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Examination of Drinking Habits and Motives of Collegiate Student-Athletes

Elizabeth A. Taylor
Rose Marie Ward
Robin Hardin

Abstract

Universities across the United States have reported consistently high rates of alcohol use and abuse among students during the past 20 years. The college student alcohol consumption level is considered an important public health concern. The increase in problematic drinking seems to be campus wide, but there is an understudied at-risk demographic—collegiate student-athletes. The purpose of this study is to examine student-athletes' motives for alcohol consumption, drinking patterns, and alcohol-related negative consequences. Student-athletes ($N = 283$) from five Midwestern universities completed an online questionnaire assessing this behavior. Male student-athletes reported higher levels in all three categories than females. In addition, differences were found in the drinking motives of individual and team sport student-athletes. Unlike previous studies, Division I student-athletes did not differ from Division III with respect to these behaviors. Male student-athletes seem particularly at-risk for problematic alcohol consumption. Additionally, differences were found in motives experienced for alcohol consumption based on sport type (i.e., individual versus team). Level of play was not found to influence drinking motives or alcohol consumption which may signify participation in intercollegiate athletics is a greater influence than division. Differences found in gender and sport type may provide insight to help decrease dangerous drinking habits of student-athletes.

Keywords: *Drinking motives; collegiate student-athletes; alcohol consumption, NCAA*

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Problematic drinking can be found campus wide, but collegiate student-athletes represent a specific at-risk demographic. Collegiate student-athletes consume more alcohol than nonathletes and are more likely to engage in more extreme styles of alcohol consumption (Green, Uryasz, Petr, & Bray, 2001; Hildebrand, Johnson, & Bogle, 2001). Eighty percent of collegiate student-athletes reported consuming alcohol as compared to 60% of the general student body (Green et al., 2001; Lisha & Sussman, 2010). Additionally, those who participate in collegiate athletics tend to be more likely to engage in a wide variety of risky behaviors than nonathletes (Hildebrand et al., 2001; Yusko, Buckman, White, & Pandina, 2008). The college experience creates an environment that fosters alcohol use, and those individuals participating in collegiate athletics have an additional context, thereby increasing the likelihood of problematic drinking (Crawford & Novak, 2010).

Collegiate student-athletes have a number of distinct concerns, including balancing time spent on athletics with academics; maintaining a high level of athletic performance, dealing with injuries; maintaining success or reacting to lack of success; and managing relationships with coaches, teammates, family, friends, and faculty (Ford, 2007). All of these factors may contribute to their alcohol consumption, and experts have dubbed collegiate student-athletes as a high-risk group for alcohol abuse (Brenner & Swanik, 2007; Martens, Pedersen, Smith, Stewart, O'Brien, 2011; Zamboanga, Horton, Leitkowski, & Wang, 2006). Thus, the purpose of this research was to examine the drinking habits and alcohol consumption of collegiate student-athletes and to determine if differences exist between team and individual sports and competition level (i.e., NCAA Division I vs. NCAA Division III). It is important to examine this topic to determine if a team culture can exist that would promote alcohol consumption as this would allow coaches and administrators to be proactive in developing a team culture that promotes positive decision-making. It is also important to determine if the competition pressures at Division I are more likely to contribute to alcohol consumption. The negative consequences of alcohol consumption were explored as well as drinking motives. Research has examined the motivations for student-athletes to consume alcohol, but there has been limited research in the exploration of these motives with respect to team vs. individual sports, competition level, and alcohol-related consequences.

Literature Review

Alcohol Consumption in Collegiate Student–Athletes

Student-athletes consume more alcohol than the general student body and are more likely to engage in risky behaviors while intoxicated (Leichliter, Meilman, Presley, & Chashin, 1998; Nelson, & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zankos, 1997). Brenner and Swanik (2007) found 60% of male and 50% of female collegiate student-athletes self-reported heavy episodic alcohol consumption during a given 2-week period. They also found 34% of col-

legiate student-athletes reported consuming 11 or more alcoholic drinks in one session the past 30 days. (Brenner & Swanik, 2007). Risky behavior and negative consequences often as a result of heavy, episodic drinking. The risky behaviors include drinking and driving, greater number of sexual partners, and increased likelihood of involvement in physical fights (Brenner & Swanik, 2007; Faurie, Pointier, & Raymon, 2004, Reel, Joy, & Hellstrom, 2012). Negative consequences of alcohol consumption include physical illness and injury, greater likelihood of drinking and driving or riding with an intoxicated driver, increased amounts of risky sexual behavior (e.g., unprotected sex, unwanted sex), amplified amounts of sensation-seeking behavior (e.g., risky, reckless behavior), and decreased academic success (Vaisman-Tzachor & Lai, 2008; Yusko, Buckman, White, & Pandina, 2007). The high-profile nature of collegiate athletics also places the student-athlete in a precarious position of being “front-page” news as a result of risky behavior or making a poor choice. This negative consequence is not one that other college students face, and the risky behavior can also have an impact on future professional sport opportunities.

Negative consequences are experienced from consuming alcohol but college students, including student-athletes, continue to do so in a hazardous manner (Vaisman-Tzachor & Lai, 2008; Yusko et al., 2007). Student-athletes also face negative consequences specific to their role as an athlete. Exercise physiology research on alcohol consumption suggests that high rates of alcohol consumption can lead to impairments to strength, speed, muscular and cardiovascular endurance, and power (Barnes, 2014). In addition, alcohol use can decrease psychomotor coordination, maximal oxygen consumption, impair temperature regulation, and cause dehydration (American College of Sport Medicine, 1982; O'Brien & Lyons, 2000). Furthermore, consuming alcohol post athletic activity can worsen dehydration, which can hinder muscle recovery and increase risk for injury (El-Sayed, Omar, & Lin, 2000; Maughan, 2006). It is for these reasons research on motivations for alcohol consumption and exploring rates of alcohol consumption in student-athletes is of a great importance.

