Published in final edited form as:

Psychol Addict Behav. 2009 September ; 23(3): 539–545. doi:10.1037/a0015176.

Gender-Specific Normative Perceptions of Alcohol-Related Protective Behavioral Strategies

Melissa A. Lewis, Michiko Rees, and Christine M. Lee

Department of Psychiatry and Behavioral Sciences, University of Washington.

Abstract

The present research aimed to (1) determine if students underestimate gender-specific descriptive normative perceptions for protective behavioral strategies; (2) to evaluate the relationships among perceived gender-specific descriptive and injunctive drinking norms and perceived gender-specific descriptive norms for protective behavioral strategies; and (3) to examine whether normative perceptions for protective behavioral strategies relate to use of these strategies when controlling for relevant drinking behavior factors (i.e., alcohol consumption, negative consequences, and attitude toward drinking behavior) and social norms factors (i.e., perceived descriptive and injunctive norms). Students ($N = 666$; 56.6% male) completed measures assessing drinking behavior and attitudes toward drinking, perceived descriptive and injunctive norms, perceived protective behavioral strategies, and protective behavioral strategies. Findings demonstrated that students consistently underestimated the use of strategies for the typical male student, whereas results were less consistent for the typical female student. In addition, results indicated that same-sex normative perceptions for protective behavioral strategies were associated with personal use of these strategies, even when controlling for relevant drinking behavior and social norms factors. Results stress the importance of evaluating factors that are associated with use of protective behavioral strategies. Implications for social norms preventative interventions are discussed.

Keywords

normative perceptions; social norms; alcohol; protective behavioral strategies

Protective behavioral strategies (PBS) for drinking are behaviors that individuals engage in to reduce or limit alcohol consumption and related negative consequences, such as alternating alcoholic and nonalcoholic drinks (Glassman, Werch, & Jobli, 2007; Martens et al., 2004, 2005; Martens, Pederson, LaBrie, Ferrier, & Cimini, 2007; Werch, 1990; Werch & Gorman, 1988). While research has found that more frequent use of PBS is negatively associated with drinking behavior (Martens et al., 2004, 2005) and that increasing use of PBS can reduce alcohol consumption (Larimer et al., 2007), few studies have examined factors related to the use of PBS. Understanding why students use PBS may aid in developing efficacious preventative interventions to increase the use of these strategies. Specifically, the present study expands previous research by determining if college students misperceive the use of PBS for

Please send correspondence concerning this article to Melissa A. Lewis, Department of Psychiatry and Behavioral Sciences, Box 354944, University of Washington, Seattle, WA 98195. Phone: 206-221-6932 Fax: 206-616-1705 lewisma@u.washington.edu.

Publisher's Disclaimer: The following manuscript is the final accepted manuscript. It has not been subjected to the final copyediting, fact-checking, and proofreading required for formal publication. It is not the definitive, publisher-authenticated version. The American Psychological Association and its Council of Editors disclaim any responsibility or liabilities for errors or omissions of this manuscript version, any version derived from this manuscript by NIH, or other third parties. The published version is available at www.apa.org/journals/adb.

gender-specific normative referents, and whether these normative perceptions relate to gender-specific descriptive and injunctive drinking norms. Additionally, this research will aid in determining whether normative perceptions for PBS relate to personal use of strategies when controlling for gender, drinking behavior factors (i.e., alcohol consumption, negative consequences, and attitude toward drinking behavior), and social norms factors (i.e., gender-specific descriptive and injunctive drinking norms).

Prior research has established that social norms are associated with alcohol consumption and related negative consequences (Borsari & Carey, 2001; Carey, Borsari, Carey, & Maisto, 2006; Lewis & Neighbors, 2004; Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Perceived descriptive drinking norms are the perceived prevalence of drinking behavior, whereas perceived injunctive drinking norms refer to the perceptions of how much others approve of drinking behavior. Social norms studies have found that students *overestimate* peer drinking behavior and approval, such that students perceive their peers as drinking more and being more approving of alcohol relative to their drinking behavior and approval (Carey et al., 2006; Lewis & Neighbors, 2004). However, when examining descriptive normative perceptions of PBS, research has found that individuals *underestimate* the use of these strategies. Benton and colleagues (2008) found that students perceived the typical student as using PBS less relative to their own use of strategies and that descriptive normative perceptions for PBS by the typical college student was positively and uniquely associated with use of PBS, when controlling for drinking behavior and gender.

