

## Binge-drinking and non-binge-drinking student-athletes: The Role of Proximal Norms, Negative Expectancies, and Selected Socio-Demographic Variables

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### Abstract:

Researchers have identified college student-athletes as a subgroup at risk for heavy drinking and associated consequences. Yet, few studies have examined multiple variables simultaneously to determine which stand out as most robust to explain drinking behavior among student-athletes. Student-athletes from 54 National Collegiate Athletic Association (NCAA) member institutions ( $N = 2,659$ ) completed an online questionnaire as part of an online alcohol education program. Logistic regression analyses demonstrated a unique profile based on descriptive and injunctive norms and alcohol outcome expectancies among binge-drinking student-athletes compared to non-binge-drinking athletes. Gender differences also emerged within the sample. Implications for campus mental health, university, and athletic personnel are discussed.

**Keywords:** binge drinking | expectancies | social norms | student-athletes

### Article:

The voluminous amount of research on collegiate drinking suggests that college students consume significantly more alcohol and experience greater consequences compared to other age groups or non-college peers (Bachman et al., [1]; Wechsler, Lee, Nelson, & Kuo, [48]). Survey results have highlighted that more than two-fifths (44%) of college students engaged in heavy, episodic drinking (i.e., "binge drinking") within the previous two weeks (Core Institute, [7]; Wechsler et al., [48]), and 23% (Core Institute, [7]; Wechsler et al., [48]) have reported *frequent* heavy, episodic drinking, or engaging in this behavior three or more times within the previous two weeks. Heavy, episodic drinking places college students (both drinking and non-drinking) at significant risk for alcohol-related problems ranging from missing class, to assault, to even death

(Hingson, Zha, & Weitzman, [16]). Despite the scope and quantity of research on this topic, the rates and levels of heavy drinking remain relatively high. The level of college drinking and associated problems has forced college leaders and administrators to take a focused, detailed look into this problem (National Institute on Alcohol Abuse and Alcoholism [NIAAA], [31]).

Although many surveys of college drinking have included campus-wide assessments, recent attention has been levied on subgroups of college students who are considered *at risk* for heavy drinking and developing alcohol-related problems (Milroy et al., [28]). It is believed that understanding the drinking patterns of tight-knit groups within the campus environment avoids the "one size fits all" approach that characterizes much of college drinking research. In addition, exploring subgroup drinking patterns allows campus leaders to better implement *tailored* prevention and intervention efforts.

One such subgroup that has garnered attention in the literature is student-athletes (Perkins & Craig, [36]), who have been identified as an at-risk group for heavy drinking and associated consequences, even when compared to non-student-athletes (Leichliter, Meilman, Presley, & Cashin, [21]; Lewis & Paladino, [23]; Milroy et al., [28]; Nelson & Wechsler, [33]; Thombs, [41]). Findings from several research studies lend support to student-athletes' at risk status. Turrisi, Mastroleo, Mallett, Larimer, and Kilmer ([43]), for example, found that student-athletes engage in more heavy, episodic drinking episodes and reported getting drunk more frequently than non-student-athletes, a similar finding to Wechsler, Davenport, Dowdall, Grossman, and Zanakos ([47]). Researchers have found that 49% of student-athletes engage in heavy, episodic drinking one or more times within a two-week period, which is considerably more often than general campus percentages (National Collegiate Athletic Association [NCAA], [29]). Given these relatively high rates of heavy drinking, student-athletes also experience significant negative alcohol-related consequences (Martens, Dams-O'Connor, & Beck, [25]), often at higher rates than non-athlete students (Nelson & Wechsler, [33]). For example, according to the NCAA ([29]), roughly 25% of student-athletes reported driving while intoxicated and 36% reporting fighting or arguing because of drinking at least once in the previous year.

Given the structure of student-athletes' schedules and the need to stay physically fit for their respective sport (Overman & Terry, [35]), it is somewhat surprising that harmful drinking is so prominent among this subgroup of students. Researchers have proposed numerous reasons for the higher rates of student-athlete drinking. One suggestion is that student-athletes have increased demands on their time (e.g., the need to balance classes with practice), have to keep many commitments, and face pressures to maintain high performance levels (Leichliter et al., [21]). Another proposed reason is that leaders within athletic teams (i.e., coaches and team leaders) have attitudes that promote or encourage heavy drinking. For example, Lewis ([23]) found that binge-drinking student-athletes perceived their coaches as having more lenient attitudes toward drinking behavior, and this was a significant distinguishing feature compared to non-binge-drinking athletes. Leichliter and colleagues ([21]) pointed out that team leaders have demonstrated heavier drinking compared to non-team leaders, debunking the myth that student-athlete leaders are always good role models. Other researchers have turned to theory to explain student-athlete drinking.

