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Drinking before Drinking: Pre-gaming and Drinking Games in Mandated Students

Brian Borsari, **Kelly E. Boyle**, **John T. P. Hustad**, **Nancy P. Barnett**, **Tracy O'Leary Tevyaw**, and **Christopher W. Kahler**
Brown University Center for Alcohol and Addiction Studies Box G-BH, Providence, RI 02912

Abstract

Pre-gaming, the practice of consuming alcohol before attending a social function, has not received as much research attention as drinking games among college students. This study investigated the prevalence of both pre-gaming and drinking game participation in a sample of mandated students (N = 334) who had been referred for an alcohol violation. Approximately one-third (31%) of the sample reported pre-gaming on the night of their referral event. Pre-gaming was associated with higher estimated blood alcohol content on that night, along with a greater history of pre-gaming and taking greater responsibility for the incident. A higher proportion of the students (48.7%) reported playing drinking games on the event night and reported the event to be less aversive than non-players. Neither drinking games nor pre-gaming was consistently related to recent alcohol consumption or problems, nor did they frequently occur together on the event night. Pre-gaming was a unique predictor of intoxication on the night of the referral, and drinking games were not. Therefore, pre-gaming and drinking games appear to be distinct activities. This research suggests methods of prevention for both activities as well as promising research directions for future research.

More than 2 out of 3 college students report consuming alcohol in the past month (O'Malley & Johnston, 2002). Though daily drinking is quite low (5%), approximately 31% of the 8 million college students in the U.S. meet the diagnostic criteria for alcohol abuse (Knight et al., 2002). The most commonly used indicator of problem drinking is heavy episodic drinking (defined as 5 or more drinks on one occasion in the past two weeks for men; 4 or more drinks for women; NIAAA, 2004). College students often engage in heavy episodic drinking and consume large quantities of alcohol over a short time, which can result in dangerously high blood alcohol concentrations (BAC; Fourneir, Ehrhart, Glindemann & Geller, 2004). Alcohol use is also the greatest single contributor to college student morbidity and mortality, contributing to an estimated 1,717 student deaths in 2001 (Hingson, Hereen, Winter, & Wechsler, 2005).

Risky drinking leads to many students being cited for violations of campus alcohol policies each year (Barnett & Read, 2005). A recent survey of 4,711 colleges indicated a 4.7% increase in mandated students from 2000 to 2001 (from 26,155 to 27,386 students; Hoover, 2003). The sanctions for students who violate the alcohol policy and these numbers appear to be increasing

Correspondence to: Brian Borsari.

Corresponding author: Brian Borsari, Ph.D Assistant Professor (Research) Center for Alcohol and Addiction Studies Brown University Box G-BH Providence, RI 02912 Office: 1−401−867−3821 FAX: 1−401−444−1888 Email: Brian_Borsari@brown.edu.

as well; in another survey of 199 schools, the number of students required to attend alcohol programs rose from 1.8% in 1993 to 3.5% in 2001 (Wechsler et al., 2002).

Given the link between risky drinking and the increase in alcohol policy violations, it would be beneficial to understand the specific drinking behaviors that may contribute to alcohol violations. Recently, pre-gaming has attracted increased media attention (Bombardieri, 2006; Tucker, 2006). Pre-gaming (also called pre-loading, pre-bar, or pre-partying) occurs when students drink alcohol before a primary social gathering or event. Pre-gaming may derive its name from its association with tailgating (Vicary & Karshin, 2002), which is the practice of partying before a sporting event, usually in the parking lot of the facility. However, the use of the term has become more broad and is used to describe drinking while waiting for people to gather for the social event, drinking in order to "get buzzed' before going to a party or function where alcohol will be expensive (e.g., at a bar or club), or drinking prior to entering a social situation where alcohol would be difficult to obtain (e.g., at a school function).

To date, only one study has empirically examined pre-gaming (DeJong & DeRicco, 2007). This qualitative study conducted ten focus groups at colleges and universities in Pennsylvania in order to record students' pre-gaming habits. Of the 112 students included in these focus groups, 72 (64%) had engaged in pregaming in the past two weeks. Students reported that pre-gaming occurred primarily in small, private contexts (e.g., dorm rooms). For most students, the purpose of pre-gaming was to get intoxicated, often quickly (e.g., by doing shots of alcohol or drinking beer quickly). Moreover, a common reason for pre-gaming cited by undergraduates in this investigation was social anxiety. Many students reported that pre-gaming allows them to loosen up before a social event or makes it more likely that they will be able to engage in conversations with members of the opposite sex (DeJong & DeRicco, 2007).

