and enforcing family policies on substance abuse; and training in drug education and information (Ashery, Robertson, & Kumpfer, 1998).

Measurement

Indicator	Source
Parent Norms	Parent survey
Family Management	Parent survey; Youth survey

Park et al. (2000) provide measures for various parenting constructs/family influences including parents' norms, family management, and family conflict.

Parents' Norms - sixteen parents items and one child self-report item were combined for a measure of parents' norms against substance use (e.g., How wrong would it be for children who are the same age as your child to drink alcohol?).

Family Management - eighteen parent and three child self-report items were combined for a measure of proactive family management. Items assessed parents' vigilance in the monitoring of their child (e.g., In the course of a day, how often do you know where this child is?), parents' consistent discipline practices (e.g., How often do you discipline this child for something at one time, and then at other times not discipline him or her for the same thing?), and establishment of clear family rules (e.g., The rules in my family are clear).

Strategies

Family Education Programs - Family programs are designed to affect the specific families and thus children who participate in the program. They are not designed to change the behavior of children separate from the whole family. Family programs attempt to help parents improve their skills to explicitly establish family norms for behavior; manage their families with clear communication, monitor and enforce family norms, and manage and reduce family conflict. Several family-based programs have been effective in delaying initiation to alcohol use and reducing quantity-frequency of drinking among youth, including the Adolescent Transition Program (Dishion et al., 2002), Strengthening Families Program (Spoth et al., 1999a, 1999b, 2001; Spoth & Redmond, 2002), and Preparing for the Drug Free Years (Park et al., 2000). The Preparing for the Drug Free Years program significantly reduced the growth of alcohol use and improved parent norms regarding adolescent alcohol use over time. The Strengthening Families Program demonstrated a significantly lower rate of increase in alcohol initiation through the 10th-grade follow-up assessment for students in the

program, relative to those in the control group (Spath et al., 2001). Such programs may also reinforce and increase the effectiveness of other interventions. Youth in the Strengthening Families Program + Life Skills Training intervention reported lower initiation of alcohol use than adolescents in either the control or Life Skills Training -only groups (Spath et al., 2002). The practical question for such intensive family training is whether the level of youth reported reduction in “any drinking” and “binge or high volume drinking” is practically significant to justify an investment in the program.

School Influence

Many studies have shown that school bonding is related to alcohol use. Generally, closer bonding to school and greater connectedness to school are associated with lower levels of alcohol use at the individual level (e.g., Bond et al., 2007; Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Hawkins et al., 1997; Henry, Swaim, & Slater, 2005). A recent study showed that regardless of a student's own level of school attachment, students who attend schools where the pupils overall tend to be well attached to school are less likely to use alcohol (Henry & Slater, 2007). In addition, they also have lower intentions to use alcohol, perceive that fewer of their peers at school use alcohol, and more strongly hold aspirations that are inconsistent with alcohol use. It should be noted that all of this research addressed school influence based upon individual self-report, not population level effects.

Measurement

Indicator	Source
School Bonding	HKCS School Domain Risk & Protective Factors – Opportunities for Prosocial Involvement; Rewards for Prosocial Involvement; Low Commitment
School Rules & Policies	Content analysis of school policy or interviews with school administrators

Perceived attachment or bonding to school has been a primary variable used to describe potential for school influence. It has been measured with survey items that ask about liking of school, importance of doing well in school, participation in school activities, aspirations, and grades. Scales based on these items have good internal consistency and are known to

correlate moderately and negatively with adolescent drinking, smoking, and drug use. Perceptions of the school context, norms, and atmosphere can also be measured through survey items aggregated to the school-level. Rules and policies can be measured directly through content analyses or surveys of principals and school administrators.