Gender is important when examining degree of overestimation or underestimation among various behaviors. Previous research has found that students tend to perceive the typical male student as drinking heavier and less concerned for campus alcohol use and drunk driving than the typical female student (Lewis & Neighbors, 2004; Suls & Green, 2003). Furthermore, research has found that women were more likely than men to perceive both typical female and male students as less concerned about alcohol use on campus and drunk driving relative to their own personal views (Suls & Green, 2003). Benton and colleagues (2008) found that women were more likely than men to perceive the typical student as using PBS less frequently relative to their own reported use of strategies. In addition to gender differences in normative perceptions, prior research has found that male college students consume larger quantities of alcohol and drink more frequently than female college students (Clements, 1999; O'Malley & Johnston, 2002). Thus, gender differences in alcohol consumption and perceived use of PBS may be reflected in normative perceptions for gender-neutral normative referents, such as the typical student. Research has yet to examine the relationship between gender-specific normative perceptions of PBS (i.e., same-sex norms and opposite-sex norms) and one's own use of PBS; therefore, the present study aimed to fill this gap in the literature.

Finally, this study will evaluate the relationships among perceived gender-specific descriptive and injunctive drinking norms and perceived descriptive normative perceptions for PBS. Research has yet to examine if descriptive and injunctive drinking normative perceptions are related to descriptive normative perceptions for PBS. Moreover, the present study will examine the relationship between gender-specific normative perceptions for strategies and personal use of strategies in the context of other relevant drinking behavior factors (i.e., alcohol consumption, negative consequences, and attitude toward drinking behavior) and social norms factors (i.e., gender-specific descriptive and injunctive drinking norms).

Based on the above considerations, we expected (1) students, especially women, would perceive the typical female and typical male student as using PBS less frequently than one's own use of PBS; (2) that perceiving the typical same-sex student as consuming higher amounts of alcohol and as more approving of drinking behavior would be associated with perceiving the typical same-sex student as using PBS less frequently (a similar relationship was expected

for opposite-sex norms); and (3) normative perceptions for PBS would be associated with use of PBS, even when controlling for gender and relevant drinking behavior and social norms factors.

Methods

Participants and Procedures

A random sample ($N = 2,000$) of undergraduates between the ages of 18 and 30 were mailed and emailed invitations to participate in 40-minute Web-based survey assessing drinking and sexual behavior. A total of 1,002 students (56.9% female) agreed to participate, and of those 958 (95.6%) completed the survey. Participants received \$20 for survey completion. All procedures were approved by the university's institutional review board. The mean age of the sample was 20.61 ($SD = 2.07$). Participants were 60.0% Caucasian, 26.1% Asian, 8.7% multi-racial; and 5.2% other. Participants ($n = 666$) in the final analyses included those students who reported consuming at least one drink per typical week in the past three months.

Measures

Alcohol-related problems were assessed with the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992; $\alpha = .90$), which measures problems related to drinking. An example item is "Have you gotten into physical fights when drinking?" Item responses for this scale were modified from the past year to the past three months to be consistent with drinking behavior. Participants rated ten responses on a scale from 0 (*No, never*) to 9 (*Yes, 40 or more times in the past three months*), thirteen responses on a scale from 0 (*No, never*) to 4 (*Yes, 3 or more times in the past three months*), and four responses on a scale from 0 (*No, never*) to 2 (*Yes, in the past three months*). Responses to the 27 items were summed to create a final score.

Alcohol consumption. Typical drinks per week were assessed with the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985). Participants were asked: "Consider a typical week during the last three months. How much alcohol, on average, (measured in number of drinks), do you drink on each day of a typical week?" Scores were computed by summing the number of drinks the participants reported drinking on each day of the typical week.

Descriptive normative perceptions for drinking were measured by a modified version of the Drinking Norms Rating Form (Baer, Stacy, & Larimer, 1991). The gender-specific version (Lewis & Neighbors, 2004) assesses perceived typical weekly drinking in which participants fill in the average number of standard drinks they think the typical (male/female) student on campus consumes for each day of the week over the past three months. Scores represent perceptions of the average number of drinks consumed in a typical week over the previous three months.

