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"I'll Never Drink Like That Again": Characteristics of Alcohol-Related Incidents and Predictors of Motivation to Change in College Students*

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Abstract

Objective—Alcohol use and its associated behaviors are among the most common reasons for medical treatment and disciplinary infractions among college students. The purpose of this study was to describe the characteristics of students who had recent serious alcohol-related incidents and to identify predictors of motivation to change alcohol use and heavy drinking in particular, with specific attention to gender.

Method—Students (N = 227; 52% female) who had been mandated to attend a session of alcohol education following alcohol-related medical treatment and/or a disciplinary infraction were assessed on their alcohol use, alcohol problems, characteristics of their alcohol-related incident, reactions to the incident, attributions about the incident, and motivation to change drinking and heavy drinking. Path and regression analyses were used to identify the individual and incident-related characteristics that were related to motivation to change.

Results—Perceived aversiveness of the incident was directly and positively related to motivation to change drinking and heavy drinking. Alcohol consumption in the month before the incident and past-year alcohol problems were negatively related to motivation to change heavy drinking, and women were more motivated to change heavy drinking than men. The more students consumed in the incident, the more likely they were to feel responsible for it, and the more responsible they felt about the incident, the greater its aversiveness.

Conclusions—Individual and incident-related characteristics are both directly and indirectly associated with motivation to change following an alcohol-related incident, and therefore have implications for interventions with college drinkers who have experienced an alcohol-related incident.

Approximately 68% of college students report drinking alcohol at least once in the past month, with 42% reporting heavy episodic drinking (five or more drinks in a row in the past 2 weeks; Johnston et al., 2005). Excessive alcohol use in college students is linked to physical illness (Engs and Aldo-Benson, 1995), unintentional injury (Presley et al., 1996), and a wide range of behavioral problems, including decrements in academic performance

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(Montgomery and Haemmerlie, 1993; Wood et al., 2000), fighting and physical aggression (Giancola, 2002; Marcus and Reio, 2002), and risky sexual behavior (Abbey et al., 1998; Wechsler et al., 2000). College drinkers also often consume large quantities of alcohol over relatively brief time periods, which can result in dangerously high blood alcohol concentrations (Fournier et al., 2004).

On college campuses, alcohol use and its associated behaviors are among the most common reasons for disciplinary infractions and emergency medical care (Bergen-Cico, 2000; Dannells, 1991; Stone and Lucas, 1994; Wright and Slovis, 1996). A survey of 194 college officials found that alcohol consumption was a factor in 60% of all violent behavior, half of physical injuries, and two thirds of vandalism damage on campus (Anderson and Gadaleto, 2001). Arrests and violations of campus alcohol and drug policies have been increasing over the past decade (Hoover, 2004; Nicklin, 2000). Studies have determined that undergraduates who received university alcohol violations were more likely to be heavy drinkers, compared with nonadjudicated students (O'Hare, 1997) and had higher alcohol-related problem scores relative to campus norms (Caldwell, 2002). However, very little other information is available about students who have been identified by their college as having had an alcohol-related incident.

There is evidence that certain incidents—such as hospitalization and medical problems—are related to subsequent drinking reductions among adults (Dunn et al., 2003; Perreira and Sloan, 2001) and that intention to change behavior is high after salient events. For example, Apodaca and Schermer (2001) found that most adult patients hospitalized for alcohol-related trauma intended to change their drinking. Barnett et al. (2003) reported that young adult Emergency-Room (ER) patients were more likely to be contemplating reducing heavy drinking if they were being treated for an alcohol-related incident, compared with patients with similar patterns of alcohol severity who were not being treated for alcohol-related reasons. In the only identified similar study with college students, Reis et al. (2004) assessed first-year students who had been transported to a hospital for alcohol overdose and reported that 83% of these students stated that they planned to decrease the amount they drank.

In studies of natural recovery from alcohol problems, individuals commonly identify specific events as precursors to change. Sobell et al. (1993) found that nearly one third of adults who had resolved their alcohol problem with out treatment attributed their resolution to a specific event, "such as a traumatic health problem or a frightening experience" (p. 221). In their review of studies on natural recovery, Watson and Sher (1998) also established that events that promote self-evaluation often provide a catalyst for change. Although these studies are limited by possible retrospective bias, their findings are consistent with those already described that assessed individuals immediately following specific alcohol incidents; together, they indicate that discrete events can compel some individuals to change their drinking behavior.