Strategies

School Policies and Violations - School policies are formal regulations which provide for sanctions against youth for the possession of alcohol on school property. Many schools are adopting zero-tolerance policies. These policies mandate predetermined consequences or punishments for specific serious student infractions. A large majority (87 percent) of public schools report having zero-tolerance policies for alcohol violations (Heaviside, Rowand, Williams, & Farris, 1998, March). Such policies are popular among schools such that nearly half of elementary, middle/junior high, and senior high schools in the U.S. have explicit policies prohibiting alcohol use on campus and at school functions and, in some cases, any possession of alcohol by students (Modzeleski, Small, & Kann, 1999). When alcohol policies are violated, a common response is suspension or expulsion, a response that may be dictated by state law (see, e.g., HAW. REV. STAT. § 302A-1134.6 [2002]). Gottfredson and colleagues (2000) conducted a national survey of school principals, which among other things asked about principals' responses to undesirable behavior. Gary Gottfredson, (Gottfredson Associates, Inc., personal communication, October 9, 2002) calculated the rates of suspension and expulsion exclusively for alcohol infractions and found some consistency across grade levels. According to elementary school principals surveyed, for alcohol policy violations, 65.4 percent of the principals reported that their students are automatically suspended or expelled, while 24.2 percent of the principals said their students receive a hearing, but this hearing usually results in suspension or expulsion. For middle schools, 74 percent of the principals said that when alcohol policy violations occur, students violating the policies are automatically suspended or expelled, and another 23 percent of the principals said their students are usually suspended or expelled after a hearing. Finally, for high school, 67.5 percent of the principals surveyed said students violating alcohol policies are automatically suspended or expelled, and another 24 percent are usually suspended or expelled after a hearing for an alcohol policy violation. Thus, suspension or expulsion is the dominant response to alcohol violations regardless of grade level.

Alcohol Policies at Universities - Universities have similar policies prohibiting alcohol in school facilities, prohibiting use by underage students, or restricting alcohol advertising on campus (Wechsler, Kuo, Lee, & Dowdall, 2000). Grimes and Swisher (1989) found that students report such policies are barriers to drinking, but there are few controlled evaluations of such policies. Odo, McQuiller, and Stretsky (1999) in a study of newly enacted policy that prohibited alcohol in all university affiliated living residences (i.e., dorms, fraternities, sororities) found that such policies were associated with reduced prevalence of drinking in the affected residences, but not with the frequency of heavy drinking. A case study of a campus prohibition on underage drinking or possession of alcohol, public consumption, and use of kegs reported positive findings; however, because it lacked a control or comparison condition, it is not possible to accept the findings unconditionally (Cohen & Rogers, 1997). These studies provide promising but incomplete evidence of the potential for such administrative policies to reduce underage drinking.

Peer Influence

Many studies have addressed the relations between perceived peer drinking, peer approval of drinking and alcohol consumption (Baumrind, 1985, 1991; Brook et al., 1990; Chassin et al., 1993; Downs, 1987; Dishion & Loeber, 1985). These studies routinely have shown that young people who report (perceive) more peer drinking and peer approval of drinking are more likely to drink and drink heavily and frequently, even after controlling for numerous individual-level characteristics. Many fewer studies have investigated the relations between actual peer behavior and beliefs and drinking among young people. As has been noted, youth may over-estimate drinking and approval of drinking among peers and this may, in itself, be a risk factor.

Measurement

Indicator	Source
Perceived Peer drinking	HKCS Middle School question 61; HKCS High School question 64; HKCS Peer/Individual Domain Risk Factor – Peer Use of ATOD

Measures of peer drinking and approval of drinking can be obtained through surveys. These measures can be either aggregated at the level of school or community or considered at the individual level.

Strategies

Life Skills Training – Life Skills Training (LST) is a universal preventive intervention program based on social/cognitive learning theory (Bandura, 1977, 1986, 1997) and problem behavior theory (Jessor & Jessor, 1977). The primary goals of LST are to promote skill development (such as social resistance, self-management, and general social skills) and to provide a knowledge base concerning substance use. These skills moderate or reduce susceptibility to social influences (Epstein & Botvin, 2002; Epstein, Zhou, Bang, & Botvin, 2007). Skill development is accomplished through five curriculum components:

- *Cognitive Component* - designed to present information concerning the consequences, prevalence rates, and social acceptability of substance use;
- *Self-Improvement Component* - related to self-image improvement;
- *Decision-Making Component* - containing decision-making strategies;
- *Coping with Anxiety Component* - designed to recognize anxiety-inducing situations and to rehearse strategies to cope with anxiety; and
- *Social Skills Training Component* - including communication, overcoming shyness, boy–girl relationships, assertive skills, and substance use resistance skills (Botvin, 2000; Botvin & Griffin, 2002; Botvin & Kantor, 2000).

The LST intervention has shown positive effects among urban and minority populations (Botvin, Griffin, Diaz, & Ifill-Williams, 2001) and in a rural Midwestern population (Spoth et al., 2002). There were strong positive correlations between initial levels of expectancies and refusal intentions; there also were strong negative correlations between initial levels of expectancies and refusal intentions and substance initiation. Other studies have shown significant reductions in both drug and polydrug use for groups that received the LST program relative to controls, with up to 44% fewer drug users and 66% fewer polydrug (tobacco, alcohol, and marijuana) users in those groups (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995). Rates of binge drinking were compared among youth who received the program beginning in the 7th grade and a control group that did not. The prevention program reduced the prevalence of binge drinking by as much as 50% at the 1-year and 2-year follow-up assessments. There were also

significant positive effects on drinking knowledge, pro-drinking attitudes, and peer drinking norms (Botvin et al., 2001).