### **Social norms theory**

Another common explanation for heavy college drinking rests on the assumptions of social norms theory. Social norms theory (or social norms) was based on the observation that students consistently overestimated the amount of alcohol that their peers were consuming and the extent to which their friends were supportive of excessive drinking behavior (Berkowitz, [4]). At its essence, social norms theory explains how individuals converge to a false behavioral norm as a way to conform to the majority. Heavy college drinking results when students misperceive the actual amount of drinking on campus as being higher than it really is. For example, a student might normally drink three beers at a party, but perceives other students as drinking five beers. Social norms theory predicts that this student will increase his or her alcohol consumption to match the false norm so as not to be in the "out-group." In general, researchers have posited two types of social norms: descriptive and injunctive (Berkowitz, [4]; Borsari & Carey, [5]; McAlaney, Bewick, & Hughes, [26]).

Descriptive social norms are based on perceptions of others' intensity of drinking that emanate from observing peers consume alcohol in discrete drinking situations (Borsari & Carey, [5]). Descriptive norms are usually based on how much (quantity of drinking) or how often (frequency of drinking) students perceive others drinking on a "typical occasion." Descriptive social norms often serve as the basis for popular social norms campaigns designed to deter heavy drinking across campus (McAlaney et al., [26]).

Injunctive social norms relate to "perceived approval of drinking, represent[ing] perceived moral rules of the peer group" (Borsari & Carey, [5], p. 331). Berkowitz ([4]) noted that injunctive norms include attitudes about what is right based on moral beliefs. The primary contrast between descriptive norms and injunctive norms is that the former are based on actual drinking behaviors and the latter are based on ideas, attitudes, and moral convictions about drinking behavior.

Researchers have largely focused on descriptive norms and their relation to collegiate drinking; however, there is some evidence suggesting that injunctive norms may play an important role in drinking behavior as well (Berkowitz, [4]). For example, examining data from the 2001 Harvard School of Public Health College Alcohol Study (CAS), a national surveillance project of full-time undergraduates ( $N = 10,008$ ), Ward and Gryczynski ([46]) reported that greater perceived peer acceptance of risky alcohol behaviors resulted in higher rates of heavy episodic drinking, even after controlling for individual characteristics, such as gender.

As an explanatory mechanism, social norms theory has been shown to be a robust predictor of college drinking. Researchers have consistently yielded results indicating that misperceptions of drinking on campus explain more of the variance in college student drinking behavior than any other variable (Korcuska & Thombs, [20]; Neighbors, Lee, Lewis, Fossos, & Larimer, [32]; Perkins & Wechsler, [37]; Thombs, Wolcott, & Farkash, [42]).

### Social norms and student-athletes

Researchers have explored social norms theory and its application to student-athlete drinking. Lewis and Paladino ([23]) found that student-athlete descriptive norms made a significant contribution to both quantity and frequency of alcohol consumption. The researchers

also found that descriptive norms followed a gender-specific pattern, especially with teammates. That is, student-athlete drinking seemed to be most influenced by perceptions of their same-sex teammates' drinking. Similarly, Lewis ([23]) found that proximal norms (i.e., closest friend) were a greater influence on student-athlete drinking than distal (i.e., typical student) norms. In a study that looked at the predictive power of both descriptive and injunctive norms among student-athletes, Hummer, LaBrie, and Lac ([18]) found that both normative types were strong predictors of drinking, with descriptive norms showing the greatest influence compared to all other variables (e.g., sociodemographic, drinking motives). Similar findings in a multisite study were reported by Perkins and Craig ([36]), who found that among student-athletes, descriptive norms related to drinking frequency were the strongest predictor of alcohol consumption for self, compared to several demographic, school, and individual variables.

In a study specific to injunctive norms and student-athletes, Seitz, Wyrick, Rulison, Strack, and Fearnow-Kenney ([39]) assessed perceptions about teammate and coach approval of alcohol and their relation to drinking among students in their first year of athletic ability. Teammates were perceived as more approving of alcohol than coaches, although perceived approval of drinking from both teammates and coaches were each uniquely associated with alcohol use for self. Given the higher levels of problematic drinking among student-athletes, the associated negative consequences, and the social value that athletics play on campuses of all sizes, it is important to further investigate the nuances of social norms theory and how it applies to this subgroup of college students (Perkins & Craig, [36]). For example, misperceptions of drinking norms may manifest differently among general college students compared to student-athletes. In addition, student-athletes usually have multiple peer (and other) networks that may exert influence on their drinking (teammates, friends, coaches). More research is needed across multiple college campuses to determine the generalizability of misperceptions among student-athletes on these campuses and to further clarify the relative influence of descriptive versus injunctive norms (Perkins & Craig, [36]). Teasing out these intricacies can further refine prevention and treatment efforts to help student-athletes engage in responsible behavior.

### Alcohol outcome expectancies

College drinking behavior also has been examined through expectancy theory. Individuals often consume alcohol because they think it will have a certain effect or outcome. Thus, alcohol outcome expectancies refer to beliefs people hold related to the biochemical effects of consuming ethyl alcohol (Brown, Goldman, Inn, & Anderson, [6]). Alcohol outcome expectancies are one of the most studied variables related to college drinking (Baer, [2]; Ham & Hope, [12]), and have been linked to both alcohol use intensity and alcohol-related negative consequences among college students (Ham, Stewart, Norton, & Hope, [13]; Neighbors et al., [32]; Valdivia & Stewart, [44]).

