Psychology & Health

ISSN: 0887-0446 (Print) 1476-8321 (Online) Journal homepage: www.tandfonline.com/journals/gpsh20

Motives to play drinking games and their unique associations with drinking game behaviors and consequences in a national sample of university students in the United States

Byron L. Zamboanga, Amie R. Newins, Katherine Walukevich-Dienst, Jennifer E. Merrill, Banan Ramarushton, Su Yeong Kim, Jessica K. Perrotte & P. Priscilla Lui

To cite this article: Byron L. Zamboanga, Amie R. Newins, Katherine Walukevich-Dienst, Jennifer E. Merrill, Banan Ramarushton, Su Yeong Kim, Jessica K. Perrotte & P. Priscilla Lui (28 Nov 2024): Motives to play drinking games and their unique associations with drinking game behaviors and consequences in a national sample of university students in the United States, Psychology & Health, DOI: 10.1080/08870446.2024.2429607

To link to this article: https://doi.org/10.1080/08870446.2024.2429607

PSYCHOLOGY & HEALTH
https://doi.org/10.1080/08870446.2024.2429607

Motives to play drinking games and their unique associations with drinking game behaviors and consequences in a national sample of university students in the United States

Byron L. Zamboanga[a#], Amie R. Newins[b#], Katherine Walukevich-Dienst[c], Jennifer E. Merrill[d], Banan Ramarushton[e], Su Yeong Kim[f], Jessica K. Perrotte[g] and P. Priscilla Lui[h]

[a]Department of Psychological Science, University of Arkansas, Fayetteville, AR, USA; [b]Department of Psychology, University of Central Florida, Orlando, FL, USA; [c]Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA, USA; [d]Department of Behavioral and Social Sciences, Brown University, Providence, RI, USA; [e]Department of Psychology, University of North Texas, Denton, TX, USA; [f]Department of Human Development and Family Sciences, University of Texas at Austin, Austin, TX, USA; [g]Department of Psychology, Texas State University, San Marcos, TX, USA; [h]Department of Psychology, University of Washington, San Marcos, TX, USA

ABSTRACT

Objective: Playing drinking games (DGs) is a common behavior among university students, which is concerning given that DG participation is related to more alcohol use/consequences. People's motivations for playing DGs are associated with certain DG behavior patterns and negative consequences. However, few studies have accounted for general drinking motives and other key covariates when examining the unique associations between DG-specific motivations and DG outcomes. The present study used a large, multisite national sample of university students in the United States to determine cross-sectional associations between DG-specific motives (e.g. sexual pursuit, enhancement/thrills, conformity) and DG frequency, quantity, and negative consequences, above and beyond relevant demographics and general drinking motives. **Method:** University students (N=8922) completed a self-report survey that assessed DG-specific behaviors, consequences, and motives, as well as general drinking behaviors and motives. **Results:** Multivariate findings indicated that enhancement/thrills and sexual pursuit motives are the riskiest DG motives, given their association with DG frequency, quantity, and consequences. Conformity was positively associated with negative consequences while competition and boredom were positively associated with DG frequency. Social lubrication was unrelated to all outcomes. **Conclusion:** Enhancement/thrills, sexual pursuit, and conformity DG motives may be particularly important targets for DG-specific prevention and intervention efforts.

ARTICLE HISTORY
Received 20 November 2023
Accepted 8 November 2024

KEYWORDS
Drinking game; drinking game motives; drinking motives; negative drinking consequences

CONTACT Byron L. Zamboanga byronz@uark.edu Department of Psychological Science, University of Arkansas, 216 Memorial Hall, Fayetteville, AR, 72701, USA; Amie R. Newins amie.newins@ucf.edu Department of Psychology, University of Central Florida, Orlando, FL, USA.
[#]Drs. Zamboanga and Newins contributed equally to this manuscript.
This article has been corrected with minor changes. These changes do not impact the academic content of the article.

Introduction

A drinking game (DG) is a rule-based, social drinking activity that requires participants to perform a mental and/or motor activity and typically involves consuming large amounts of alcohol (Zamboanga et al., 2013). Indeed, a large body of research has documented positive correlations between DG participation and alcohol use and negative drinking outcomes (Zamboanga et al., 2014, 2021). Although playing a DG can increase a person's risk for sustaining a number of adverse health outcomes (e.g. blacking out; Hoyer & Correia, 2022a; Zamboanga, Napper, et al., 2019), many university students in the United States (U.S.; 50–70%, Zamboanga et al., 2014) and other countries (e.g. >60% lifetime participation rates in Australia; see Zamboanga, Van Hedger, et al., 2023) report having played a DG. It is important that researchers and practitioners understand what motivates university students to play DGs given (a) how popular these games are among this population, and (b) the adverse behavioral (e.g. acting impulsively) and physical (e.g. getting sick) outcomes that can occur from playing them (Zamboanga et al., 2014, Zamboanga, Napper, et al., 2019, 2023).

The motivational theory of alcohol use provides a theoretical framework for why people drink (Cooper et al., 2016; Cox & Klinger, 1988; Kuntsche et al., 2005). A key tenet of this framework is (a) people drink because they seek to reduce or remove their negative feelings and/or enhance how they feel, and (b) these motivations are influenced in part by past experiences, alcohol outcome expectancies, and social and contextual incentives to consume alcohol (Cox & Klinger, 1988; Kuntsche et al., 2005). This motivational framework of alcohol served as the theoretical basis for the development of the Drinking Motives Questionnaire-Revised (DMQ-R, Cooper, 1994) and later the Modified-Drinking Motives Questionnaire-Revised (M-DMQ-R; Grant et al., 2007), which consist of social, enhancement, coping, and conformity motives to drink. Over a decade of research (Bresin & Mekawi, 2021; Cooper et al., 2016; Kuntsche et al., 2005) suggests that certain drinking motives (esp., enhancement and coping motives) can increase people's risk for increased alcohol use and negative alcohol-related consequences, and drinking motives are 'the final common pathway to alcohol use' (Cox & Klinger, 1988, p. 178).

Decades of research suggests that different motives for alcohol use (as measured by the DMQ-R) are predictive of certain drinking patterns (Bresin & Mekawi, 2021; Cooper et al., 2016; Kuntsche et al., 2005). Studies on general drinking motives and DG behaviors among university students in the U.S. and Australia show similar effects. For example, Hoyer and Correia (2022b) found only conformity motives were predictive of DG consumption in multivariate models. Additionally, using a sample of university students in Australia, Mulligan et al. (2016) found that only coping motives were predictive of DG frequency in multivariate models. In short, these findings provide evidence for a positive association between some general drinking motives and DG behaviors. We, therefore, accounted for general motives to drink as covariates in our analyses in order to ascertain the extent to which motives specific to playing DGs are uniquely associated with DG behaviors and related consequences. In addition, this approach is necessary to determine the utility of assessing both DG motives and general drinking motives in future research and to inform the development of personalized prevention and intervention efforts for university students.

