

## Effects of a Brief Motivational Intervention With College Student Drinkers

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This study consisted of a randomized controlled trial of a 1-session motivational intervention for college student binge drinkers. Sixty students who reported binge drinking 2 or more times in the past 30 days were randomly assigned to either a no-treatment control or a brief intervention group. The intervention provided students with feedback regarding personal consumption, perceived drinking norms, alcohol-related problems, situations associated with heavy drinking, and alcohol expectancies. At 6-week follow-up, the brief intervention group exhibited significant reductions on number of drinks consumed per week, number of times drinking alcohol in the past month, and frequency of binge drinking in the past month. Estimates of typical student drinking mediated these reductions. This study replicates earlier research on the efficacy of brief interventions with college students and extends previous work regarding potential mechanisms of change.

Brief motivational interventions have emerged as a promising method to reduce drinking in college students (Dimeff, Baer, Kivlahan, & Marlatt, 1999). Such brief interventions typically consist of a comprehensive assessment of alcohol use and related problems and expectancies. This information is then presented to the individual during a feedback session, often using motivational interviewing (Miller & Rollnick, 1991). Defined as “a directive, client centered counseling style for eliciting behavior change by helping clients explore and resolve ambivalence” (Rollnick & Miller, 1995, p. 326), it combines both style (e.g., empathy) and technique (e.g., reflective listening). Five basic principles are used to foster problem recognition and enhance motivation for change: expressing empathy, developing discrepancy, avoiding argumentation, rolling with resistance, and supporting self-efficacy (Rollnick & Miller, 1995). The interviewer helps the person evaluate behavioral options, reinforces self-motivational statements, and avoids being confrontive.

Only two published studies have evaluated brief motivational interventions for college drinking, both performed at the University of Washington (Baer et al., 1992; Marlatt et al., 1998). Participants were undergraduates exhibiting high-risk drinking patterns. Baer et al. evaluated three formats of alcohol risk reduction for college students: a 6-week alcohol skills training group, a self-help manual, and a 1-hr motivational feedback and advice session. Brief intervention group members exhibited significant reductions (as much as 40%) in alcohol use, maintained at the 2-year follow-up and comparable with the reductions in the

6-week group. In the second study, Marlatt et al. identified incoming college students as high-risk drinkers while high school seniors. They were randomly assigned to a no-treatment control or to a brief intervention condition, similar to that used by Baer et al. Two-year follow-ups revealed significant decreases in drinking rates and problems associated with alcohol use, and the brief intervention group compared favorably with the control group at all follow-ups.

The discussion of two topics may be especially influential in facilitating reductions in drinking: (a) perceived drinking norms and (b) alcohol expectancies. *Norms* are defined as “self-instructions to do what is perceived to be correct by members of a culture” (Solomon & Harford, 1984, p. 460). Heavy drinkers appear to justify their own alcohol use by viewing other’s drinking as heavier or riskier than their own (e.g., Baer, Stacy, & Larimer, 1991; Perkins & Berkowitz, 1986). In brief motivational interventions, discrepancy may be developed by revealing one’s alcohol use to be higher than actual normative data. Such comparisons have reduced drinking in interventions using other formats (Agostinelli, Brown, & Miller, 1995; Haines & Spear, 1996).

Alcohol expectancies are a person’s beliefs regarding the positive and negative effects of alcohol use. “Dose-related” expectancies have been challenged in interventions with college students (Fromme, Stroot, & Kaplan, 1993). For example, one may believe that drinking four to five beers in an hour is required to become relaxed and sociable. Information about alcohol’s effects on mood and judgment at varying blood alcohol levels may prompt one to consume less alcohol without sacrificing the desired and expected positive effects of drinking. Both positive and negative expectancies of drinking were addressed during the intervention.

The goals of the present study were threefold. First, we assessed the feasibility and acceptability of an hour-long motivational intervention with binge drinking college students screened from a large survey course. Although the term *binge* can describe a multiday, intensive drinking episode, in college research it is defined as consuming five or more drinks on one occasion (four or more for women; Wechsler, Dowdall, Maenner, Gledhill-Hoyt, &

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Lee, 1998). Second, we attempted to replicate the Baer et al. (1992) and Marlatt et al. (1998) findings at a large Northeastern university. Third, we examined the potential mediating roles of two constructs addressed in the intervention: (a) perceived drinking norms of close friends and a typical student and (b) positive and negative alcohol expectancies.