Alcohol outcome expectancies, resting largely on operant conditioning, can be either positive or negative. Positive alcohol outcome expectancies refer to the anticipated positive effects of drinking; as such, those who believe that drinking will lead to positive experiences or consequences are more likely to consume alcohol compared to those who do not hold these beliefs (Brown et al., [6]). College students who hold strong positive outcome expectancies

related to drinking have been shown to engage in risky drinking practices and consequences (Herschl, McChargue, MacKillop, Stoltenberg, & Highland, [14]).

Negative alcohol outcome expectancies refer to negative consequences one anticipates experiencing after consuming alcohol. As such, expectancy theory suggests that those with negative expectancies would either avoid or consume less alcohol compared to those with positive expectancies. However, the literature is somewhat mixed as to the exact role that negative expectancies play in alcohol consumption and alcohol-related negative consequences (Fromme, Stroot, & Kaplan, [9]; Neighbors et al., [32]). One issue appears to be how negative expectancies are measured; Neighbors and colleagues ([32]) noted that when negative expectancies are used as a global measure, instead of as individual expectancies, they are predictive of alcohol use intensity and alcohol-related negative consequences among collegiate drinkers.

Researchers are just beginning to examine the role of alcohol outcome expectancies in drinking behavior among high-risk groups such as student-athletes. In a longitudinal study among female college athletes, Zamboanga, Horton, and Leitkowski, and Wang ([49]) found that positive expectancies increased the likelihood of heavy drinking at baseline and one-year follow-up. In a Structural Equation Modeling (SEM) model, Olthuis, Zamboanga, Martens, and Ham ([34]) found that positive expectancies related significantly to hazardous drinking, although both positive and negative expectancies did not appear to mediate the relationship between injunctive norms and drinking. Against the backdrop of social norms theory, alcohol outcome expectancies may provide additional explanatory mechanisms into heavy drinking among student-athletes; it seems reasonable to explore if these typical predictors of general college student drinking also apply to student-athletes.

To better address the issue of collegiate drinking and related consequences among student-athletes, several calls in the literature have recommended more theory-driven research, additional use of multivariate methods, and data gathered from geographically diverse Division II and III schools (Perkins & Craig, [36]). In addition, few studies have examined multiple variables simultaneously to determine which stand out as most robust to explain drinking behavior among student-athletes. As such, in the current study we incorporated two theoretical models and a multivariate assessment of the data, and examined a sample of student-athletes representing all three NCAA divisions.

The purpose of this study was twofold. First, through a multivariate assessment, we sought to determine if a risk factor profile, based on predictor variables, emerged for student-athletes, based on descriptive and injunctive norms (social norms theory), alcohol outcome expectancies (expectancy theory), and selected sociodemographics. Second, we sought to determine if this profile differed across male and female student-athletes. The research questions were (a) What variables (norms, expectancies, and demographics) increase the odds of a student-athlete being a binge drinker? and (b) Do these variables differ between male and female student-athletes? We hypothesized that an identifiable risk factor profile would emerge based on both descriptive and injunctive norms and alcohol outcome expectancies, and that risk factors would differ across male and female student-athletes.

## Method

### Participants and procedures

Ages of participants (from sample of 2,659; see results section) ranged from 18 to 25 years and endorsed seven different races; however, most participants indicated their age to be 18 or 19 ( $M = 18.56$ ,  $SD = 2.36$ ) and their race to be White or Caucasian (72%). This sample was equally represented by both male (51%) and female (49%) student-athletes.

All NCAA divisions were represented in similar proportions; Division I (30.1%); Division II (30.0%); and Division III (22.9%). Seventeen percent of respondents chose not to endorse a specific NCAA division. The majority of participants were in their first year of eligibility (85%), both in-season (56.4%) and out-of-season (43.6%), and all NCAA-sponsored sports were represented.

During the spring semester of 2012, 54 NCAA member institutions agreed to participate in a federally funded study of an alcohol and other drug (AOD) prevention program designed for NCAA student-athletes. Any new student-athletes (i.e., freshman or transfer) at each institution were eligible to participate in the study ( $N = 5,935$ ). Via electronic invitation, participants were assigned a unique username and password that would provide them access to the online AOD education program and any associated surveys (pretest, posttest, and follow-up). As per institutional review board (IRB) approval and once logged in, participants were provided a detailed description of the study, were informed that participation was voluntary, and given a choice to bypass data collection procedures. Those who provided consent to participate in data collection procedures were then directed to a Web-based pretest survey. Those who refused to provide consent, or were 17 years of age or younger, were automatically directed to the online AOD education program. Upon accessing a survey, a unique code was assigned to each participant to ensure anonymity of responses. Following the pretest survey, participants were provided access to the online AOD education program. Whereas the larger study included a pretest survey, and immediate posttest survey, as well as a 30-day follow-up survey, findings reported in this paper come from a cross-section of items generated via the pretest survey. A total of 3,932 (66.3% of those solicited) student-athletes completed the pretest survey (of this total, however, only 2,659 surveys were used in data analyses; see results section).