Young people's motives to drink alcohol in the context of playing DGs (e.g. Zamboanga, Audley, et al., 2019; Zamboanga, Ford, et al., 2024) have received empirical attention over the last two decades. Johnson and Sheets (2004) developed the first measure of DG motives, which was revised by Zamboanga, Audley, et al. (2019) and is now referred to as the Motives for Playing Drinking Games measure (MPDG). The MPDG consists of seven subscales: competition, boredom, novelty, sexual pursuit, social lubrication, enhancement/thrills, and conformity. While social lubrication, enhancement/thrills, and conformity DG motives align with the subscales captured in the DMQ-R and the M-DMQ-R, the other four do not. The reasons for this are twofold. First, coping motives to play DGs were not found in factor analytic studies with young adults/university students in the U.S. (Zamboanga, Audley, et al., 2019) and university students in Australia (George et al., 2018). Second, the unique social features of certain types of DGs (e.g. compete wtih others; LaBrie et al., 2013) and the novel drinking experiences (e.g. drinking to song lyrics) that playing DGs provides (Zamboanga, Ford, et al., 2024) are not captured in the DMQ-R and the M-DMQ-R. Thus, people's motivations to play DGs extend beyond general motives to drink.

Studies that examined all seven DG motives (measured by the MPDG) and their associations with DG behaviors and related consequences among young adults/university students have produced a few key findings. Using a multisite sample of university students in the U.S., findings from Zamboanga et al. (2018) multivariate analysis that accounted for general drinking motives indicated that enhancement/thrills were positively predictive of DG frequency and consumption. These results were consistent with studies that did not account for general drinking motives and found positive associations between enhancement/thrills and DG frequency (Zamboanga, Audley, et al., 2019), consumption (George et al., 2018; Zamboanga, Kearns, et al., 2019), and consequences (George et al., 2018, 2019; Zamboanga, Audley, et al., 2019). Enhancement/thrills motives appear to be particularly and strongly related with negative consequences, as findings from a recent latent class study indicated that university students who belonged in the 'most problems' DG consequences class also endorsed higher levels of enhancement/thrills motives on the MPDG compared to those who were in the 'fewer problems' class (Hoyer & Correia, 2022a). Sexual pursuit motives (George et al., 2018; Zamboanga, Audley, et al., 2019) are also positively related to DG consequences among university students in the U.S. and Australia. Since endorsing enhancement/thrills and/or sexual pursuit DG motives tends to be consistently related to more DG frequency and consumption, they pose the greatest risk for DG behaviors and related consequences. Additionally, Zamboanga et al. (2018) also found a positive association between competition motives and DG frequency in multivariate analyses that accounted for general drinking motives. Although the latter finding is consistent with other work (Zamboanga, Audley, et al., 2019), it differs from other studies that did not include general drinking motives as covariates in a multivariate model, which have also found positive associations between conformity and negative DG consequences (George et al., 2018; Zamboanga, Audley, et al., 2019) and DG consumption (Zamboanga, Kearns, et al., 2019). In short, these findings suggest that conformity motives confer some risk associated with DG behaviors. Competition appears to be somewhat less risky compared to other DG motives (Zamboanga, Audley, et al., 2019) given its positive relation only to DG frequency, while social lubrication seems to

pose the least risk given the null (multivariate) findings reported in prior research. Thus, similar to the general drinking motives literature, endorsement of specific motives for playing DGs is correlated with certain DG behaviors and adverse health outcomes.

Study aims

The present study was guided by a motivational model of alcohol use (see Kuntsche et al., 2005) and findings from prior studies which indicated that specific motivations for playing DG are associated with certain DG outcomes. Specifically, we sought to advance prior research on students' motivations to play DGs by examining how each DG motive on the MPDG uniquely predicts how often they play DGs, the typical number of drinks they consumed when playing, and the number of negative DG consequences they experienced over and above key demographic correlates of DG behaviors, general alcohol use, and general drinking motives. The effects of each DG motive were examined for all three DG outcome variables given that previous research on general drinking motives has shown that the associations between different motives and different alcohol outcomes (e.g. frequency, quantity, consequences) vary by motive type (see Bresin & Mekawi, 2021, for a review). Furthermore, there are theoretical reasons to expect that certain motives may be more strongly associated with specific DG outcomes. For example, sexual pursuit motives may be associated with increased likelihood of negative consequences (e.g. sexual aggression, unprotected sex), and boredom motives may increase frequency of DG participation (e.g. to fill time) without increasing quantity of consumption during DGs. All of the aforementioned MPDG studies included age and general alcohol use as covariates in analyses and most included gender, but only one (Zamboanga et al., 2018) accounted for general drinking motives. Given prior research showing a link between general drinking motives and DG behaviors, we included general drinking motives that align with their respective motives for playing DG (i.e. M-DMQ-R social and MPDG social lubrication; M-DMQ-R enhancement and MPDG enhancement/thrills; and M-DMQ-R conformity and MPDG conformity) as covariates in our multivariate models in order to fully ascertain the unique associations between DG motives and DG behaviors and related negative consequences. Gender differences in DG motives (Hoyer & Correia, 2022a; Johnson & Sheets, 2004) and DG behaviors and negative consequences (Zamboanga et al., 2014, Zamboanga, Napper, et al., 2019) have also been reported in prior research. Age (typically being younger; Zamboanga et al., 2014) and Greek fraternity/sorority affiliation (Haas et al., 2012) have also been found to be correlated with DG behaviors. Finally, differences in DG behaviors as a function race/ethnicity (Wegner et al., 2019; Zamboanga et al., 2015) and athletic status (Grossbard et al., 2007) have been documented. As such, we also included these demographic variables as covariates in our models. Finally, we also sought to enhance the generalizability of our findings by conducting our study with a large multisite national sample of university students ($N = 8992$).

Based on prior research with university students, we hypothesized that enhancement/thrills and sexual pursuit would be associated positively with all three DG outcomes, above and beyond demographics and general drinking motives. We also expected conformity to be positively related to DG quantity and negative

consequences, and competition to be positively associated with DG frequency. Given the relatively limited research on the MPDG and the null findings regarding the other DG motives (e.g. novelty, social lubrication), we did not advance specific hypotheses regarding their associations with our DG outcome variables and therefore treated these analyses as exploratory.