Attitude toward drinking behavior and injunctive normative perceptions were assessed with a modified version of Baer's (1994) measure. The present measure extended Baer's measure by assessing nine additional drinking behaviors. Thirteen items ($\alpha = .77$) were used to assess personal attitudes and acceptance of various drinking behaviors. Students were asked "How acceptable (or unacceptable) do you find each of the following behaviors?" Example items are "drinking alcohol every weekend," and "drinking to have fun." Responses ranged from 1 = *unacceptable* to 7 = *acceptable*. Final responses were mean scored. Injunctive normative perceptions were assessed with 13 items that mirrored the attitude toward drinking behavior items for the typical male student ($\alpha = .87$) and the female student ($\alpha = .82$) on campus. Responses ranged from 1 = *unacceptable* to 7 = *acceptable*. Final responses were mean scored.

Protective behavior strategies were assessed by a modified version of the Protective Behavior Strategies Survey (PBSS; Martens et al., 2005), which consists of 15 items that measure types of strategies (limiting/stopping drinking ($\alpha = .78$), manner of drinking ($\alpha = .68$), and serious harm reduction ($\alpha = .60$) used to be safer or more responsible when consuming alcohol.) An example item is “drinking slowly, rather than gulp or chug.” Mean scores were created for each subscale. This measure was modified to include percentages on the anchors, such that students reported how often they used the strategies with response options ranging from 0 = *Never* (0%) to 4 = *Always* (100%).

Perceived protective behavior strategies were assessed with a modified version of the PBSS (Martens et al., 2005). Students reported use of PBS for the typical male student and the typical female student specific to their campus. As with the PBSS, there are three subscales that assess types of strategies (limiting/stopping drinking ($\alpha = .88$ male; $\alpha = .84$ female), manner of drinking ($\alpha = .75$; male $\alpha = .65$ female), and serious harm reduction ($\alpha = .60$ male; $\alpha = .66$ female)) used to be safer or more responsible when consuming alcohol. Mean scores were created for each subscale. This measure also included percentages on the anchors. The measures assessing PBS and perceived PBS were modified to be less subjective to help confirm that students underestimate the use of PBS, as one student’s “sometimes” is equally defined at 50% as another student’s “sometimes.”

Results

Means and standard deviations are presented in Table 1 for drinking behavior, descriptive and injunctive drinking norms, normative perceptions for PBS, and PBS.

A repeated measures multivariate analysis of variance (MANOVA) was conducted to determine if (1) students *underestimate* use of PBS for the typical male student and the typical female student and if (2) women are more likely to underestimate than men. Strategies for limiting/stopping drinking, manner of drinking, and serious harm reduction were the dependent variables. Personal behavior and perceived behavior were entered as within-subject factors and gender of perceiver was entered as a between-subjects factor.

Multivariate findings indicated that there was a main effect for perceived and personal behavior (i.e., repeated measures), such that men and women perceived others as engaging in PBS at different frequencies relative to themselves, Wilks’ $\Lambda = .24$, $F(6, 640) = 339.42$, $p < .001$, $\eta_p^2 = .76$. Univariate tests revealed similar results for limiting/stopping drinking, $F(2, 1290) = 279.60$, $p < .001$, $\eta_p^2 = .30$, manner of drinking, $F(2, 1290) = 328.13$, $p < .001$, $\eta_p^2 = .34$, and serious harm reduction, $F(2, 1290) = 708.12$, $p < .001$, $\eta_p^2 = .52$, such that men and women perceived the typical male student as using PBS less frequently relative to their own reported use of PBS. However, results are less consistent for the perceived typical female. Specifically, men and women perceived the typical female as using PBS for limiting/stopping drinking more relative to themselves, but PBS for serious harm reduction less often relative to themselves. For manner of drinking, students were accurate in their perceptions for the typical female student relative to their use of PBS. As expected, perceived use of PBS was significantly lower for the typical male student than for the typical female student ($ps < .001$).