## Method

### Recruitment and Screening

Participants were recruited from an introductory psychology class. Those who reported drinking five or more drinks (four or more for women) on one occasion two or more times in the past month were eligible to participate. Sixty-three of the 109 individuals screened met the selection criteria (58%). Sixty of the students were telephoned and asked to participate. All agreed to take part in the project and were then randomized (by flipping a coin) into one of the two groups. As compensation, participants received credit toward their research experience requirement. Prior to the study, there had been no previous contact, personal or professional, between either author and the participants.

### Sample Description

The 29 participants in the brief intervention group had a mean age of 18.45 years ( $SD = 0.11$ ); 59% were female, and 14% were minorities. The control group consisted of 31 participants and had a mean age of 18.71 years ( $SD = 0.17$ ); 55% were female, and 10% were minorities. Most participants (52/60) lived in on-campus dormitories. No baseline differences existed between groups on any demographic, outcome, or hypothesized mediators (see Table 1).

### Procedure

**Baseline assessment.** The baseline assessment included questions about the students' age, gender, residence, and race. The Drinking Norms Rating Form (Baer et al., 1991) assessed participants' average and heaviest weekly drinking, as well as that of close friends, fraternity/sorority members, and the typical student. A version of the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985) evaluated typical alcohol consumption in the past 30 days. The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) quantified alcohol-related problems experienced in the past 30 days. Expectancies regarding heavy alcohol use were measured using the Cognitive Appraisal of Risky Events (Fromme, Katz, & Rivet, 1997). Efforts to maximize the validity of self-report data included (a) emphasizing confidentiality, (b) using measures extensively pilot tested with college samples, (c) emphasizing the importance of accuracy, and (d) using a 30-day reporting interval that balanced desires for accuracy and representativeness (Babor & Del Boca, 1992).

**Content of brief intervention.** Interventions were conducted by the first author, a clinical graduate student. Treatment integrity was ensured by regular supervision by the second author, a clinical psychologist trained in motivational interviewing.

The intervention was adapted from the handbook *Brief Alcohol Screening and Intervention for College Students* (Dimeff et al., 1999). Following established procedure, the interview was customized to reflect the student's baseline information. The intervention consisted of five components. First, the interviewer helped the student review personal alcohol use in the past month, which was then compared with both campus and national norms. Perceptions of the drinking of close friends and that of the typical student were addressed in regard to the influence of perceived norms on drinking. Second, personal negative consequences of drinking were reviewed. Third, the influence of positive and negative expectancies on personal alcohol use

Table 1  
Means and Standard Deviations of Primary Variables at Baseline and Follow-Up

Variable	Baseline				Follow-up			
	Brief intervention ( <i>n</i> = 29)		Control ( <i>n</i> = 31)		Brief intervention ( <i>n</i> = 29)		Control ( <i>n</i> = 30)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Criterion variables								
Drinking variables								
No. of drinks consumed per week	17.57	8.20	18.56	12.48	11.40	7.03 <sup>a</sup>	15.78	8.17
No. of times consuming alcohol, past month <sup>b</sup>	4.41	0.62	4.53	0.90	3.83	0.89 <sup>a</sup>	4.57	1.07
Frequency of binge drinking, past month <sup>c</sup>	3.20	0.90	3.50	0.90	2.55	1.40 <sup>a</sup>	3.37	1.25
Drinking problems								
RAPI	7.39	4.43	5.76	5.28	6.71	1.40	6.41	5.49
Proposed mediators								
Drinking norms								
Weekly drinking of friends	23.21	11.29	23.73	15.46	16.84	8.14 <sup>d</sup>	21.12	11.22
Weekly drinking of typical student	23.71	11.31	26.87	15.29	16.74	9.77 <sup>e</sup>	24.12	11.05
Expectancies of heavy drinking <sup>f</sup>								
Positive	3.78	1.41	3.22	1.61	3.59	1.43	3.40	1.40
Negative	3.94	1.05	4.28	1.53	4.28	1.42	4.49	1.30

Note. Follow-up *n* for control group reflects attrition of 1 participant. RAPI = Rutgers Alcohol Problem Index.