Method

Participants and procedures

Participants ($N = 30{,}389$) were pooled from two large cross-sectional survey studies: Study A (Zamboanga, Merrill, et al., 2024) and Study B (Zamboanga, Merrill, et al., 2022). Data for Study A consisted of students (ages 18 or older) from universities (12 total) in different U.S. regions (Northeast, Southwest, South, Midwest, Southeast, and Atlantic Coast). Data were collected during the spring/fall semesters (2018) and spring semester (2019). Participants were recruited from psychology subject pools, psychology classes or courses related to this field, and email announcements. Students who participated in the study received research credits, extra credit, or were entered into a drawing to win a prize. Investigators for Study A received IRB approval to collect data at their site. Data for Study B consisted of National Collegiate Athletic Association Division I, II, and III varsity student-athletes (ages 18 or older) from 119 universities who participated in an alcohol/substance use online prevention program (*myPlaybook*; Wyrick et al., 2014). Study B data were collected during the 2017–2018 academic year (fall/spring semesters); student-athletes did not receive any compensation for participating in the study. The principal investigator's institutional review board (IRB) approved the Study B protocols. The data analytic sample for this study consisted of 8922 participants ($n = 3083$ [34.6%] from Study A; $n = 5839$ [65.4%] from Study B) who reported having played a DG at least once in the past month; see Figure 1 for data analytic sample selection).

Measures

Drinking game behaviors and related negative consequences

Participants completed the Hazardous Drinking Game Measure (HDGM; Borsari et al., 2014). Students reported how often they played DGs in the past month on a 4-point scale (0 = *never*, 1 = *monthly or less*, 2 = *2–4x/month*, 3 = *2–3x/week*, 4 = *4 + times/week*) and how many total drinks they typically consume when they are playing DGs. Students also indicated if they experienced (0 = *no*, 1 = *yes*) eight negative DG consequences (e.g. regretted unplanned sexual activity, blacked out) in the past month. The total number of endorsed negative DG consequences score was computed.

Motives to play drinking games

Participants completed a revised version of the MPDG (33-items; Zamboanga, Audley, et al., 2019). As recommended in Zamboanga, Audley, et al. (2019), 5-items were added to the MPDG to improve this measure and recent confirmatory factor analysis of this 33-item version of the MPDG in a subsample of the current sample indicated that the

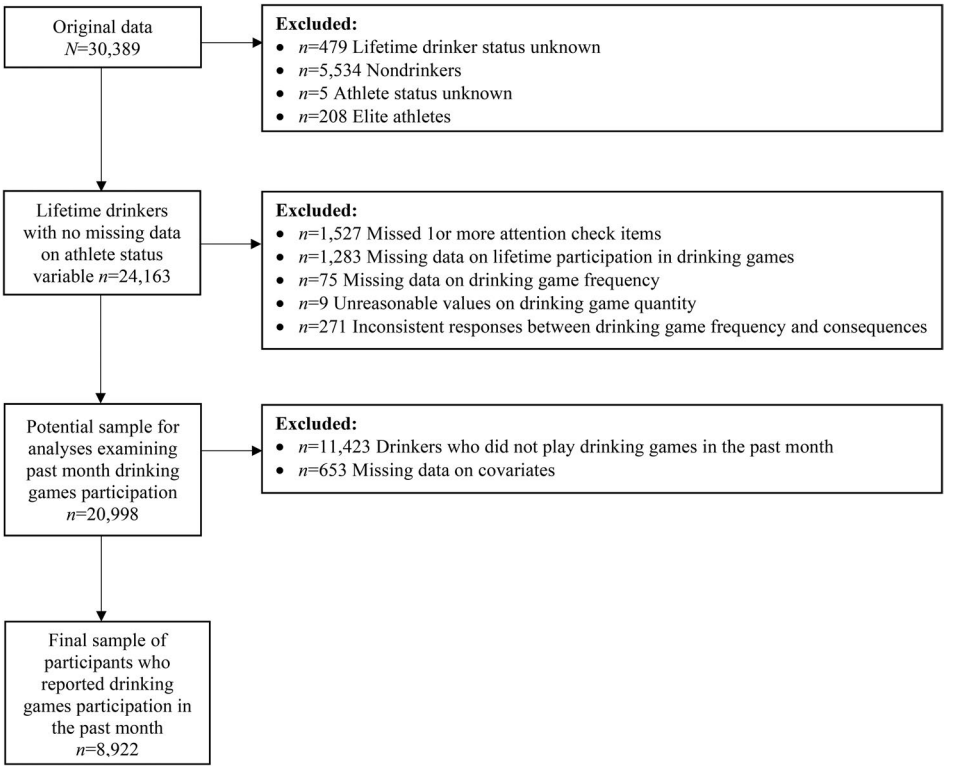

Figure 1. Flow chart of data analytic sample selection.

7-factor structure fit the data well (Zamboanga, Newins, et al., 2024). The MPDG asks participants to report how important each item is in influencing their decision to play DGs on a 4-point scale (1 = *not at all important*, 2= *somewhat important*, 3 = *moderately important*, 4 = *very important*). Mean scores were computed for each subscale.

Covariates

Participants reported their age, gender, Greek fraternity/sorority affiliation, athletic status, and race/ethnicity, which were included as covariates in the analyses. Students also completed the 28-item M-DMQ-R (Grant et al., 2007). Given their overlap with the MPDG-33 subscales of social lubrication, enhancement/thrills, and conformity, we computed mean scores for the social, enhancement, and conformity M-DMQ-R subscales. Students from Study B completed a weekly grid modified from the Daily Drinking Questionnaire (Collins et al., 1985), wherein student-athletes indicated the number of drinks consumed per typical day in the past month. Responses were used to calculate drinking days per week and average drinks per drinking day. Participants in Study A reported past year drinking which included two items from the Alcohol Use Disorders Identification Test-Consumption scale (AUDIT-C; Barry et al., 2015): How often do you have a drink containing alcohol (Item 1) and how many drinks containing alcohol do you have on a typical day when you are drinking (Item 2). We computed a general alcohol frequency and drink quantity variable that applied to both samples.[1]

Data analytic procedure

Data were first entered into SPSS, Version 28, for data preparation and computation of descriptive statistics. Although the participants were clustered within site, intraclass correlation coefficients indicated that site accounted for <1% of the variability in DG behaviors. Therefore, multi-level modeling was not deemed necessary for the analyses. An ordinal regression was run to examine predictors of DG frequency. Ordinary least squares regression was used to examine DG quantity because some participants reported non-integer quantities (e.g. 2.5 drinks) and because the sample distribution was not significantly positively skewed. Negative binomial regression was used to examine DG consequences because it was a positively skewed count variable. Age, gender, Greek fraternity/sorority affiliation, race/ethnicity, athlete status, general alcohol use (frequency and quantity), and gender drinking motives (social, enhancement, and conformity) were included as covariates in all models; DG frequency and quantity were included as covariates in the model with negative consequences as the outcome.

Results

Descriptive statistics for all study variables and bivariate correlations with DG variables are presented in Table 1. Almost all DG motives were positively correlated with DG frequency, DG quantity, and negative DG consequences; the only exception was that conformity DG motives were not significantly correlated with DG frequency.

The results of the regressions are presented in Table 2. Enhancement/thrills and sexual pursuit motives were positively associated with DG frequency, quantity, and negative consequences, even after accounting for demographic covariates and general drinking motives. Novelty motives were negatively associated with DG frequency. Conformity motives were negatively associated with DG frequency but positively associated with negative consequences and not significantly associated with DG quantity. In contrast, competition motives were positively associated with DG frequency but negatively associated with negative consequences, and boredom motives were positively associated with DG frequency but negatively associated with DG quantity. Social lubrication motives were not significantly associated with any of the DG variables.