Although such critical events have presented opportunities to provide education and/or intervention for a target behavior (e.g., Dunn et al., 2003; Minugh et al., 1997; Monti et al., 2001), little is known about the effects of these incidents themselves and their potential for promoting behavior change. To best design intervention strategies, researchers and clinicians must first understand the individual and event or incident-level characteristics that are related to client motivation to change drinking. Individual characteristics can be instrumental in either leading to continued heavy drinking or to self-evaluation and subsequent change following an alcohol-related incident. For example, prior drinking experience is likely to influence one's response to a specific alcohol consequence. In samples of adolescents (Barnett et al., 2002) and young adults (Barnett et al., 2003) treated in an ER for alcohol-related reasons, we found that less prior experience with alcohol and

fewer prior alcohol problems predicted greater intention to change at the time of the ER visit.

It is also likely that immediate affective and cognitive responses to an alcohol-related incident are associated with plans to change. Barnett and colleagues (2002, 2003) found that greater fear or distress about the incident, greater be lief that the patients' alcohol use was responsible, and be lief that the precipitating incident was their fault and that their risk-taking was responsible predicted greater motivation to change. Studies with older adults found similar relations; Longabaugh and colleagues (1995) reported that the attribution of alcohol as a cause of injury in combination with the perception of aversiveness of the injury predicted motivation to change drinking in a sample of injured adult drinkers presenting for treatment at an ER.

Research with college samples suggests that men drink more often and more heavily than women and are more likely to experience "public" alcohol-related consequences (Johnston et al., 2004; Perkins, 2002), but no studies have examined gender in the context of identified incidents. Specifically, gender may be associated with the characteristics of alcohol-related incidents, attributions and affective responses to the incident, and motivation to change drinking. The relations among these characteristics also may differ for men and women.

There is very little information about college students who have specific, identified alcohol-related incidents on campus, and whether characteristics of these incidents, the students' prior experience with alcohol, and the students' reactions to the incidents are related to motivation to change drinking. The objective of this study was to describe college students who experienced an alcohol-related incident and to examine predictors of motivation to change, with particular attention to gender.

"Motivation" has been operationalized as statements of problem recognition or intention to change. Measurement of the construct of motivation with college students is challenging, however, because there is generally a low rate of problem recognition (an assumption of many measures of motivation to change), and because some measures contain items that refer to being in treatment, whereas college students are not typically assessed in the context of treatment- seeking (Carey and Hester, 2005). The motivational target can also vary (e.g., it can refer to drinking or heavy drinking and can target reduction or abstinence). To best explore the associations with motivation in our population, we focused on two targets of motivation: motivation to change drinking in general and motivation to reduce heavy drinking. Investigating motivation to change heavy drinking allowed us to examine the impact of background variables and incident characteristics on commitment to change problematic drinking, which has recently been shown to be important for predicting treatment outcomes (Amrhein et al., 2003). Data for this study were collected as part of the baseline assessment for a randomized clinical trial testing the efficacy of brief interventions with students who were required to attend a session of alcohol education. We expected that lower alcohol use and fewer alcohol problems before the incident, greater perceived aversiveness of the incident, and higher internal attributions of the incident would be related to greater motivation to change drinking and heavy drinking.

Method

Participants

Participants attended a private university in the Northeast and were eligible if they were required to attend an alcohol education session following either a disciplinary infraction related to alcohol or a medical evaluation for intoxication from September 2000 to May 2004. Self-referred students were excluded, and seniors were excluded because they would

graduate during the 12-month follow- up period of the intervention trial. During the period of enrollment, 348 eligible students were invited to participate and 227 (65%) students agreed. The sample was 52% female and ranged in age from 17 to 21 (mean [SD] = 18.84 [0.88]). Race and ethnicity endorsements were 172 (75.8%) white, 34 Asian (15.0%), 29 Hispanic (12.8%), 8 black (3.5%), 5 Native American (2.2%), and 6 other (2.6%). Proportions of race and ethnicity endorsements do not equal 100% because 25 (11.0%) participants reported they were members of more than one race or ethnic category. The majority of participants were freshman (n =151; 66.5%), with 45 (19.8%) sophomores and 31 (13.7%) juniors. There were no significant gender or class differences between participants and students who declined to participate (52% female and 60% freshman).