Alcohol Consumption Motives

A common method to examine why college students and student-athletes continue to engage in excessive patterns of alcohol consumption is to examine their alcohol consumption motives (Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2005; Lac & Donaldson, 2016). The reason for examining alcohol consumption motives is due to the fact that motives have been linked to alcohol consumption levels and experience of negative consequences (Carey & Correia, 1997). Individuals consume alcohol in order to achieve specific esteemed outcomes (Rodriguez, Knee, & Neighbors, 2014). Individuals will also experience distinctive patterns of experiences and consequences when their alcohol consumption tendencies are motivated by different needs (Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2005). Individuals will be motivated to consume alcohol for different reasons

therefore experiencing different outcomes, both positive and negative (Crutzen, Kuntsche, & Schelleman-Offermans, 2013).

Cooper (1994) suggests there are four primary motives behind alcohol consumption: (a) social (e.g., to increase the enjoyment of social functions), (b) coping (e.g., to forget about your problems), (c) conformity (e.g., to be liked or peer-pressure), and (d) enhancement (e.g., because you like the feeling). Coping motives may be the most problematic because those individuals who experience these motives lack the ability to manage these negative emotions in a more healthy method (Cooper, 1994; Rodriguez, Knee, & Neighbors, 2014). Furthermore, if the individual does not gain the ability to cope in more healthy ways, then they have an increased likelihood of becoming psychologically dependent on alcohol (Cooper, 1994; Vernig & Orsillo, 2014). Coping motives have been found to be directly linked to alcohol-related problems (Merrill, Wardell, & Read, 2013). Individuals who endorse coping motives may need additional attention for interventions. It is common for students in a college setting to be motivated to consume alcohol for social reasons (e.g., to be sociable, to make social gatherings more fun; to celebrate special occasions with friends; to conform to their peers) (Cooper, 1994; Read, Wood, Kahler, Maddock, & Palfai, 2003). Gender differences in social and enhancement motives were found in late adolescence; young men scored higher on social and enhancement motives than young women (Kuntsche, Knibbe, Gmel, & Engles, 2006). Social motives are associated with moderate alcohol use, whereas enhancement motives are associated with heavy alcohol use, and coping motives are associated with alcohol-related problems (Kuntsche et al., 2005).

Examining motives for alcohol consumption is crucial when attempting to decrease alcohol consumption through intervention. By examining an individual's motives you gain a better understanding of when and why someone will most likely consume alcohol. Additionally, endorsement of certain motives may increase the likelihood of experiencing a greater amount of specific negative consequences. This allows for interventions to be strategically put in place for specific instances and student-athletes.

Alcohol Consumption Motives of Collegiate Student-Athletes

Damm and Murray (1996) suggest that collegiate student-athletes may consume higher than normal levels of alcohol in order to cope or conform. Others point to an increased number of social opportunities afforded to student-athletes compared to their nonathlete counterparts, which leads to an increase in social motives (Tricker, Cook, & McGuire, 1989). Moreover, student-athletes who report high levels of both coping and conformity motives experience the greatest number of alcohol-related negative consequences (Doumas, 2013). Student-athletes from a variety of sports reported social motives as their greatest motive to consume alcohol; however, not all sports experienced the same amount of social motivation. (Martens et al., 2006b).

Martens and colleagues (2005) sought to establish a measurement of drinking motives specific to collegiate student-athletes. This inventory was created on the idea that being a student-athlete creates a unique experience, compared to that of nonathlete college students, that may influence the drinking habits of this specific population. Additionally, as previously mentioned, student-athletes report consuming a greater amount of alcohol than their nonathlete counterparts (Green, Uryasz, Petr, & Bray, 2001; Hildebrand, Johnson, & Bogle, 2001), and alcohol motives have been found to influence alcohol consumption levels (Carey & Correia, 1997).

Using a comparison of inventories on alcohol consumption motives between student-athletes and their nonathlete counterparts, they developed the Athlete Drinking Scale (ADS). The three subscales of the ADS are (a) positive reinforcement (e.g., because I work so hard at my sport, I should be able to drink to have a good time), (b) team/group (e.g., I feel pressure from my teammates to drink alcohol), and (c) sport-related coping (e.g., I drink to help me deal with poor performances). The ADS has been used in several (e.g., Martens & Martin, 2010; Martens et al., 2008, 2011).

Sport-Specific Differences in Alcohol Consumption

Typically, research examines student-athletes as a uniform group with respect to alcohol consumption; however, this may be inappropriate, because one factor that may influence alcohol consumption patterns among student-athletes is the sport in which they participate. Martens et al. (2006b) indicated alcohol consumption patterns differ based on specific sport and gender. Specifically, male student-athletes generally consume more than females; male student-athletes participating in swimming/diving, soccer, and baseball reported significantly higher alcohol consumption than other sports such as basketball and track and field. This is consistent with prior research on sport-type differences in the alcohol consumption of student-athletes (NCAA, 2001). Moreover, research has found student-athletes participating in team sports (i.e., baseball, basketball, football, soccer, and volleyball) reported higher rates of risky drinking compared to individual sport student-athletes (i.e., golf, gymnastics, swimming and diving) (Brenner & Swanik, 2007; Leichliter, Meilman, Presley, & Cashin, 1998; Martens et al., 2006b; O'Brien, 2000; O'Brien & Kypri, 2008; Wichstrøm & Wichstrøm, 2009). Similarly, Rockafellow and Saules (2006) found that collegiate student-athletes participating in team sports reported higher rates of alcohol and chewing tobacco use than those in non-team (individual) sport student-athletes. Research indicates that this difference is likely to be caused by the socializing and bonding factor of drinking with teammates (Brenner & Swanik, 2007). These behaviors may begin at the high school level where Caucasian male high school students involved in team sports have been found to report more substance (e.g., alcohol, stimulants, and anabolic steroids) use than their nonathlete peers (Donohue, Pitts, Gavrilova, Ayarza, & Cintron, 2013).