Additionally, multivariate findings indicated an interaction between repeated measures and gender. Students, especially women, perceived the typical male student as using PBS less frequently relative to their own use of strategies (Figure 3), Wilks’ $\Lambda = .79$, $F(6, 640) = 29.06$, $p < .001$, $\eta_p^2 = .21$. Univariate results (Table 2) indicated this relationship was present for PBS for limiting/stopping drinking, manner of drinking, and serious harm reduction. Estimated marginal means and standard errors are presented in Table 2.

To evaluate the relationships among perceived descriptive and injunctive drinking norms, and perceived PBS norms, we examined zero-order correlations (Table 3). As expected, perceiving the typical same-sex student as consuming more alcohol and as more approving of drinking behavior was associated with perceiving the typical same-sex student as using PBS less frequently. A similar relationship was found for opposite-sex normative perceptions.

In order to examine how various drinking behavior and social norms factors were associated with use of PBS for limiting/stopping drinking, manner of drinking, and serious harm reduction subscales, we conducted correlation (Table 3) and hierarchical regression analyses. Greater use of PBS was associated with consuming fewer drinks per week and experiencing alcohol-related negative consequences less frequently. Results indicated a similar relationship for drinking behavior attitude and PBS. Specifically, greater use of PBS was related to having a less accepting attitude toward drinking behavior. For descriptive and injunctive drinking norms, same-sex norms were negatively associated with using strategies. Specifically, the more students perceived the typical same-sex student as consuming more drinks per week than the less they reported using strategies. Similarly, the more students perceived the typical same-sex student as having a more accepting attitude toward drinking behavior than the less they used strategies. Finally, use of PBS for limiting/stopping drinking, manner of drinking, and serious harm reduction by same-sex student peers was associated with using these PBS more frequently. However, perceived PBS by opposite-sex peers was associated with using PBS less frequently.

For the hierarchical regression analyses, gender, drinking behavior, descriptive and injunctive drinking norms were entered at Step 1. At Step 2, perceptions of PBS were entered. Effect sizes (Cohen's d) were calculated using the formula $d = 2t \sqrt{df}$ (Rosenthal & Rosnow, 1991). Small, medium, and large effects are generally considered to be in the .2, .5, and .8 ranges respectively (Cohen, 1992). Continuous variables were mean centered to facilitate interpretation of parameter estimates (Cohen, Cohen, West, & Aiken, 2003).

Hierarchical regression results were similar to correlations (Tables 4 – 6). One exception is that the relationship between perceived same-sex and opposite-sex drinks per week with PBS were no longer significant when taking other factors into account. The relationship between perceived PBS by opposite-sex peers and PBS was no longer significant in general. When evaluating strategies for limiting/stopping drinking, manner of drinking, and serious harm reduction, normative perceptions for these strategies accounted for an additional 9%, 3%, and 12% of the variance.

Discussion

The present study indicates that underestimating use of PBS is found when estimating for the typical male student but not always the case when estimating PBS use for the typical female student. As expected, students perceived the typical male student as using PBS less frequently relative to one's own use of PBS and that students perceived the typical male student as using PBS less frequently than the typical female student. Furthermore, results indicated that women were more likely than men to perceive the typical male student as using few PBS relative to one's own use of strategies. However, findings indicated that men and women perceived the typical female as using PBS for limiting/stopping drinking more relative to one's own use of PBS. Possible explanations are that women drink less than men (Clements, 1999; O'Malley & Johnston, 2002) and that drinking may be thought of as primarily a male activity (Suls & Green, 2003). If college students perceive women to drink less and perceive drinking as a male activity then both male and female students may perceive the typical female student as frequently using PBS that are meant to limit or stop drinking.

Findings also demonstrated that descriptive and injunctive drinking normative perceptions and perceived use of PBS were related. Perceiving the typical same-sex student as consuming heavy amounts of alcohol and having greater approval of drinking behavior was associated with perceiving the typical same-sex student as using PBS less frequently. The same relationships were present for opposite-sex norms. However, it is important to note that the magnitude of some of these relationships were small. Finally, findings indicated that same-sex normative perceptions for PBS were associated with use of PBS, even when controlling for gender and relevant drinking behavior and social norms factors. Overall, findings stress the importance of evaluating factors that are associated with use of PBS, especially gender-specific normative perceptions of PBS.