Procedures

Students who called to schedule a session of alcohol education were assessed for eligibility by the study project coordinator. Eligible students were offered the option to participate in the research project as an alternative to completing a 1-hour education and counseling session with a university health educator. The requirement to meet with the health educator was waived for students who enrolled in the research study and completed the baseline assessment and intervention. No other compensation was provided for baseline participation. The baseline assessment consisted of a brief interview conducted by project staff regarding the nature of the incident and recent alcohol use. Participants next self-administered a battery of questionnaires. The baseline assessment took approximately 60 minutes (not all administered measures are described herein). All procedures were approved by the Brown University Institutional Review Board, and informed consent was pro vided by all participants.

Measures

The interviewer collected information about the incident, including the date, the amount of alcohol consumed, and the reason for referral, including the types of disciplinary violations. This information was used to establish the time line for subsequent measures, and to define the incident for the participant as encompassing the alcohol use and its consequences. The incident date, reason for referral, and disciplinary violations were also confirmed through review of the institution's incident report. Alcohol use was measured with an interviewer-administered Timeline Followback (Sobell and Sobell, 1992, 1996). Data were collected for the 30-day time frame before the date of the drinking incident and for the day of the drinking incident itself. For each day of drinking, the number of standard drinks (12 oz of beer, 1.25 oz of distilled spirits, 4 oz of wine) was calculated. Computed variables from this measure were number of drinking days, number of heavy drinking days (five or more drinks for males, four or more drinks for females), and average number of drinks consumed per week (total number of drinks in the 30 days divided by 4.29 [number of weeks in the 30 days]). To create a single indicator variable for past month alcohol use, we created a composite score by first standardizing then averaging past month number of drinking days, number of heavy drinking days, and average drinks per week.

The following measures were self-administered. Demographic information, including race and ethnicity and year in school, was collected. The Contemplation Ladder (CL; Biener and Abrams, 1991) was originally designed to measure motivation to change smoking, and was later modified to assess motivation to change alcohol use (Becker et al., 1996). This instrument contains an image of a ladder and reads, "Each rung of this ladder represents where a person might be in thinking about changing their drinking. Select the number that best represents where you are now." Response options are from 0 to 10 and the anchors are 0 ("no thought of changing"), 3 ("think I need to consider changing someday"), 5 ("think I should change, but not quite ready"), 8 ("starting to think about how to change my drinking

patterns"), 10 ("taking action to change [e.g., cutting down]"). The second measure of motivation was a single- item gender-specific (five or more for men, four or more for women) stage of change (SOC) for heavy episodic drinking measure, which was developed and validated on college student drinkers (Laforge et al., 1998). This item asked, "In the last month have you had 5/4 or more drinks in a row?" Responses reflect precontemplation ("Yes, and I do not intend to stop drinking 5/4 or more drinks in a row"), contemplation ("Yes, but I intend to stop drinking 5/4 or more drinks in a row during the next 6 months"), preparation ("Yes, but I intend to stop drinking 5/4 or more drinks in a row during the next 30 days"), and action ("No, but I have had 5/4 or more drinks in a row in the past 6 months"). Participants who endorsed the other options, "No, and I have not had 5/4 or more drinks in a row in the past 6 months" or "No, I have never had 5/4 or more drinks in a row" were not classified on the stages of change for heavy drinking.

The Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut and Sher, 1992) is a 27-item measure that assesses lifetime and past-year frequency of alcohol problems. The YAAPST was developed for use with college students and has demonstrated strong internal consistency (Hurlbut and Sher, 1992). Each item was dichotomized (0 = did not happen/1 = happened), and items were summed to derive a total score for past-year alcohol problems. Internal consistency in our sample was $\alpha = .83$.

Items reflecting attributions about the incident and aversiveness of the incident were derived from a measure developed by Longabaugh et al. (1995). Attribution items are, "To what extent do you believe your alcohol consumption was responsible for this incident?" "To what extent was the incident your own fault?" and "To what extent do you believe your own risk-taking behavior was responsible for this incident?" Aversiveness items are, "To what extent has this incident upset you?" "When thinking about this incident, how badly do you feel about it?" and "How un pleasant has this incident been for you?" All items are scored from 1 (not at all) to 7 (extremely or totally). Alpha coefficients for the attribution and aversiveness scales were .71 and .89, respectively. Total scores were calculated for analyses.