In addition, student-athletes participating in NCAA Division I sports are more likely to engage in binge drinking than Division III student-athletes. However, Division III student-athletes reported drastically higher rates of drinking across a 12-month period than Division I or II student-athletes. These differences may be due to the differing philosophies at each level of NCAA athletics or the differential demands of the in-season schedule (Brenner & Swanik, 2007). Division I students-athletes were concerned with the negative impact drinking could have on athletic performance as compared to Division II and Division III student-athletes (Milroy, Orsini, Wyrick, Fearnow-Kenney, Kelly, & Burley, 2014). Additionally, Division III student-athletes engage in lower levels of high-risk alcohol consumption. Division III student-athletes report higher levels of campus engagement than student-athletes at Division I or II institutions which may play a role in their decreased alcohol consumption (Brenner, Metz, & Brenner, 2009). Division III student-athletes were also more likely to drink for social reasons as well (i.e., to celebrate, have fun, teammates were drinking, to meet people other than Division I and Division II student-athletes) (Milroy et al., 2014). Whereas differences in the literature exist for alcohol consumption across NCAA division level, there is limited research in alcohol consumption motives across NCAA division levels.

Purpose

The purpose of this study was to explore whether student-athletes who participate in different types of sport (i.e., individual, team) and division (i.e., Division I, Division III) differ with respect to motivations to consume alcohol (as measured by the Athlete Drinking Scale (ADS) and Drinking Motives Questionnaire (DMQ-R), alcohol consumption patterns, and alcohol-related negative consequences. Replicating the literature, gender differences across the scales of the ADS, DMQ-R, alcohol-related consequences, and alcohol consumption pattern were also examined. Previous literature has examined intercollegiate athlete populations using the ADS or the DMQ-R, but not both. Additionally, negative consequences have not been examined in conjunction with drinking motives. Therefore, the following research questions were addressed:

R1: Do athletes who participate in different types of sports (i.e., individual, team) report different motives to consume alcohol?

R2: Do athletes who participate in different divisions (i.e., Division I, Division III) report different motives to consume alcohol?

R3: Do male and female athletes report different motives to consume alcohol?

R4: Do student-athletes experience different levels of negative consequences related to alcohol consumption based on gender, type of sport, or division?

Methods

Participants

The study included 283 student-athletes from five Midwestern universities. Participants predominately reported being Caucasian (84.5%, $n = 239$) or Black, African American, or Haitian (7.1%, $n = 20$). Student-athletes were distributed across by year in college (25.5% freshmen, $n = 69$; 28.3% sophomore, $n = 80$; 24.0% junior, $n = 65$; 16.6% senior, $n = 47$; 2.5% fifth year, $n = 7$; and 1.1% graduate students, $n = 3$). Female student-athletes accounted for 56.5% ($n = 152$) of the sample while male student-athletes comprised 43.5% ($n = 117$). The mean age of the sample was 20.15 years ($SD = 1.5$) with ages ranging from 18 to 27. The sample included Division I student-athletes (60.9%, $n = 162$) and Division III student-athletes (39.1%, $n = 104$). The student-athletes participated in a wide variety of sports including basketball (5.7%), football (9.5%), ice hockey (7.1%), swimming and diving (14.5%), track and field (27.5%), volleyball (9.2%). Approximately 62.6% ($n = 164$) of the sample described their playing time as “consistent starter” and 24% ($n = 63$) had a formal leadership role on the team (e.g., team captain). The current study had a response rate of 47.88%. Details of the study population are included in the following section.

Procedure

The primary author's Institutional Review Board approved the procedures of the study. A convenience sample of Division I and Division III student-athletes was obtained through personal contacts of the authors. Student-athletes from two public Division I and three public Division III universities in the Midwestern United States were surveyed. None of the student-athletes that participated in the study attended institutions that were religiously affiliated. None of the researchers had relationships with athletic directors or coaches at Division II universities, therefore no Division II institutions were surveyed. Initial emails were sent to coaches asking for consent to survey their teams. Those coaches who agreed to allow their teams to participate were sent e-mails to forward to the student-athletes. A possible 591 student-athletes were emailed. The breakdown of teams emailed includes four volleyball (average of 15 student-athletes), two softball (average of 20 student-athletes), one basketball (average of 15 student-athletes), three swimming and diving (average of 25 student-athletes), three track and field/cross country (average of 30 student-athletes), two baseball (average of 40 student-athletes), three hockey (average of 25 student-athletes), one gymnastics (average of 10 student-athletes), one field hockey (average of 15 student-athletes), one football (average of 100 student-athletes), one golf (average of 10 student-athletes), one synchronized skating (average of 15 student-athletes), and one tennis (average of six student-athletes). The e-mail included a general description of the research, including the nature of research, as well as a link to the online questionnaire. The

responses were anonymous. Although coaches from a variety of sports were e-mailed asking for permission to survey their student-athletes, the coaches had to forward the recruitment email to their student-athletes therefore a lack of student-athletes from certain sport (e.g., softball and baseball) may indicate those coaches did not forward the e-mail onto their student-athletes.

Instrumentation

Demographic measures. Demographic measures used in the data analysis were gender, division, and sport type which were the focus of the study. Other demographic questions included year in school, academic major, grade point average (GPA), race, fraternity or sorority membership, and marital status. Current sport experience questions assessed the participants' institution, sport(s) participated in, playing time, and leadership role.

Alcohol consumption. Participants reported if they had ever consumed an alcoholic beverage. Participants who responded that they did not drink alcohol completed the questionnaire and were prompted to a question that asked why they do not consume alcohol. In several locations on the questionnaire, participants were provided with the definition of a standard drink. A standard drink was defined as 12 ounces beer, 1.5 ounces of liquor, or 5 ounces of wine. The participants also were asked about the highest number of alcoholic drinks they consumed across the last month and the number of days they consumed at least one alcohol beverage during a typical week.

Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994). The DMQ-R examines general drinking motives. The DMQ-R is a 20-question, self-report survey where participants rate their motivation to consume alcohol on a 5-point scale from 1 (almost never/never) to 5 (almost always/always); it consists of four subscales: social motives (5 items), enhancement motives (5 items), coping motives (5 items), and conformity motives (5 items). Higher scores indicate more endorsement of a certain type of motive. Participants are prompted with the question: "Think of all the times you drink, how often would you say that you drink for each of the following reasons?" Example items are, "Because it helps you enjoy a party," "I drink to forget my worries," "So that others won't kid you about not drinking," or "Because it's fun."

Athlete Drinking Scale (ADS; Martens et al., 2008). The ADS is a 19-question instrument that utilizes a 6-point scale 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (somewhat agree), 5 (agree), and 6 (strongly agree). The ADS assesses sport-related motives to consume alcohol; it consists of three subscales: Team/Group motives (7 items), Sport-Related Coping motives (3 items), and Positive Reinforcement motives (9 items). Example items include: "If I've performed well, I feel like I can go out and drink a little more than usual," "I drink to fit in with my teammates," "I drink to help deal with a poor performance."

Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). The RAPI measures problematic drinking and alcohol-related negative consequences. The RAPI is a 23-question questionnaire with a five-point scale. The response options are 0 (never), 1 (1-2 times), 2 (3-5 times), 3 (6-10 times), and 4 (10 or more times) participants recall the number of times they experienced certain situations when they were drinking or because of their drinking during the past year. Example items include: “Not able to do your homework or study for a test,” “got into fights, acted bad or did mean things,” and “missed out on other things because you spent too much money on alcohol.”

Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). The DDQ is a measure of daily alcohol consumption. The DDQ contains a statement instructing participants to indicate how many drinks they consumed for each day of the week. Convergent validity was established between the DDQ and the Drinking Practices Questionnaire (Collins, Parks, & Marlatt, 1985).

Results

Drinking Motives Questionnaire-Revised. Mean scores for the four subscales were: social motives = 3.11 ($SD = 1.14$), coping motives = 1.75 ($SD = .78$), enhancement motives = 2.52 ($SD = 1.11$), and conformity motives = 1.61 ($SD = .72$). Martens et al. (2003) found convergent validity for student-athletes through their factor analysis of the DMQ-R. Cronbach's alphas for this study were .90, .87, .86, and .81 for the social, enhancement, conformity, and coping subscales respectively.

A series of one-way MANOVAs examined the drinking motives subscales across gender, NCAA division, and sport type. There was a significant overall effect for gender, Wilks' $\lambda = .88$, $F(4, 211) = 7.12$, $p < .001$. Follow-up tests indicated that male student-athletes reported higher levels on the social motives scale and enhancement motives scale than female student-athletes. The one-way MANOVAs examining NCAA division (i.e., Division I, Division III) was nonsignificant. A one-way MANOVA examined sport type across the DMQ-R scales; the overall effect was significant, Wilks' $\lambda = .95$, $F(4, 211) = 3.09$, $p = .02$. Individual sport student-athletes had higher levels on the enhancement and conformity scales than team sport student-athletes. See Table 1 for means and standard deviations.

Athlete Drinking Scale. Mean scores for the three subscales were: Positive Reinforcement $M = 2.83$ ($SD = 1.32$), Team/Group motives $M = 1.99$ ($SD = 1.02$), and Sport-Related Coping $M = 1.76$ ($SD = 1.01$). Psychometric analyses of the ADS were performed by Martens et al. (2008), and the inventory was found to have construct validity by comparing with the Drinking Motives Measure (DMM, Cooper, 1994). The ADS also has incremental validity in terms of predicting both alcohol use and problems linked to alcohol use (Martens et al., 2005). Cronbach's alpha scores for the current sample were: .93 for the Positive Reinforcement subscale, .88 for the Team/Group subscale, and .80 for the Sport-Related Coping subscale.

Table 1*Oneway MANOVA Results across DMQ-R*

Means based on Gender			
	Male	Female	F-Test
	Wilks' $\lambda = .88$, $F(4, 211) = 7.12$, $p < .001$, partial $\eta^2 = .12$		
Social	3.40 (.99)	2.89 (1.12)	$F(1, 214) = 12.51$, $p < .001$, partial $\eta^2 = .06$
Coping	1.80 (.74)	1.72 (.81)	$F(1, 212) = .55$, $p = .46$, partial $\eta^2 = .003$
Enhancement	2.82 (.97)	2.25 (1.00)	$F(1, 212) = 18.09$, $p < .001$, partial $\eta^2 = .08$
Conformity	1.49 (.62)	1.60 (.72)	$F(1, 212) = 1.47$, $p = .23$, partial $\eta^2 = .01$
Means based on Division			
	Division I	Division III	F-Test
	Wilks' $\lambda = .98$, $F(4, 211) = 1.03$, $p = .40$, partial $\eta^2 = .02$		
Social	3.08 (1.13)	3.14 (1.02)	$F(1, 214) = .13$, $p = .72$, partial $\eta^2 = .001$
Coping	1.80 (.77)	1.68 (.79)	$F(1, 212) = 1.25$, $p = .27$, partial $\eta^2 = .01$
Enhancement	2.51 (1.06)	2.46 (.96)	$F(1, 212) = .15$, $p = .70$, partial $\eta^2 = .001$
Conformity	1.52 (.64)	1.58 (.74)	$F(1, 212) = .27$, $p = .60$, partial $\eta^2 = .001$
Means based on Sport Type			
	Individual	Team	F-Test
	Wilks' $\lambda = .95$, $F(4, 211) = 3.09$, $p = .02$, partial $\eta^2 = .06$		
Social	3.22 (1.16)	2.97 (1.01)	$F(1, 214) = 2.99$, $p = .09$, partial $\eta^2 = .01$
Coping	1.77 (.76)	1.72 (.79)	$F(1, 212) = .26$, $p = .61$, partial $\eta^2 = .001$
Enhancement	2.66 (1.13)	2.31 (.88)	$F(1, 212) = 6.80$, $p = .01$, partial $\eta^2 = .03$
Conformity	1.65 (.72)	1.46 (.63)	$F(1, 212) = 4.50$, $p = .04$, partial $\eta^2 = .02$