<sup>a</sup> Brief intervention/control between-groups *t* test on variables significant at  $p < .017$  (one-way Bonferroni adjustment). <sup>b</sup> Answered on 0–9 scale (0 = no alcoholic beverages in past month, 9 = 3 or more times daily). <sup>c</sup> Answered on a 0–5 scale (0 = no binge drinking occasions in past month, 5 = 10 or more binge drinking occasions in past month). <sup>d</sup> Brief intervention/control between-groups *t* test on variables significant at  $p = .06$ . <sup>e</sup> Brief intervention/control between-groups *t* test on variables significant at  $p < .01$ . <sup>f</sup> Answered on a 1–7 scale (1 = not at all likely, 7 = very likely).

were discussed. Perceived risks and benefits of drinking were detailed to clarify decisional balance. Fourth, misconceptions about drinking were challenged by providing accurate information about alcohol and its effects. Fifth, options were provided to facilitate a decrease in drinking and foster the ability to recognize and avoid high-risk drinking situations. All activities aimed to develop a discrepancy between the participant's actual and ideal drinking behavior, which may have increased the motivation to reduce alcohol use. A harm reduction approach to drinking was endorsed (e.g., Marlatt, 1996): The participant was encouraged to reduce alcohol use in order to decrease the negative consequences of drinking.

**Participant evaluations.** At the end of the brief intervention, participants rated (a) how satisfied they were with the feedback session (1 = *very dissatisfied*, 4 = *very satisfied*). They also rated (b) whether the information used in the session reflected their actual drinking, (c) whether they would recommend such a session to a student like themselves, and (d) whether they would recommend such a session to a friend having a problem with his or her drinking (1 = *definitely not*, 4 = *definitely*).

**Follow-up assessment.** On agreeing to participate, brief intervention group members scheduled a feedback session. All of the participants received an appointment for a 6-week follow-up. One participant (in the control group) did not complete the follow-up.

## Results

### Brief Intervention Evaluations

Participants reported high levels of satisfaction ( $M = 3.5$ ,  $SD = 0.6$ ) with the intervention and agreed that (a) the information provided reflected their actual drinking ( $M = 3.0$ ,  $SD = 0.7$ ), (b) they would recommend such a session to a student like themselves ( $M = 3.4$ ,  $SD = 0.6$ ), and (c) they would recommend the session to a friend with a drinking problem ( $M = 3.2$ ,  $SD = 0.4$ ).

### Outcome Analyses

Four variables served as primary outcome measures in this study: (a) number of drinks consumed per week, (b) number of times consuming alcohol in the past month, (c) frequency of binge drinking in the past month, and (d) RAPI scores. The three drinking variables were significantly correlated (coefficients ranged from .29 to .59) but not perfectly so. We analyzed them separately for two reasons. First, these three variables are indicative of different high-risk drinking styles (e.g., consistently heavy drinking vs. intense binge drinking episodes). Second, all three drinking indices were specifically addressed in the intervention, so differential changes may have been evident.

As can be seen in Table 1, *t* tests revealed no significant differences between the two groups at baseline. For descriptive purposes, we conducted a series of *t* tests on these outcome variables at follow-up. To control for Type I error, the Bonferroni correction was used to hold the familywise error rate to .05 (Grove & Andreason, 1982). The brief intervention group drank significantly less than the control group on all three indices at follow-up. There was no difference on RAPI scores.

