

Binge-Drinking-Related Consequences in College Students: Role of Drinking Beliefs and Mother–Teen Communications

Rob Turrisi
Boise State University

Kimberly A. Wiersma
University of Washington

Kelli K. Hughes
University of Texas at San Antonio

The present research contrasted theoretical models depicting the nature of the relation among drinking beliefs, drinking tendencies, and behavioral consequences in 266 incoming freshman college students. It also examined the theoretical relations between mother–teen communications and drinking beliefs relevant to behavioral consequences. The findings revealed direct relations between binge-drinking consequences and the drinking beliefs: Alcohol can make positive transformations, can enhance social behavior, and can increase negative affect and normative approval. Direct relations were not observed between consequences and the drinking beliefs regarding physical risk and health orientation. Finally, the present research found consistent support for the relation between mother–teen communications and drinking beliefs relevant to binge-drinking consequences.

Alcohol consumption and alcohol-related problems represent a significant concern on our nation's college campuses (e.g., Gfroerer, Greenblatt, & Wright, 1997; Schuckit, Klein, Twitchell, & Springer, 1994; Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998). Studies conducted over the last 10 years reveal that the highest proportion of drinkers, heavy drinkers, and individuals with multiple substance dependencies tend to be within the age range encompassing over 92% of all enrolled college students (e.g., Hurlbut & Sher, 1992; Johnston, O'Malley, & Bachman, 1997; Wechsler, Issac, Grodstein, & Sellers, 1994). Furthermore, heavy episodic (or binge-type drinking) among

college students has been consistently associated with higher incidences of unplanned sexual activity, alcohol-related driving injuries and fatalities, sexual and physical assaults, date rape, physical injury, criminal mischief, property damage, and trouble with campus and local police (e.g., Abbey, 1991; Baer, Kivlahan, & Marlatt, 1995; Wechsler, Davenport, Dowdall, Mowkens, & Castillo, 1995). In response, college administrators have adopted more intensive on-campus alcohol and drug abuse education and prevention programs (e.g., Dodge, 1991; Kunz, Irving, & Black, 1993). In spite of these efforts, the magnitude of college student binge drinking and the related problems has not decreased significantly in the past 10 years (Schuckit et al., 1994).

Perhaps one reason that the problems associated with college student binge drinking have not changed dramatically is that the major emphasis of study has generally been on preventing binge-drinking behavior per se. The above-mentioned studies reveal that not all students who binge drink experience the range and magnitude of the consequences typically associated with binge-drinking tendencies. Thus, the expe-

Rob Turrisi, Department of Psychology, Boise State University; Kimberly A. Wiersma, Department of Psychology, University of Washington; Kelli K. Hughes, Department of Psychology, University of Texas at San Antonio.

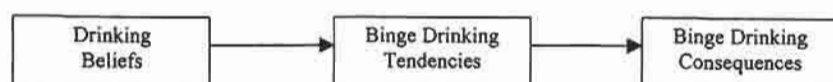
Correspondence concerning this article should be addressed to Rob Turrisi, Department of Psychology, Boise State University, 1910 University Drive, Boise, Idaho 83725. Electronic mail may be sent to rturrisi@boisestate.edu.

rience of binge-drinking consequences must be influenced, at least in part, by variables other than binge-drinking tendencies. The type of variables that are likely to influence whether an individual experiences binge-drinking consequences might then include situational variables (e.g., drinking in a location where there is a greater chance for problems to occur) or individual-difference variables (e.g., characteristics of the individual that might increase the probability of experiencing the consequences). The role of situational variables has been widely examined in the context of the literature on server intervention and interpersonal contexts (e.g., Jones-Webb et al., 1997; McKnight & Streff, 1994; Saltz & Elandt, 1986; Turrise, Nicholson, & Jaccard, 1999). In contrast, studies that have examined individual-difference variables have primarily examined variables that are resistant to change, such as gender (e.g., Leichter, Meilman, Presley, & Cashin, 1998), religious background (e.g., Poulson, Eppler, Satterwhite, Wuensch, & Bass, 1998), and group membership (e.g., Meilman, Leichter, & Presley, 1999). Despite the evidence that cognitive variables are less resistant to change in short-term educational settings and have been linked to postdrinking behavioral tendencies (e.g., Turrise, Jaccard, & McDonnell, 1997; Turrise & Wiersma, 1999), few studies have adopted this

approach to examining binge-drinking related consequences. Thus, a major focus of the present study was to examine cognitive variables that are related to the experience of negative binge-drinking consequences.

Cognitive variables, such as drinking expectancies (or beliefs), have been extensively linked to drinking tendencies in the literature (e.g., Baer, 1994; Cooper, 1994; Critchlow, 1987; Darks & Goldman, 1993; Evans & Dunn, 1995; Stacy, Widaman & Marlatt, 1990). Conceptually, these studies have examined a model that maintains that the beliefs individuals hold toward alcohol tend to influence the quantity and frequency of their alcohol consumption. More recently, Turrise (1999) extended this notion to the analysis of binge drinking: Individuals who held more positive beliefs toward binge-drinking type activities (e.g., going to a bar vs. going to a movie) were more likely to engage in binge-drinking behaviors. The approach argues that a direct relation does not exist between drinking beliefs and behavioral consequences but rather that drinking beliefs are theoretically linked to drinking tendencies, which in turn influence the experience of negative consequences (see traditional expectancy model [Model 1] in Figure 1). An alternate but equally plausible conceptualization is that individuals who binge drink can be ordered accord-

Model 1 Traditional Expectancy Model



Model 2 Direct Effects Model

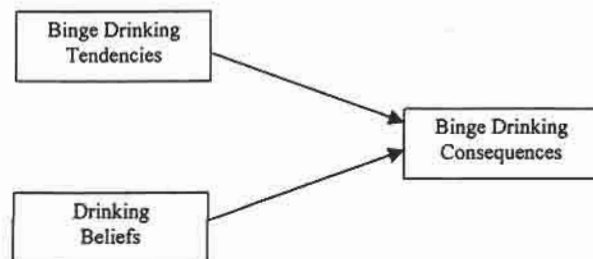


Figure 1. Conceptual models relating drinking beliefs and binge-drinking tendencies to binge-drinking consequences.

ing to their drinking beliefs, and those who hold more risky drinking beliefs by comparison are more likely to experience consequences. For example, consider the individual who perceives that drinking alcohol is unlikely to lead to physical harm. This individual is perhaps more likely to engage in behaviors after drinking that are highly related to experiencing negative consequences relative to individuals who do not hold that belief. This conceptual model is illustrated in Model 2 in Figure 1 (direct-effects model). In contrast to Model 1, theoretical Model 2 predicts effects of drinking beliefs on consequences that are not mediated by binge-drinking tendencies. In the present study we contrasted the empirical viability of these two theoretical models.

