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Sport-Related Achievement Motivation and Alcohol Outcomes: An Athlete-Specific Risk Factor among Intercollegiate Athletes

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Abstract

Intercollegiate athletes report greater alcohol consumption and more alcohol-related problems than their non-athlete peers. Although college athletes share many of the same problems faced by non-athletes, there are some consequences that are unique to athletes. Studies have demonstrated that alcohol negatively affects athletic performance including increased dehydration, impeded muscle recovery, and increased risk for injury. Beyond risk factors for alcohol misuse that may affect college students in general, research has begun to examine risk factors that are unique to collegiate athletes. For example, research has found that off-season status, the leadership role, and athlete-specific drinking motives are associated with increased alcohol use. Given these findings, it is possible that other athlete-specific variables influence alcohol misuse. One such variable may be sport achievement orientation. The purpose of the current study was to examine the relationship between sport achievement orientation and alcohol outcomes. Given previous research regarding seasonal status and gender, these variables were examined as moderators. Varsity athletes ($n = 263$) completed the Sport Orientation Questionnaire, which assesses sport-related achievement orientation on three scales (Competitiveness, Win Orientation, and Goal Orientation). In addition, participants completed measures of alcohol use and alcohol-related problems. Results indicated that Competitiveness, Win Orientation, and Goal Orientation were all significantly associated with

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Author Disclosure

Contributors

Dr. Martens designed the study and wrote the protocol for the project from which this data came. Dr. Weaver was responsible for the literature search, and wrote the first draft of the paper with the assistance of Dr. Martens, Ms. Cadigan, and Ms. Takamatsu. Dr. Pedersen provided the rationale for the investigation and conducted the statistical analyses. Ms. Treloar also assisted in statistical analyses related to reviewer comments. All authors contributed to and approved the final manuscript.

Conflict of Interest

There are no conflicts of interest to disclose.

alcohol use, but not alcohol-related problems. Moreover, these relationships were moderated by seasonal status and gender. These interactions, clinical implications, and limitations are discussed.

Keywords

college athletes; alcohol use; sport-related achievement motivation; seasonal status; gender

1. Introduction

Heavy alcohol use is a well-documented problem on college campuses (Johnston, O'Malley, Bachman, & Schulenberg, 2010). National studies have shown college students drink more than their non-college attending peers, and over 40% of college students endorse heavy episodic or "binge" drinking (generally defined as 5+ drinks in one sitting for men and 4+ drinks in one sitting for women) in the preceding two weeks (Dawson, Grant, Stinson, & Chou, 2004; Wechsler et al., 2002). Drinking among college students is associated with many negative consequences, driving after drinking, injuries, and death (Hingson, Zha, & Weitzman, 2009; Wechsler et al., 2002). Furthermore, 20% of college students meet diagnostic criteria for an alcohol use disorder (Dawson et al., 2004).

Even higher rates of binge drinking have been documented for collegiate athletes in comparison to their non-athlete peers (Brenner & Swanik, 2007; Leichliter, Meilman, Presley, & Chasin, 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). For example, in three national studies the past two-week binge drinking rate ranged from 57%-62% among male athletes and 48%-50% among female athletes, compared to 43%-49% among male non-athletes and 36%-40% among female non-athletes (Leichliter et al., 1998; Nelson & Wechsler, 2001; Wechsler et al., 1997). Not surprisingly, college athletes also report experiencing more negative consequences as a result of alcohol use than non-athletes. One national study showed that as a result of alcohol use approximately 30% of college athletes experienced academic difficulties, 20% experienced trouble with police or other authorities, 17% were taken advantage of sexually, and 15% damaged property; these percentages were significantly higher than corresponding rates for non-athletes (Leichliter et al., 1998).

The effects of excessive alcohol use on athletic performance are also a salient concern for sport psychologists working with college athletes. For thirty years the American College of Sports Medicine (1982) has acknowledged the negative effects of alcohol use on athletic performance, stating that alcohol consumption is associated with a number of detrimental effects such as decreased psychomotor coordination, decreased maximal oxygen consumption, and impaired temperature regulation. The dehydrating effects of alcohol can negatively impact athletic performance (O'Brien & Lyons, 2000), and drinking alcohol after athletic activity can worsen dehydration associated with physical activity, impede muscle recovery, and enhance injury risk (El-Sayed, Omar & Lin, 2000; Gutgesell & Canterbury, 1999; Maughan, 2006; Shirreffs & Maughan, 1997).

Taken together, the aforementioned studies highlight the importance for researchers to identify risk factors for heavy drinking among the college athlete population. Studies

examining correlates of heavy drinking among college students have suggested student athletes are susceptible to similar risk factors as student non-athletes (Martens, Watson, & Beck, 2006). For example, being a white male (Leichliter et al., 1998; Wechsler et al., 2002), participation in Greek organizations (Cashin, Presley, & Meilman, 1998), high levels of drinking motives (Martens, Ferrier, & Cimini, 2007; Martens, Pedersen, Smith, Stewart, & O'Brien, 2011), positive alcohol expectancies (Olthuis, Zamboanga, Martens, & Ham, 2011; Zamboanga, Schwartz, Ham, Borsari, & Van Tyne, 2010), high levels of impulsivity (Cyders, Flory, Rainer, & Smith, 2009; Martens et al., 2011; Littlefield, Sher, & Steinley, 2010), and perceived heavy drinking norms (Borsari & Carey, 2003; Dams-O'Connor, Martin, & Martens, 2007; Grossbard et al., 2009; Martens et al., 2011; Olthuis et al., 2011) are all risk factors associated with alcohol-related harms in both athlete and non-athlete college samples.