Data analysis

Outliers (responses greater than 3 standard deviations above the mean) were found on the drinks per week mea sure, and were adjusted to equal 1 unit greater than the largest nonextreme outlying value. In addition, because of positive skewness, we applied a log-transformation to the variable reflecting number of drinks consumed before the incident.

We used path analysis to examine simultaneously the relations among alcohol use in the past month, drinking problems in the past year, incident drinking, incident characteristics, and motivation to change drinking. Alcohol use and alcohol problems were conceptualized as exogenous variables, and we estimated the covariance between them. All direct paths were estimated from past month alcohol use, past-year alcohol problems, and incident characteristics to motivation to change alcohol use (CL). Paths were also estimated from the following: (1) alcohol use and alcohol problems to incident number of drinks, incident aversiveness, and incident attribution; (2) incident number of drinks to incident aversiveness and incident attribution; and (3) incident attribution to incident aversiveness. Using methods outlined by Kline (1998), multiple group path analysis was used to examine differences in path coefficients across men and women. We compared a model in which all path coefficients were constrained to be equal with a model in which all path coefficients were unconstrained. The chi-square difference between the constrained and unconstrained models was used to determine cross- group invariance; if there is a significant difference between the models, the hypothesis that the path coefficients are invariant across groups is rejected. All analyses were conducted using maximum likelihood estimation in AMOS version 5.0 (Arbuckle, 2003).

Using the same predictors as in our path analysis, we conducted a hierarchical multivariate logistic regression analysis to determine whether drinking and incident-related characteristics of the sample could be used to differentiate between participants who reported intentions to reduce their heavy alcohol consumption (contemplation, preparation or action stage) versus those who reported no intentions to change (precontemplation stage). Background variables (gender, race, college year) were entered on the first step, alcohol use and alcohol problems were entered on the second step, number of drinks associated with the incident was entered on the third step, and reactions to the incident (aversiveness and attributions) were entered on the final step.

Results

Description of sample and incidents

The majority of participants had received an evaluation for acute intoxication or alcohol-related injury by emergency medical services or the University Health Clinic (n = 187; 82.4%). A smaller proportion had a disciplinary hearing (n = 28; 12.3%), and 12 participants (5.3%) had both emergency medical services contact and a disciplinary hearing. Participants who had disciplinary hearings received 1–6 violations for their incident (median = 2.0; mean [SD] = 2.5 [1.72]), with the most common violation being illegal possession or use of alcohol (n = 36; 90%). Other violations included the following: behavior that is unreasonably disruptive of the university community and its neighborhood (n = 18; 45%); alcohol-related behavior (n = 16; 40%); behavior that causes damage to property (n = 10; 25%); behavior that causes physical harm to a person (n = 8; 20%); behavior that shows flagrant disrespect for the well-being of others (n = 7; 17.5%); and illegal provision, sale, or possession with intent to sell alcohol (n = 5; 12.5%).

Alcohol use, alcohol problems, incident characteristics, and motivation to change for the total sample are listed in Table 1. Means and standard deviations for all alcohol use and incident characteristics are also listed separately for male and female students, along with t test statistics for gender differences. As a group, the sample drank one to two times a week, with heavy drinking episodes occurring on more than half of their drinking days. Compared with women, men consumed alcohol on significantly more days in the past month, had a greater number of past-month heavy drinking days, consumed more drinks per week, and drank more on the day of the incident. Men also reported lower incident attributions for alcohol and risk-taking, and reported significantly lower incident aversiveness on two of the three aversiveness items. Motivation to change drinking in general (CL) was not significantly different between males and females, but significantly more females than males reported considering reducing heavy drinking (SOC).

Path analysis

The sample size for the path analysis was reduced to 220 because of missing data on alcohol use (2 cases), alcohol problems (2 cases) incident attribution (2 cases), and incident aversiveness (1 case). Listed in Table 2 are the intercorrelations among the variables included in the path model for the full sample and for men and women.