Community Norms about Youth Drinking

In an early empirical study, Larson and Abu-Baban (1968) found that consumption increases or decreases depending on the extent of norms proscribing drinking or consumption limits. In general, where drinking is more accepted it is natural to assume that drinking (in general) will be more widespread and average consumption is higher. The acceptability of drinking also has an important influence on drinking pattern. For example, the more prominent drinking is in a community, the lower the abstinence rates are likely to be. While underage drinking is certainly influenced by general community norms, there is limited research on the specific empirical relationship of overall community norms about drinking in general and to the level of underage drinking. Thus it is reasonable to think about community norms in two parts: (a) general acceptability of drinking and (b) the specific acceptability (or concern) about underage or youth drinking. Most surveys of public opinion find high concern about underage drinking and thus support for underage drinking laws (Wagenaar et al., 2000a). It is not clear from empirical research exactly how community norms from the general population about drinking specifically affect underage drinking. That is, are changes in the general acceptability of drinking in a community also related to reduced acceptability of underage drinking?

It is the second aspect of community norms which may be of most import to underage drinking and that is using community concern about underage drinking as a foundation for support of strategies designed to reduce underage drinking. Such support has been frequently noted as a key ingredient of effective community underage drinking prevention. See Wagenaar et al. (2000a) and Holder and Treno (1997).

Measurement

Indicator	Source
Students' Perceived Level of Alcohol Use by Adults	Youth focus group or survey
Youth Perceived Approval/Disapproval of Teen Alcohol Use by Adults	HKCS Middle School question 62; HKCS High School question 65; Youth focus group or survey
Youth perceptions of how wrong adults in	Youth focus group or survey

neighborhood think it is for young people to drink	
Youth perceptions of how wrong adults in neighborhood think it is for young people to get drunk	Youth focus group or survey

Community norms can be measured in a variety of ways:

- Youth perceived level of alcohol use by adults they know other than own parents
- Youth perceived approval/disapproval of teen alcohol use by adults they know
- Youth perceptions of how wrong adults in neighborhood think it is for young people to drink
- Youth perceptions of how wrong adults in neighborhood think it is for young people to get drunk

Strategies

Strategies directed at community norms and prevention of underage drinking have primarily been directed at public support of actions to reduce access of alcohol to youth and thus reductions in underage drinking. There are no examples of strategies which have attempted to change the general acceptability of drinking across all ages as a means to reduce underage drinking specifically. Thus, it is proposed that community norms regarding underage drinking will, in part, affect the extent to which underage drinking and possession laws and laws regarding provision of alcohol to minors will be implemented and enforced. An evaluation of the Reducing Underage Drinking through coalitions (RUD) project funded ten states for 8 years to form coalitions designed to change the policy and normative environment regarding youth access to alcohol (Wagenaar, Erickson, Harwood, & O'Malley, 2006). Measures included print news media coverage, legislative bills enacted, youth drinking behavior, and youth alcohol-related driving behaviors and traffic crash mortality. Significant differences between treatment and comparison states were found for several outcome measures, particularly in the more-proximal outcome domains. Across all outcome domains, the pattern of effects was in the direction of positive effects of the RUD coalitions, although for most individual measures the differences were not statistically significant.

Strategic use of media can play a key role in building community norms around alcohol issues. Results from the Community Trials Project (Holder & Treno, 1997) indicate that:

- Training in media advocacy can increase coverage of news events generated by local community members including volunteers
- Increased news coverage can be generated for both electronic (television) and print media
- Increased news coverage did focus public attention on specific issues in support of prevention components
- While there are differential audiences/readers for the print (newspaper) and electronic (TV) media, both audiences are affected
- Media advocacy can be more effective than a paid public information campaign in increasing public awareness of alcohol issues

Community participation and mobilization are important complements to formal enforcement efforts because inadequate community support for such interventions may serve to reduce resources dedicated to enforcement (Wagenaar & Wolfson, 1994, 1995). Lewis et al. (1996) found that enforcement implemented through a community coalition could be just as effective in reducing youth access to alcohol as more traditional enforcement mechanisms. In their study, liquor stores under citizens' surveillance showed a reduction in underage sales, from 83% to 33%, compared to a decrease from 45% to 36% in control sites.