### Instrumentation

The pretest survey queried participants about sociodemographic information and a range of substance abuse behaviors and attitudes that were entered for data analyses. Quantity (e.g., "On average, how many drinks of alcohol do you consume per sitting?") and frequency (e.g., "During the past 30 days, on how many days did you get drunk?") of alcohol use were adapted using recommendations from the National Institute on Alcohol Abuse and Alcoholism (NIAAA; n.d.). Binge drinking status was assessed by the item, "During the past two weeks, how many times have you had five or more drinks at a sitting (males) or four or more drinks at a sitting (females)?" In order to increase the relevancy of items and adjust them for college student-athletes, descriptive (e.g., "What percentage of your close friends/teammates do you think has consumed five or more drinks in one sitting during the past 30 days?") and injunctive (e.g.,

"How would your close friends/teammates feel about you getting drunk frequently?") norms items were adapted from a previously validated instrument (Drinking Norms Rating Form; Baer, Stacy, & Larimer, [3]) and have been utilized in the popular Brief Alcohol Screening and Intervention for College Students (BASICS) program (Dimeff, Baer, Kivlahan, & Marlatt, [8]). Finally, positive and negative alcohol outcome expectancy variables were measured using items from the Brief Comprehensive Effects of Alcohol Questionnaire (BCEOA; Ham et al., [13]), which demonstrated acceptable validity and reliability compared to the original Comprehensive Effects of Alcohol Questionnaire (CEOA; Fromme et al., [9]; Fromme & D'Amico, [10]).

Using these previously validated questionnaires as the basis for our survey, six composite variables were formed: positive alcohol outcome expectancies (four items), negative alcohol outcome expectancies (five items), total consequences of drinking (17 items), and injunctive norms (two items across three reference groups: teammates, coaches, and closest friends; see Table 1 for example items). Descriptive norms were assessed with a single item across two reference groups ("What percentage of your close friends/teammates do you think has used each alcohol during the past 30 days?"). Although the pretest survey used during data collection was adapted from previously validated instruments, acceptable internal consistency scores (Cronbach's alpha) were found for each composite variable in the current sample. The composite variables, sample items, and alpha values are listed in Table 1.

**Table 1.** Calculated composite variables.

Composite Variable (No. of Items)	Example Item	$\alpha$
Positive Alcohol Outcome Expectancies (4)	How likely or unlikely is it that you would personally bond with your teammates better if you were to drink 5 or more whole drinks per sitting of an alcoholic beverage? (Scale = Very unlikely; Somewhat unlikely; Somewhat likely; Very likely)	.85
Descriptive Norms (single item across 2 reference groups: closest friends and teammates)	What percentage of your close friends do you think have consumed 5 or more alcoholic drinks in one sitting? Note: Same question used with teammates as the reference group.	N/A, single item
Injunctive Norms (2 items across 3 reference groups: teammates, coaches, closest friends) <sup>a</sup>	How would your teammates feel about you having one or two drinks nearly every day? (Scale = Strongly disapprove; Somewhat disapprove; Neither approve or disapprove; Somewhat approve; Strongly approve) How would your teammates feel about you getting drunk frequently? (Scale = same as above) Note: Same question and scale used for composite injunctive norm related to coaches and closest friends.	.80
Negative Alcohol Outcome Expectancies (5)	How likely or unlikely is it that you would personally become a victim of violence if you were to drink 5 or more whole drinks per sitting of an alcoholic beverage? (Scale = Very unlikely; Somewhat unlikely; Somewhat likely; Very likely)	.83
Total Consequences of Drinking (17)	In the past 30 days, how many times have you experienced the following (e.g., had a hangover, drove a car while intoxicated, missed a class, etc.) due to your drinking? (Scale = None; Once or twice; 3 to 5 times; 6 or more times)	.97

<sup>a</sup> The Cronbach's alphas for the other two references groups were .742 (coaches) and .80 (closest friends).

Milroy and colleagues ([28]) examined the reasons for alcohol use versus non-use among a diverse sample of student-athletes. The researchers found significant differences for use and non-use among student-athletes across NCAA, gender, and ethnicity. In the current study, we sought to sample from all three NCAA divisions, as well as examine gender and ethnicity as key variables in our model. Several other variables were assessed by our survey and used in data

analyses as additional predictor variables. These additional variables have also been shown to contribute significantly to variance in collegiate drinking in previous studies and include intentions to drink in the next 30 days, feelings about teammates drinking, GPA, and season status (i.e., in-season or out-of-season; Lewis & Paladino, [23]; Rhodes & Clinkinbeard, [38]; Syverson, [40]; Wagoner et al., [45]).

## Data analysis plan

The data were examined using logistic regression analyses, predicting binge-drinking status (non-binge versus binge). Logistic regression is one of the most commonly used statistical techniques in the social sciences (Hilbe, [15]). Logistic regression was observed as the most appropriate analysis given our data structure of continuous predictor variables and a binary or discrete dependent variable. In addition, logistic regression assists in determining the risk or odds of an event happening given a predictor variable, consistent with our desire to determine a "risk-factor profile," comprised of a set of significant predictor variables, related to the odds of being a binge drinker among student-athletes. All data and results were analyzed using the SPSS 20.0.