Pre-gaming is distinguished from drinking games, which have received considerable research attention (see Borsari, 2004, for a review). Drinking games, which date back to ancient Greece (Garland, 1982), have been well documented on college campuses; there are as many as 500 different drinking games, all having the common goal of getting participants intoxicated. Between 50% − 62% of college students report having played drinking games in the past month, and participation in drinking games is consistently associated with greater frequency and quantity of drinking as well as alcohol-related problems (Adams & Nagoshi, 1999; Engs & Hanson, 1993; Nagoshi, Wood, Cote & Abbit, 1994; Zamboanga, Bean, Pietras & Pabon, 2005; Zamboanga, Leitkowski, Rodriguez & Cascio, 2006). Gender differences in drinking game participation indicate that men and women engage in drinking games at similar rates, and both men and women consume more alcohol when playing drinking games than when they don't. In one study, however, alcohol-related negative consequences from drinking games were found only in women, suggesting a differential risk (Pedersen & LaBrie, 2006). This pattern, combined with the finding that women are also at particular risk of sexual victimization following drinking game participation (Johnson & Stahl, 2004), highlight the importance of understanding gender differences in college student drinkers.

Pre-gaming and drinking games are not mutually exclusive and it is likely that they often occur simultaneously. Indeed, drinking games are frequently played for the purpose of pre-gaming (DeJong & DeRicco, 2007). However, pre-gaming can occur without drinking games - students may simply drink by themselves or with friends before going to their primary destination. Furthermore, there are temporal distinctions between the two activities. Drinking games can be played at any time during a drinking episode – as a way to start the drinking event, a time-limited activity during the drinking event, the main focus of the drinking event, or as the final activity of the drinking event. In contrast, pre-gaming occurs exclusively at the beginning of the drinking event, before departing for another social setting. Therefore, it is important to

clearly differentiate the two drinking activities, as there may be unique as well as additive risk profiles associated with each behavior.

In sum, although the risk associated with participation in drinking games is well established, the risks associated with pre-gaming have not been well studied. Furthermore, whether engaging in both pre-gaming and drinking games in the same drinking episode contributes to intoxication has not been investigated. This project investigated the prevalence of pre-gaming and drinking games in a sample of students who had received alcohol violations. We evaluated three hypotheses. First, we hypothesized that there would be no differences in pre-gaming between men and women. Second, due to reports of drinking games being a common component of pre-gaming (DeJong & DeRicco, 2007), we hypothesized that the two activities would co-occur more often than either would occur alone. Third, we hypothesized that students who pre-gamed would exhibit higher past month alcohol use and higher estimated blood alcohol content (BAC) on the night of the referral event than students who did not pre-game.

Method

Setting

The project was conducted at a four-year, private liberal arts university located in the Northeast. The school has an enrollment of 3,300 undergraduates (15% minority, 51% female). Most (79%) undergraduate students live on campus. There are no fraternities or sororities.

Participants and Recruitment

Participants for this study were enrolled in a randomized controlled trial of students referred for mandatory alcohol intervention following an alcohol policy violation (see Borsari, O'Leary Tevyaw, Barnett, Kahler & Monti, in press) for four semesters from spring, 2005 through the end of fall, 2006. All students with a first-time alcohol offense are referred to the university's Alcohol Incident Referral Program (AIRP) by resident hall advisors or campus security. Students are required to pay a $50 fine for their offense and to receive a brief alcohol intervention. Students were invited to participate in this project when they presented for their initial session at the AIRP. Out of 421 eligible students, 334 students (79%) enrolled in the study. Participants were 63% male, 95% Caucasian, and 66% freshman (mean age 18.6 years). Participants in the project fulfilled their obligation to the university and were paid $15 for their baseline assessment. All procedures were approved by the university Institutional Review Board.