Price

It has been estimated that increasing taxation on alcohol in the US to keep pace with inflation would lead to a 19% reduction in heavy drinking by youth and a 6% reduction in high risk drinking. It has been specifically estimated that increasing the price of beer, often the preferred beverage of youth, to keep pace with inflation would reduce youth drinking by 9% and heavy drinking by 20% (Laixuthai & Chaloupka, 1993). In contrast to these studies, however, recent research has found no evidence for the effects of taxation and price on alcohol consumption and alcohol-related traffic fatalities, either among youth or in the general population (Dee, 1999; Young & Likens, 2000). Although taxation and price increases may be effective prevention strategies in some cases, price elasticities are moderated by social, environmental, and economic factors. As a result, the price sensitivity of alcohol may vary considerably across time, states, and countries, depending on drinking patterns and attitudes and on the presence of other alcohol policies. Increasing alcohol costs would reduce both violent and nonviolent crime, including damaging property, getting into fights, being a perpetrator of sexual assault, and abusing a child (Grossman & Markowitz, 2001; Markowitz, 2000; Markowitz & Grossman, 2000). Ohsfeldt and Morrissey (1997) found that a \$0.25 increase in beer taxes would reduce work-loss days from nonfatal injuries by 4.6 million, at an estimated savings in lost productivity by \$491 million.

More recent studies suggest that the relations between taxes on alcohol and alcohol consumption and problems may have weakened in recent years in the US, possibly because of the implementation of the age 21 minimum legal drinking age and other alcohol policies (Young & Likens, 2000). It recently has been suggested that people respond primarily to changes in the full price of alcohol, including opportunity costs (Trollidal & Ponicki, 2005). As a result, the demand for alcohol should be less sensitive to changes in price where regulation is stricter. It was concluded that communities with relatively strong existing policies might expect smaller impacts on alcohol-related problems to result from the implementation of new policies than suggested by prior research, whereas communities with weak policies might expect larger benefits. In addition, although tax increases may serve as a means to raise the cost of alcohol, consumers may find means to circumvent such increases. They may switch to cheaper forms of alcohol or to cheaper brands (Treno, Gruenewald, Wood, & Ponicki, 2006).

Measurement

Indicator	Source
Pricing of Alcohol	Intervening Variable Toolkit #2 and #3
Level of Taxation of Alcohol	The Tax Foundation http://www.taxfoundation.org/news/show/245.html

Price elasticity refers to the percent change in consumption expected for a unit change in price. Although price is affected by other considerations as well, it most easily indexed to or measured as level of taxation (Young & Bielinska-Kwapisz, 2003).

Strategies

Restrictions on Discount Pricing and Promotions - Several types of policies affect price of alcohol. One type of policy is restrictions on happy hours or price promotions (e.g., two drinks for the price of one, women drink for free). Restrictions on happy hours can be implemented by individual outlets, campuses (if a licensed establishment is on campus), local communities (if communities are not preempted by state law) and the State. In non-licensed settings on campus where alcohol is served, event planners may want to limit the amount of free alcohol available.

Increasing Excise Taxes – another policy that affects the price of alcohol. Using national samples of youth, several studies indicate that raising alcohol excise taxes may have large effects in reducing youth drinking. Higher beer taxes are associated with less frequent drinking among 16- to 21-year olds (Coate & Grossman, 1988; Grossman et al., 1994); effects of tax increases are stronger among frequent and fairly frequent drinkers than among infrequent drinkers which lends support to this strategy as a means to reduce higher risk drinking patterns among youth.

Tax increases may influence not only consumption, but also other alcohol-related outcomes, and youth again appear to be more price responsive than adults in terms of these outcomes. For example, increased costs appear to reduce drinking and driving among youth more than among adults (Chaloupka, Saffer, & Grossman, 1993).

Manning, Blumberg, and Moulton (1995) reported that moderate drinkers were most price responsive. They also found that both light and heavy drinkers had nearly the same responsiveness to price. In contrast,

Chaloupka, Grossman, Becker, and Murphy (1992) found that a 10% increase in alcohol price would reduce cirrhosis mortality (i.e., reduce consumption among heavy drinkers) by an estimated 8.3% to 12.8%. Cook and Tauchen (1982) reported that a \$1.00 increase in alcohol would reduce cirrhosis mortality by 5.4% to 10.8%.