We used multiple regression to test the main hypotheses of the study, which allowed us to control for demographic variables known to influence alcohol use. A three-stage regression was used to model reductions in drinking. At Step 1, demographics were entered; at Step 2, group membership was entered; and at Step 3, hypothesized mediators were examined. As can be in Table 2, this

procedure was used first to predict the number of drinks consumed per week at follow-up. Demographic variables (e.g., age, residence, and gender) were entered in the first step of Model 1. Except for gender, all of these variables were dropped from the model ( $ps > .05$ ). In Step 2, group membership significantly increased the variance accounted for by the model,  $F(2, 55) = 5.69$ ,  $p = .006$ . Analyses of the Gender  $\times$  Group interaction revealed it not to be significant at  $p < .05$ , so it was excluded from the final model. Similar results were yielded by parallel models (Models 2 and 3) for the number of times consuming alcohol in the past month,  $F(2, 56) = 7.77$ ,  $p = .001$ , and the frequency of binge drinking in the past month,  $F(2, 56) = 3.36$ ,  $p = .041$ . Group membership consistently predicted significant amounts of variance in criterion variables over and above the influence of gender. Medium to large effect sizes (ESs) were found for Step 2 for weekly drinking (ES = 0.21), number of times consuming alcohol per month (ES = 0.28), and binge drinking (ES = 0.12). Model 4 illustrates that group membership did not predict a reduction in RAPI scores,  $F(2, 54) = 0.71$ ,  $p = .496$ .

### Mediation Analyses

A variable acts as a mediator when three conditions exist: (a) Variations in the independent variable significantly account for variations in the mediator; (b) variation in the mediator significantly account for variations in the dependent variable; and (c) when the relationships in Conditions a and b are controlled, the previously significant relationship between the independent and outcome variables is no longer significant (Baron & Kenny, 1986).

We examined the relationship described in Condition c in Step 3 of Table 2. Because of the lack of group effect on drinking-related problems, we did not perform mediation analyses on the RAPI scores. Four follow-up variables were predicted to mediate the relationship between group membership and drinking at follow-up: estimated weekly drinking of friends, estimated weekly drinking of a typical student, and positive and negative expectancies of heavy drinking. Each potential mediator was examined separately for each criterion variable. Gender, a significant predictor of follow-up drinking, was included in the mediation analyses. As Step 3 indicates, only the estimate of the typical student's drinks per week mediated the relationship between group membership and follow-up drinking.

To fully establish the presence of mediation, we used partial correlations to verify Conditions a and b. Gender was partialled out because of its significant prediction of drinking at follow-up. Table 3 indicates that the perception of typical student drinking is significantly correlated with (a) group membership and (b) the three dependent variables. Therefore, the three requirements for mediation were fulfilled.

## Discussion

Our first goal was to evaluate the acceptability of a brief intervention, using as evidence both the participation rate and intervention feedback. All of the students invited to participate in the project agreed to do so. Their reaction to the study was one of interest and willingness to participate, not one of suspicion and resistance. Participants also rated the brief intervention as a favor-

Table 2  
*Summary of Regression Analyses Predicting Drinking at Follow-Up*

Variable	<i>B</i>	<i>SE of B</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>	Adj. <i>R</i> <sup>2</sup>
Model 1: No. of drinks consumed per week						
Step 1: Gender	4.95	2.00	0.31	.016	.09*	.08
Step 2					.17**	.14
Gender	4.79	1.93	0.30	.016		
Group	-4.21	1.92	-0.27	.032		
Step 3					.29***	.26
Gender	4.38	1.80	0.29	.018		
Group	-2.12	1.90	-0.14	.270		
Estimate of typical student drinking	2.47	0.79	0.38	.003		
Model 2: No. of times consuming alcohol, past month						
Step 1: Gender	0.66	0.26	0.32	.014	.10*	.08
Step 2					.22***	.19
Gender	0.63	0.25	0.30	.014		
Group	0.71	0.25	0.34	.006		
Step 3					.27***	.23
Gender	-0.58	0.25	0.28	.020		
Group	0.51	0.26	0.24	.053		
Estimate of typical student drinking	-0.22	0.11	0.26	.043		
Model 3: Frequency of binge drinking, past month						
Step 1: Gender	1.77	1.89	0.12	.352	.01	.00
Step 2					.11*	.08
Gender	1.54	1.81	0.10	.400		
Group	4.34	1.80	-0.30	.020		
Step 3					.13*	.09
Gender	0.88	1.78	0.06	.062		
Group	-2.83	1.88	-0.20	.138		
Estimate of typical student drinking	1.34	0.80	0.23	.092		
Model 4: Rutgers Alcohol Problem Index						
Step 1: Gender	1.62	1.38	0.16	.248	.03	.00
Step 2					.03	.00
Gender	1.64	1.40	0.16	.246		
Group	0.39	1.38	0.04	.778		

Note. *n* = 59. *R*<sup>2</sup> is cumulative. Adj. = adjusted.  
 \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

able and valuable experience. The interpretation of this positive feedback is constrained because of the absence of a comparison group. Nonetheless, our findings support the continued development of brief interventions for high-risk college drinkers.