## Results

### Descriptive statistics related to drinking

Participants in the study engaged in significant drinking behavior, although somewhat less in intensity than what has been reported for general college students. Among those who reported having a whole drink in their lifetime (70% of the sample), 30.1% reported drinking to get drunk at least two or more times during the past 30 days from the survey. Just under 35% (34.1%) reported engaging in at least one binge-drinking episode within the past two weeks. Among female student-athletes, 28.3% reported engaging in binge drinking, whereas 39.2% of male student-athletes reported engaging in at least one binge-drinking episode. Among 18- to 20-year-olds, 30% reported binge drinking at least two times within the past two weeks. These statistics suggest that, among this sample, the binge-drinking rate was somewhat lower than the national average among college students in general (ranging from 44% [Core Institute, [7]] to 37% [Johnston, O'Malley, Bachman, & Schulenberg, [19]]), and among student-athletes as reported by the NCAA ([29]; 49%). However, the percentages are in similar ranges, and support the general notion that as with non-student-athletes, heavy drinking among student-athletes remains a concern for campus administrators and team personnel.

Out of a total sample of 3,932 participants, only those who had engaged in drinking in their lifetime (i.e., non-abstainers) were included in the data analyses.<sup>1</sup> This resulted in 2,635 usable cases for data analysis purposes. The predictor set for the logistic regression analysis had a significant effect on binge drinking (LR chi-square = 1,183,  $p < .000$ ). The Nagelkerke  $R^2$

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<sup>1</sup> Research has shown that students who have never consumed alcohol tend to endorse several reasons for not drinking, including lifestyle choice, personal values, religious beliefs, not endorsing the image as a drinker, and negative expectancies about alcohol's behavioral effects (Huang, DeJong, Schneider, & Towvim, [17]). As such, the impact of social norms may not have as much sway with those who are firmly committed to an abstinence lifestyle. However, among those who do consume alcohol, perceptions of peer drinking have been found to be a well-established predictor of drinking behavior.



statistic indicated that an estimated 55.7% of the variance in binge-drinking status (non-binge or binge) could be explained by the predictor set (see Table 2). The variable that best distinguished student-athletes who engaged in binge drinking from those who had not was intentions to drink in the next 30 days (OR = 2.26; CI = 2.02–2.52). The next strongest predictor variables that had significant, independent associations with binge-drinking status were season status (in versus out of season of competition; OR = 0.64; CI = 0.50–0.81), gender (OR = .731; CI = 0.57–.931), and perceptions of teammate binge drinking (OR = 1.14; CI = 1.08–1.20). Other variables that had significant associations with binge-drinking status were current GPA, perceptions of closest friend binge drinking, negative alcohol expectancies, and total consequences of drinking. All three injunctive norms (range = 2–10; coach:  $M = 2.46$ ,  $SD = 1.07$ ,  $p = .372$ ; teammate:  $M = 3.75$ ,  $SD = 1.77$ ,  $p = .213$ ; closest friend:  $M = 4.12$ ,  $SD = 1.91$ ,  $p = .363$ ), ethnicity (range = 1–2;  $M = 1.78$ ,  $SD = .411$ ,  $p = .259$ ), age (range = 1–9;  $M = 2.91$ ,  $SD = 1.09$ ,  $p = .485$ ), how one felt about teammates drinking (range = 1–5;  $M = 1.91$ ,  $SD = .943$ ,  $p = .608$ ), and positive outcome expectancies (range = 4–16;  $M = 10.1$ ,  $SD = 3.05$ ,  $p = .082$ ) did not contribute appreciably to the model.

**Table 2.** Logistic regression analysis of two drinking groups in a sample of collegiate student-athletes (N = 2,635).

Significant Variables in Model (range)	Non-binge	Binge	OR (95% CI)	Wald	Sig.
	Drinker (N = 1,735)	Drinker (N = 900)			
	Mean (SD)	Mean (SD)			
Intention to drink in 30 days (range = 1–5)	2.4 (1.18)	4.06 (1.01)	2.26 (2.02– 2.52)	200.09	.000
Season status (1 = in season, 2 = out of season)	N/A	N/A	0.64 (0.50– 0.81)	14.13	.000
Gender (1 = male, 2 = female)	N/A	N/A	.731 (0.57–.931)	6.45	.011
Teammate–Binge <sup>a</sup> (range = 1–10)	3.41 (2.82)	6.26 (2.89)	1.14 (1.08– 1.20)	26.17	.000
Current GPA (range = 0–6)	3.10 (.612)	3.02 (.593)	.815 (0.67–0.99)	5.00	.026
Closest friend– Binge <sup>b</sup> (range = 1–10)	4.02 (2.97)	6.95 (2.72)	1.13 (1.07–1.19)	20.74	.000
Alcohol expectancies–Negative (range = 5–20)	14.1 (4.00)	13.27 (3.46)	0.94 (.911–.967)	15.61	.000
Total consequences of drinking (range = 17–85)	26.43 (9.34)	35.42 (6.00)	1.10 (1.07– 1.11)	94.75	.000

<sup>a</sup> Perceptions of teammate binge drinking; <sup>b</sup> perceptions of closest friend binge drinking.