A second focus of the present research was an examination of variables that have a plausible relation to the cognitive variables that are theoretically relevant to binge-drinking consequences. Numerous studies have reported relations between teen drinking tendencies and parents' attitudes and beliefs (Hawkins, Catalano, & Miller, 1992), parental awareness of teen drinking (Beck & Lockhart, 1992; Beck, Summons, & Mathews, 1991), parental alcohol consumption (Ary, Tildesley, Hops, & Andrews, 1993), parental approval of alcohol consumption (Barnes & Welte, 1986), parental modeling (Hansen et al., 1987), parental monitoring (Dielman, 1995; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998), the quality of the parent-teen relationship (Coombs, Paulson, & Richardson, 1991), family management practices (Barnes & Farrell, 1992; Peterson, Hawkins, Abbott, & Catalano, 1995), and parent-friend compatibility (Jessor, 1987). The extensive work in this area has resulted in parent-based intervention efforts to prevent or reduce adolescent drinking and substance abuse (e.g., Dishion, Kavanagh, & Reid, 1989; Johnson et al., 1990; Perry, Pirie, Holder, Halper, & Dudovitz, 1990; Peterson et al., 1995).

Despite the research cited above, the examination of parent-teen relations has not been applied to the area of binge drinking in college students. This probably derives from the implicit assumption that parents have minimal influence on their children when they are living away from home at college. However, there is considerable research that suggests that parents

are quite active in the plans of students as they prepare for college and that they maintain their influence after the student has moved to a college campus. Galotti and Mark (1994) examined the sources of information that graduating senior high school students used (parents, peers, other adults, teachers, information from colleges, media) in evaluating academic factors (courses, type of school, programs), institutional factors (campus atmosphere, location, dorms/off-campus housing), personal and social factors (distance from home, friends' choices), and financial factors of colleges they planned to attend or apply to. They found that parents were consulted significantly more often than any other of the sources for every evaluative category examined. Stage and Rushin (1993) used a senior cohort of 28,000 individuals from the High School and Beyond database (National Center for Educational Statistics) to examine a longitudinal study of students' posthigh-school plans, aspirations, student involvement, goal commitment, and graduation. They found that the best predictor of plans and aspirations were parent-student interactions and parental encouragement. In turn, the best predictor of student involvement, goal commitment, and graduation were students' plans and parental encouragement, respectively. Amerikaner, Monks, Wolfe, and Thomas (1994) found that college students high in psychological health reported better communication with their parents and were more satisfied with their families than students low in psychological health. Finally, Langhinrichsen-Rohling, Larsen, and Jacobs (1997) observed that adolescents who feel more of a sense of cohesion with their families had easier transitions in life, such as going to college and developing new relationships. Despite the publicity that has surrounded recent assertions that parents have minimal influence on their adolescent sons and daughters (Harris, 1998), there is a strong and convincing body of literature indicating that parents are an important source of influence in their sons' and daughters' lives, even when they have achieved young adulthood, moved away from home to go to college, or both.

On the basis of the above findings, it is our contention that parent-teen communication may lead to parents instilling certain drinking-related beliefs within their sons and daughters

that may reduce the probability of them experiencing the negative consequences associated with binge drinking in college (e.g., drinking alcohol leads to physical harm). Previous research on parenting and parent-teen communication has suggested that mother-teen communication appears to have a greater influence on teen behavior relative to father-teen communication (e.g., Jaccard & Dittus, 1993; Turrissi, Jaccard, Kelly, & Valera, 1995; Noller & Callan, 1988). To this extent, in the present study we examined a model by which the experience of a negative drinking outcome was presumed to be a direct function of an individual's binge-drinking tendencies and drinking beliefs. The drinking beliefs, in turn, are theoretically influenced by specific mother-teen communications (see Figure 2).

To summarize, the goals of the present research were to (a) examine drinking beliefs that theoretically influence the experience of binge-drinking consequences and (b) examine the relation between specific mother-teen communications and theoretically relevant drinking beliefs.

Method

Sample

Respondents consisted of 266 incoming freshman students from a moderately sized northwestern university participating as part of introductory psychology course requirements. Participants completed measures assessing binge-drinking tendencies, consequences, beliefs, and mother-teen communication approximately 30–50 days after the beginning of the fall semester. Each respondent participated in a 1-hr session. Despite the fact that all respondents were

below the legal age for drinking alcohol, 32.3% indicated that they drank weekly, and 7.3% indicated that they drank almost on a daily basis (for more detail on the drinking tendencies of the sample, see Table 1). The demographic composition of the sample was as follows: 37.9% men, 62.1% women; 35.8% Protestant, 20.4% Catholic, 16.2% Church of Jesus Christ of Latter Day Saints, 23.8% nonreligious, and 3.8% other. The mean age of the sample was 18.24 years.

Procedure

At the start of the research session each respondent was given a packet containing general instructions and a battery of questionnaires. A graduate student research assistant remained present throughout the entire session. However, the research assistant's role was to read directions to the respondents for each section of the questionnaire. All the responses to the items were made directly on the questionnaire, and at the end of the session participants turned in completed packets to the research assistant, who then delivered them to Rob Turrissi.