Measures

A staff member of the AIRP administered a paper and pencil baseline assessment. Demographic information was collected including gender, age, ethnicity, and year in school. Past month alcohol consumption, including number of drinking days and number of heavy drinking days was measured with the *Alcohol and Drug Use Measure* (Borsari & Carey, 2000; 2005). This measure also records information required to calculate the students' typical and event blood alcohol concentration (tBAC and eBAC, respectively), where **BAC = [(consumption/2) × (GC/weight)]-(.017 × hours)**, where (a) consumption = number of drinks, (b) hours = number of hours of the drinking occasion , (c) weight = weight in pounds, and (d) GC = gender constant (9.0 for females and 7.5 for males; Matthews & Miller, 1979). A sub-sample of the students (n = 95) completed an additional item that assessed the frequency of their pre-gaming over the past month

Alcohol-related consequences were assessed by the *Brief Young Adult Alcohol Consequences Questionnaire* (B-YAACQ; Kahler, Strong & Read, 2005). The B-YAACQ is a 24-item measure that was created using a confirmatory factor analysis of a variety of alcohol

consequences measures. Dichotomous items (yes/no) are summed for a total number of alcohol-related consequences experienced in the past month. This measure has demonstrated high internal consistency in previous research with college students (α = .89; Kahler et al., 2005) as well as in this sample (α = .89). Participants also completed a 7-item *Event Attributions and Reactions*, a measure that was developed to assess reactions to alcohol-related injuries in Emergency Room patients (Longabaugh et al., 1995). This measure has been used previously with mandated students (Barnett, Goldstein, Murphy, Colby & Monti, 2006), and a principal components analysis revealed two scales: *responsibility for the event* (3 items, e.g., to what extent was the event your own fault?) and *aversiveness of the event* (4 items, e.g., how unpleasant has this event been for you?). Items are scored from *not at all* (1) to *extremely or totally* (7). In this sample, internal consistency was adequate for both the responsibility scale (α = 0.85) and aversiveness scale (α = 0.64).

The *Event Description Measure* is an open-ended interviewer-administered instrument developed for use in brief intervention studies for alcohol-related incidents (Barnett et al., 2003; Barnett et al., 2004; Monti et al., 1999). The measure records the participants' detailed description of the drinking and events that resulted in the alcohol-related infraction. Information used to estimate BAC in the event, including number of drinks consumed and the amount of time spent drinking is also collected in the Event Description. This interview was audiotaped.

Using audiotapes of the interviewer-administered *Event Description Measure* the first and second authors coded pre-gaming and drinking game involvement. Pre-gaming was defined as consuming alcohol before going out for the night or before a function started. Drinking game participation was defined as playing a game in which the players were required to drink as a consequence of their (or someone else's) actions. This did not include drinking while playing a game (e.g., drinking a beer while playing a video game). Furthermore, the game had to have established rules and not be simply a method of drinking (e.g., kegstand, funnel, beer shotgun, shots of liquor). The two raters independently rated whether the student participated in pre-gaming and drinking games. These ratings were then compared, and disagreements (n = 6) were settled by reviewing the tape a second time and coming to a consensus.

Results

Analysis Plan

To learn more about the prevalence of pre-gaming in mandated students, we first examined the prevalence of pre-gaming among on the night of their referral. Then, we compared the students who reported pre-gaming on the night of their referral with those who did not to identify which characteristics were associated with pre-gaming. Identical analyses were conducted with drinking game participants in order to examine how drinking game participants differed from those who did not participate in drinking games on the night of the referral. Finally, we conducted hierarchical regressions to determine the degree to which pre-gaming was linked to the participants' eBAC. Interactions in these models were tested by adding all interactions as a group (or “chunk”), evaluating whether they significantly improved model fit, and then using a hierarchical backwards elimination strategy (Jaccard & Turrisi, 2003; Kleinbaum, 1992).

Preliminary Analyses

Examination of the distributional properties of continuous variables revealed no variables were significantly skewed or kurtotic. Outliers for eBAC (n = 5) and tBAC (n = 2) greater than 3 standard deviations above the mean were incrementally recoded to one unit above the next lowest value (Fidell & Tabachnick, 2003).

Pre-gaming.

Regarding the prevalence of pre-gaming, 31% of the sample (n = 95) reported pre-gaming on the night of their violation while the remaining 69% of students (n = 209) did not pre-game. A comparison of the two groups is provided in Table 1. Our first hypothesis was supported: men were not more likely to pre-game than women. Overall, though, pre-gamers demonstrated more alcohol involvement than non-pre-gamers. Pre-gamers were more likely to drink more frequently and assume greater responsibility for the referral event. In addition, students who pre-gamed on the night of their referral reported greater frequency of pregaming in the past month than those who did not pre-game.

Drinking Games.