Drinking Beliefs

Drinking Beliefs is a general category made up of five individual beliefs about alcohol. These beliefs are Alcohol Attitudes, Alcohol Expectancies, Alcohol Normative Beliefs, Subjective Alcohol Availability, and Refusal/Resistance Efficacy Beliefs.

Alcohol Attitudes - Overall affective evaluations of drinking (e.g., wrong-not wrong; good-bad; pleasant-unpleasant) by an individual. Alcohol attitudes are hypothesized to mediate the effects of alcohol expectancies and normative beliefs on drinking behaviors. Research indicates that drinking increases as attitudes toward alcohol become more favorable.

Alcohol Expectancies - Perceptions of perceived risk and the *perceived personal* likelihood of positive and negative consequences of drinking and heavy drinking. Thus they are the cognitive representations of anticipated rewards and costs associated with drinking behaviors. Studies indicate that more favorable expectancies (lower negative and higher positive) are related to an increase in drinking.

Alcohol Normative Beliefs - Perceptions of the approval or disapproval of drinking by significant others (prescriptive norms) and the extent to which these others drink themselves (descriptive norms). Perception of friends' drinking is a strong predictor of underage drinking and changes in consumption over time. Youth with normative beliefs that are supportive of drinking may place fewer limits on their drinking behavior and take greater risks when drinking than those with more conservative drinking beliefs. Peers may also place direct pressure on some youth to drink or drink heavily or may be sources for alcohol, providing opportunities to drink. Additionally, peers may also reinforce expectations that alcohol makes one attractive, powerful, and mature.

Subjective Alcohol Availability - Perceived ease or difficulty of obtaining alcohol overall and from specific social and commercial sources and to the frequency of use of these sources. Studies considering subjective availability show that as perceived ease of obtaining alcohol increases, quantity and frequency of drinking also increase among adolescents.

Refusal/Resistance Efficacy Beliefs - Perceptions of one's own ability to resist peer pressure to drink and offers to drink. These beliefs also include

perceptions of how easy or difficult it would be to avoid situations in which youth drinking occurs. Research indicates that resistance/refusal efficacy beliefs are negatively correlated with frequency and quantity of alcohol consumption and with risky drinking. That is, the better an adolescent's refusal skills, the less likely s/he is to drink. Moreover, these efficacy beliefs may contribute to drinking independently of expectancies and other beliefs. Thus, drinking refusal self-efficacy may have broader application in understanding drinking behaviors among youth.

Measurement

Drinking Beliefs	Measures
Alcohol Attitudes	Youth survey HKCS Middle School question 60; HKCS High School question 63; Percentage of people ages 12-17 who perceive regular alcohol use as a great risk – ASPIRE; Percentage of people ages 18-25 who perceive regular alcohol use as a great risk – ASPIRE;
Alcohol Expectancies	HKCS Middle School questions 58 & 59; HKCS High School questions 61 & 62
Normative Beliefs	HKCS Middle School questions 61 & 62; HKCS High School questions 64 & 65
Subjective Alcohol Availability	HKCS Middle School question 57; HKCS High School question 60
Refusal/Resistance Efficacy Beliefs	Youth focus group or survey

Alcohol Attitudes: Attitudes Toward Alcohol Use - Typical alcohol attitude items ask young people how wrong they think it is for someone their age to drink beer, wine, or hard liquor or how “good” or “bad” drinking is. Such items show excellent convergent validity and are highly predictive of drinking, heavy drinking, and drinking intentions among youth (e.g., Grube & Morgan, 1990a; Hampson, Andrews, Barckley, & Severson, 2006, Trafimow, Brown, Grace, Thompson, & Sheeran, 2002).

Alcohol Expectancies - Alcohol expectancies are measured with items focusing on perceived personal consequences of drinking. More general items relating to perceived risk ask how much respondents think people risk harming themselves (physically or in other ways) if they drink alcoholic beverages. Specifically, respondents are asked how likely or unlikely they think it is that a series of consequences would happen to them personally if, for example, they were to have 3 or more drinks.

Normative Beliefs - Survey items can include measures of *descriptive* norms (i.e., perceived levels of alcohol use by others) and *prescriptive*

norms (i.e., perceived level of approval or disapproval of alcohol use by others).

Subjective Alcohol Availability - Subjective alcohol availability is measure by an overall perception of how easy or difficult alcohol is to obtain through retail and/or social sources.