Materials

Binge drinking and drinking tendencies. Measures of alcohol use were based, in part, on items selected from the literature on drinking (e.g., Donovan & Marlatt, 1982; Turrissi & Jaccard, 1992; Wechsler et al., 1994). The first item asked, "Given that it is a typical week, please write the number of drinks you probably would have each day (if none, then write in 0; if you are not exactly sure then write in your best estimate)." A response scale was provided for Friday and Saturday (e.g., Friday ____). The next item asked, "During the past 30 days, how many times have you gotten drunk, or very high from alcohol? (Please make your best estimate)." The response

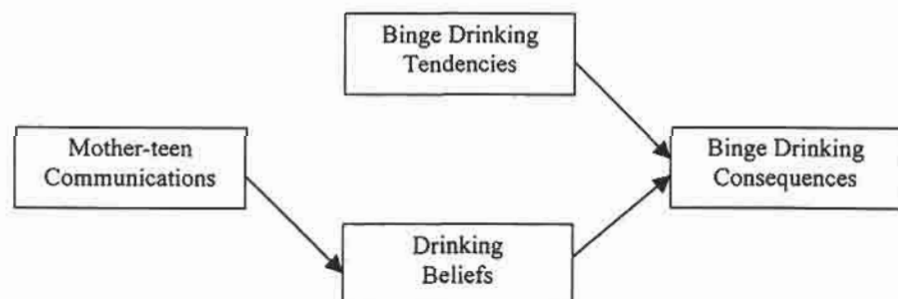


Figure 2. Conceptual model relating mother-teen communications to drinking beliefs and binge-drinking tendencies to binge-drinking consequences.

Table 1
Drinking Tendencies of the Sample

Drinking frequency	5 or more drinks on a single occasion within the past 2 weeks			No. times intoxicated in past 30 days		
	Total sample	Men	Women	Total sample	Men	Women
3 or more times	16	26	10	25	40	20
2 times	6	10	4	9	8	9
1 time	12	10	15	16	12	18
0 times	66	54	71	50	40	53
	No. drinks on a typical Friday night			No. drinks on a typical Saturday night		
	Total sample	Men	Women	Total sample	Men	Women
5 or more drinks	24	35	19	27	41	21
2-4 drinks	19	14	21	18	9	22
0-1 drink	57	51	60	55	50	57

Note. All numbers in table body are percentages.

scale for this item was as follows: Never, 1 to 2, 3 to 4, 5 to 6, 7 to 8, and 9 or more. In our previous research with adolescents and adults (e.g., Turrisi, 1999; Turrisi & Jaccard, 1991) we have observed nonsignificant correlations between these measures and indexes of social desirability, reasonably high test-retest reliability estimates (e.g., $r_s = .85-.90$), and good convergence between these items and indexes of drinking quantity-frequency (e.g., $r = .70$ or greater). The last item was based on the recent work of Wechsler et al. (1994). The measure has concurrent validity and has behaved in theoretically expected ways in the context of the larger body of literature on binge drinking. The measure asked individuals to report the number of times during the last 2 weeks that they had five or more drinks in a row on a single occasion (e.g., in the same evening).

The above measures rely on self-reports of drinking tendencies. One could argue that the measures are biased by the respondents' willingness to admit to drinking alcohol. This issue was confronted in several ways. First, in the orienting instructions given to the respondents the importance of obtaining honest answers was emphasized. Second, at no time did the respondents have to directly tell an interviewer their responses. The individual's name never appeared on the questionnaires; only arbitrary identification numbers were used. Finally, all respondents were notified of these procedures in advance.

The reliability and validity of the measures were evaluated in several ways. First, convergence between the measures was strong, with an average convergent validity coefficient of .87. Second, correlations between the measures and the short version of the Good Impression scale from the California Psychological Inventory (Gough, 1957) were also low and nonsignificant ($p > .10$), suggesting that the

influence of social desirability tendencies was minimal. We derived an overall index of binge-drinking tendencies using the measures by standardizing each measure and then summing across the three indexes. High scores indicate a greater tendency to binge drink. Past research has demonstrated gender differences (i.e., men drink more often and in larger amounts; Abel & Zeidenberg, 1985; Cosper & Mozersky, 1968; Wechsler et al., 1994). Confidence in the validity of the aggregated measure is greater if such gender differences are also observed, thereby establishing concurrent validity. Comparison of men ($M = 1.45$) and women ($M = 0.62$) revealed a significant difference in the aggregated index of the measures, $F(1, 263) = 15.79, p < .01$. Thus, the individual and aggregated indexes exhibit high levels of reliability, convergent validity, concurrent validity, and discriminant validity (with social desirability tendencies). Although the measures are not perfect, given the strong convergence they appear to be sufficiently valid to provide insights into binge-drinking tendencies.

Binge-drinking consequences. Five items from the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992) were used to evaluate binge-drinking consequences. We selected the YAAPST because it was developed specifically for use with college students, and the test-retest reliability correlation over approximately 9 months was reported to be .73. The content of the items was as follows: involvement in a physical fight, experiencing a blackout, driving an automobile after drinking too much, regretting a sexual situation, and experiencing a headache or other hangover symptoms after drinking. Individuals responded to the items by indicating that they had or had not experienced the consequence.

Binge-drinking beliefs. These beliefs were derived from a literature review of cognitive models of

alcohol use (e.g., Brown, Goldman, Inn, & Anderson, 1980; Christiansen, Goldman, & Inn, 1982; Christiansen, Smith, Roehling, & Goldman, 1989) as well as findings in previous research on adolescents and college students showing them to be related to binge-drinking tendencies (e.g., Turrissi, 1999; Turrissi et al., 1997). For example, the items that we chose to focus on consisted of the following: alcohol can make positive transformations (e.g., "having a few drinks is a nice way to celebrate special occasions" and "a few drinks makes it easier to talk to people"), can enhance social behaviors (e.g., "I tend to drink when my friends are drinking"), physical risk (e.g., "I doubt I will get caught driving drunk"), negative affect (e.g., "drinking alcohol can result in negative changes in my personality and makes me irritable"), health orientation (e.g., "I am committed to a healthy lifestyle"), and normative approval (e.g., "teens who drink are cool"). Individuals responded to each of the items on a 5-point (strongly agree, moderately agree, neutral, moderately disagree, strongly disagree) Likert-type scale. In previous studies, estimates of test-retest reliability of the items have been generally high (e.g., r s ranging from .72 to .93), and none of the items have been correlated with social desirability tendencies. We subjected the items to a principal-components factor analysis with an oblique rotation (see Jaccard & Wan, 1996). We used an oblique rotation to permit correlations to the extent that such relations existed among the cognitive variables (factor loadings were greater than 0.70; eigenvalues were all > 1.0 , and interitem correlations were all $> .50$). A score on each multiple-item factor was defined by summing the multiple items that load on the factor (coefficient alphas on multiple item factors were all $> .90$). High scores on the factors Physical Risk, Negative Affect, and Health Orientation reflect less favorable views toward drinking alcohol (e.g., increased physical risk), whereas high scores on the factors Positive Transformations, Enhance Social Behaviors, and Normative Approval reflect more positive views toward drinking (e.g., increased social behaviors).