Discussion

Our study aim was to examine how motives specific to playing DGs (as measured by the MPDG-33; Zamboanga, Newins, et al., 2024) were uniquely associated with DG behaviors (frequency and quantity) and negative consequences from playing DGs, over and above demographic factors, general alcohol use, and general drinking motives in a large national multisite sample of university students in the U.S. Some notable strengths of our study include the large, multisite national sample of university students (8922 participants), inclusion of general drinking motives as covariates in the analyses, and the measurement of DG-specific negative consequences. There are four noteworthy findings. First, as hypothesized, enhancement/thrills were positively associated with DG frequency, quantity, and negative consequences. This finding aligns with prior research

Table 1. Sample descriptives for participants ($n = 8922$).

Variable	*M*/(*SD*) or %	α	Correlation with DG frequency	Correlation with DG quantity	Correlation with DG consequences
Demographics					
Age	19.97 (1.41)	--	--	--	--
Gender–Female[a]	58.2%	--	--	--	--
Greek Affiliated	18.7%	--	--	--	--
Athlete status					
Varsity Athlete	65.9%	--	--	--	--
Recreational Athlete	8.2%	--	--	--	--
Non-Athlete	25.9%	--	--	--	--
Racial/ethnic group[b]					
Asian/Asian American	4.0%	--	--	--	--
White	74.5%	--	--	--	--
Black	6.5%	--	--	--	--
Hispanic	11.8%	--	--	--	--
American Indian/Native American	0.4%	--	--	--	--
Other Race/Ethnicity	2.7%	--	--	--	--
Drinking Game Frequency[c]	1.68 (0.66)	--	--	--	--
Drinking Game Quantity	3.78 (2.15)	--	.12***	--	--
Drinking Game Consequences	1.09 (1.38)	0.69	.22***	.28***	--
Number of Consequences					
None	45.6%				
One	26.1%				
Two	14.1%				
Three	7.1%				
Four	3.4%				
Five	2.2%				
Six	1.4%				
Motives to Play Drinking Games					
Social lubrication (e.g. 'to meet interesting people')	1.87 (0.72)	0.89	.08***	.16***	.24***
Conformity (e.g. 'to fit in')	1.49 (0.57)	0.84	.01	.09***	.24***
Enhancement/thrills (e.g. 'because they are fun')	2.39 (0.71)	0.87	.25***	.24***	.35***
Competition (e.g. 'for the competition')	2.11 (0.88)	0.81	.20***	.16***	.19***
Novelty (e.g. 'to try something different')	1.85 (0.73)	0.84	.03**	.14***	.21***
Sexual pursuit (e.g. 'to have sex w/someone')	1.18 (0.40)	0.89	.07***	.13***	.21***
Boredom (e.g. 'to kill time')	1.61 (0.64)	0.71	.14***	.09***	.24***
Alcohol Use Behavior					
General Alcohol Use Quantity[d]	1.63 (0.61)	--	.45***	.20***	.18***
General Alcohol Use Frequency[e]	3.23 (1.42)	--	.40***	.08***	.14***
General Drinking Motives					
Social (e.g. 'improves parties/celebrations')	2.93 (0.92)	0.81	.11***	.19***	.29***
Enhancement (e.g. 'it's fun/exciting')	2.63 (0.93)	0.83	.16***	.22***	.29***
Conformity (e.g. 'so you won't feel left out')	1.37 (0.64)	0.87	.02*	.08***	.22***

Note. [a]Participants who identified as transgender female ($n = 2$) and were recoded as female; whose who identified as transgender male ($n = 8$) and were recoded as male. Gender was coded as missing for analyses among those who reported 'Other' or 'Prefer not to respond' ($n = 19$). [b]Native American/'Other' race/ethnicity were collapsed for analyses; 3 participants did not report their race/ethnicity. [c]1 = *monthly or less*, 2 = *2–4x/month*, 3 = *2-3x/week*, and 4 = *4 + times/week*. [d]1 = *1-2.9 drinks*, 2 = *3–4.9 drinks*, 3 = *5–6.9 drinks*, 4 = *7–9.9 drinks*, 5 = *10+ drinks*. [e]1 = *weekly or less*, 2 = *2–3 times/week*, 3 = *4+ times/week*. *$p < .05$, **$p < .01$, ***$p < .001$.

Table 2. Regressions predicting drinking game behaviors and drinking game consequences.

	Drinking game frequency		Drinking game quantity		Drinking game consequences	
	b	*p*	*b*	*p*	*B*	*p*
Motives to Play Drinking Games						
Social lubrication	.09	.055	−0.05	.265	−0.04	.170
Conformity	**−0.22**	**<.001**	−0.10	.069	**.14**	**<.001**
Enhancement/thrills	**.57**	**<.001**	**.57**	**<.001**	**.35**	**<.001**
Competition	**.15**	**<.001**	−0.02	.533	**−0.05**	**.025**
Novelty	**−0.40**	**<.001**	−0.02	.580	−0.05	.101
Sexual Pursuit	**.17**	**.012**	**.24**	**<.001**	**.14**	**.001**
Boredom	**.13**	**.006**	**−0.18**	**<.001**	.01	.721
Level 1 Covariates						
Age	−0.08	<.001	.01	.342	.01	.338
Male Gender (ref = Female)	.13	.011	.71	<.001	−0.27	<.001
Greek Affiliated (ref = Not Affiliated)	.35	<.001	−0.22	<.001	−0.01	.883
Asian (ref = White)	.00	.976	.13	.215	−0.13	.124
Black (ref = White)	−0.18	.065	.43	<.001	−0.03	.609
Hispanic (ref = White)	−0.16	.041	.40	<.001	.07	.209
Other race (ref = White)	−0.06	.669	.42	<.001	.02	.802
Varsity Athlete (ref = non-Athlete)	.58	<.001	−1.64	<.001	−0.20	<.001
Recreational Athlete (ref = Non-Athlete)	.40	<.001	−0.22	.013	−0.07	.282
General Social Motives	−0.01	.864	.00	.933	.12	<.001
General Enhancement Motives	.06	.135	.04	.262	.03	.305
General Conformity Motives	.06	.192	.06	.142	.08	.005
Drinking Game Frequency	--	--	--	--	.23	<.001
Drinking Game Quantity	--	--	--	--	.11	<.001
General Alcohol Use Quantity	.41	<.001	.43	<.001	.10	<.001
General Alcohol Use Frequency	.78	<.001	−0.08	.041	.05	.133

Note. **Bold** indicates significant associations of interest in the present study. ref = referent group.

with young adults/university students in the U.S. and Australia and suggests that higher endorsement of enhancement/thrills is likely to pose a risk for DG frequency (Zamboanga et al., 2018; Zamboanga, Audley, et al., 2019), quantity (George et al., 2018; Zamboanga et al., 2018; Zamboanga, Audley, et al., 2019; Zamboanga, Kearns, et al., 2019), and/or negative consequences (George et al., 2018, 2019; Zamboanga, Audley, et al., 2019), over and above demographic variables and general drinking motives (Zamboanga et al., 2018). In short, the social components of DG (e.g. typically played in groups and with friends) and consumption features of DG (e.g. designed to facilitate heavy drinking; are a more exciting way to drink) could draw students who are motivated to play DG for enhancement/thrills (i.e. to have fun and get a good laugh, get drunk/buzzed, drink in a more exciting way) to play more often and drink more while playing which could result in experiencing more negative DG consequences.