Refusal/resistance efficacy beliefs – These beliefs are measure by perceptions of one's own ability to resist drinking, refuse drink offers, and resist direct pressure to drink. The Drinking Refusal Self-Efficacy Questionnaire (Lee & Oei, 1993; Oei, Hasking, & Young, 2005; Young, Hasking, Oei, & Loveday, 2007) measures these beliefs. The Drinking Refusal Self-Efficacy Questionnaire--Revised Adolescent Version (DRSEQ-RA) also designed to assess an individual's belief in their ability to resist drinking alcohol consists of three factors reflecting social pressure refusal self-efficacy, opportunistic refusal self-efficacy and emotional relief refusal self-efficacy.

Strategies

School Educational Approaches Alone - Although some educational programs have been found to be moderately effective in reducing youth drinking or delaying onset of drinking (Donaldson, Piccinin, Graham, & Hansen, 1995; Griffin, Botvin, & Nichols, 2004; Hecht, Graham, & Elek, 2006; Shope, Copeland, Kamp, & Lang, 1999; Taylor, Graham, Cumsille, & Hansen, 2000), others have been found to be less effective. Meta analyses suggest that interactive and peer-lead delivery methods, social influence and life skills models, and programs that focus on norms, commitment not to use, and intentions not to use may be most effective (Cuijpers, 2002). School-based education cannot provide a complete answer to the problem of drinking by young people. In part, this limitation arises because young people are immersed in a broader social context in which alcohol is readily available and glamorized (Mauss, Hopkins, Weisheit, & Kearney, 1988).

School Educational Approaches with Community Elements - Adding community elements to school education may increase the effectiveness of school-based programs (Cuijpers, 2002). Project Northland (Perry et al., 1996), a school educational program which included components targeting sixth graders with family take-home assignments, has led to substantial reductions (19-46%) in alcohol use among younger adolescents in rural Minnesota. Project Northland also included environmental strategies such

as stimulating local policies requiring responsible beverage service (RBS) for on- and off-premise alcohol establishments, and implementing a gold-card system with local merchants to give discounts to students who pledged to remain alcohol- and drug-free (Veblen-Mortenson et al., 1999).

Social Norms Education or Marketing - In addition to school-based education, media and public educational approaches are also used in an attempt to modify alcohol norms beliefs. There is some evidence that media interventions, especially social norms marketing or campaigns, can affect drinking beliefs and behaviors among young people (DeJong et al., 2006). Polonec, Major, and Atwood (2006) found that among college students specifically, the students' immediate group or social network norms are more influential on students' own drinking behavior than are estimates of the campus drinking norm.

Alcohol Promotion

Alcohol portrayals are relatively common on television, in film, and in music and music videos. These portrayals are largely positive or neutral, often associating drinking with positive consequences or desirable attributes. Negative consequences of drinking are rarely portrayed. Survey research studies on alcohol advertising and young people consistently indicate that there are small, but significant, correlations between awareness of and affect toward alcohol advertising and drinking beliefs and behaviors among young people. Children and adolescents who are more aware of and favorably disposed to alcohol advertisements hold more favorable beliefs about drinking, intend to drink more frequently as adults, and drink more frequently and in larger quantities than do other young people. Taken as a whole, the survey studies provide some evidence that alcohol advertising may influence drinking beliefs and behaviors among some children and adolescents.

Each year, the alcohol industry in the United States spends more than a billion dollars on "measured media" advertising, that is, television, radio, print, and outdoor ads. See <http://www.ftc.gov/reports/alcohol/appendixb.htm>. The available evidence indicates that more than 300 wine brands, 350 beer brands, and 1,400 distilled spirits brands are marketed in the U.S., but fewer than a quarter of them are advertised through measured media each year.

While precise figures are not available, special reports to the United States Federal Trade Commission suggest that total expenditures to promote alcohol may be three or more times its expenditures shown in measured media advertising alone. Even for heavily advertised brands, measured media advertising typically accounts for only one third to one half of total promotional expenditures and obviously many alcoholic brands do not use measured media at all. Alternative forms of alcohol promotion beyond purchased mass advertising used by the industry include:

- Sponsorship of cultural, musical, and sporting events;
- Internet advertising;
- Point-of-sale materials, including window and interior displays at retail outlets, bars, and restaurants;
- Distribution of brand-logoed items such as t-shirts, hats, watches, and glassware;
- Product placements in movies and TV shows;
- Catalogs and other direct mail communications;

- Price promotions such as sales, coupons, and rebates; and
- Trade promotions directed at wholesalers and retailers.