Note: M (SD), Means are based on 1 to 5 scale anchored by 1 = almost never/never and 5 = almost always/always

A series of one-way MANOVAs examined the Athlete Drinking subscales across gender, NCAA division, and sport type. A one-way MANOVA examined gender across the Athlete Drinking Scale subscales (i.e., Positive Reinforcement, Team/Group, Sport- Related Coping). The overall effect was significant, Wilks' $\lambda = .85$, $F(3, 211) = 8.05$, $p < .001$. Male student-athletes reported higher levels of the ADS subscales than female student-athletes. In a one-way MANOVA analyzing division across the ADS subscales, the overall effect was nonsignificant, Wilks' $\lambda = .98$, $F(3, 211) = 1.76$, $p = .16$. Additionally, a one-way MANOVA examined sport type (i.e., individual vs. team) across the ADS subscales, and the overall effect was nonsignificant, Wilks' $\lambda = .98$, $F(3, 210) = 1.27$, $p = .29$. See Table 2 for means and standard deviations.

Table 2*One-Way MANOVA Results Across ADS*

Means Based on Gender			
	Male	Female	F-Test
	Wilks' $\lambda = .85$, $F(3, 211) = 12.31$, $p < .001$, partial $\eta^2 = .15$		
Positive Reinforcement	3.50 (1.21)	2.51 (1.18)	$F(1, 213) = 36.34$, $p < .001$, partial $\eta^2 = .15$
Team/Group	2.41 (1.09)	1.80 (.86)	$F(1, 213) = 21.00$, $p < .001$, partial $\eta^2 = .09$
Coping	2.04 (1.09)	1.62 (.90)	$F(1, 213) = 8.86$, $p = .002$, partial $\eta^2 = .04$
Means Based on Division			
	Division I	Division III	F-Test
	Wilks' $\lambda = .976$, $F(3, 211) = 1.76$, $p = .16$, partial $\eta^2 = .02$		
Positive Reinforcement	2.97 (1.28)	2.88 (1.31)	$F(1, 213) = .21$, $p = .65$, partial $\eta^2 = .001$
Team/Group	2.04 (1.00)	2.10 (1.04)	$F(1, 213) = .16$, $p = .69$, partial $\eta^2 = .001$
Coping	1.90 (1.04)	1.65 (.94)	$F(1, 213) = 3.15$, $p = .08$, partial $\eta^2 = .02$
Means Based on Sport Type			
	Individual	Team	F-Test
	Wilks' $\lambda = .98$, $F(3, 210) = 1.27$, $p = .29$, partial $\eta^2 = .02$		
Positive Reinforcement	3.05 (1.37)	2.81 (1.20)	$F(1, 212) = 1.78$, $p = .18$, partial $\eta^2 = .01$
Team/Group	2.17 (1.12)	1.93 (.89)	$F(1, 212) = 3.13$, $p = .08$, partial $\eta^2 = .02$
Coping	1.82 (1.04)	1.79 (.98)	$F(1, 212) = .08$, $p = .78$, partial $\eta^2 = .001$

Note: M (SD), Means are based on a 1 to 6 scale anchored by 1 = strongly disagree and 7 = strongly agree.

Daily Drinking Questionnaire. In a one-way MANOVA examining gender across the Daily Drinking Questionnaire variables (DDQ), the overall effect was significant, Wilks' $\lambda = .78$, $F(7, 261) = 10.31$, $p < .001$. Male student-athletes reported consuming a greater number of drinks per day of the week, across all days of the week, than did female student-athletes. A one-way MANOVA assessed division (i.e., Division I vs. Division III) across the DDQ variables. The overall

effect was nonsignificant, Wilks' $\lambda = .96$, $F(7, 258) = 1.75$, $p = .10$. In a one-way MANOVA analyzing sport type (i.e., individual vs. team sports) across the DDQ variables, the overall effect was significant, Wilks' $\lambda = .93$, $F(7, 253) = 2.47$, $p = .01$. On Thursdays, individual sport student-athletes reported consuming a greater number of drinks per day than did team sport student-athletes. However on Sundays, team sports reported more drinks than individual sports. See Table 3 for means, standard deviations, and follow-up tests.