The path model illustrated in Figure 1 is a recursive, just-identified model. One characteristic of just-identified models is that, because all possible parameters are estimated, they have 0 degrees of freedom, and as a result they fit the data perfectly (Kline, 1998); thus, we estimated path coefficients for our hypothesized model but did not estimate the fit of the model. Standardized estimates for the path model are illustrated in Figure 1. Past-year alcohol problems were significantly and negatively associated with incident attribution. Number of drinks consumed on the day of the incident was significantly and positively

associated with greater personal incident attribution. Alcohol use and incident attribution were both significantly associated with incident aversiveness; greater prior alcohol use was associated with lower incident aversiveness, and greater personal attribution for the incident was associated with greater aversiveness. In turn, incident aversiveness was significantly and positively associated with motivation to change alcohol use, as measured by the CL. There were no significant direct paths from alcohol use, alcohol problems, number of incident drinks, or incident attributions to motivation to change drinking.

Gender differences—We used the model illustrated in Figure 1 as the baseline model for testing gender invariance. Using methods outlined by Kline (1998), we compared the model in which all path coefficients were constrained to be equal with a model in which all paths were unconstrained. The chi-square difference between the constrained and unconstrained model was not significant ($\chi^2 = 9.63$, 14 df; $n = 220$), indicating that the path coefficients for the hypothesized model did not significantly differ for men and women.

Predictors of intentions to change heavy drinking

As described previously, the stage of change measure is a categorical measure of motivation to change heavy drinking and reflects a different motivational target than the CL (the correlation between these two measures in this sample [$r = .37$, $p < .001$], although significant, was modest). Eight participants had missing data on measures used in this analysis, and seven participants indicated that they had no heavy drinking episodes within the past 6 months and were not classified on the SOC. Of the remaining 212 participants, 116 (54.7%) were in the precontemplation stage of change, 33 (15.6%) were in the contemplation stage, 41 (19.3%) were in the preparation stage, and 22 (10.4%) were in the action stage. We combined categories to create two groups: (1) those who were considering or intending to change their heavy drinking (contemplation, preparation, or action; $n = 96$) versus (2) those with no intention to stop heavy drinking (precontemplation; $n = 116$). (Because the homogeneity of the three groups of contemplation, preparation, and action could be questioned, these groups were also examined separately, and the pattern of results did not differ. We therefore combined the three later stages into one group for this analysis.) Logistic regression coefficients, odds ratios, and 95% confidence intervals for this analysis are presented in Table 3. The steps that included demographics, alcohol consumption and problems, and incident reactions were statistically significant. Women were more likely than men to be intending to change heavy drinking. Participants with greater incident aversiveness ratings were also more likely to be intending to change. Conversely, consuming more alcohol in the month before the incident and having more alcohol problems in the past year were associated with a lower likelihood of intending to change heavy drinking.

Discussion

In this study of college students who had a recent alcohol-related incident, we consistently found that perceived aversiveness of the incident predicted motivation to change drinking and heavy drinking; students who found their incident to be more aversive were more motivated to reduce their alcohol use. These findings are consistent with other work conducted with adults and adolescents following alcohol-related incidents that found that perceived incident aversiveness was associated with motivation to change drinking (Barnett et al., 2003; Longabaugh et al., 1995).

Our hypothesis that alcohol consumption and problems would be negatively related to motivation was supported when motivation to change heavy drinking was considered; we found that participants (all of whom had prior heavy drinking) with lower alcohol use and

fewer alcohol problems were more likely to have some intention to change heavy drinking. It is possible that having had a salient drinking incident, students with less experience become quickly motivated to avoid further heavy drinking, whereas students who regularly experience the benefits of drinking may be less affected by a single alcohol-related incident. In deed, although alcohol use is associated with myriad health and social problems (Hingson et al., 2005), alcohol consumption is also correlated with positive social consequences (Murphy et al., 2005), and college students report that these positive drinking outcomes are more common and important than negative outcomes (Park, 2004). Even after experiencing a significant alcohol-related incident, frequent drinkers may still decide that the benefits of drinking out weigh the costs and may not be ready to reduce their drinking (e.g., Sobell et al., 1993). However, the relationship between low alcohol use/problems and greater motivation was not found in our path model. This difference in findings may be a function of differences in the target behavior of the measure (drinking in the CL measure and heavy drinking in the SOC measure) or its format (i.e., dichotomous vs continuous).