There are a number of reasons why students are likely to overestimate some behaviors while underestimate others. One explanation for overestimating drinking behavior and drinking approval is that examples of these behaviors and attitudes tend to be observable and salient in the college environment. For example, students are more likely to notice and to discuss their peers who drink excessively than those who drink moderately or not at all. According to the availability heuristic (Tversky & Kahneman, 1974), examples of heavy drinking and strong approval of drinking behavior are more likely to be recalled than moderate drinking or neutral approval of drinking behavior; thus, students are more likely to overestimate these behaviors. It is likely that use of PBS is less observable and less salient than heavy drinking behavior and attitudes. For example, it may be difficult for students to observe whether or not their peers drank water while drinking alcohol, whether or not their peers avoided drinking games, or whether or not their peers knew where their drink was at all times. Furthermore, it seems unlikely that students will discuss whether or not their peers engaged in these protective behaviors. Because use of PBS is more difficult to observe and is likely to be less salient, these behaviors are likely to be difficult to recall and thus underestimated.

Research that identifies factors associated with use of PBS is important, as it can aid in the development of efficacious interventions aimed to increase the use of PBS. To our knowledge only one preventative intervention has included normative information regarding use of strategies. Turner and colleagues (2008) evaluated a social norms marketing campaign that included providing drinking behavior norms and normative information regarding protective behaviors; however, the specific effects of normative information on drinking could not be determined since it was a multi-component intervention. Future research is necessary to evaluate if normative information regarding PBS increases perceived use of PBS by peers, and whether correcting underestimated PBS norms mediates intervention efficacy in terms of increasing use of PBS and reducing drinking and related negative consequences.

Personalized normative feedback (Lewis & Neighbors, 2006), a type of social norms intervention, could be modified to provide personalized normative information specific to protective strategies. A personalized normative feedback intervention would provide students with information aimed to create two discrepancies: “Most students use protective strategies more than I thought they did” and “Most students use protective strategies more than I do.” A potential difficulty with providing normative information for PBS is the relatively low rate of use for some strategies. In the present study, means for limiting/stopping drinking and manner of drinking strategies indicated that students “rarely” or “sometimes” use these strategies. Selection of which strategy to provide normative information is important so that students are being provided with information pertaining to strategies that other students frequently use.

Because of the cross-sectional nature of the present study, our ability to make casual inferences is limited. Future research examining the relationships among drinking behavior, social norms, and PBS over time would be useful in evaluating causal precedence. Additionally, it should be noted that some items of the measure assessing PBS may overlap with alcohol consumption

variables and that some PBS items may be difficult to interpret without specifying a specific drinking situation or knowing the individual's level of consumption. Moreover, when assessing perceived peer use of PBS, there may be limitations associated with asking students how often the typical student engages in these strategies without specifying the typical student's drinking level. By providing a more detailed context, students may be able to provide more accurate perceptions for strategies used. Finally, PBS items imply an intention to reduce drinking or harm from drinking, which might not be present among fairly light drinkers who do not see their drinking as something requiring effort to control.

The present study extends previous research on social norms literature by demonstrating that college students have gender-specific normative misperceptions for protective behaviors as well as high-risk behaviors. Moreover, these results demonstrated that same-sex perceptions of PBS were related to use of PBS, even when taking gender, drinking behavior, and social norms into account. Future research is needed to empirically evaluate the use of social norms interventions in efforts to increase the use of PBS among college students.

Acknowledgments

Data collection and manuscript preparation was supported by National Institute on Alcohol Abuse and Alcoholism Grant K01AA016966 awarded to M. Lewis.