Jernigen, Ostroff, and Ross (2005) demonstrated that alcohol companies have placed significant amounts of advertising where youth are more likely to be exposed to it than adults. These data are updated in Center for Alcohol Marketing and Youth (2007) www.camy.org.

Research suggests that there is high recall of alcohol advertising among youth (e.g., Lieberman & Orlandi, 1987). This is not surprising because many advertisements are of high production value and use a combination of fast action, popular music, provocative imagery and humor. Nevertheless, the association between recall of number of advertisements seen on the one hand, and drinking status or behaviors on the other, does not necessarily signify a causal connection.

Kuo, Weschler, Greenberg, and Lee (2003) provided compelling evidence linking price and promotions to problem drinking among college students. Results of a survey of over 10,000 college students and over 2500 vendors showed that low price and heavy advertising and promotional activities were associated with increased heavy drinking among college students and with total number of drinks consumed.

Researchers have also found that alcohol advertising is disproportionately concentrated in low-income minority neighborhoods (Pasch et al., 2007). One study found that minority neighborhoods in Chicago have on average seven times the number of billboards advertising alcohol as do Caucasian neighborhoods (Hackbarth, Silvestri, & Casper, 1995).

Point of Purchase Promotion to Underage Drinking - Although the exact relation is unknown, greater promotion may decrease price by increasing competition. This especially appears to be the case for local advertising. Price may then mediate the effects of promotion on consumption. In a study of college communities, for example, it was found that alcohol specials, promotions, and advertisements were prevalent in the alcohol outlets around the campuses. Low sale prices and frequent promotions and advertisements were associated with higher binge drinking rates (Kuo et al., 2003).

Snyder et al. (2006) found that restrictions on point-of-purchase price

advertising at liquor stores reduced the probability of drinking and driving among all drinkers and with price advertising, prices may be expected to fall, thereby leading to increases in over all consumption. They found that drinkers who lived in states permitting grocery stores to sell beer and wine had a significantly higher probability of drinking and driving and they concluded that that advertising and availability of alcohol promote drinking.

Ellickson, Collins, Hambarsoomians, and McCaffrey (2005) examined the relationship between exposure to different forms of alcohol advertising and subsequent drinking among US adolescents. They found that for seventh-grade non-drinkers, exposure to in-store beer displays predicted drinking onset by grade 9; for seventh-grade drinkers, exposure to magazines with alcohol advertisements and to beer concession stands at sports or music events predicted frequency of drinking in grade 9.

Bray, Loomis, and Engelen (2007) investigated the association between beer product characteristics (type, package size, and brand name), market-area socioeconomic characteristics, and promoted sales of beer in grocery stores. Using supermarket scanner data from 64 market areas across the United States over 5 years they found that large-volume product containers, such as 144-oz and 288-oz packages, are more likely to be promoted than smaller package sizes. The researchers noted that marketing research has shown in-store merchandising and promotions to substantially increase beer sales and that purchasing large package sizes may increase total consumption.

Measurement

Indicator	Source
General Mass Media Advertising	http://www.cspinet.org/booze/FactSheets/advertising.htm
Content Analyses of Advertising	Austin & Hust, 2005
Billboard Advertising	Number of billboards
Point-of-Purchase Advertising or Promotion	Intervening Variable Toolkit #2 and #3

General Mass Media Advertising - this has been measured by (a) amount of dollars paid for general alcohol advertising or (b) the amount of time or space purchased for alcohol advertising.

Content Analyses of Advertising - this measurement involving coding the amount of general advertising about alcohol and/or the coding of advertising which is judged to appeal to youth drinkers. See Austin and Hust (2005) for information about content coding of alcohol advertising.

Billboard Advertising - the number, placement and size of billboard advertising of alcohol has been used in some communities as a measure of extent of local alcohol advertising. See Pasch, Komro, Perry, Hearst, and Farbakhsh (2007) for information on approaches to documenting billboard advertising.

Point-of-Purchase Advertising or Promotion - where permitted by regulation, retailers place advertising or promotional materials or signs. The presence/absence or placement (at the point of service or sales or at the table in a bar or restaurant) are alternative means to measure advertising which is closely associated with actual sales or service of alcohol.

Strategies

Advertising Restrictions - Saffer and Dhaval (2002) concluded following an analysis of national alcohol consumption related to total advertising expenditures that alcohol advertising bans decrease alcohol consumption.

They found that one more ban on beer and wine or on spirits advertising would reduce consumption by about 5% and one more ban on all alcohol advertising in a media would reduce consumption by about 8%.