Our second goal was to replicate promising research performed at another university (Baer et al., 1992; Marlatt et al., 1998). Our regression analyses indicate that there were significant group dif-

ferences in the number of drinks consumed per week, the number of times alcohol was consumed in the past month, and frequency of binge drinking in the past month. Although our study followed participants for only 6 weeks, it suggests that substantial short-term reductions can be achieved. The robust ESs of these drinking reductions can be informative when viewed in combination with the smaller ESs evident at longer follow-ups (Baer et al., 1992;

Table 3  
*Partial Correlations Among Perceptions of Typical Student Drinking and Outcome Variables*

Variable	Drinks per week	Times consuming alcohol, past month	Binge drinking, past month	Group
Perception of typical student drinking	.452***	.362**	.304*	.352**

Note. *n* = 59. Gender was partialled out of each correlation.  
 \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

Marlatt et al., 1998). Perhaps efforts can be made to capitalize on the substantial decreases in drinking evident shortly after the intervention. For example, booster sessions have been used to maintain initial decreases in substance use (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995).

The lack of a significant interaction between gender and group membership indicates that the brief intervention resulted in comparable drinking reductions in women and men. These findings are similar to those of Marlatt et al. (1998). This result may be attributed to our use of a gender-sensitive criterion for binge drinking. In future studies, attention to differences in body mass and alcohol metabolism may further illuminate gender-linked patterns of consumption and consequences.

The brief intervention group in this study exhibited a decrease in drinking but not a concurrent reduction in drinking-related problems. This discrepancy may be related to the 6-week follow-up. If reductions in drinking result in lifestyle changes (i.e., not staying out as late and/or getting into risky situations), the stage may be set for an eventual reduction in drinking-related problems.

Our third goal was to evaluate factors that might mediate the relationship between group membership and drinking. Of the two sets of mediators specifically addressed in the brief intervention, only the perception of typical student drinking mediated the relationship between group membership and alcohol use. In this study, comparisons between the participants' estimates and the actual norms were intended to challenge the commonly held view among heavy drinkers that others drink just as heavily (Baer et al., 1991). Challenging these beliefs, and demonstrating the relatively high level of participant drinking, may have provoked discrepancy (Miller & Rollnick, 1991) that the individual attempted to reduce by decreasing alcohol use. Further research is needed to clarify these hypothesized mechanisms of change.

In contrast, alcohol expectancies were not influential mediators. One explanation may be that expectancies concerning alcohol's effects are well established, many having been learned before the individual takes his or her first drink (Christiansen & Goldman, 1983). Once established in memory, these expectancies can be very engrained and related to a wide variety of experiential elements, such as drug consumption, situational cues, and affective states (Brown, 1993). Such complexity may explain why alcohol-related expectancies appear to be more resilient to change than perceived norms (Agostinelli & Miller, 1994). In this study, participants' continued drinking may have sustained most of their expectancies of alcohol use. New approaches, such as expectancy challenge, may be more effective in changing alcohol-related expectancies (Darkes & Goldman, 1998).

The conclusions presented here are limited by certain design features of this study. First, the follow-up period was relatively short—only 6 weeks. Second, circumstances of recruitment may have created some biases. The participants signed up willingly for a study on "alcohol use in college students." It is possible that high-risk drinkers avoided participating. Third, inclusion of collateral data, or other validation of self-reported drinking, would enhance confidence in the outcome measures. Finally, an "active" comparison group was not used. As a result, it is impossible to exclude the influence of nonspecific factors in the process of providing feedback (e.g., interviewer attention). These threats to internal validity, common to all treatment/no-treatment designs,

limit our ability to conclude that specifics of the intervention accounted for the decreases in alcohol use. Nevertheless, the brief intervention implemented shows promise as an effective method of reducing the alcohol consumption of binge drinking college students.

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