References

- Baer JS. Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors* 1994;8:43–50.
- Baer JS, Stacy A, Larimer ME. Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol* 1991;52:580–586. [PubMed: 1758185]
- Benton SL, Downey RG, Glider PJ, Benton SA. College students' norm perception predicts reported use of protective behavioral strategies for alcohol consumption. *Journal of Studies on Alcohol and Drugs* 2008;859–865. [PubMed: 18925344]
- Borsari B, Carey KB. Peer influences on college drinking: A review of the research. *Journal of Substance Abuse* 2001;13:391–424. [PubMed: 11775073]
- Carey KB, Borsari B, Carey MP, Maisto SA. Patterns and importance of self-other differences in college drinking norms. *Psychology of Addictive Behaviors* 2006;20:385–393. [PubMed: 17176173]
- Clements R. Prevalence of alcohol-use disorders and alcohol-related problems in a college student sample. *Journal of American College Health* 1999;48:111–118. [PubMed: 10584445]
- Cohen J. A power primer. *Psychological Bulletin* 1992;112:155–159. [PubMed: 19565683]
- Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. *Applied multiple regression/correlation analysis for the behavioral sciences*. 3rd ed.. Lawrence Erlbaum Associates; Mahwah, NJ: 2003.
- Collins RL, Parks GA, Marlatt GA. Social determinants of alcohol consumption: The effects of social interaction and model status on self-administration of alcohol. *Journal of Consulting and Clinical Psychology* 1985;53:189–200. [PubMed: 3998247]
- Glassman T, Werch C, Jobli E. Alcohol self-control behaviors of adolescents. *Addictive Behaviors* 2007;32:590–597. [PubMed: 16876961]
- Hurlbut SC, Sher KJ. Assessing alcohol problems in college students. *Journal of American College Health* 1992;41:49–58. [PubMed: 1460173]
- Larimer ME, Lee CM, Kilmer JR, Fabiano P, Stark C, Geisner IM, Mallett K, Lostutter TW, Cronce JM, Freaney M, Neighbors C. Personalized mailed feedback for college drinking prevention: A randomized clinical trial. *Journal of Consulting and Clinical Psychology* 2007;75:285–293. [PubMed: 17469886]
- Lewis MA, Neighbors C. Gender-specific misperceptions of college student drinking norms. *Psychology of Addictive Behaviors* 2004;18:334–339. [PubMed: 15631605]

- Lewis MA, Neighbors C. Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health* 2006;54:213–218. [PubMed: 16450845]
- Martens MP, Ferrier A, Sheehy MJ, Corbett K, Anderson DA, Simmons A. Development of the protective behavioral strategies survey. *Journal of Studies on Alcohol* 2005;66:698–705. [PubMed: 16329461]
- Martens MP, Pederson ER, LaBrie JW, Ferrier AG, Cimini MD. Measuring alcohol-related protective behavioral strategies among college students: Further examination of the protective behavior strategies scale. *Psychology of Addictive Behaviors* 2007;21:307–315. [PubMed: 17874881]
- Martens MP, Taylor KK, Damann KM, Page JC, Mowry ES, Cimini MD. Protective behavioral strategies when drinking alcohol and their relationship to negative alcohol-related consequences in college students. *Psychology of Addictive Behaviors* 2004;18:390–393. [PubMed: 15631613]
- Neighbors C, Dillard AJ, Lewis MA, Bergstrom RL, Neil T. Normative misperceptions and temporal precedence of perceived norms and drinking. *Journal of Studies on Alcohol* 2006;67:290–299. [PubMed: 16562412]
- Neighbors C, Lee CM, Lewis MA, Fossos N, Larimer ME. Are social norms the best predictors of outcomes among heavy drinking college students? *Journal of Studies on Alcohol and Drugs* 2007;68:556–565. [PubMed: 17568961]
- O'Malley PM, Johnston LD. Epidemiology of alcohol and other drug use among American college students. *Journal of Studies on Alcohol* 2002;(Suppl 14):23–39.
- Rosenthal, R.; Rosnow, RL. *Essentials of behavioral research: Methods and data analysis*. 2nd ed. McGraw-Hill; New York: 1991.
- Suls J, Green P. Pluralistic ignorance and college student perceptions of gender-specific alcohol norms. *Health Psychology* 2003;22:479–486. [PubMed: 14570531]
- Turner JT, Perkins W, Bauerle J. Declining negative consequences related to alcohol misuse among college students exposed to social norms marketing intervention on a college campus. *Journal of American College Health* 2008;57:85–93. [PubMed: 18682350]
- Tversky A, Kahneman D. Judgment under uncertainty: Heuristics and biases. *Science* 1974;185:1124–1130. [PubMed: 17835457]
- Werch CE. Behavioral self-control strategies for deliberately limiting drinking among college students. *Addictive Behaviors* 1990;15:119–128. [PubMed: 2343785]
- Werch CE, Gorman DR. Relationship between self-control and alcohol consumption patterns and problems of college students. *Journal of Studies on Alcohol* 1988;49:30–37. [PubMed: 3347074]

Figure 1.
Estimated marginal means and standard errors for perceived and actual use of protective behavioral strategies.