Second, and as hypothesized, sexual pursuit was positively related to DG frequency, quantity, and negative consequences, and is consistent with Zamboanga, Audley, et al. (2019) findings. Perhaps individuals who are motivated to play DG so they can express romantic or sexual interest in someone might play more frequently to increase opportunities to attain such pursuits (e.g. selecting a person for whom one is attracted to drink when playing certain types of DGs; Audley et al., 2018) and/or they might drink more when playing in order feel less inhibited when expressing interest in a person (e.g. 'to work up the courage to "put the moves" on someone'). These students might also be at risk for experiencing more negative consequences due to increased alcohol consumption while playing DG and/or involvement in certain behaviors linked

to sexual motives for playing (e.g. engaging in unprotected sex, being overly sexually aggressive). Given prior work linking sexually related motives for playing DG and regrettable/negative sexual experiences from playing DGs (Johnson & Stahl, 2004), future studies that are designed to further our understanding of these associations are needed.

Third, as expected and consistent with research with young adults/university students in the U.S (Zamboanga, Audley, et al., 2019) and university students in Australia (George et al., 2018), conformity motives to play DG were positively related to negative consequences. Thus, it appears that conformity confers some degree of risk given its positive association with negative consequences. While it is not clear how conformity motives are linked to negative consequences from playing DG, it is possible that students are conforming to certain risky behaviors that their DG peers may also be engaging in. For example, students' peers may directly or indirectly encourage them to drive to another destination after drinking heavily from playing DG, engage in unplanned sexual activity, and/or act rude or obnoxious. To fully understand the risk factors associated with conformity motives to play DGs, research that identifies peer (e.g. the type of behaviors that their peers are engaging in during and/or after playing a DG) and contextual (e.g. group dynamics/pressures) predictors of playing DGs to conform to others is needed.

We did not find support for our hypothesis that conformity motives to play DG would be positively associated with DG quantity. This finding aligns with other studies conducted with university students in Australia (George et al., 2018, 2019), university/non-university attending young adults (Zamboanga, Audley, et al., 2019), and university students (Zamboanga et al., 2018) in the U.S. In contrast, results from prior research with female student-athletes (Zamboanga, Kearns, et al., 2019) indicated a positive association between these two variables. Perhaps differences between the samples can explain these findings (female student-athletes at a private undergraduate institution vs. a more representative sample of students from 12 large public universities), particularly given that student-athletes with stronger team-based social identities are highly susceptible to conform to peer influence (Graupensperger et al., 2018). Given that DGs are typically played in group settings, future research could examine how group dynamics and social identity might influence those who endorse conformity motives to play DG to drink more while playing. Finally, the inclusion of our covariates may explain some of these discrepant findings, as it is possible that the associations are different when the impact of demographic and general conformity drinking motives are accounted for in the analyses.

As hypothesized, the fourth major finding was that higher endorsement of competition motives to play DGs was related only to more frequent participation in DGs. This finding is consistent with prior research (Zamboanga, Audley, et al., 2019) including a study that accounted for general drinking motives in their analyses (Zamboanga et al., 2018). The competitive features of some DGs (e.g. beer pong) may appeal to students who want to compete against others which can result in increased participation in DGs, especially competitive types of games (see LaBrie et al., 2013). Prior research suggests that competition motives to play DG may be relatively benign, especially compared to other DG motives such as enhancement/thrills and sexual

pursuit (Zamboanga, Audley, et al., 2019), and our multivariate analysis demonstrated competition motives to be unrelated to consumption and quantity. One possible explanation for this is that students who are motivated to play DG for the competition may have more practice (e.g. 'play to get practice at the game') with certain types of games which could reduce their risk for increased DG consumption and related consequences if they perform well and/or frequently win while playing (and thus do not have to drink as part of losing). Such students may be motivated to play DGs because they value the 'game aspect' of DGs more than the 'drinking aspect' (Zamboanga, Ford, et al., 2024) which might protect them from the risk that DGs may otherwise pose for heavy and/or consequential drinking.

As far as novelty and social lubrication DG motives are concerned, they were not uniquely associated with any DG outcomes in the multivariate models. The latter finding is consistent with findings reported in other work that examined the associations of each MPDG subscale with DG behaviors and related negative consequences in multivariate analyses (e.g. Zamboanga, Audley, et al., 2019) which includes a study that accounted for general drinking motives in their model (Zamboanga et al., 2018). Thus far, the evidence suggests that social lubrication and novelty motives to play DGs are not uniquely predictive of DG behaviors and related negative consequences once demographic factors, other motives to play DGs, general drinking motives (Zamboanga et al., 2018), and/or general alcohol use are accounted for (George et al., 2018, 2019; Zamboanga, Audley, et al., 2019).

Finally, endorsement of boredom as a motive for playing DG was positively associated with frequency of playing DGs but negatively related to DG consumption. Although the latter finding differs from prior work with female student-athletes which showed a positive association with DG consumption (Zamboanga, Kearns, et al., 2019), most studies indicate that these motives are not significantly associated with DG frequency, consumption (George et al., 2018; Zamboanga et al., 2018; Zamboanga, Audley, et al., 2019), or DG consequences (George et al., 2018, 2019; Zamboanga, Audley, et al., 2019). Results from qualitative studies that were conducted during the COVID-19 pandemic suggest that students played DGs to alleviate boredom (Cerezo et al., 2021; Pakdaman & Clapp, 2021). Our findings extend this work by indicating that although students who endorse this particular motive tend to play DGs more frequently, perhaps as a way to alleviate feeling distressed from boredom by gaining entertainment from DGs, they might drink less when they do play.