Table 3*One-Way MANOVA Results Across DDQ*

	Means Based on Gender		F-Test
	Male	Female	
	Wilks' $\lambda = .78$, $F(7, 261) = 10.31$, $p < .001$, partial $\eta^2 = .22$		
Monday	.17 (.68)	.01 (.08)	$F(1, 267) = 8.38$, $p = .004$, partial $\eta^2 = .03$
Tuesday	.83 (2.32)	.02 (.18)	$F(1, 267) = 18.20$, $p < .001$, partial $\eta^2 = .06$
Wednesday	.34 (1.21)	.06 (.35)	$F(1, 267) = 7.47$, $p = .01$, partial $\eta^2 = .03$
Thursday	1.37 (3.08)	.16 (.68)	$F(1, 267) = 22.34$, $p < .001$, partial $\eta^2 = .08$
Friday	3.12 (4.11)	1.08 (1.91)	$F(1, 267) = 29.28$, $p < .001$, partial $\eta^2 = .10$
Saturday	5.62 (5.02)	1.84 (2.48)	$F(1, 267) = 65.85$, $p < .001$, partial $\eta^2 = .20$
Sunday	.27 (1.21)	.05 (.45)	$F(1, 267) = 5.15$, $p = .02$, partial $\eta^2 = .02$
	Means Based on Division		F-Test
	Division I	Division III	
	Wilks' $\lambda = .96$, $F(7, 258) = 1.75$, $p = .10$, partial $\eta^2 = .05$		
Monday	.09 (.53)	.06 (.31)	$F(1, 265) = .30$, $p = .58$, partial $\eta^2 = .001$
Tuesday	.49 (1.90)	.19 (.89)	$F(1, 265) = 2.24$, $p = .14$, partial $\eta^2 = .01$
Wednesday	.11 (.60)	.28 (1.11)	$F(1, 265) = 2.75$, $p = .10$, partial $\eta^2 = .01$
Thursday	.82 (2.56)	.49 (1.41)	$F(1, 265) = 1.52$, $p = .22$, partial $\eta^2 = .01$
Friday	2.13 (3.29)	1.74 (3.15)	$F(1, 265) = .93$, $p = .34$, partial $\eta^2 = .003$
Saturday	3.61 (4.49)	3.34 (3.84)	$F(1, 265) = .26$, $p = .61$, partial $\eta^2 = .001$
Sunday	.07 (.38)	.27 (1.16)	$F(1, 265) = 4.41$, $p = .04$, partial $\eta^2 = .02$
	Means Sport Type		F-Test
	Individual	Team	
	Wilks' $\lambda = .93$, $F(7, 253) = 2.87$, $p = .07$, $\eta^2 = .07$		
Monday	.12 (.61)	.04 (.26)	$F(1, 259) = 2.20$, $p = .14$, partial $\eta^2 = .01$
Tuesday	.56 (2.06)	.22 (.99)	$F(1, 259) = 2.92$, $p = .09$, partial $\eta^2 = .01$
Wednesday	.20 (.90)	.13 (.92)	$F(1, 259) = .46$, $p = .50$, partial $\eta^2 = .002$
Thursday	1.19 (2.95)	.24 (.92)	$F(1, 259) = 12.62$, $p < .001$, partial $\eta^2 = .05$
Friday	2.04 (3.23)	1.94 (3.28)	$F(1, 259) = .06$, $p = .81$, partial $\eta^2 = .001$
Saturday	3.47 (4.35)	3.50 (3.96)	$F(1, 259) = .003$, $p = .96$, partial $\eta^2 < .001$
Sunday	.04 (.21)	.25 (1.08)	$F(1, 259) = 4.68$, $p = .03$, partial $\eta^2 = .02$

Note: *M* (*SD*), Means are based on number of drinks per night.

Alcohol consumption. Approximately 84.8% ($n = 240$) student-athletes reported that they had consumed an alcohol beverage. Participants reported drinking an average of 1.03 ($SD = 1.20$) days per week with a range from zero to seven days. Student-athletes reported consuming an average of 3.70 ($SD = 3.25$; range: 0 to 18) standard drinks on a typical drinking day and an average of 5.60 ($SD = 5.57$; range 0 to 25) standard drinks on their highest drinking occasion over the last 30 days. A series of one-way ANOVAs was used to analyze number of drinking days, typical number of drinks per episode, and peak number of drinks consumed across gender, division (i.e., Division I, Division III), and sport type (i.e., individual, team). The one-way ANOVA examining gender by number of drinking days was significant, $F(1, 257) = 45.67, p < .001$, partial $\eta^2 = .15$, male student-athletes reported a higher number of drinking days than female student-athletes. The one-way ANOVA examining gender by number of drinks consumed on a typical drinking day was significant, $F(1, 257) = 56.04, p < .001$, partial $\eta^2 = .18$, male student-athletes reported a higher number of drinks consumed. The one-way ANOVA examining gender by peak number of drinks consumed was significant, $F(1, 256) = 105.50, p < .001$, partial $\eta^2 = .29$, male student-athletes reported a higher number of drinks consumed. No significant findings were discovered across division (i.e., Division I, Division III) and sport type (i.e., individual, team) for drinking behaviors (i.e., number of drinking days, typical number of drinks per episode, and peak number of drinks consumed). See Table 4 for means and standard deviations on drinking behaviors.

Rutgers Alcohol Problem Index. The sample had a mean of 5.37 ($SD = 7.45$) and a Cronbach's alpha of .89. Research supports the reliability and validity of the RAPI with college drinkers (Martens, Neighbors, Dams-O'Connor, Lee, & Larimer, 2007). One-way ANOVAs examined the scores on the RAPI across gender, division, and sport type. The ANOVA examining gender was significant, $F(1, 216) = 23.12, p < .001$. Male student-athletes experienced a higher number of consequences than female student-athletes. The ANOVA examining NCAA division (i.e., Division I versus Division III) was nonsignificant, $F(1, 216) = 3.44, p = .07$. The ANOVA examining sport type (team versus individual) was nonsignificant, $F(1, 216) = 2.74, p = .10$. See Table 4 for means and standard deviations.