Two variables predicted ratings of incident aversiveness in the path model. Alcohol consumption in the month be fore the incident was negatively related to incident aversiveness. One interpretation of this finding is that students who engage in higher levels of alcohol consumption have developed an acceptance of the negative effects of alcohol and/or have acquired strategies for minimizing the acute impact of alcohol's effects and therefore do not experience any one incident as intensely. Students with lower levels of consumption, on the other hand, have not had these learning experiences. This may explain their stronger reactions to a singular incident.

Personal incident attributions also predicted perceived aversiveness of the incident. Students who attributed the incident to their alcohol consumption or poor decision-making rated the incident as more aversive than students who did not make these personal attributions. Students with greater personal attributions also reported drinking more on the night of the incident. In other words, the more students drank in the incident, the more likely they were to make personal attributions for it. In turn, the more students felt a sense of responsibility for the incident, the greater was their discomfort about it, and the greater their discomfort, the more ready they were to address their drinking.

Finally, univariate analyses showed that men reported greater past-month drinking and more drinks on the night of the incident. Our analyses also showed that female students were more likely to be considering or intending to reduce their heavy drinking. The finding that women re ported greater motivation to change heavy drinking than men is consistent with previous research demonstrating that college women are more responsive to alcohol-related incidents or citations (Fromme and Corbin, 2004). That the path coefficients did not differ between men and women indicates that individual and incident characteristics and responses to incidents do not have sex-specific associational patterns with motivation to change.

These analyses cannot determine whether postincident changes in drinking behavior occurred, nor whether motivation reported in the postincident assessment translated into actual changes in drinking behavior. However, there is evidence from other work that stage of change and motivation to change measured after significant events predict later behavior change (Reed et al., 2005; Wells-Parker et al., 2000). We did not have a measure of motivation before the incident, nor did we have a measure of incident reactions immediately after the incident. This information would have allowed us to determine more precisely the impact of the incident on motivation. We cannot establish whether students who did not join the study were different from those who enrolled in ways other than in basic demographics. Our sample was reasonably racially/ethnically diverse for a college student alcohol study, and it adequately reflected the population at this college (28% nonwhite). However, the

relatively small numbers of participants in each racial/ ethnic subgroup restricted us from being able to test for invariance across these subgroups. This was a mandated sample, and our results may not generalize to all college students.

Implications for interventions with college student drinkers

Assessments conducted a few weeks after identified critical alcohol-related incidents experienced by undergraduate college students determined that they were heterogeneous, consisting of acute intoxication, injuries, and disciplinary infractions. Volume of drinking on the day of the incident was high; students drank an average of nine drinks on these nights, and most students received emergency medical at tention for intoxication. It is possible that the incident and/ or the mandated referral prompted some students to consider changing their behavior; there is evidence that discrete alcohol incidents are related to subsequent higher motivation to change in young adults (Barnett et al., 2003). However, only 29.7% of heavy drinking students were either planning change or actively reducing their drinking following the incident (i.e., were in the preparation or action stage of change), which suggests that—for most students—the incident itself was not sufficient to elicit drinking reductions. On the other hand, it has been observed that negative consequences are most salient following a period of acute intoxication and that reviewing those circumstances can be motivating (Clancy, 1964; Pediaditakis, 1962; Watson and Sher, 1998). Indeed, alcohol-related incidents that come to the attention of authorities provide an opportunity for students to learn and reflect on their drinking behavior and its consequences. Interventions conducted proximal to these incidents might capitalize on the salience of the topic of alcohol and the interest in avoiding additional violations, provide the opportunity for students to consider their behavior, and offer additional resources if needed. Most colleges have mandatory sanctions for students who violate alcohol policies or require medical care for intoxication (Anderson and Gadaleto, 2001). Although there have been few controlled trials with mandated students (Barnett and Read, 2005), there are indications that college-based intervention programs designed for high-risk drinkers can lead to reductions in alcohol use and alcohol- related problems among students mandated to attend (Borsari and Carey, 2005; Fromme and Corbin, 2004).