A parallel set of comparisons were made for students who reported participating in drinking games on the night of the event (n = 150) and those who did not (n = 154). As can be seen in Table 2, males were more likely to report involvement in drinking games on the night of the referral than females. Overall, players and non-players were quite similar, with the exception that drinking game participants reported consuming about one more drink per occasion than non-players. Interestingly, drinking game players also found the referral event to be less aversive than the non-players.

Co-Occurrence of Pre-gaming and Drinking Games.

Examination of the concurrence of drinking games and pregaming did not support our second hypothesis. Of the entire sample, 129 participants (39%) did not participate in pre-gaming *or* drinking games, 110 (33%) played drinking games but did not pre-game, 55 (17%) pre-gamed but did not participate in drinking games, and only 40 (12%) engaged in *both* pre-gaming and drinking games during the referral event. A chi-square test of independence on drinking game participation and pre-gaming was non- significant, χ^2 (1), = 0.42, p = 0.51.

Pre-gaming and Drinking Games as Predictors of eBAC.

The average event blood alcohol content (eBAC) for the entire sample was 0.144 (SD = 0.11). We conducted a hierarchical regression to further understand the contribution of pregaming, drinking game participation and other variables to the estimated BAC on the night of the event (Table 3). As a first step, we added gender, age, and tBAC (over the past month). Only tBAC emerged as a significant predictor: those with higher typical intoxication in the past month had a higher estimated BAC the night of the event. In the second step, we added event aversiveness and responsibility. Responsibility was associated with eBAC – the higher the eBAC, the more responsible the participant felt about the incident. In the third step, we added pregaming and drinking game participation. Only pre-gaming was a significant predictor of eBAC. On the night of the event, pre-gamers tended to have higher eBAC than non-pre-gamers. Finally, adding all interactions as a group significantly increased model fit (ΔR^2 = .024, F (4,312) = 3.27, p = .012), however, the hierarchical backwards elimination strategy revealed one significant interaction (model 4). For pre-gamers, the higher the eBAC, the more aversive the event; however, this relationship was not evident for non-pre-gamers. There were no significant three-way interactions.

Discussion

To our knowledge, this is the first published research study to examine pre-gaming in college students, as well as the first to examine the intersection between pre-gaming, drinking games, and the level of intoxication on the night of an alcohol violation. Of particular interest is that approximately one-third of the students reported engaging in pre-gaming on the event night. Such a high prevalence of pre-gaming in a single assessment supports findings of previous

research (in which two-thirds of students reported pre-gaming in the past two weeks; DeJong & DeRicco, 2007). It appears that a considerable number of students drink before going out, regardless of whether this leads to a troublesome incident. This has considerable implications for the campus environment, as a number of intoxicated students are in motion, either by foot or by car, throughout the night. We also found that pre-gaming was associated with higher estimated BACs; estimated BAC among pre-gamers was almost three times the legal limit for operating at a vehicle under the influence. Beyond the risk of motor vehicle crashes, students are at greater risk of hurting themselves or others, or being involved in incidents of vandalism, fighting, or other alcohol-related behaviors while traveling under the influence of alcohol. Therefore, pregaming may contribute significantly to the primary and secondary effects of alcohol use on college campuses (e.g., Wechsler, Moeykens, Davenport, Castillo & Hansen, 1995).

Other interesting trends emerged regarding the relationship between pre-gaming and drinking game participation. Previous qualitative research suggested that pre-gaming and drinking games frequently co-occur. This was not the case in this sample of at-risk students; instead, students tended to participate in one activity or the other – only 12% of the students engaged in both pre-gaming and drinking games prior to their identified incident. Therefore, pre-gaming and drinking games appear to be relatively distinct activities. Furthermore, pre-gaming emerged as the riskier of the two activities in that it was significantly related to intoxication in the event, whereas participation in drinking games was not. This may be due to the different nature of the two activities. Although drinking alcohol is the focus of both pre-gaming and drinking games, pre-gaming may appeal more to students who desire to become intoxicated. Indeed, in this sample the eBAC of students who participated in pre-gaming was significantly higher than that of students who had not engaged in pre-gaming prior to their event. In contrast, the wide variety of drinking games may result in greater variability in the pace and amount of alcohol consumption. The variability in consumption depends on the individual's skill at the game, the game played, the type of liquor used, and the degree to which the fellow game players enforce the rules (e.g., make someone drink the required amount or have mercy; Borsari, 2004). The variety of games may explain why drinking game participation was much more prevalent in students: close to half of the students played drinking games the night of the event. As a result, a more heterogeneous group of students may play drinking games, lessening the relationship between eBAC and participation.