### Male student-athletes

Out of a total sample of 2,020 male participants, only those who had engaged in drinking in their lifetime (i.e., non-abstainers) were included in the data analyses. This resulted in 1,423 usable cases for data analysis purposes. The predictor set for the logistic regression analysis had a significant effect on binge drinking (LR chi-square = 663.54,  $p < .000$ ). The Nagelkerke  $R^2$  statistic indicated that an estimated 56.7% of the variance in binge-drinking status (non-binge or binge) could be explained by the predictor set (see Table 3). The variable that best distinguished student-athletes who engaged in binge drinking from those who had not was intentions to drink in the next 30 days (OR = 2.31; CI = 2.02–2.67). The next strongest predictor variables that had significant, independent associations with binge-drinking status were season status (in versus out of season of competition; OR = .573; CI = .418–.787), perceptions of closest friend binge drinking (OR = 1.24; CI = 1.17–1.13), negative alcohol outcome expectancies (OR = .934; CI = .893–.976); and total consequences of drinking (OR = 1.09; CI = 1.07–1.12). Injunctive norms (range = 2–10; coach:  $M = 2.61$ ,  $SD = 1.21$ ,  $p = .720$ ; teammate:  $M = 4.05$ ,  $SD = 1.88$ ,  $p = .748$ ; closest friend:  $M = 4.35$ ,  $SD = 1.97$ ,  $p = .833$ ), ethnicity (range = 1–2;  $M = 1.75$ ,  $SD = .428$ ,  $p = .244$ ), age (range = 1–9;  $M = 3.04$ ,  $SD = 1.17$ ,  $p = .789$ ), GPA (range = 0–4;  $M = 2.98$ ,  $SD = .611$ ,  $p = .107$ ),

how one felt about teammates drinking (range = 1–5;  $M = 1.96$ ,  $SD = .967$ ,  $p = .366$ ), and positive outcome expectancies (range = 4–16;  $M = 10.25$ ,  $SD = 3.13$ ,  $p = .658$ ) did not contribute appreciably to the model for male student-athletes.

**Table 3.** Logistic regression analysis of two drinking groups in a sample of male ( $N = 1,423$ ) and female collegiate student-athletes ( $N = 1,236$ ).

Significant Variables in Model (range)	Non-binge	Binge	OR (95% CI)	Wald	Sig.
	Drinker (N = 865)	Drinker (N = 558)			
	Mean (SD)	Mean (SD)			
Male student-athletes					
Intention to drink in 30 days (range = 1–5)	2.36 (1.21)	4.06 (1.06)	2.31 (2.02–2.67)	138.02	.000
Season status (1 = in season, 2 = out of season)	1.44 (.497)	1.54 (.498)	.573 (.418–.787)	11.88	.001
Closest friend– Binge <sup>aa</sup> (range = 1–10)	4.15 (3.00)	6.95 (2.78)	1.24 (1.17–1.30)	61.22	.000
Alcohol expectancies– Negative (range = 5–20)	13.35 (4.03)	12.72 (3.45)	.934 (.893–.976)	9.25	.002
Total consequences of drinking (range = 17–85)	26.93 (9.54)	35.59 (6.26)	1.09 (1.07–1.12)	60.28	.000
Female student-athletes					
Intention to drink in 30 days (range = 1–5)	2.47 (1.15)	4.05 (.916)	2.32 (1.92–2.79)	78.90	.000
Closest friend– Binge <sup>a</sup> (range = 1–10)	3.89 (2.93)	6.95 (2.61)	1.28 (1.20–1.36)	58.26	.000
Alcohol expectancies–Positive (range = 5–20)	9.38 (2.91)	11.14 (2.64)	1.90 (1.01–1.17)	5.88	.015
Total consequences of drinking (range = 17–85)	25.94 (9.13)	35.16 (5.51)	1.093 (1.07–1.13)	36.68	.000
Alcohol expectancies– Negative(range = 5–20)	14.98 (3.78)	14.15 (3.28)	.938 (.890–.988)	5.88	.015

<sup>a</sup> Perception of closest friend binge drinking.