Taken together, and much like the general drinking motives literature (Bresin & Mekawi, 2021; Cooper et al., 2016; Kuntsche et al., 2005), our multivariate findings suggest that higher endorsement of different motives for playing DGs are associated with unique patterns of DG behaviors and related negative consequences. Students who endorse enhancement/thrills and sexual pursuit as motives for playing DGs appear to be most at risk for multiple DG outcomes, even after accounting for their endorsement of general drinking motives. Practitioners working with undergraduates can take several measures to help reduce students' risk for DG related harms. These include but are not limited to (a) identification of students who endorse these motives for playing DG through alcohol screening, (b) exposure to programs that inform students of the potential risk for harms associated with this activity and that promote

the use of alcohol protective behavioral strategies in the context of a DG (see Stephens et al., 2022), (c) screening and evaluating the specific types of negative consequences that students have experienced from playing DG (Zamboanga, Napper, et al., 2019, 2023), and/or (d) using a motivational interviewing-informed approached (Miller & Rollnick, 2012) to explore and resolve ambivalence around motives for playing DG and to identify alternative strategies to obtain desired outcomes without the risk for negative consequences. Given the limited efficacy of general brief alcohol intervention programs on reducing university students' involvement in DGs (Croom et al., 2009, 2015; Fernandez et al., 2017; Zamboanga, Merrill, et al., 2019), it is important that practitioners evaluate the effectiveness of their clinical efforts and adjust their methods accordingly. Prevention and intervention efforts might be tailored to students based on their self-reported DG motives, particularly those that increase risk for more frequent participation, elevated drinking consumption during play, and/or negative consequences from playing. For example, among students who endorse conformity motives for playing DGs, drinking self-refusal skills training (Kenney et al., 2014) may help mitigate their risk for DG harms given the positive association between conformity motives and negative DG consequences found in the present study and prior work (Zamboanga, Audley, et al., 2019). Likewise, for students who endorse competition, boredom, or enhancement/thrills motives, universities can take measures to provide these students with fun, safe, and competitive activities that do not involve alcohol consumption (Zamboanga, Audley, et al., 2019; Zamboanga, Merrill, et al., 2019). With respect to sexual pursuit motives to play DGs, university-wide prevention and intervention efforts designed to combat alcohol misuse on campus could include reminders about sexual consent requirements and discussion of how DG participation could impact individuals' ability to provide consent. Such efforts may be particularly important with respect to DG participation that involve selecting other players to drink while playing (e.g. targeted games: LaBrie et al., 2013; Audley et al., 2018).

While the strengths of our study include the use of a large sample size, multisite data, and a strong data analytic approach, there are limitations worth noting. The cross-sectional study design precludes inferences of causal effects among the study variables. Participants may have also over- or under-reported their DG motives and behaviors given the self-report method of data collection. We also acknowledge the limitations of using the HDGM to assess negative DG consequence because each adverse consequence item has the same weighting (e.g. a hangover and blacking out) and as such, higher scores may not reflect more severe levels of problematic DG consequences and instead reflect experiencing a broader range of different types of consequences. Furthermore, because data from two studies with different measures of general alcohol use were combined for these analyses, approximations of equivalent responses for general alcohol use frequency were necessary, which may have reduced the accuracy of this variable. Finally, we did not examine motives for playing specific types of DGs. Future research could therefore examine whether different motives to play DGs and their link to DG behaviors and related negative consequences vary depending on DG type.

Despite the limitations of our study, our investigation contributes to the alcohol and drinking motives literature as this is the first large scale national study with U.S. students which showed that motives specific to DGs are uniquely associated with DG behaviors and related negative consequences over and above both general alcohol

use and motives to drink alcohol more broadly. Much work is needed that examines the mechanisms by which DG motives influence DG behaviors and risk for harms. Thus far, there is ample evidence that supports the importance of considering motives specific to DGs, particularly among university students in the U.S. and other countries (Zamboanga, Ford, et al., 2024), and their unique patterns of associations with DG outcomes. Prevention and intervention efforts tailored specifically to DG behaviors, consequences, and motives are needed. We hope our study will inspire researchers to examine DG motives and behaviors given the prevalence (see Zamboanga et al., 2014; Zamboanga, Van Hedger, et al., 2023) of this risky drinking practice among young adults and university students in many different countries.

Note

1. For frequency, revised responses were 1 (1 drinking day on DDQ, or either 'monthly or less' or '2 to 4 times/month' on AUDIT-C, item 1), 2 (2 or 3 drinking days on DDQ, or '2 to 3 times/week' on AUDIT-C, item 1), and 3 (4+ drinking days on DDQ typical week, or '4 or more times/week' as per AUDIT-C, item 1). For quantity, revised responses were 1 (1–2.9 drinks per drinking day on DDQ, or '1 or 2' on AUDIT-C, item 2), 2 (3–4.9 drinks per drinking day on DDQ, or '3 or 4' on AUDIT-C, item 2), 3 (5–6.9 drinks per drinking day on DDQ, or '5 or 6' on AUDIT-C, item 2), 4 (7–9.9 drinks per drinking day on DDQ, or '7 to 9' on AUDIT-C, item 2), and 5 (10+ drinks on either DDQ or AUDIT-C, item 2).

Acknowledgments

Data collection for this study was conducted by the Acculturation and Substance Use Research Team (Drs. Heidemarie Blumenthal; Miguel A. Cano; Alexandra Davis; Timothy Grigsby; Lindsay S. Ham; Su Yeong Kim; P. Priscilla Lui; Jessica L. Martin; Dennis McChargue; Alan Meca; Amie R. Newins; Jessica K. Perrotte; Brandy Pina-Watson) and the College Athlete Risky Drinking Study (CARDS: Drs. Jessica L. Martin, Alan Meca, Jeffrey J. Milroy, Janine V. Olthuis, David L. Wyrick, and Byron L. Zamboanga). Prof. Zamboanga is a Research Affiliate for the Institute to Promote Athlete Health and Wellness (IPAHW; Directed by Dr. David L. Wyrick) at the University of North Carolina-Greensboro. He received an honorarium from the IPAHW for developing the CARDS.

Funding

The author(s) reported there is no funding associated with the work featured in this article.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Study title/IRB approval numbers from each site

Psychological and Sociocultural Determinants of College Drinking Attitudes and Behaviors: Texas Tech University (IRB2017-1030); University at Albany (18-E-045-01); Old Dominion University (17-268); University of Arkansas (1712091620); University of North Texas (18-032); University of New Mexico (1164666-1); University of Central Florida (SBE-18-13927); Florida International University (IRB-18-0084); University of Texas-San Antonio (18-079E); University of Texas at Austin

(2017-12-0004); University of Nebraska (IRB#20180318082EP); Southern Methodist University (H18-006 LUIP).

ORCID

Byron L. Zamboanga http://orcid.org/0000-0001-9763-2407
Jessica K. Perrotte http://orcid.org/0000-0002-4091-7820

Data availability statement

The data used for the analyses in this study can be made available upon a reasonable request to the corresponding author and will require approval from the principal investigator's and site collaborator's Institutional Review Boards.