The nature of pre-gaming and drinking games has implications for prevention and detection. Pre-gaming tends to occur in smaller groups and quieter contexts, which will make it more difficult to detect. Tight controls on alcohol in the residence halls and close monitoring by residential leaders around peak pre-gaming times may limit the extent of this activity. If not detected or prevented in the residences, the next opportunity to intervene will be when the students are moving from location to location or arriving at another social function. Establishing sobriety checkpoints using breath test devices at campus functions may discourage pre-gaming, or at least prevent intoxicated students from aversely affecting functions. Advertising and enforcing the requirement that intoxicated students will not be permitted entrance to social functions may also reduce pre-gaming. A benefit of such monitoring is that intoxicated students can receive medical evaluation and treatment if necessary. In contrast, drinking games may be easier to detect because they often involve more people, can go on longer than pre-gaming, and create significant noise. In addition, many games have apparatus (e.g., beer pong) which are clear indications of game play.

An unexpected finding in this study was the significant interaction between event aversiveness and pre-gaming in the regression analysis. Specifically, for pre-gamers a higher level of intoxication in the event was related to a more aversive reaction to the event. In addition, pre-gamers took more responsibility for the referral event than students who did not pre-game.

Taken together, these findings may be indicative of awareness in pre-gamers of the relationship between their heavy drinking and consequences. Such a pattern of response to an alcohol violation suggests that pre-gamers may be more receptive to intervention following a referral (Barnett et al., 2006). In contrast, participants who engaged in drinking games found their event was less aversive overall than those who did not participate in drinking games. This may be a reflection of the amount of enjoyment students derive from drinking games: if students find drinking games pleasurable, they may view the referral to be worth the aggravation and therefore less aversive (e.g., "at least I was having fun"). As a result, these students may be more resistant to intervention efforts.

Some limitations of this study deserve mention. First, these data represent an event level analysis – the night the students received an alcohol violation. Therefore, we cannot draw inferences regarding the typical pre-gaming and drinking game participation of the students. It is likely that engaging in high-risk activities such as drinking games and pre-gaming increases the risk of receiving an alcohol violation. As a result, the prevalence of both activities may be elevated in this sample and not representative of the general student body. Second, the majority of the offenses (79%) in this sample were for possession and/or being in the presence of alcohol, limiting our ability to link pre-gaming participation to a particular type of violation. Finally, data were collected via student self-report. Although there is no evidence that mandated students misrepresent their alcohol use (Laforge, Borsari, & Baer, 2005), use of collateral informants would increase our confidence in the validity of the data.

The findings of this study suggest several avenues of future research. First, more research is needed to characterize the nature of pregaming more fully. Perhaps most importantly, assessment of the behavior should include a clear definition of the activity and detailed recording of how many drinks were consumed while pregaming (e.g., through the use of methods such as the timeline follow-back interview; Sobell & Sobell, 1995). Thoughtfully conducted qualitative and quantitative work would provide information regarding the prevalence of this risky drinking behavior, as well as the different approaches to pregaming (e.g., doing several shots versus drinking a few beers). Pre-gaming may also be more prevalent before some activities (e.g., alcohol-free events) than others. Second, although we did not find gender differences in pre-gaming, further examination of gender differences in pre-gaming may reveal gender-specific styles of and motives for pre-gaming. Specifically, DeJong & DeRicco (2007) found that men tended to report pre-gaming in order to get intoxicated and perhaps to relieve social anxiety, whereas women were more likely to report drinking before going out so they would know the content of their drinks. Third, linking pre-gaming to personal characteristics may inform prevention and intervention efforts. For example, pre-gaming may be linked to social anxiety – students drink heavily before they know they are going to be in social situations. Interventions could target this vulnerability. Other traits such as sensation seeking or alcohol-related expectancies may also help us better predict who will engage in pre-gaming. Finally, longitudinal examination of pre-gaming would be a valuable way to detect fluctuations in this behavior. It is possible that pre-gaming is more common among underage drinkers, or perhaps develops as students become more tolerant of alcohol and its effects (i.e., need to drink more before a party to achieve the same effect). While some students may mature out of pre-gaming, much in the same way that most college student drinkers mature out of heavy episodic drinking (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001), some may continue to pre-game into their adult years. Developing more tailored intervention approaches that target this behavior may help to forestall continued hazardous drinking after graduation.