Mother-teen communication. Mother-teen communication was assessed at the level of the teen and on the basis of the work of Jaccard and Dittus (1993) and Noller and Callan (1988), which focused on mother-teen communication. We developed a 16-item measure to assess the degree of alcohol-based mother-teen communication. The content of the items was derived from a literature review of adolescent alcohol use, alcohol expectancies, and mother-teen relationships (e.g., Brown et al., 1980; Christiansen et al., 1989; Jaccard & Turrissi, 1999; Turrissi, 1999). An example of the content of the items is as follows: "My mom and I have talked about how drinking could get me into trouble with the police," "My mom and I have talked about how drinking

changes your personality," "My mom and I have talked about the negative consequences of mixing alcohol and sex," and "My mom and I have talked about the importance of being committed to a healthy lifestyle." Individuals responded to the items on 4-point scales (not at all, somewhat, a moderate amount, a great deal). In a pilot study on an independent sample of college students ($N = 100$), the reliability of the individual items ranged from .53 to .75 with a mean of .64. Only one of the items was statistically significantly correlated with a measure of social desirability tendencies ($r = -.18$), and it was in the direction opposite to what would be predicted.

Results

The results are organized in two sections: First, we examined drinking beliefs that were theoretically relevant to the experience of binge-drinking consequences. Second, we examined the relation between mother-teen communications and the relevant drinking beliefs.

Analysis of Drinking-Related Consequences

Because of the dichotomous nature of the consequence outcome variables, we conducted a series of logistic regressions in which a given consequence item (e.g., involvement in a physical fight) was regressed onto binge-drinking tendencies and a drinking belief (e.g., make positive transformations).¹ This permitted the evaluation of the effect of a given drinking belief on the experiencing of the negative consequence over and above what might be expected by the effect of binge drinking. Thus, if the belief were related to the consequence only indirectly, by virtue of its relation to the tendency to binge drink (as traditional expectancy-value/attitude-

¹ We considered an alternate analysis in which the consequence items were aggregated to reduce the negative effects of multicollinearity (correlated predictors) and inflated Type I errors (numerous statistical tests). We rejected this approach after we examined the correlations between the consequence items and observed that they were not strong enough to warrant concern about multicollinearity in subsequent analyses (e.g., r s $< .40$). We also considered aggregating the items with moderate correlations; however, these lacked conceptual similarity (e.g., regretting sexual situations and experiencing a hangover) and revealed poor factor structures that did not yield good model fit indices using confirmatory analytic procedures.

behavior theory would predict), whatever remaining variance for the resulting belief-consequence relationship would be non-significant in the analyses. In contrast, if the belief were directly related to the consequence after the variance of binge-drinking tendencies had been partialled out (as the direct-effect model would predict), then it could be assumed that the belief was having an impact on the experience of the consequence independent of the tendency to binge drink.² The results of these analyses are discussed in turn.

Consistent with the previous research examining the binge-drinking-consequence relation (Baer et al., 1995; Wechsler et al., 1994), in all of the analyses binge-drinking tendencies were found to be significantly positively related to experiencing the consequences. The range of the odds ratios estimating the relations between binge drinking and the consequences was 1.04–1.30 (all $ps < .05$).³ It is important to note that when interpreting odds ratios a value of 1.0 indicates no relation (i.e., multiplying something by 1.0 yields itself), a value above 1.0 indicates a positive relation, and a value below 1.0 indicates a negative relation, with the magnitude of the effect indicated by how far the odds ratio diverges from 1.0 in either direction. It is interesting that the evaluation of the effects of the belief-consequence relations revealed numerous significant effects over and above the effects of binge-drinking tendencies (the odds ratios from these analyses are presented in Table 2).

Examination of the consequences experiencing a blackout, regretting a sexual situation, and experiencing a headache or other hangover symptoms after drinking revealed significant positive relations with the beliefs that alcohol that can make positive transformations and can enhance social behaviors. As these beliefs increased in magnitude the odds of individuals experiencing a blackout, regretting a sexual situation, or experiencing a headache or other hangover symptoms after drinking increased significantly. In contrast, normative approval was negatively related to the consequence of experiencing a headache or other hangover symptoms after drinking. Thus, individuals who perceived drinking as cool were less likely to report hangover symptoms.

For the consequence of getting into a physical

fight after drinking, a significant positive relation was observed with the belief that alcohol can enhance social behavior. As the magnitude of the belief increased, the odds that individuals were more likely to be involved in a physical fight increased significantly. In contrast, the belief that alcohol can result in negative affect (e.g., change one's personality and make one irritable) was negatively related to the consequence of getting into a physical fight after drinking.

Finally, driving after drinking too much was positively related to the belief that alcohol can make positive transformations.

Taken together, the above findings provide support for a direct-effects conceptualization of the experience of negative binge-drinking related consequences for the drinking beliefs regarding alcohol can make positive transformations, can enhance social behavior, negative affect, and normative approval. No support for a direct-effects conceptualization was found for the beliefs regarding physical risk and health orientation.

Analysis of Relevant Beliefs

We conducted a series of multiple regressions in which a drinking belief (e.g., alcohol can

² We examined another plausible model in which the relation between drinking tendencies and consequences was moderated by drinking beliefs. The analyses did not turn out as we expected, and we were left wondering about drawing inaccurate conclusions. As it turns out, most interaction effects using drinking-belief based variables in traditional multiple regression tend to be fairly small in terms of percentage of variance accounted for when the R^2 for the main-effect model is compared with the model including the product term (e.g., around 1%–2% or less; Turrissi, 1999; Turrissi et al., 1997); however, because of the power associated with the parametric statistic it is still possible to observe significant effects even with small effect sizes. In contrast, when we used the less powerful logistic approach we were unable to observe reliable significant effects with small effect sizes. Hence, we reported the more appropriate logistic analyses in the Results section using nonmoderator models.