Table 1

Means and Standard Deviations

Variable	M	SD
Drinks per Week	9.50	9.15
Alcohol-Related Problems	16.45	13.16
Drinking Behavior Attitude	4.46	0.81
Perceived Male Drinks Per Week	18.11	10.82
Perceived Female Drinks Per Week	11.86	7.29
Perceived Male Injunctive Norms	5.22	0.96
Perceived Female Injunctive Norms	4.65	0.87
Perceived Male PBS — Limiting/Stopping Drinking	1.28	0.60
Perceived Female PBS — Limiting/Stopping Drinking	1.99	0.54
Perceived Male PBS — Manner of Drinking	1.27	0.56
Perceived Female PBS — Manner of Drinking	1.94	0.49
Perceived Male PBS — Serious Harm Reduction	1.76	0.66
Perceived Female PBS — Serious Harm Reduction	2.69	0.58
PBS — Limiting/Stopping Drinking	1.64	0.77
PBS — Manner of Drinking	1.97	0.75
PBS — Serious Harm Reduction	3.01	0.90

Note. *Ns* ranged from 647 to 666 due to missing data.

Table 2

Estimated Marginal Means and Standard Errors for Protective Behavioral Strategies

Variable	Personal PBS			Perceived Male PBS			Perceived Female PBS			Univariate Results	
	M	SE		M	SE		M	SE		<i>F</i> (2, 1290)	η^2_p
PBS — Limiting/Stopping Drinking										52.25 ***	0.08
Men	1.47	0.05		1.42	0.04		2.11	0.03			
Women	1.78	0.04		1.17	0.03		1.90	0.03			
PBS — Manner of Drinking										48.41 ***	0.07
Men	1.81	0.04		1.43	0.03		2.06	0.03			
Women	2.09	0.04		1.16	0.03		1.86	0.03			
PBS — Serious Harm Reduction										90.79 ***	0.12
Men	2.64	0.05		1.89	0.04		2.70	0.04			
Women	3.30	0.04		1.68	0.04		2.71	0.03			

Note. *N* = 647.***
p < .001.

Table 3

Zero-Order Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Drinks per Week	-														
Alcohol-Related Problems	.69***	-													
Drinking Behavior Attitude	.33***	.38***	-												
Same-Sex Drinks Per Week	.43***	.31***	.11**	-											
Opposite-Sex Drinks Per Week	.27***	.26***	.01	.58***	-										
Same-Sex Injunctive Norms	.01	-.01	.36***	.23***	.07	-									
Opposite-Sex Injunctive Norms	-.08	-.01	.24***	.04	.31***	.59***	-								
Same-Sex Limiting Drinking	-.07	-.01	-.09*	-.11**	.18***	-.17***	.17***	-							
Opposite-Sex Limiting Drinking	.12**	.05	.07	.15***	-.31***	.09*	-.37***	.06	-						
Same-Sex Manner of Drinking	-.11**	-.04	-.07	-.25***	.03	-.27***	.08*	.69***	-.07	-					
Opposite-Sex Manner of Drinking	.10*	.04	.07	.07	-.38***	.01	-.45***	-.07	.79***	-.04	-				
Same-Sex Harm Reduction	-.10*	-.04	-.14***	-.15***	.21***	-.18***	.22***	.55***	-.26***	.46***	-.34***	-			
Opposite-Sex Harm Reduction	.18***	.09*	.11**	.16**	-.30***	.10*	-.35***	-.13***	.74***	-.20***	.65***	-.14***	-		
Limiting Drinking	-.28***	.30***	-.42***	-.08*	.03	-.19***	-.04	.35***	.02	.19***	-.12**	.22***	-.09*	-	
Manner of Drinking	-.42***	-.44***	-.38***	-.22***	-.16***	-.13***	-.02	.17***	-.06	.26***	-.01	.19***	-.08*	.47***	-
Harm Reduction	-.16***	-.22***	-.22***	-.09*	.12**	-.11**	.09*	.24***	-.17***	.14***	-.23***	.49***	-.08*	.41***	.30***

Note. Ns ranged from 647 to 666 due to missing data.