Nelson (2003) used a panel of 45 states for the period 1982–1997. This study concluded that “bans of advertising do not reduce total alcohol consumption.”

Warning Labels - Warning labels on beverage containers constitute another strategy for targeting risky drinking. The warning label legislation is among the few U.S. federal alcohol policies motivated by public health concerns to be successfully enacted after 20 years of legislative attempts (Kaskutas, 1995). It was enacted in 1988 (P.L. 100-690) and implemented in November 1989. The warning label mandated on all alcohol containers carried a “Government Warning” tag line and alluded to the Surgeon General as the source of the determinations covered. The warnings included: 1) birth defects risks during pregnancy; 2) impairment when driving; 3) impairment when operating machinery; and 4) health problems.

An early evaluation of warning labels on alcohol beverage containers in the US found that about one fifth of respondents to a national survey remembered seeing the warnings six months after their introduction (Kaskutas & Greenfield, 1992; Graves, 1993). A study of US adolescents found that there were increases in awareness, exposure to, and memory of the labels after they were implemented, but there were no changes in alcohol use or beliefs about the risks targeted by the warning (MacKinnon, Pentz, & Stacy, 1993).

Mass Media Counter-Advertising Campaigns - This intervention involves disseminating information about a product, its effects, or the industry that promotes it, in order to decrease its appeal directly (Stewart, 1997). Counter-advertising can take the form of media literacy efforts to raise public awareness of industry tactics, and a module in community or school prevention programs (e.g., Greenfield & Zimmerman, 1993). There is evidence that synergies are achieved by implementing multi-faceted strategies, such as health messages at the point of purchase signs and public service announcements (PSAs) (Kaskutas & Graves, 1994; Kaskutas et al., 1998).

Ban of Alcohol Advertising on Billboards - Billboard advertising, which can also include freestanding signs and signs on buildings, vehicles and other public locations (such as bus placards or subway ads) have been targeted by communities as a prevention strategy to reduce alcohol promotion. Some communities have undertaken the strategy of restricting or limiting the number and/or placement of billboards which contain alcohol advertising (Hackbarth et al., 2001). Such strategies are based upon the potential influence of exposure to positive alcohol messages on intention to drink and actual drinking by underage persons.

The following resources provide information on alcohol advertising.

- Center for Science in the Public Interest (CSPI) & Community Anti-Drug Coalitions of America (CADCA) at:
http://www.cspinet.org/booze/Alcohol_Advertising.pdf and
<http://www.cspinet.org/booze/FactSheets/advertising.htm>
- Complete handbook for local action on alcohol advertising is found at:
<http://www.faceproject.org/Resources/CommunityActionKits.html>
- University of Minnesota School of Public Health suggested legal ordinance to limit billboards which advertise alcohol:
<http://www.epi.umn.edu/alcohol/sample/billbrd.shtm>
- Center for Health Improvement, Health Policy Guide:
<http://www.healthpolicyguide.org/doc.asp?id=126>

Glossary

Retail Availability - the ease of physical access to alcohol by underage persons through commercial sources including on-premise outlets (bars or restaurants) and off-premise outlets (grocery stores, liquor stores, other outlets licensed to sell alcohol)

Visible Enforcement - enforcing policies in order to decrease retail, social availability, and youth use of alcohol through threat of sanctions. Official policies might call for arrest, prosecution, and punishment vendor/provider and the youth. “Informal enforcement,” such as communities unwilling to patronize stores that sell to minors, is also an important complement to formal mechanisms.

Social Availability - access to alcohol through “social sources” including receiving, stealing, or buying substances from friends, relatives, and strangers. A substantial portion of alcohol obtained by underage persons is from social sources.

Social Norms - youth acquire knowledge, attitudes, and values about substance use through a gradual and intricate process of assimilating information from numerous social sources including family, peers, school, and the community.

Price - the retail price or direct monetary costs of a product. Alcohol is price sensitive meaning that as the price increases, the demand for the alcohol declines and vice versa.

Drinking Beliefs - general category made up of five individual beliefs about alcohol. These beliefs are Alcohol Attitudes, Alcohol Expectancies, Alcohol Normative Beliefs, Subjective Alcohol Availability, and Refusal/Resistance Efficacy Beliefs.

Alcohol Promotion - attempting to increase demand through the advertising and promotion of alcohol. The purpose of advertising and promotion is to increase the attractiveness of drinking by creating an image favorable to consumption of these substances. Advertising and promotion are designed to recruit new users and to retain old users.

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