### Female student-athletes

Out of a total sample of 1,906 female participants, only those who had engaged in drinking in their lifetime (i.e., non-abstainers) were included in the data analyses. This resulted in 1,236 usable cases for data analysis purposes. The predictor set for the logistic regression analysis had a significant effect on binge drinking (LR chi-square = 490.08,  $p < .000$ ). The Nagelkerke  $R^2$  statistic indicated that an estimated 52.9% of the variance in binge-drinking status (non-binge or binge) could be explained by the predictor set (see Table 3). The variable that best distinguished student-athletes who engaged in binge drinking from those who had not was intentions to drink in the next 30 days (OR = 2.32; CI = 1.92–2.79). The next strongest predictor variables that had significant, independent associations with binge-drinking status were perceptions of closest friend binge drinking (OR = 1.28; CI = 1.20–1.36), positive alcohol outcome expectancies (OR = 1.90; CI = 1.01–1.17), total consequences of drinking (OR = 1.09; CI = 1.06–1.13), and negative alcohol outcome expectancies (OR = .938; CI = .890–.988). Injunctive norms (range = 2–10; coach:  $M = 2.29$ ,  $SD = .852$ ,  $p = .440$ ; team:  $M = 3.4$ ,  $SD = 1.57$ ,  $p = .108$ ; closest friend:  $M = 3.85$ ,  $SD = 1.81$ ,  $p = .202$ ), ethnicity (range = 1–2;  $M = 1.81$ ,  $SD = .385$ ,  $p = .411$ ), age (range = 1–9;  $M = 2.76$ ,  $SD = .963$ ,  $p = .285$ ), how one felt about teammates drinking (range = 1–5;  $M = 1.86$ ,  $SD = .915$ ,  $p = .806$ ), GPA (range = 0–4;  $M = 3.18$ ,  $SD = .583$ ,  $p = .082$ ), and season status (range = 1–2;  $M = 1.44$ ,  $SD = .496$ ,  $p = .162$ ) did not contribute appreciably to the model for female student-athletes.

### Discussion

The first hypothesis, that an identifiable risk factor profile would emerge based on both descriptive and injunctive norms and alcohol outcome expectancies, was partially supported in the current study. Perceptions of teammate and closest friend binge drinking and negative

alcohol outcome expectancies made significant contributions to the logistic regression model in the overall sample. However, several sociodemographic and non-theoretical variables emerged to provide a more complete profile of student-athlete binge drinkers. As such, having stronger intentions to drink in the next 30 days, being in the season of competition, being male, and perceiving one's closest friends and teammates as frequently engaging in binge drinking increased the odds of being a binge drinker. In addition, binge-drinking student-athletes tended to have lower GPAs, hold fewer negative alcohol outcome expectancies, and experience greater consequences of drinking alcohol compared to non-binge-drinking athletes.

The second hypothesis, that risk factor profiles would differ across male and female student-athletes, was supported, but differences were modest. Among both male and female student-athletes, strong intentions to drink in the next 30 days, perceiving their closest friends as drinking heavily, holding fewer negative alcohol outcome expectancies, and experiencing more alcohol-related consequences increased the odds of being a binge drinker. However, season status (in season of competition versus out) did not have any impact on drinker status among female student-athletes. In addition, holding positive alcohol outcome expectancies led to a 90% increase in the odds of being a binge drinker. Taken together, these findings suggest that binge drinking may hold less significance for females during the season of competition compared to males. Compared to males, female student-athletes who binge drink appear to do so because of the perceived positive benefit from drinking.

### Social norms

Our results have somewhat mixed support from existing literature related to social norms. For example, Hummer and colleagues ([18]) found that both injunctive and descriptive norms were significant predictors of alcohol consumption among student-athletes, whereas our findings support the significance of descriptive norms, but not injunctive norms, as a predictor of binge drinking. Other studies, however, clearly support our findings that descriptive norms are the most salient normative predictor of binge drinking among student-athletes (Lewis & Paladino, [23]; Perkins & Craig, [36]). In addition, our findings suggest that proximal norms, or perceptions of teammate and closest-friend drinking behaviors, produce strong positive associations with student-athlete binge drinking, a finding consistent with both student-athlete and non-student-athlete drinking research (Lewis & Paladino, [23]; Halim, Hasking, & Allen, [11]).

It is noteworthy that injunctive norms did not play a prominent role in this study. This suggests that, at least among our sample of student-athletes, perceived moral rules about drinking did not encourage or deter greater drinking for self. For student-athletes in our sample, it did not appear to matter whether he or she perceived drinking behavior as right or wrong, as a more potent influence was simply observing drinking among peers and drawing conclusions (perceptions) about what was normative behavior. This finding is inconsistent with the findings of Ward and Gryczynski ([46]), who demonstrated that injunctive norms were related to heavy drinking among undergraduates in general. Additional research may be able to clarify the mechanisms behind how specific social norms (injunctive versus descriptive) operate within the student-athlete culture. In the meantime, prevention and treatment specialists may wish to focus on more descriptive norms as part of their social norm campaign efforts to deter heavy, problematic drinking.

## Outcome expectancies

Negative alcohol outcome expectancies decreased the odds of being a binge drinker in the current sample. This intuitively makes sense, given that the more one expects negative consequences from drinking, the less likely one will engage in this behavior. This finding is supported by Neighbors and colleagues ([32]), who found that among undergraduates binge drinkers tend to hold fewer negative alcohol outcome expectancies. Interestingly, however, our findings conflict with studies examining negative expectancies within the student-athlete population. For example, Zamboanga and colleagues ([49]) found that positive outcome expectancies increased the odds of hazardous alcohol use, but that negative outcome expectancies have no impact on drinking among student-athletes. More research is needed to clarify the role that negative outcome expectancies have on student-athlete drinking.