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

p < .001.

Hierarchical Regression Results for Drinking Behavior and Social Norms as Predictors of Protective Behavioral Strategies — Limiting/Stopping Drinking

Table 4

	Predictor	B	SE B	β	d	Adj. R ²
Step 1	Gender	−0.20	0.09	−0.12*	−0.18	0.21***
	Drinks per Week	−0.01	0.01	−0.11*	−0.17	
	Alcohol-Related Problems	−0.01	0.01	−0.13*	−0.20	
	Drinking Behavior Attitude	−0.27	0.04	−0.29***	−0.53	
	Same-Sex Drinks Per Week	0.01	0.01	0.10	0.14	
	Opposite-Sex Drinks Per Week	−0.01	0.01	−0.02	−0.02	
	Same-Sex Injunctive Norms	−0.11	0.05	−0.12*	−0.18	
	Opposite-Sex Injunctive Norms	0.04	0.05	0.04	0.07	
Step 2	Same-Sex PBS — Limiting/Stopping Drinking	0.37	0.05	0.29***	0.54	0.30***
	Opposite-Sex PBS — Limiting/Stopping Drinking	0.09	0.05	0.08	0.12	

Note. $N = 643$.

Gender was coded as Female = 0 and Male = 1.

* $p < .05$.

*** $p < .001$.

Hierarchical Regression Results for Drinking Behavior and Social Norms as Predictors of Protective Behavioral Strategies—Manner of Drinking

Table 5

	Predictor	B	SE B	β	d	Adj. R ²
Step 1	Gender	−0.24	0.08	−0.16**	−0.25	0.29***
	Drinks per Week	−0.01	0.01	−0.16**	−0.24	
	Alcohol-Related Problems	−0.01	0.01	−0.21***	−0.34	
	Drinking Behavior Attitude	−0.22	0.04	−0.24***	−0.47	
	Same-Sex Drinks Per Week	0.01	0.01	0.10	0.14	
	Opposite-Sex Drinks Per Week	−0.01	0.01	−0.19***	−0.27	
	Same-Sex Injunctive Norms	−0.05	0.04	−0.06	−0.09	
Step 2	Opposite-Sex Injunctive Norms	0.03	0.04	0.04	0.06	
	Same-Sex PBS — Manner of Drinking	0.28	0.05	0.21***	0.43	0.32***
	Opposite-Sex PBS — Manner of Drinking	0.01	0.05	0.01	−0.01	

Note. $N = 643$.

Gender was coded as Female = 0 and Male = 1.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Hierarchical Regression Results for Drinking Behavior and Social Norms as Predictors of Protective Behavioral Strategies — Serious Harm Reduction

Table 6

	Predictor	B	SE B	β	d	Adj. R ²
Step 1	Gender	−0.68	0.10	−0.39***	−0.54	0.18***
	Drinks per Week	0.01	0.01	0.06	0.08	
	Alcohol-Related Problems	−0.01	0.01	−0.20***	−0.31	
	Drinking Behavior Attitude	−0.12	0.05	−0.10*	−0.18	
	Same-Sex Drinks Per Week	0.01	0.01	0.08	0.10	
	Opposite-Sex Drinks Per Week	−0.01	0.01	−0.01	−0.01	
	Same-Sex Injunctive Norms	−0.02	0.05	−0.03	−0.04	
Step 2	Opposite-Sex Injunctive Norms	−0.02	0.05	−0.02	−0.02	
	Same-Sex PBS — Serious Harm Reduction	0.49	0.06	0.40***	0.71	0.30***
	Opposite-Sex PBS — Serious Harm Reduction	0.11	0.05	0.10*	0.17	

Note. N = 643.

Gender was coded as Female = 0 and Male = 1.

* $p < .05$.

*** $p < .001$.