Table 4

One-Way ANOVA Results Across Drinking Behavior and Consequence Variables

	Means Based on Gender		<i>F</i> -Test
	Male	Female	
# Drinking Days	1.58 (1.42)	.64 (.80)	$F(1, 257) = 45.67,$ $p < .001,$ partial $\eta^2 = .15$
# Typical Drinks	5.31(2.55)	3.76 (2.10)	$F(1, 257) = 56.04,$ $p < .001,$ partial $\eta^2 = .18$
Peak Drinks	9.11 (3.06)	6.12 (3.17)	$F(1, 256) = 105.50,$ $p < .001,$ partial $\eta^2 = .29$
RAPI	7.60 (8.40)	3.15 (4.99)	$F(1, 216) = 23.12,$ $p < .001,$ partial $\eta^2 = .10$
Means Based on Division			
	Division I	Division III	
# Drinking Days	.93 (1.17)	1.15 (1.19)	$F(1, 257) = 2.63,$ $p = .11,$ partial $\eta^2 = .01$
# Typical Drinks	3.80 (3.61)	3.31 (3.19)	$F(1, 257) = .204,$ $p = .65,$ partial $\eta^2 = .001$
Peak Drinks	5.15 (5.53)	6.36 (5.63)	$F(1, 256) = 2.90,$ $p = .09,$ partial $\eta^2 = .01$
RAPI	5.83 (7.95)	4.00 (5.17)	$F(1, 216) = 3.44,$ $p = .07,$ partial $\eta^2 = .02$
Means based on Sport Type			
	Individual Sport	Team Sport	
# Drinking Days	1.06 (1.32)	.97 (1.01)	$F(1, 256) = .38,$ $p = .54,$ partial $\eta^2 = .001$
# Typical Drinks	3.69 (3.36)	3.73 (3.15)	$F(1, 256) = .01,$ $p = .92,$ partial $\eta^2 < .001$
Peak Drinks	5.15 (5.79)	5.99 (5.37)	$F(1, 255) = 1.46,$ $p = .23,$ partial $\eta^2 = .01$
RAPI	5.97 (7.69)	4.38 (6.47)	$F(1, 216) = 2.74,$ $p = .10,$ partial $\eta^2 = .01$

Note: *M* (*SD*), RAPI means are based on a 0 to 4 scale with anchored by 0 = never and 4 = 10 or more drinks.

Discussion

The main purpose of this study was to determine if differences in drinking motives and alcohol consumption patterns exist based on student-athlete gender, sport type, and competition level. Male student-athletes consumed more alcohol, consume alcohol more frequently, reported more alcohol-related negative consequences, and tended to report higher levels of drinking motives than female student-athletes. In contrast to Brenner and colleagues (2009), the student-athletes from Division I and Division III institutions did not differ across the alcohol consumption variables, drinking motives, and alcohol-related negative consequences. Individual sports tended to report higher levels of enhancement motives, conformity, and motives than team sports. This result suggests that it may not be the sport structure, or team emphasis of team sports (i.e., volleyball), but the culture

created by the student-athletes and coaches that influences student-athletes motivations for alcohol consumption.

Prior experiences and learned behavior will cause individuals to act in a similar way to future experiences (Deeming & Johnson, 2009). Student-athletes may choose to consume alcohol or binge drink based on the actions of fellow student-athletes and teammates (Bandura, 1962, 1977). Alcohol consumption may seem the norm, and as freshmen enter the institution they will drink just as upper classmen drink and this behavior will continue to perpetuate itself. Alcohol consumption could possibly continue after graduation and into the professional life of these student-athletes. The likelihood of engaging in a selected behavior increases when people associate it with others who exhibit the behavior, which perhaps justifies the behavior (Akers, 2009).

Although there was no significant effect found when examining sport type (i.e., individual, team) across the Athlete Drinking Scale, there was a significant difference among Drinking Motives Questionnaire-Revised scales. Individual sport student-athletes had higher endorsements of both enhancement and conformity motives compared to team sport student-athletes. Previous research suggested that differences in alcohol consumption between individual and team sport athletes was likely to be caused by the socializing and bonding factor of drinking with teammates in team sport athletes (Brenner & Swanik, 2007). However, the findings of this study suggests that it may not be the sport structure, or team emphasis of team sports (i.e., volleyball, football, softball), but the culture created by the student-athletes and coaches that influences student-athletes' motivations for alcohol consumption. Individual sport student-athletes may experience higher endorsements of enhancement and conformity motives because their team bonding happens off the field or court.

However, in contrast to the motivation results, individual and team sport student-athletes did not differ with respect to quantity and frequency measures, alcohol-related negative consequences, and alcohol consumption across most of the days of the week. The lack of differences between quantity and frequency measures, alcohol-related negative consequences, and alcohol consumption across most of the days of the week in conjunction with significant differences in motives is interesting and may suggest several conclusions. First, differences in motives may have been found due to high number of swimmers and divers who participated in the study. Previous research has indicated that swimmers and divers consume significantly greater amounts of alcohol than student-athletes from other sports (Martens et al., 2006b). The higher than average rates of alcohol consumption may increase motivation of alcohol consumption for the individual sport group. Second, the differences in motivation still need to be addressed. Coaches and athletic administrators need to understand what motivates their student-athletes to consume high levels of alcohol. If coaches and athletic administrators can gain insight into what motivates student-athletes, they may be able to better curb

their dangerous drinking habits. The current study examined student-athletes as a fairly homogeneous group, future studies might seek to replicate the comparison between individual and team sports, or go further and look at sport specific differences (i.e., basketball vs. football vs. swimming and diving vs. track and field/cross country).

Similar to studies using samples of non-student athletes, male student-athletes reported higher levels of almost all drinking motives scales, quantity and frequency measures of alcohol consumption, and alcohol-related negative consequences (Glassman, Dodd, Sheu, Reinzo, & Wagenaar, 2010). Consistent with research conducted on college student populations (e.g., Read et al., 2003), the social motives subscale from the Drinking Motives Questionnaire-Revised subscale had the highest motives for both male and female student-athletes. Similar to previous research on general drinking motives (e.g., Kuntsche et al., 2006), male student-athletes reported higher levels of the social and enhancement drinking motives compared to female student-athletes. Prior research on general college student populations (e.g., Read et al., 2003) found conceptual and statistical overlap between social and enhancement motives, which may be the reason both motives were statistically significant.

Male student-athletes endorsed higher levels of all the student-athlete specific drinking motives as measured by the Athlete Drinking Scale. In contrast to the findings from the nonathlete specific drinking coping motives scale, male and female student-athletes significantly differed with respect to sport-related coping. In nonathlete samples, increased levels of coping motives also relate to experiencing increased negative consequences from alcohol consumption (Kuntsche et al., 2005; 2006). In the current sample, male student-athletes reported higher levels of alcohol-related negative consequences. In student-athletes, it is possible that the link between coping and alcohol-related negative consequences requires the use of an athlete specific coping measure. However, further research is needed to establish this link in student-athletes.