Motivation is generally accepted as a primary intervention target for brief alcohol interventions (DiClemente and Velasquez, 2002; Miller and Rollnick, 2002). This is especially true for college students, who often do not require extended behavioral or pharmacological treatment to alter their drinking (Larimer et al., 2004/2005;Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002; Walters and Neighbors, 2005). According to our findings, college women and students who found the alcohol-related incident to be more aversive were more motivated to reduce their alcohol use. These students may be responding to the incident itself or to their contact with medical personnel or school authorities. It remains to be seen whether further intervention is needed, but these students might benefit from a brief intervention that consolidates their motivation, develops a specific plan to change drinking, and includes education about harm-reduction strategies. Men and students who did not find the incident especially aversive may not be as motivated to reduce their drinking and may benefit from an intervention that explicitly targets motivation to change. For example, they might respond well to personalized drinking feedback and/or a motivational interview that includes a discussion of the incident that highlights its aversiveness and consequences (Dimeff et al., 1999; Walters and Neighbors, 2005). It also might be helpful to discuss previous alcohol-related negative consequences and the contingent relation between their drinking and adverse outcomes, because it has been suggested that changes in drinking may occur following not one but a series of negative alcohol-related events that over time may develop personal meaning (Vik et al., 2003). Understanding the evolution of drinking in the college years, including the

phenomenological experience of and response to alcohol consequences, is essential for the continued development of effective interventions for college student problem drinkers.

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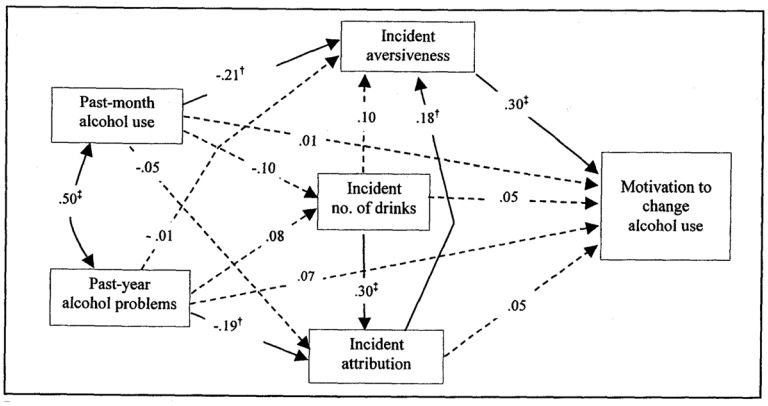

Figure 1.

Model of associations among alcohol use, alcohol problems, incident characteristics, and motivation to change. Past-month alcohol use is a composite measure consisting of the average of standardized scores for past 30 days number of drinking days, number of heavy drinking days, and average number of drinks per week. Past-year alcohol problems consists of the total score from the Young Adult Alcohol Problems Screening Test Incident number of drinks is log-transformed. Significant paths are shown in solid lines; nonsignificant paths are shown in dashed lines.

$^{\dagger}p < .01$; $^{\ddagger}p < .001$.

Table 1

Means, standard deviations, ranges, and gender differences for drinking variables, alcohol problems, incident characteristics, and motivation to change

Variable	*n*	Range	Total Mean (SD)	Men (*n* = 110) Mean (SD)	Women (*n* = 117) Mean (SD)	*t*
Past-month alcohol use[a]						
No. of drinking days	225	0–28	5.68 (5.29)	7.04 (6.48)	4.42 (3.46)	3.82, 223 df‡
No. of heavy drinking days	225	0–28	3.10 (4.26)	4.16 (5.36)	2.12 (2.56)	3.68, 223 df‡
Average drinks per week[b,c]	225	0–40.89	7.13 (8.82)	9.98 (11.22)	4.50 (4.41)	4.89, 223 df‡
Alcohol problems						
YAAPST	225	0–11	2.85 (2.22)	3.03 (2.32)	2.68 (2.13)	1.18, 223 df
Incident characteristics						
Incident no. of drinks[c]	227	0–33.34	8.90 (5.46)	9.78 (6.11)	8.08 (4.64)	2.36, 225 df*
Incident attribution						
My alcohol use was responsible	227	1–7	5.68 (1.94)	5.26 (2.11)	6.07 (1.68)	3.19, 225 df†
Incident was my fault	227	1–7	5.95 (1.50)	5.78 (1.56)	6.10 (1.44)	1.64, 225 df
My risk taking was responsible	225	1–7	5.20 (1.85)	4.85 (1.90)	5.53 (1.74)	2.78, 223 df†
Incident aversiveness						
Incident upset me	227	1–7	4.09 (1.66)	3.90 (1.70)	4.27 (1.61)	1.70, 225 df
Felt badly about incident	227	1–7	4.00 (1.79)	3.61 (1.82)	4.36 (1.68)	3.23, 225 df†
Incident was unpleasant	226	1–7	4.26 (1.72)	3.90 (1.77)	4.60 (1.60)	3.12, 224 df†
Motivation to change alcohol use						
Contemplation ladder	227	0–10	5.45 (3.38)	5.21 (3.32)	5.68 (3.44)	1.06, 225 df
% intending to change heavy drinking[d]	219	–	44.7%	34.6%	54.5%	χ^2 = 8.75, ldf†