Positive outcome expectancies were significantly related to drinking status in the current study, but only for female student-athletes, a finding consistent with Zamboanga and colleagues ([49]). Positive expectations related to drinking may be more salient for college women in general, given that they may have differing expectations of behavior than college men (Likis-Werle, [24]). For example, Likis-Werle, in an investigation examining drinking motivations and behaviors among undergraduate college women, found that female undergraduates see drinking as a social experience, part of college, and that they were positively reinforced for behaving "badly." High-risk female drinkers believed drinking was just what one does and an avenue to meet people. They also had a shared culture of "bad" experiences and believed that telling stories of drinking endeavors built camaraderie and friendship (Likis-Werle, [24]). It may be that female student-athletes hold similar positive expectancies toward drinking. Indeed, a closer examination of the individual expectancy items shows that a vast majority of female student-athletes in the current sample (71%) endorsed expecting to "have more fun" from drinking.

## Implications for treatment

Our results have potential implications for mental health professionals and other stakeholders who work closely with student-athletes throughout the academic year. Addictions counselors, student affairs leaders, coaches, athletic trainers, and other campus personnel first need to assess if student-athletes are an at-risk group for heavy alcohol consumption and associated consequences on their respective campuses. Prevention and treatment initiatives can occur among student-athletes as an entire group, at the team level, or individual level. As with college students in general, social norms appear to be a robust explanatory mechanism for student-athlete drinking among the current sample, especially descriptive-based norms. Broad-based, educational initiatives that address the social norm problem can provide student-athletes with accurate normative information, which could then translate to changes in behavior. This research further emphasizes the influence that friends and close peers have on drinking, as proximal norms (i.e., teammates and closest friends) appear to show the greatest impact.

The finding that proximal descriptive norms has the greatest influence in binge-drinking status is not surprising given the consistency of this finding with college students in general. Nonetheless, the finding may have implications for prevention and treatment efforts, many of which could be

spearheaded by mental health counselors and other campus leaders. Social norm campaigns targeted at student-athletes would appear to be most effective if they do avoid focusing on reference groups that do not "connect" with the student-athlete. For example, providing corrective normative information by noting "typical student" drinking behaviors would probably be ignored by most student-athletes. In contrast, corrective normative messages that specifically target student-athletes' drinking and associated behaviors may have greater success at deterring heavy drinking. Normative information focused on teammate (or closest friend) drinking also could be included in programming for student-athletes, such as counseling sessions or activities that are led by athletic personnel such as classes, workshops, or general information dissemination strategies. According to social norms theory, the more one accurately estimates the actual drinking norms on campus, the less he or she will feel a need to fulfill a false norm by drinking heavily.

Heavy-drinking student-athletes in the current sample did not appear to hold strong negative expectancies related to drinking. Theoretically, negative alcohol outcome expectancies are thought to deter drinking among college students, although the literature is somewhat mixed on the exact role that these expectancies play in drinking (Neighbors et al., [32]). Nonetheless, our results tentatively support strategies for changing or modifying outcome expectancies among student-athletes. For example, explorations of the pros and cons of drinking, developing discrepancies between drinking behavior and goals and values, and other motivational interviewing-based interventions may be effective methods to help student-athletes accurately assess the costs of their heavy-drinking behavior (Miller & Rollnick, [27]). Among female student-athletes, our results suggest that counseling interventions addressing both positive and negative alcohol expectancies may be worthwhile. In these cases, interventionists could challenge positive expectancies (which are often inaccurate), and raise consciousness of the negative effects that heavy drinking is having on these student-athletes.

#### Limitations and additional research

Similar to many other studies, the research described in this article was not without its own limitations. Inherent to behavioral research, when sensitive data are solicited there is a risk that socially desirable answers are collected; especially if the participant believes that someone else may view their answers. However, this limitation was minimized by clearly informing potential participants, prior to entering each survey, that their anonymity would be protected at all costs. In addition, all studies approved by an IRB are prohibited from mandating human subjects to participate in data collection procedures. Consequently, those who participated in this study willingly did so on their own accord; therefore, eliminating the chance for selection bias was very difficult.

Despite these limitations, the present study makes an important contribution to the literature on heavy alcohol use among college student-athletes. Heavy-drinking student-athletes appear to hold significant misperceptions of others drinking, hold fewer negative expectancies, and experience a greater number of alcohol-related negative consequences. In addition, they may hold strong intentions to drink, and may drink more in the season of competition. Gender differences should also be noted. Counselors, student affairs personnel, coaches, athletic trainers, and other prevention and intervention staff may wish to offer year-round prevention and

intervention programs tailored to student-athletes, such as social norms clarification, positive outcome expectancy challenges (especially for female student-athletes), coping skills training, and brief motivational interventions.

The findings of this study need to be replicated and future researchers should examine the efficacy of these tailored intervention programs with student-athletes as well as to assess the utility of these interventions with first-year student-athletes during their competitive and non-competitive seasons. Researchers may wish to examine additional profiles of student-athlete drinking based on theoretical variables as well as determine any mediators and moderators that may be at play.

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