Gender differences were found for the positive reinforcement and team/group motives subscales of the Athlete Drinking Scale. Although specific research has not been done to examine gender across the Athlete Drinking Scale, connections can be made using the relationship between the subscales of the Athlete Drinking Scale and the Drinking Motives Questionnaire-Revised. The positive reinforcement subscale of the Athlete Drinking Scale is most closely related to the enhancement motives subscale of the DMQ-R which prior research has shown to be more highly endorsed by male than female participants (Kuntsche, Rehm, & Gmel, 2004). The team/group motives subscale reflects a combination of the social and conformity motives subscales of the DMQ-R; research indicates that male participants tend to report higher levels of social motives than female participants (Cooper, 1994; Kuntsche et al., 2006). In addition, Tricker and colleagues (1989) found that student-athletes are afforded a greater number of social opportunities than nonathletes which may lead to increased levels of team/group motives.

Significant gender differences were found in alcohol consumption patterns of the student-athletes in this study. Male student-athletes reported a significantly higher number of typical drinking days during the week, number of drinks consumed on a typical day drinking, and number of drinks consumed on the heaviest drinking occasion in the last 30 days. These findings are consistent with gender and alcohol consumption research that has found male participants to consistently surpass women in typical drinking frequency and quantities (Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). These results also suggest that male student-athletes may be a particularly at risk population for high levels of alcohol consumption and alcohol-related negative consequences. Findings suggest that athletic directors, coaches, and support staff should provide additional educational training to male student-athletes about the dangers of excessive alcohol consumption.

In contrast to previous research (e.g., Brenner & Swanik, 2007), there were no significant divisional status results regarding drinking motives or drinking behavior. In previous research, Division I student-athletes were more likely to engage in binge drinking than Division III student-athletes; however, Division III student-athletes reported drastically higher rates of drinking across a 12-month period than Division I or II student-athletes (Brenner & Swanik, 2007). However, in the current study, student-athletes from Division I and Division III reported similar levels of all drinking motives subscales on both the Drinking Motives Questionnaire-Revised and the Athlete Drinking Scale. In addition, student-athletes from both divisions reported similar drinking habits (i.e., drinking days, typical drinking, peak drinking, drinking across the days of the week). It is possible that survey timing (i.e., competitive seasonal status) could alter the current study's findings. Future research might examine competitive seasonal status due to its impact on alcohol consumption patterns (i.e., Brenner & Swanik, 2007) and endorsement of drinking motives (Martens, Dams-O'Connor, & Duffy-Paiement, 2006).

Limitations and Future Research

Although the current study extends the literature, there are several limitations. First, data was collected through self-report surveys. Research has indicated that individuals typically provide accurate accounts of their alcohol consumption behaviors (e.g., Babor, Steinberg, Anton, & Del Boca, 2000); however, there was no way to verify how accurate the participants' responses were. Secondly, future studies might utilize methods to ensure a large variety of sports are represented and sufficient sample size from each sport. Due to the current sports team sample size, analyses based on individual and team sport could not be further explored at the team level. Future research should focus on getting larger samples from specific sports. Third, the data was collected from five Midwestern Division I and Division III universities. It is possible that these results might not generalize to institutions outside of the Midwest. Finally, the sample used was a convenience sample. Participants were not chosen at random, and student-athletes were only recruited after coach permission was secured.

Despite the limitations aforementioned, the current study extends the literature as it examines collegiate student-athletes' drinking motivations and alcohol consumption patterns. Motivational differences for alcohol consumption were found in male and female student-athletes as well as individual and team sport student-athletes. Given these differences, collegiate student-athletes do not appear to be a homogeneous group with respect to alcohol consumption. Specifically, male student-athletes and members of individual sports seem to be particularly at risk for high level of alcohol consumption, drinking motives, and alcohol-related negative consequences. It may, however, be the culture and climate of the team that influences the student-athletes' level of motivation for each subscale or that certain student-athletes are attracted to certain sports due to these cultures. Teams with greater acceptance of and more lenient rules towards alcohol consumption may experience higher levels of any or all of the drinking motives. Teams may use alcohol consumption as a way to bond with team members (e.g., parties where majority or all of the team is in attendance and consuming alcohol). Further, teams may alcohol to celebrate victories or cope with losses. Continued research will also help to create a profile for the most 'at-risk' student-athlete groups. Such a profile may potentially assist university officials, athletic directors, and coaches when creating intervention and prevention courses to further educate student-athletes on the dangers of high levels of alcohol consumption. Research should also explore geographic location, size of the university, community culture, and religious affiliated universities to determine if alcohol consumption varies based on those characteristics (Yusko et al., 2008).

Conclusion

Despite the fact that research on alcohol consumption patterns of collegiate student-athletes is prevalent, there is often a gap between research and practice. It is important to educate athletic directors, head coaches, and support staff (i.e., strength and conditioning coaches, athletic trainers, nutritionists, and academic support) about the drinking habits of their student-athletes and the dangers associated with high levels of negative consumption. By better understanding what motivates student-athletes to consume alcohol and their drinking patterns, improvements can be made to intervention programs. The impact of this behavior can also begin to perpetuate based on Bandura's (1962, 1977) Social Learning Theory. Incoming student-athletes could come to the conclusion that student-athletes participate in heavy alcohol consumption and binge drinking based on the behavior of upperclassmen. This conclusion could perpetuate the culture of drinking which in turn could lead to poor decision-making both in an athletic sense and socially.

Additionally, administrators must receive training on the physiological side effects of high rates of alcohol consumption which include slower reflexes, decreased

endurance, dehydration, and increased rates of injury (Lecoultre & Schutz, 2009; Shirreffs & Maughan, 2006). These stakeholders must also evaluate the culture of teams across their athletic departments to determine which teams share drinking motives and cultural views that are permissive to high levels of alcohol consumption. Student-athletes must also be educated of the negative consequences, both on and off the field, associated with high levels of alcohol consumption.

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