Notes: YAAPST = Young Adult Alcohol Problems Screening Test.

[a] Alcohol use in the 30 days before the incident;

[b] scores are adjusted for outliers;

[c] the upper end of the range is not a whole number because participants did not always consume whole standard drink units (e.g., a 16 oz beer); the average drinks per week measure is derived from a 30-day drinking calendar which also results in fractions of drinks;

[d] contemplation, preparation or action stage of change.

* $p < .05$;

† $p < .01$;

‡ $p < .001$ on independent *t* tests of gender differences.

Table 2

Intercorrelations among variables for the full sample (n = 220) and separately for men (n = 107) and women (n = 113)

	Full sample					
Variable	**1**	**2**	**3**	**4**	**5**	**6**
1. Past-month alcohol use[a]						
2. Alcohol problems (YAAPST)	.50‡					
3. Incident no. of drinks	−.06	.03				
4. Incident attribution	−.17*	−.21†	.30‡			
5. Incident aversiveness	−.26‡	−.16*	.17*	.24‡		
6. Motivation to change drinking (CL)	−.05	.02	.11	.12	.31†	
	Men and women					
	1	2	3	4	5	6
1. Past-month alcohol use[a]	–	.40‡	−.01	−.23*	−,27†	−.15
2. Alcohol problems (YAAPST)	.59‡	–	.14	−.17	−.14	−.05
3. Incident no. of drinks	−.11	−.06	–	.26†	.12	.12
4. Incident attribution	−.08	−.23*	.36‡	–	,28†	.17
5. Incident aversiveness	−.21*	−.15	.19*	.14	–	.33‡
6. Motivation to change (CL)	.03	.10	.12	.06	.29†	–

Notes: Correlations for men are reported below the diagonal, and correlations for women are reported above the diagonal. YAAPST = Young Adult Alcohol Problems Screening Test; CL = Contemplation ladder.

[a]Past- month alcohol use is a composite consisting of standardized scores for number of drinking days, number of heavy drinking days, and average number of drinks per week in the past 30 days.

*$p < .05$;

†$p < .01$;

‡$p < .001$.

Table 3

Multivariate logistic regression analyses predicting intention to change heavy drinking (n = 96) versus no intention to change (n = 116)

Variable	*B* (SE)	Wald	OR (95% CI)	χ^2
Step 1				10.38, 3 df*
Gender	0.77 (0.28)	7.29†	2.15 (1.23–3.75)	
Race	−0.43 (0.30)	2.13	0.65 (0.36–1.16)	
Freshman	0.22 (0.30)	0.50	1.24 (0.69–2.22)	
Step 2				37.10, 2 df‡
Past-month alcohol use	−1.06 (0.31)	11.94‡	0.35 (0.19–0.63)	
Alcohol problems	−0.19 (0.09)	4.83*	0.82 (0.69–0.98)	
Step 3				1.60, 1 df
Incident number of drinks	−0.77 (0.61)	1.60	0.46 (0.14–1.53)	
Step 4				30.92, 2 df‡
Incident attribution	0.10 (0.14)	0.50	1.10 (0.84–1.45)	
Incident aversiveness	0.65 (0.13)	23.34‡	1.92 (1.47–2.50)	

Notes: For gender, male = 0, female = 1; for race, nonwhite = 0, white = 1; for freshman status, 0 = nonfreshman, 1 = freshman; past-month alcohol use = composite of the average of standardized scores for number of drinking days, number of heavy drinking days, and average number of drinks per week in the past 30 days; alcohol problems = total score on the Young Adult Alcohol Problems Screening Test. OR = odds ratio; CI = confidence interval.

*$p < .05$;

†$p < .01$;

‡$p < .001$.