³ More specific information on the values of the regression coefficients and odds ratios for the binge-drinking tendencies are available from Rob Turrissi on request.

Table 2

Odds Ratios (e^b) and Wald's Coefficients (W) From the Analyses in Which Binge-Drinking Consequences Were Regressed Onto Drinking Beliefs

Drinking belief	Consequence				
	Involved in a physical fight	Experienced a blackout	Drove after drinking too much	Regretted a sexual situation	Experienced a headache or hangover symptoms
Positive transformations					
e^b	1.00	2.15	1.72	2.13	1.96
W	.00	17.97**	9.01**	15.59**	15.43**
Enhance social behaviors					
e^b	2.03	1.33	1.05	1.35	1.69
W	4.98*	6.08**	0.16	6.33**	17.97**
Physical risk					
e^b	1.09	0.89	0.84	0.95	0.93
W	0.27	1.44	2.95	0.26	0.45
Negative affect					
e^b	0.58	0.85	0.96	1.06	0.80
W	7.65**	2.01	0.17	0.31	3.27
Health orientation					
e^b	1.57	0.83	0.82	0.84	0.72
W	2.06	1.43	1.59	1.23	3.21
Normative approval					
e^b	0.76	0.81	0.78	1.02	0.73
W	1.60	2.27	3.12	0.02	4.04*

* $p < .05$. ** $p < .01$.

make positive transformations) was regressed onto the mother-teen communication items. The parameter estimates from these analyses are presented in Table 3. With the exception of the communications about how drinking gets in the way of making true friends and how drinking makes problems worse and not better, the majority of communication items were related to only one or two drinking beliefs. The strongest relations for the belief that alcohol can make positive transformations were with the communications regarding how drinking makes problems worse and not better, how getting caught might get publicized in the newspaper, and how getting caught could get the teen in trouble with the police. The strongest relations for the belief that alcohol can enhance social behaviors were with the communications regarding how drinking gets in the way of making true friends and how drinking makes problems worse and not better. The strongest relations for the belief that alcohol can increase negative affect were with the communications regarding how drinking gets in the way of making true friends, how drinking makes problems worse and not better,

and how alcohol changes one's personality. Finally, the strongest relations for the belief regarding normative approval were with the communications regarding the importance of being committed to a healthy lifestyle and how being caught drinking would be embarrassing for the family.

Together, these analyses provide supportive evidence that mother-teen communications are related to teens' drinking beliefs relevant to the experience of binge-drinking consequences.

Discussion

Past research has shown the importance of drinking expectancies related to drinking tendencies (e.g., Baer, 1994; Critchlow, 1987; Darkes & Goldman, 1993; Evans & Dunn, 1995; Stacy et al., 1990). Despite the importance of expectancies in this regard, few studies have examined the direct impact of these constructs on binge-drinking consequences in a systematic manner. The primary focus has generally been on binge-drinking tendencies and, when the study has examined the consequences,

Table 3

Significant Regression Coefficients and Semipartial r^2 s From the Analyses in Which Drinking Beliefs Were Regressed onto Mother-Teen Communication Items

	Drinking belief							
	Positive transformations		Enhance social behaviors		Negative affect		Normative approval	
	β	pr	β	pr	β	pr	β	pr
Mom and I have talked about . . .								
How drinking could get me into trouble with the police	-.140**	.03					-.133**	.03
What my punishment would be if I were to get caught drinking	-.131**	.03						
How alcohol changes your personality			-.180*	.02	.202**	.04		
The importance of being committed to a healthy lifestyle					.173*	.03	-.176**	.04
How embarrassing it would be for the family if I were caught drinking							-.170**	.04
How being caught drinking might lead to being made fun of by my friends					.252*	.03		
How being caught drinking might result in publication of my arrest in the newspaper	-.150**	.03					-.138**	.03
The importance of being able to improve my mood without the use of alcohol			-.173*	.03	.153*	.02		
How alcohol can create a false sense of power			-.194*	.03				
How alcohol only gets in the way of making true friends	-.127*	.02	-.317**	.05	.207**	.04	-.117*	.02
How drinking only makes problems worse, not better	-.167**	.04	-.265**	.05	.252**	.05		

* $p < .05$. ** $p < .01$.

the underlying assumption is that the consequences are due to the act of binge drinking. It is interesting that the relation between the act of binge drinking and the experience of consequences is not perfect; binge drinking becomes a necessary, but not sufficient, predictor of experiencing consequences. Other variables must also then be considered in the conceptualizations predicting drinking consequences. Moreover, as new variables or relations are identified behavioral interventions should be designed with these in mind to reduce the frequency and magnitude of consequences. The present research was conducted in an attempt to address some of these issues by examining psychological constructs relevant to the drinking-related consequences. The nature of the findings is now discussed.

From a theoretical standpoint, the present

study formally compared theoretical models using drinking beliefs, binge-drinking tendencies, and behavioral consequences. Two conceptual models were proposed that suggested the presence of direct and indirect effects of drinking beliefs on the experience of negative binge-drinking consequences. We observed support for a direct-effects conceptualization of the experience of binge-drinking consequences for the beliefs that alcohol can make positive transformations, can enhance social behavior, increases negative affect, and is normal for teens. Individuals who held more positive beliefs regarding alcohol's effect on positive transformations and enhancement of social behavior were more apt to experience the negative consequences associated with binge-drinking tendencies relative to individuals with less positive beliefs. This was the case regardless of the magnitude

of binge drinking. These findings run counter to what would be predicted by traditional expectancy-value conceptualizations, a prediction that, in its simplest form, argues that beliefs influence attitudes rather than behaviors (e.g., Ajzen & Fishbein, 1980). Although our findings are atypical, they are not an anomaly in the alcohol literature. Stacy et al. (1990) found support for models that predicted drunk driving behavior from expectancies and personality rather than from attitudinal constructs.