In conclusion, pre-gaming appears to be a distinct phenomenon from drinking games. Given its relation to BAC on the night of the referral event, pre-gaming also is an especially risky drinking behavior. Therefore, continued study of different aspects of pre-gaming is warranted in both referred students and the general student population. Research on pre-gaming, which

can examine motivating factors (e.g., social anxiety), direct implications (e.g., elevated BAC levels and visiting multiple locations while intoxicated), and secondary ramifications and consequences of participating in pre-gaming (e.g., harm to self or others), will assist efforts to decrease risky college alcohol use.

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References

Adams CE, Nagoshi CT. Changes over one semester in drinking game playing and alcohol use and problems in a college student sample. Substance Abuse 1999;20:97–106. [PubMed: 12511824]

Baer JS, Kivlahan DR, Blume AW, McKnight P, Marlatt GA. Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. American Journal of Public Health 2001;91:1310–1316. [PubMed: 11499124]

Barnett NP, Goldstein A, Murphy JG, Colby SM, Monti PM. “I'll never drink like that again”: Characteristics of alcohol-related incidents and predictors of motivation to change in college students. Journal of Studies on Alcohol 2006;67(5):754–763. [PubMed: 16847545]

Barnett NP, Fromme K, O'Leary Tevyaw T, Borsari B, Carey KB, Corbin WR, Colby SM, Monti PM. Brief alcohol interventions with mandated or adjudicated students. Alcoholism: Clinical and Experimental Research 2004;28:966–975.

Barnett NP, Monti PM, Spirito A, Colby SM, Rohsenow DJ, Ruffolo L, Woolard R. Alcohol use and related harm among older teenagers treated in an Emergency Room: The importance of alcohol and college status. Journal of Studies on Alcohol 2003;64:342–349. [PubMed: 12817822]

Barnett NP, Read JP. Mandatory alcohol intervention for alcohol-abusing college students: A systematic review. Journal of Substance Abuse Treatment 2005;29:147–158. [PubMed: 16135343]

Bombardieri, M. Colleges crack down on preparty drinking.. Boston Globe. Apr 9. 2006 http://www.boston.com/news/local/articles/2006/04/09/colleges_crack_down_on_preparty_drinking/ http://www.boston.com/news/local/articles/2006/04/09/colleges_crack_down_on_preparty_drinking/Retrieved from

Borsari B. Drinking games in the college environment: A review. Journal of Alcohol and Drug Education 2004;48:29–51.

Borsari B, Carey KB. Effects of a brief motivational intervention with college student drinkers. Journal of Consulting and Clinical Psychology 2000;68:428–733.

Borsari B, Carey KB. Two brief alcohol interventions for mandated college students. Psychology of Addictive Behaviors 2005;19:296–302. [PubMed: 16187809]

Borsari B, O'Leary Tevyaw T, Barnett NP, Kahler CW, Monti PM. Stepped care for mandated college students: A pilot study. The American Journal on Addictions. in press

DeJong, W.; DeRicco, B. Pre-gaming: An exploratory study of strategic drinking by college students in Pennsylvania. 2007. Unpublished report

Engs RC, Hanson DJ. Drinking games and problems related to drinking among moderate and heavy drinkers. Psychological Reports 1993;73:115–120. [PubMed: 8367548]

Fidell, LS.; Tabachnick, BG. Preparatory data analysis.. In: Schrinka, JA.; Velicer, WF., editors. Handbook of psychology: Research methods in psychology. 2. John Wiley & Sons; New York: 2003. p. 115-141.

Fournier AK, Ehrhart IJ, Glindemann KE, Geller ES. Intervening to decrease alcohol use at university parties: Differential reinforcement of intoxication level. Behavior Modification 2004;28:167–181. [PubMed: 14997946]

Garland R. Greek drinking parties. History Today 1982;32:18–21.

Hingson RW, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related morbidity and mortality among U.S. college age students 18-24: Changes from 1998 – 2001. Annual Review of Public Health 2005;26:259–279.

Hoover E. Drug and alcohol arrests increased on campuses in 2001. Chronicle of Higher Education 2003;49:A38.

Jaccard, J.; Turrisi, R. Interaction effects in multiple regression. 2nd ed.. Sage; Thousand Oaks, CA: 2002.

Johnson TJ, Stahl C. Sexual experiences associated with participation in drinking games. The Journal of General Psychology 2004;13:304–320. [PubMed: 15248595]

Kahler CW, Strong DW, Read JP. Toward efficient and comprehensive measurement of the alcohol problems continuum in college students: The Brief Young Adult Alcohol Consequences Questionnaire. Alcoholism: Clinical and Experimental Research 2005;29:1180–1189.