References

Audley, S., Grenier, K., Martin, J. L., & Ramos, J. (2018). Why me? An exploratory qualitative study of drinking gamers' reasons for selecting other players to drink. *Emerging Adulthood*, *6*(2), 79–90. https://doi.org/10.1177/2167696817703256

Barry, A. E., Chaney, B. H., Stellefson, M. L., & Dodd, V. (2015). Evaluating the psychometric properties of the AUDIT-C among college students. *Journal of Substance Use*, *20*(1), 1–5. https://doi.org/10.3109/14659891.2013.856479

Bresin, K., & Mekawi, Y. (2021). The "why" of drinking matters: A meta-analysis of the association between drinking motives and drinking outcomes. *Alcoholism, Clinical and Experimental Research*, *45*(1), 38–50. https://doi.org/10.1111/acer.14518

Borsari, B., Peterson, C., Zamboanga, B. L., Correia, C. J., Olthuis, J. V., Ham, L. S., & Grossbard, J. (2014). The Hazardous Drinking Games Measure (HDGM): A multi-site implementation. *The American Journal of Drug and Alcohol Abuse*, *40*(5), 395–402. https://doi.org/10.3109/00952990.2014.924522

Cerezo, A., Ramirez, A., O'Shaughnessy, T., Sanchez, A., Mattis, S., & Ross, A. (2021). Understanding the power of social media during COVID-19: Forming social norms for drinking among sexual minority gender expansive college women. *Journal of Homosexuality*, *68*(4), 560–576. https://doi.org/10.1080/00918369.2020.1868183

Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption. The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, *53*(2), 189–200. https://doi.org/10.1037/0022-006X.53.2.189

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, *6*(2), 117–128. https://doi.org/10.1037/1040-3590.6.2.117

Cooper, M. L., Kuntsche, E., Levitt, A., Barber, L. L., & Wolf, S. (2016). Motivational models of substance use: A review of theory and research on motives for using alcohol, marijuana, and tobacco. In *The Oxford handbook of substance use and substance use disorders* (Vol. 1, pp. 375–421). Oxford Library of Psychology. Oxford University Press.

Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology*, *97*(2), 168–180. https://doi.org/10.1037/0021-843X.97.2.168

Croom, K., Lewis, D., Marchell, T., Lesser, M. L., Reyna, V. F., Kubicki-Bedford, L., Feffer, M., & Staiano-Coico, L. (2009). Impact of an online alcohol education course on behavior and harm for incoming first-year college students: Short-term evaluation of a randomized trial. *Journal of American College Health: J of ACH*, *57*(4), 445–454. https://doi.org/10.3200/JACH.57.4.445-454

Croom, K., Staiano-Coico, L., Lesser, M. L., Lewis, D. K., Reyna, V. F., Marchell, T. C., Frank, J., & Ives, S. (2015). The glass is half full: Evidence for efficacy of alcohol-wise at one university but not the other. *Journal of Health Communication*, *20*(6), 627–638. https://doi.org/10.1080/10810730.2015.1012239

Fernandez, A. C., Yurasek, A. M., Merrill, J. E., Miller, M. B., Zamboanga, B. L., Carey, K. B., & Borsari, B. (2017). Do brief motivational interventions reduce drinking game frequency in mandated students? An analysis of data from two randomized controlled trials. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *31*(1), 36–45. https://doi.org/10.1037/adb0000239

George, A. M., Zamboanga, B. L., Martin, J. L., & Olthuis, J. V. (2018). examining the factor structure of the motives for playing drinking games measure among Australian university students. *Drug and Alcohol Review*, *37*(6), 782–788. https://doi.org/10.1111/dar.12830

George, A. M., Zamboanga, B. L., Millington, E., & Ham, L. S. (2019). Social anxiety and drinking game behaviors among Australian university students. *Addictive Behaviors*, *88*, 43–47. https://doi.org/10.1016/j.addbeh.2018.08.007

Graupensperger, S. A., Benson, A. J., & Evans, M. B. (2018). Everyone else is doing it: The association between social identity and susceptibility to peer influence in NCAA athletes. *Journal of Sport & Exercise Psychology*, *40*(3), 117–127. https://doi.org/10.1123/jsep.2017-0339

Grant, V. V., Stewart, S. H., O'Connor, R. M., Blackwell, E., & Conrod, P. J. (2007). Psychometric evaluation of the five-factor Modified Drinking Motives Questionnaire-Revised in undergraduates. *Addictive Behaviors*, *32*(11), 2611–2632. https://doi.org/10.1016/j.addbeh.2007.07.004

Grossbard, J., Geisner, I. M., Neighbors, C., Kilmer, J. R., & Larimer, M. E. (2007). Are drinking games sports? College athlete participation in drinking games and alcohol-related problems. *Journal of Studies on Alcohol and Drugs*, *68*(1), 97–105. PMID: 17149523. https://doi.org/10.15288/jsad.2007.68.97

Haas, A. L., Smith, S. K., Kagan, K., & Jacob, T. (2012). Pre-college pregaming: Practices, risk factors, and relationship to other indices of problematic drinking during the transition from high school to college. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *26*(4), 931–938. https://doi.org/10.1037/a0029765

Hoyer, D., & Correia, C. J. (2022a). Latent class analysis of drinking game consequences among college drinkers. *Addictive Behaviors*, *126*, 107203. https://doi.org/10.1016/j.addbeh.2021.107203

Hoyer, D., & Corriea, C. J. (2022b). General drinking motives and alcohol consumption across three contexts: Drinking games, tailgating, and in stadium. *Substance Use & Misuse*, *57*(8), 1171–1176. https://doi.org/10.1080/10826084.2022.2064504

Johnson, T. J., & Sheets, V. L. (2004). Measuring college students' motives for playing drinking games. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *18*(2), 91–99. https://doi.org/10.1037/0893-164X.18.2.91

Johnson, T. J., & Stahl, C. (2004). Sexual experiences associated with participation in drinking games. *The Journal of General Psychology*, *131*, 304–320.

Kenney, S. R., Napper, L. E., & LaBrie, J. W. (2014). Social anxiety and drinking refusal self-efficacy moderate the relationship between drinking game participation and alcohol-related consequences. *The American Journal of Drug and Alcohol Abuse*, *40*(5), 388–394. https://doi.org/10.3109/00952990.2014.920849

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, *25*(7), 841–861. https://doi.org/10.1016/j.cpr.2005.06.002

LaBrie, J. W., Ehret, P. J., & Hummer, J. F. (2013). Are they all the same? An exploratory, categorical analysis of drinking game types. *Addictive Behaviors*, *38*(5), 2133–2139. https://doi.org/10.1016/j.addbeh.2012.12.002

Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change*. Guilford Press.