The implications of the direct-effects models are intriguing. First, it is clear from the data that if individuals have been binge drinking what they believe about alcohol use may ultimately affect whether they experience consequences. There are several plausible explanations for why this might occur, all of which suggest that the beliefs have some impact on later behavioral or psychological constructs that eventually lead to negative consequences. First, individuals' positive drinking beliefs may influence future decision making, and subsequent outcomes, after they have already been drinking. For example, Turrisi and Wiersma (1999) identified individual differences in the processes by which individuals determine whether they are intoxicated. These decision processes influence subsequent decision making that then results in individuals experiencing negative consequences. Second, individuals' positive drinking beliefs may lead them into situations that increase their propensity to harm. Studies have shown that bar attendance is predicted on the basis of drinking perceptions (Turrisi, 1999) and that women who frequent bars are more apt to be victimized (Fillmore, 1985; Parks & Miller, 1997). Finally, individuals' positive drinking beliefs may positively bias subsequent cognitive processing of information, which leads to poor subsequent decisions and actions. For example, there is evidence that, after drinking alcohol, individuals focus on more salient situational cues (e.g., everyone is having a good time; Norris, Nurius, & Dimeff, 1996; Steele & Josephs, 1990), ignore the less obvious cues (e.g., men perceive that women are more sexually available after they have been drinking; George, Gournic, & McAfee, 1988), and perceive the probability of experiencing negative consequences as being less likely to occur (e.g., Fromme, D'Amico, & Katz, 1997). These reports, together with the

present research, underscore the complexity of the theoretical relation between the beliefs individuals hold regarding alcohol use and the odds of experiencing consequences.

It is important to note that not all drinking beliefs were directly related to the consequences. Support for the indirect-effects model, which is consistent with the traditional expectancy-value conceptualization, was observed for the beliefs regarding physical risk and health orientation.⁴ As suggested by previous studies (Turrisi, 1999), the value of these beliefs seems to be better suited to preventing binge drinking than subsequent consequences.

A second focus of the research examined the theoretical relations between specific mother-teen communications and the drinking beliefs relevant to college binge-drinking consequences. Numerous researchers have argued that improved efforts be made at the early detection and prevention of binge drinking, as early as the first year of high school, or sooner (e.g., Johnston et al., 1997; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996). Despite the sizable literature on parent-adolescent drinking, the benefits of using parent-based approaches in early intervention efforts, and the documented importance of parents in college student development, the study of mother-teen relations has not been applied to the area of binge drinking in college students. As suggested earlier, this probably is due to the inaccurate assumption that parents have minimal influence on their children when the children are living away from home at college. The data from the present study reaffirm the importance of the relation between mother-teen communications and teen drinking-related beliefs relevant to binge-drinking consequences. We were impressed by the consistency, even across the varying content of the beliefs, with which mother-teen communications were related to the "beliefs" that prevented the experience of

⁴ Although the focus of the analyses was not to re-establish the relations between the drinking perceptions and drinking tendencies that have been reported in previous studies (e.g., Turrisi, 1999), in preliminary analyses we observed significant direct relations between all drinking beliefs and drinking tendencies (all r s $> .20$, p s $< .05$).

negative consequences. Most parent communications were related to more than a single drinking belief, and several were related to more than two (e.g., how alcohol gets in the way of making true friends, how alcohol only makes problems worse and not better). It is important to note that our methodology was correlational in nature and that one could argue that the mother-teen communications were reactive to their teens drinking while away at college (e.g., parents hear that their teens have been drinking and then communicate, rather than the opposite situation, in which parents are proactive and communicate before their children leave for school). It is unlikely that this is the case in the present study, for several reasons. First, our findings were in directions that would be theoretically consistent with proactive rather than reactive communications. For example, nearly all of the relations between mother-teen communications and beliefs were negative. This suggests that when parents communicated more, the teens were less positive about drinking. In contrast, we did not observe positive relations, which would suggest that as teens were more positive about drinking their parents tended to talk to them more. (The exceptions were the positive relations between increased negative affect and parent-teen communications. Proactive communications would predict positive relations for this belief.) Despite the theoretical consistency, future research needs to examine these relations in the context of experimentally controlled situations in which parents who are encouraged to talk to their sons and daughters are compared with controls. Our data do provide initial support for the notion that parents who are able to convey these issues to their teens in their communications might be buffering the teens from experiencing later problems in college.

It is important to note a few limitations of the present study that future research should address. First, the research examined the impact of drinking beliefs on the experience of consequences. There is, however, the potential for other psychological and behavioral variables to have an influence on the experience of consequences. As suggested earlier, drinking beliefs may be influencing decision processes or behaviors, which in turn influence the experience of consequences. For example, for an individual to have a regretted sexual experience there have

been probably several intermediate decisions that have to be made prior to the sexual experience that need to be included in the conceptual model (e.g., excessive flirting, accepting drinks from someone one just met, pairing off from friends, getting a ride from someone one doesn't know well, etc.). Second, our sample was a relatively restricted one. We examined college students from a moderate-sized university in the Pacific Northwest. Although the goal was to generate a sample of students with diverse backgrounds, future studies need to be conducted on college populations that vary from this one to examine the generalizability of the findings. Along these lines, future work needs to examine how well these findings generalize to noncollege populations. Although high percentages of college students are heavy episodic drinkers, it is likely that students make up a smaller percentage of heavy drinkers by comparison with the general population. Third, the analytic models we examined presumed that binge-drinking consequences were being influenced by binge-drinking tendencies and drinking beliefs and not the reverse—that the experience of consequences leads to binge drinking and beliefs that justify the heavy use of alcohol (i.e., a coping-response conceptualization). Although the data fit the theoretical models suggested, it is plausible that other models might fit the data as well. Future research needs to go beyond traditional conceptualizations, as well as those suggested in the present study, and compare other plausible models.

In sum, drinking consequences represent a major concern on college campuses. According to the theoretical orientation of the present study, not all individuals who drink experience consequences, and not all individuals who experience consequences experience all of the consequences. Parents may influence the development of drinking beliefs in their sons and daughters through communications with them. These beliefs, in turn, may have a role in influencing the probability of the students experiencing negative binge-drinking related consequences while at college. Interventions that attempt to increase such communications and beliefs in college students have the potential for reducing binge-drinking related consequences.