Kleinbaum, DG. Logistic regression: A self-learning text. Springer; New York: 1992.

Knight JR, Wechsler H, Kuo M, Siebring M, Weitzman ER, Schuckit MA. Alcohol abuse and dependence among U.S. college students. Journal of Studies on Alcohol 2002;63:263–270. [PubMed: 12086126]

La Forge R, Borsari B, Baer JS. The utility of collateral informant assessment in college alcohol research: Results from a longitudinal prevention trial. Journal of Studies on Alcohol 2005;66:479–487. [PubMed: 16240555]

Longabaugh R, Minugh PA, Nirenberg TD, Clifford PR, Becker B, Woolard R. Injury as a motivator to reduce drinking. Academy of Emergency Medicine 1995;2:817–825.

Matthews DB, Miller WR. Estimating blood alcohol concentration: Two computer programs and their application in therapy and research. Addictive Behaviors 1979;4:55–60. [PubMed: 420046]

Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M, et al. Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. Journal of Consulting and Clinical Psychology 1999;67:989–994. [PubMed: 10596521]

Nagoshi CT, Wood MD, Cote CC, Abbit SM. College drinking game participation within the context of other predictors of other alcohol use and problems. Psychology of Addictive Behaviors 1994;8:203–213.

NIAAA council approves definition of binge drinking. NIAAA Newsletter 2004;3:3.winter

O'Malley PO, Johnston LD. Epidemiology of alcohol and other drug use among American college students. Journal of Studies on Alcohol 2002;Suppl. 14:23–39.

Pedersen ER, LaBrie J. Drinking game participation among college students: Gender and ethnic implications. Addictive Behaviors 2006;31:2105–2115. [PubMed: 16600523]

Sobell, LC.; Sobell, MB. Alcohol Timeline Followback users' manual. Addiction Research Foundation; Toronto, Canada: 1995.

Tucker, E. Brown U. aims to curb student drinking.. Boston Globe. Mar 11. 2006 http://www.boston.com/news/local/massachusetts/articles/2006/03/11/brown_u_aims_to_curb_student_drinking?mode=PFhttp://www.boston.com/news/local/massachusetts/articles/2006/03/11/brown_u_aims_to_curb_student_drinking?mode=PFRetrieved from

Vicary JR, Karshin CM. College alcohol use: A review of the problems, issues, and prevention approaches. The Journal of Primary Prevention 2002;22:299–331.

Wechsler H, Lee JE, Nelson TF, Kuo M. Underage college students' drinking behavior, access to alcohol, and the influence of deterrence policies. Journal of American College Health 2002;50:223–236. [PubMed: 11990980]

Wechsler H, Moeykens B, Davenport A, Castillo S, Hansen J. The adverse impact of heavy episodic drinkers on other college students. Journal of Studies on Alcohol 1995;56:628–634. [PubMed: 8558894]

Zamboanga BL, Bean JL, Pietras AC, Pabon LC. Subjective evaluations of alcohol expectancies and their relevance to drinking game involvement in female college students. Journal of Adolescent Health 2005;37:77–80. [PubMed: 15963914]

Zamboanga BL, Leitkowski LK, Rodriguez L, Cascio KA. Drinking games in female college students: More than just a game? Addictive Behaviors 2006;31:1485–1489. [PubMed: 16364557]

Table 1

Group comparisons for Pre-gamers (n = 95) and non-Pre-gamers (n = 209).

	Pre-gamers M (SD)	Non-Pre-gamers M (SD)	χ^2 / *t*	p
Male Gender	53 (56%)	136 (66%)	2.57	.11
Year in School				
Freshman	56 (59.6%)	142 (68.9%)	5.38	.15
Sophomore	27 (28.7%)	38 (18.4%)		
Junior	5 (5.3%)	19 (9.2%)		
Senior	4 (4.3%)	7 (3.4%)		
Age	18.74 (0.84)	18.66 (0.88)	0.78	.43
Caucasian	91 (96%)	299 (95%)	0.01	.92
Drinking Frequency Past Month	11.00 (6.36)	9.49 (5.92)	2.00	.05
Heavy Drinking Days	8.62 (4.93)	7.49 (5.30)	1.75	.08
Typical Number of Drinks per Occasion	7.43 (3.02)	7.27 (3.42)	0.39	.70
Typical BAC[a]	0.12 (0.07)	0.11 (0.07)	0.97	.33
B-YAACQ	7.16 (4.72)	7.88 (4.56)	1.16	.25
Days Playing Drinking Games	6.78 (3.87)	6.66 (5.45)	0.18	.86
Days Pregaming[b]	8.05 (5.09)	5.09 (5.03)	2.68	.01
Event Aversiveness	3.21 (1.67)	3.04 (1.49)	0.90	.37
Event Responsibility	4.43 (1.85)	3.80 (1.61)	3.01	<.01
Event BAC	0.215 (0.12)	0.133 (0.09)	6.45	<.001