Pakdaman, S., & Clapp, J. D. (2021). Zoom (virtual) happy hours and drinking during COVID-19 in the US: An exploratory qualitative study. *Health Behavior and Policy Review*, *8*(1), 3–12. https://doi.org/10.14485/HBPR.8.1.1

Stephens, C. A. M., Eamiello, M. L., Venditti, L., Piibe, A., Zamboanga, B. L., & Reid, A. E. (2022). Will others approve? Effects of an injunctive norms intervention on intentions to use protective behavioral strategies during drinking games. *Addiction Research & Theory*, *30*(2), 149–154. https://doi.org/10.1080/16066359.2021.1970748

Wegner, R., Roy, A. R. K., DaCova, A., & Gorman, K. R. (2019). Similarities and differences in general drinking game behavior, game-specific behavior, and peer influence factors across race/ethnicity. *The American Journal of Orthopsychiatry*, *89*(5), 616–623. https://doi.org/10.1037/ort0000393

Wyrick, D. L., Rulison, K. L., Fearnow-Kenney, M., Milroy, J. J., & Collins, L. M. (2014). Moving beyond the treatment package approach to developing behavioral interventions: Addressing questions that arose during an application of the Multiphase Optimization Strategy (MOST). *Translational Behavioral Medicine*, *4*(3), 252–259. https://doi.org/10.1007/s13142-013-0247-7

Zamboanga, B. L., Audley, S., Olthuis, J. V., Blumenthal, H., Tomaso, C. C., Bui, N., & Borsari, B. (2019). Validation of a seven-factor structure for the motives for playing drinking games measure. *Assessment*, *26*(4), 582–603. https://doi.org/10.1177/1073191117701191

Zamboanga, B. L., Ford, K., George, A. M., Bacon, M., Olthuis, J. V., Wickham, R. E., Van Hedger, K., Pilatti, A., & Dresler, E. (2024). Why do university students from Australia, New Zealand, and Argentina play drinking games? A mixed-methods cross-country study. *Emerging Adulthood, 12*(1), 29–40. https://doi.org/10.1177/21676968231209795

Zamboanga, B. L., Kearns, N. T., Olthuis, J. V., Blumenthal, H., & Cloutier, R. M. (2019). Test-retest reliability of the 7-factor motives for playing drinking games scale and its associations with drinking game behaviors among female college athletes. *Journal of Clinical Sport Psychology*, *13*(4), 580–592. https://doi.org/10.1123/jcsp.2018-0058

Zamboanga, B. L., Merrill, J. E., Newins, A. R., Olthuis, J. V., Blumenthal, H., Van Hedger, K., Ham, L. S., Kim, S. Y., Perrotte, J. K., Lui, P. P., McChargue, D., & Piña-Watson, B. (2024). Comparing drinking game motives, behaviors, and consequences among varsity athletes, recreational athletes, and non-student-athletes: A multisite university study. *Journal of Studies on Alcohol and Drugs*, *85*(3), 349–360. https://doi.org/10.15288/jsad.23-00128

Zamboanga, B. L., Merrill, J. E., Newins, A. R., Olthuis, J. V., Van Hedger, K., Blumenthal, H., Kim, S. Y., Grigsby, T. J., Perrotte, J. K., Lui, P. P., & McChargue, D. (2023b). A national study on pregaming motives, frequency, consumption, and negative alcohol consequences among university students in the United States. *Drug and Alcohol Dependence*, *250*, 110839. https://doi.org/10.1016/j.drugalcdep.2023.110839

Zamboanga, B. L., Merrill, J. E., Olthuis, J. V., Martin, J. L., Jarrell, J. T., Cannon, M., Meca, A., Milroy, J. J., & Wyrick, D. L. (2022). A national study on drinking game behaviors and related consequences among NCAA student-athletes: Racial/ethnic and sex differences. *Journal of Studies on Alcohol and Drugs*, *83*(1), 74–84. https://doi.org/10.15288/jsad.2022.83.74

Zamboanga, B. L., Merrill, J. E., Olthuis, J. V., Milroy, J. J., Sokolovsky, A. W., & Wyrick, D. L. (2019). Secondary effects of *myPlaybook* on college athletes' avoidance of drinking games or pregaming as a protective behavior strategy: A multisite randomized controlled study. *Social Science & Medicine (1982)*, *228*, 135–141. https://doi.org/10.1016/j.socscimed.2019.02.016

Zamboanga, B. L., Napper, L. E., George, A. M., & Olthuis, J. V. (2019). Examining drinking game harms as a function of gender and college student status. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *33*(8), 685–696. https://doi.org/10.1037/adb0000520

Zamboanga, B. L., Napper, L. E., George, A. M., Olthuis, J. V., Newins, A. R., Wegner, R., Ham, L. S., Martin, J. L., Blumenthal, H., & Meca, A. (2023). Utility of the brief young adult alcohol consequences questionnaire-drinking game (B-YAACQ-DG) scale in screening hazardous alcohol use among university student drinking gamers in the United States. *Addiction Research & Theory*, *32*(2), 129–137. https://doi.org/10.1080/16066359.2023.2227098

Zamboanga, B. L., Newins, A. R., & Cook, M. A. (2021). A meta-analysis of drinking game participation and alcohol-related outcomes. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *35*(3), 263–273. https://doi.org/10.1037/adb0000670

Zamboanga, B. L., Newins, A. R., Olthuis, J. V., Merrill, J. E., Blumenthal, H., Kim, S. Y., Grigsby, T. J., McClain, P., McChargue, D., & Cano, M. Á. (2024). A confirmatory factor analysis of a revised motives for playing drinking games (MPDG-33) scale among university students in the United States. *Alcohol and Alcoholism*, *59*(3), agae027. https://doi.org/10.1093/alcalc/agae027

Zamboanga, B. L., Olthuis, J. V., Kenney, S. R., Correia, C. J., Van Tyne, K., Ham, L. S., & Borsari, B. (2014). Not just fun and games: A review of college drinking games research from 2004 to 2013. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *28*(3), 682–695. https://doi.org/10.1037/a0036639

Zamboanga, B. L., Pearce, M. W., Kenney, S. R., Ham, L. S., Woods, O. E., & Borsari, B. (2013). Are "extreme consumption games" drinking games? Sometimes it's a matter of perspective. *The American Journal of Drug and Alcohol Abuse*, *39*(5), 275–279. https://doi.org/10.3109/00952990.2013.827202

Zamboanga, B. L., Pesigan, I. J., Tomaso, C. C., Schwartz, S. J., Ham, L. S., Bersamin, M., Kim, S. Y., Cano, M. A., Castillo, L. G., Forthun, L. F., Whitbourne, S. K., & Hurley, E. A. (2015). Frequency of drinking games participation and alcohol-related problems in a multiethnic sample of college students: Do gender and ethnicity matter? *Addictive Behaviors*, *41*, 112–116. https://doi.org/10.1016/j.addbeh.2014.10.002

Zamboanga, B. L., Van Hedger, K., & George, A. M. (2023). Prologue to the special issue on predrinking and drinking game behaviors among adolescents and young adults in the United States and across the globe: Definitions and overview of prevalence rates. *Addictive Behaviors*, *144*, 107731. https://doi.org/10.1016/j.addbeh.2023.107731

Zamboanga, B. L., Zhang, M., Olthuis, J. V., & Kim, S. Y. (2018). Understanding drinking game behaviors: A consideration of alcohol expectancies and motives to play and drink. *Cognitive Therapy and Research*, *42*(3), 302–314. https://doi.org/10.1007/s10608-017-9886-1