References

- Abbey, S. (1991). Acquaintance rape and alcohol consumption on college campuses: How are they linked? *Journal of American College Health*, 39, 165-169.
- Abel, E. L., & Zeidenberg, P. (1985). Age, alcohol and violent death: A post-mortem study. *Journal of Studies on Alcohol*, 46, 228-231.
- Ajzen, I., & Fishbein, M. (1980). *Understanding social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Amerikaner, M., Monks, G., Wolfe, P., & Thomas, S. (1994). Family interaction and individual psychological health. *Journal of Counseling and Development*, 72, 614-620.
- Ary, D. V., Tildesley, E., Hops, H., & Andrews, J. (1993). The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International Journal of the Addictions*, 28, 213-228.
- Baer, J. S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors*, 8, 43-50.
- Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1995). High-risk drinking across the transition from high school to college. *Alcoholism: Clinical and Experimental Research*, 19, 54-61.
- Barnes, G. M., & Farrell, M. P. (1992). Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviors. *Journal of Marriage and the Family*, 54, 763-776.
- Barnes, G., & Welte, J. (1986). Predictors of driving while intoxicated among teenagers. *Journal of Drug Issues*, 18, 367-384.
- Beck, K. H., & Lockhart, S. J. (1992). A model of parental involvement in adolescent drinking and driving. *Journal of Youth and Adolescence*, 22, 123-138.
- Beck, K. H., Summons, T. G., & Mathews, M. P. (1991). Monitoring parent concerns about teenage drinking and driving: A focus group interview approach. *Journal of Alcohol and Drug Education*, 37, 46-57.
- Brown, S. A., Goldman, M. S., Inn, A., & Anderson, L. R. (1980). Expectations of reinforcement from alcohol: Their domain and relation to drinking patterns. *Journal of Consulting and Clinical Psychology*, 48, 419-426.
- Christiansen, B. A., Goldman, M. S., & Inn, A. (1982). Development of alcohol related expectancies in adolescents: Separating pharmacological from social learning influences. *Journal of Consulting and Clinical Psychology*, 50, 336-344.
- Christiansen, B. A., Smith, G. T., Roehling, P. V., & Goldman, M. S. (1989). Using alcohol expectancies to predict adolescent drinking behavior after one year. *Journal of Consulting and Clinical Psychology*, 57, 93-99.
- Coombs, R. H., Paulson, M. J., & Richardson, M. A. (1991). Peer vs. parental influence in substance use among Hispanic and Anglo children and adolescents. *Journal of Youth and Adolescence*, 20, 73-88.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, 6, 117-128.
- Cosper, R., & Mozerky, K. (1968). Social correlates of drinking. *Quarterly Journal of Studies on Alcohol, Suppl. No. 4*, 17-58.
- Critchlow, B. (1987). A utility analysis of drinking. *Addictive Behaviors*, 12, 269-273.
- Darke, J., & Goldman, M. S. (1993). Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*, 61, 344-353.
- Dielman, T. E. (1995). School-based research on the prevention of adolescent alcohol use and misuse: Methodological issues and advances. In G. M. Boyd, J. Howard, & R. A. Zucker (Eds.), *Alcohol problems among adolescents* (pp. 125-146). Mahwah, NJ: Erlbaum.
- Dishion, T. J., Kavanagh, K., & Reid, J. B. (1989, November). *Childrearing vs. peer interventions in the reduction of risk for adolescent substance use and adjustment problems: A secondary prevention strategy*. Paper presented at the conference for the Advancement of Applied Behavior Therapy, Washington, DC.
- Dodge, S. (1991, October). The use of beer kegs banned by some colleges and national fraternities. *The Chronicle of Higher Education*, 24-27.
- Donovan, D. M., & Marlatt, G. A. (1982). Personality subtypes among driving-while-intoxicated offenders: Relationship to drinking behavior and driving risk. *Journal of Consulting and Clinical Psychology*, 50, 241-249.
- Evans, D. M., & Dunn, N. J. (1995). Alcohol expectancies, coping responses and self-efficacy judgments: A replication and extension of Cooper et al.'s 1988 study in a college sample. *Journal of Studies on Alcohol*, 56, 186-193.
- Fillmore, K. M. (1985). The social victims of drinking. *British Journal of Addiction*, 80, 307-314.
- Fromme, K., D'Amico, E. J., & Katz, E. C. (1997). Effects of alcohol intoxication on the perceived consequences of risk-taking. *Experimental and Clinical Psychopharmacology*, 5, 14-23.
- Galotti, K. M., & Mark, M. C. (1994). How do high school students structure an important life decision? A short-term longitudinal study of the college