Note. B-YAACQ = Brief Young Adult Alcohol Consequences Questionnaire. Recall period for all alcohol questions is the past month.

[a] Two of the participants in the non-pregaming group did not provide enough information to calculate a typical BAC.

[b] A subset of this sample (*n* = 95) completed this question.

Table 2

Group Comparisons of Drinking Game (n=150) and Non-Drinking Game (n=154) participants.

	Drinking Games M (SD)	Non-Drinking Games M (SD)	χ^2/ *t*	*p*
Male Gender	101 (69%)	88 (57%)	4.66	.03
Year in School				
Freshman	98 (67.1%)	100 (65.7%)	2.35	.50
Sophomore	32 (21.9%)	33 (21.7%)		
Junior	13 (8.9%)	11 (7.2%)		
Senior	3 (2.1%)	8 (5.3%)		
Age	18.64 (.81)	18.73 (.92)	0.83	.41
Caucasian	147 (98%)	144 (94%)	7.92	.44
Drinking Frequency	9.75 (5.36)	10.18 (6.72)	−0.61	.54
Heavy drinking days	7.97 (4.48)	7.72 (5.52)	−0.41	.69
Typical Number of Drinks per Occasion	7.99 (3.25)	6.70 (3.23)	3.43	<.01
Typical BAC[a]	0.12 (0.07)	0.11 (0.07)	1.94	.05
B-YAACQ	7.68 (4.89)	7.08 (4.45)	1.03	.31
Days Playing Drinking Games	7.09 (4.99)	6.29 (5.01)	1.34	.18
Days Pregaming[b]	6.13 (4.78)	6.54 (5.52)	0.35	.40
Event Aversiveness	2.90 (1.44)	3.28 (1.62)	−2.20	.03
Event Responsibility	3.93 (1.63)	4.06 (1.78)	−0.68	.50
Event BAC	0.171 (0.12)	0.148 (0.10)	1.81	.07

Note. B-YAACQ = Brief Young Adult Alcohol Consequences Questionnaire. Recall period for all alcohol questions is the past month.

[a] Two of the participants in the non-pregaming group did not provide enough information to calculate a typical BAC.

[b] A subset of this sample (n = 95) completed this question.

Table 3

Summary of Hierarchical Regression Analysis for Variables Predicting Event Blood Alcohol Concentration (N = 324)

Variable	Model 1			Model 2			Model 3			Model 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Gender	0.38	1.11	0.02	0.34	1.11	0.01	−0.16	1.05	−0.01	−0.21	1.03	−0.01
Age	0.34	0.70	0.03	1.31	0.65	0.10*	0.87	0.61	0.06	1.02	0.60	0.08^{t}
tBAC	64.06	8.39	0.39***	61.04	7.71	0.38***	58.49	7.21	0.36***	56.75	7.11	0.35***
Aversiveness				0.80	0.36	0.11*	0.76	0.34	0.10*	−0.03	0.40	0.00
Responsibility				2.47	0.32	0.37***	2.06	0.30	0.31***	1.95	0.30	0.29***
Drinking Games							−0.14	1.03	−0.14	0.12	1.02	0.01
Pregaming							7.89	1.14	0.31***	7.49	1.12	0.30***
Aversiveness X Pregaming										2.37	0.69	0.19***
R^2			.16			.31			.40			.42
F for change in R^2			19.73***			34.28***			24.17***			11.89***

Note: Age, tBAC (typical blood alcohol concentration), aversiveness, and responsibility were median centered; eBAC multiplied by 100 to increase interpretability of the unstandardized betas. Ten participants did not provide enough information to calculate eBAC and/or tBAC, and were excluded from the models. The regression models were conducted with all participants; parallel regression models with only participants who reported drinking on the night of the event revealed similar results. ** $p < .01$.

^{t} p ≤ .10.

* $p \leq .05$.

*** $p \leq .001$.