- decision-making process. *Research in Higher Education*, 35, 589-607.
- George, W. H., Gourmic, S. J., & McAfee, M. P. (1988). Perceptions of postdrinking female sexuality: Effects of gender, beverage choice, and drink payment. *Journal of Applied Social Psychology*, 18, 1295-1317.
- Gfroerer, J. C., Greenblatt, J. C., & Wright, D. A. (1997). Substance use in the US college-age population: Differences according to educational status and living arrangement. *American Journal of Public Health*, 87, 62-65.
- Gough, H. G. (1957). *California Psychological Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Hansen, W. B., Graham, J. W., Sobel, J. L., Shelton, D. R., Flay, B. R., & Johnson, C. A. (1987). The consistency of peer and parent influences on tobacco, alcohol, and marijuana use among young adolescents. *Journal of Behavioral Medicine*, 10, 559-579.
- Harris, J. R. (1998). *The nurture assumption*. New York: Free Press.
- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112, 64-105.
- Hurlbut, S. C., & Sher, K. J. (1992). Assessing alcohol problems in college students. *Journal of American College Health*, 41, 49-58.
- Jaccard, J., & Dittus, P. (1993). *Parent-teen communication about premarital pregnancy*. New York: Springer-Verlag.
- Jaccard, J., & Turrisi, R. (1999). Parent-based intervention to reduce adolescent drunk driving. *Journal of Studies on Alcohol*, Suppl. No. 13, 84-93.
- Jaccard, J., & Wan, C. K. (1996). *LISREL approaches to interaction effects in multiple regression*. Thousand Oaks, CA: Sage.
- Jessor, R. (1987). Risky driving and adolescent problem behavior: An extension of problem behavior theory. *Alcohol, Drugs, and Driving*, 3, 1-12.
- Johnson, C. A., Pentz, M. A., Weber, M. D., Dwyer, J. H., Baer, N., MacKinnon, D. P., & Hansen, W. B. (1990). Relative effectiveness of comprehensive community programming for drug abuse prevention with high-risk and low-risk adolescents. *Journal of Consulting and Clinical Psychology*, 58, 447-456.
- Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (1997). *National survey results on drug use from the Monitoring the Future Study, 1975-1995: Vol. II. College students and young adults* (National Institutes of Health Publication No. 98-4140). Washington, DC: U.S. Department of Health and Human Services.
- Jones-Webb, R., Short, B., Wagenaar, A., Toomey, T., Murray, D., Wolfson, M., & Forster, J. (1997). Environmental predictors of drinking and drinking-related problems in young adults. *Journal of Drug Education*, 27, 67-82.
- Kunz, M. L., Irving, W. M., & Black, D. R. (1993). Health services at large public institutions: Funding, utilization, and staffing. *Journal of American College Health*, 42, 3-14.
- Langhinrichsen-Rohling, J., Larsen, A. E., & Jacobs, J. E. (1997). Retrospective reports of the family of origin environment and the transition to college. *Journal of College Student Development*, 38, 49-61.
- Leichtler, J. S., Meilman, P. W., Presley, C. A., & Cashin, J. R. (1998). Alcohol use and related consequences among students with varying levels of involvement in college athletics. *Journal of American College Health*, 46, 257-262.
- McKnight, A. J., & Streff, F. M. (1994). The effect of enforcement upon service of alcohol to intoxicated patrons of bars and restaurants. *Accident Analysis and Prevention*, 26, 79-88.
- Meilman, P. W., Leichtler, J. S., & Presley, C. A. (1999). Greeks and athletes: Who drinks more? *Journal of American College Health*, 47, 187-190.
- Noller, P., & Callan, V. J. (1988). Understanding parent-adolescent interactions: Perceptions of family members and outsiders. *Developmental Psychology*, 2, 707-714.
- Norris, J., Nurius, P. S., & Dimeff, L. A. (1996). Through her eyes: Factors affecting women's perception of and resistance to acquaintance sexual aggression threat. *Psychology of Women Quarterly*, 20, 123-145.
- Parks, K. A., & Miller, B. A. (1997). Bar victimization of women. *Psychology of Women Quarterly*, 21, 509-525.
- Perry, C. L., Pirie, P., Holder, W., Halper, A., & Dudovitz, B. (1990). Parent involvement in cigarette smoking prevention: Two pilot evaluations of the "Unpuffables Program." *Journal of School Health*, 60, 443-447.
- Peterson, P. L., Hawkins, D. L., Abbott, R. D., & Catalano, R. F. (1995). Disentangling the effects of parental drinking, family management, and parental alcohol norms on current drinking by Black and White adolescents. In G. M. Boyd, J. Howard, & R. A. Zucker (Eds.), *Alcohol problems among adolescents* (pp. 33-57). Mahwah, NJ: Erlbaum.
- Poulson, R. L., Eppler, M. A., Satterwhite, T. N., Wuensch, K. L., & Bass, L. A. (1998). Alcohol consumption, strength of religious beliefs, and risky sexual behavior in college students. *Journal of American College Health*, 46, 227-232.
- Reifman, A., Barnes, G. M., Dintcheff, B. A., Farrell, M. P., & Uhteg, L. (1998). Parental and peer influences on the onset of heavier drinking among ado-

- lescents. *Journal of Studies on Alcohol*, 59, 311-317.
- Saltz, R., & Elandt, D. (1986). College student drinking studies, 1976-1985. *Contemporary Drug Problems*, 13, 117-159.
- Schuckit, M. A., Klein, J. L., Twitchell, G. R., & Springer, L. M. (1994). Increases in alcohol-related problems for men on a college campus between 1980 and 1992. *Journal of Studies on Alcohol*, 55, 739-742.
- Schulenberg, J., O'Malley, P. M., Bachman, J. G., Wadsworth, K. N., & Johnston, L. D. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol*, 57, 289-304.
- Stacy, A. W., Widaman, K. F., & Marlatt, G. A. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology*, 58, 918-928.
- Stage, F. K., & Rushin, P. W. (1993). A combined model of student predisposition to college and persistence in college. *Journal of College Student Development*, 34, 276-281.
- Steele, C. M., & Josephs, R. A. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist*, 45, 921-933.
- Turrisi, R. (1999). Cognitive and attitudinal factors in the analysis of alternatives to binge drinking. *Journal of Applied Social Psychology*, 29, 1510-1533.
- Turrisi, R., & Jaccard, J. (1991). Judgment processes relevant to drunk driving. *Journal of Applied Social Psychology*, 21, 89-118.
- Turrisi, R., & Jaccard, J. (1992). Cognitive and attitudinal factors in the analysis of alternatives to driving. *Journal of Studies on Alcohol*, 53, 405-414.
- Turrisi, R., Jaccard, J., Kelly, S. Q., & Valera, E. M. (1995). Parent and teen perceptions regarding parental efforts at controlling teen drunk driving. *Journal of Applied Social Psychology*, 24, 1387-1406.
- Turrisi, R., Jaccard, J., & McDonnell, D. (1997). An examination of the relationships between personality, attitudes, and cognitions relevant to alcohol-impaired driving tendencies. *Journal of Applied Social Psychology*, 27, 1367-1394.
- Turrisi, R., Nicholson, B., & Jaccard, J. (1999). An examination of the utility of server intervention to reduce alcohol-related problems in college students. *Journal of Applied Social Psychology*, 29, 622-638.
- Turrisi, R., & Wiersma, K. (1999). Examination of judgments of drunkenness, binge drinking, and drunk driving tendencies in teens with and without a family history of alcohol abuse. *Alcoholism: Clinical and Experimental Research*, 23, 1-8.
- Wechsler, H., Davenport, A., Dowdall, G., Mowry, B., & Castillo, S. (1995). Health and behavioral consequences of binge drinking in college. *Journal of the American Medical Association*, 272, 1672-1677.
- Wechsler, H., Dowdall, G. W., Maenner, G., Gledhill-Hoyt, J., & Lee, H. (1998). Changes in binge drinking and related problems among American college students between 1993 and 1997. *Journal of American College Health*, 47, 57-68.
- Wechsler, H., Issac, N. E., Grodstein, F., & Sellers, D. (1994). Continuation and initiation of alcohol use from the first and second year of college. *Journal of Studies on Alcohol*, 55, 41-45.

Received June 14, 1999

Revision received January 25, 2000

Accepted January 25, 2000 ■