It is possible that in addition to general risk factors that impact all college students there are risk factors unique to athletic participation that may also help to explain alcohol misuse and related problems among athletes (Martens et al., 2006; Martens, Kilmer, & Beck, 2009). A number of studies support this contention, showing that a broad range of sport-related factors are associated with alcohol use among college athletes. For example, research has shown collegiate athletes use significantly more alcohol out of their competitive season than when in-season (Bower & Martin, 1999; Martens et al., 2006; Thombs, 2000; Yusko, Buckman, White, & Pandina, 2008). Other studies have shown positive associations between degree of athletic involvement (e.g., team leaders versus other athletes; collegiate athletes vs. students who participated in athletics in high school vs. students who have never participated) and alcohol use/alcohol-related problems (Hildebrand, Johnson, & Bogle, 2001; Leichliter et al., 1998). Finally, several studies have found athlete-specific drinking motives were associated with alcohol-related outcomes (Martens, LaBrie, Hummer, & Pedersen, 2008; Martens & Martin, 2010; Martens, Watson, & Beck, 2006).

Another factor related to athletics that may be associated with alcohol use among college athletes, but which has not yet been examined in detail by researchers, is sport achievement motivation (Duda & Nicholls, 1992; Gill & Deeter, 1988; Hanrahan & Biddle, 2002). Research and theory examining sport achievement motivation has included concepts similar to more general achievement motivation, which is conceptualized as the drive to demonstrate mastery of task by meeting (or exceeding) personal standards, or by performing better than others (Atkinson, 1964; Nicholls, 1984). Gill and Deeter (1988) identified a model of achievement motivation in athletics that includes three distinct factors: Competitiveness, Win Orientation, and Goal Orientation. Competitiveness has been defined as the desire to enter and strive for success in sport competition (Gill & Deeter, 1988; Gill, Dziewaltowski, & Deeter, 1988). Win Orientation has been defined as a focus on interpersonal standards and winning in sport, and has been shown to be related to achievement motivation for which success is defined as being better than, or beating, others in sport (Gill & Deeter, 1988; Hanrahan & Biddle, 2002). Finally, Goal Orientation has been defined as a focus on personal standards in sport (Gill et al., 1988), and has been shown to be related to achievement motivation for which success is defined by meeting internal, or personal, goals (Hanrahan & Biddle, 2002).

To date the association between sport achievement motivations and alcohol use has centered on competitiveness, where theoretical articles have speculated that high levels of competitiveness among athletes may translate from the practice and playing arenas into activities like attempting to out-drink one's peers (Martens, 2012; Martens et al., 2006). Some studies have supported this hypothesized relationship between competitiveness and alcohol-related outcomes, although these samples did not exclusively include college athletes. One study found competition-related motives were an important reason for drinking game participation, and these motives were associated with both alcohol use and negative alcohol-related consequences (Johnson & Sheets, 2004). Grossbard, Geisner, Neighbors, Kilmer, and Larimer (2007) found that athletes engaged in drinking games significantly more often than non-athletes, and drinking game participation mediated the relationship between athletic participation and alcohol outcomes. Another study found Competitiveness scores on the Sport Orientation Questionnaire (SOQ; Gill & Deeter, 1988) to be associated with alcohol use even after controlling for demographic variables, although the effect size was relatively small and the sample predominantly included recreational athletes (Serrao, Martens, Martin, & Rocha, 2008). Considering the commonly perceived link between competing and winning (i.e., performing better than others) in sport, athletes high in Win Orientation may be motivated to "win" by drinking more than others in the context of drinking games, chugging contests, and other activities where alcohol use becomes a competition. The link between Goal Orientation and alcohol is less apparent, but there is evidence to suggest that some college students have personal standards that they attempt to reach or improve upon in terms of their drinking behaviors. For example, one study found that some college students reported deliberately trying to increase their tolerance of alcohol, and that almost 75% of these students endorsed "wanted to break my own record" as reason for deliberately increasing their tolerance (Martinez, Steinley, & Sher, 2010).

Given the fact that (a) college athletes are a particularly at-risk population for excessive alcohol use and resulting negative consequences, (b) research has shown that several sport-related factors are associated with drinking behaviors among athletes, and (c) few studies have examined the relationship between sport achievement motivation and alcohol use, the purpose of the current study was to examine the relationship between different types of sport achievement motivation and both alcohol use and alcohol-related problems among intercollegiate athletes. We hypothesized that each sport achievement orientation subscale would be positively associated with alcohol use and alcohol-related problems. Although we did not have specific a priori hypotheses for interaction effects, since alcohol use and predictors of such use differ across in-versus off-season status (Martens et al., 2006; Martens & Martin, 2010) we examined seasonal status as a potential moderator of the sport achievement effects. Given gender differences on alcohol use and related predictors among college students, such as women being less likely to engage in drinking contests or to train in order to beat personal drinking records (Engs & Hanson, 1993; Martinez et al., 2010), gender was also examined as a moderator variable. Given the dearth of literature examining the relationship between sport achievement motivation, alcohol outcomes, and gender, no a priori hypotheses were made regarding specific gender effects.

2. Method

2.1. Participants

The sample included varsity athletes who were recruited from three college campuses from different regions of the United States participating in a larger study examining the effects of a brief alcohol intervention (see Martens, Kilmer, Beck, & Zamboanga, 2010). Baseline data from the parent project were used for this study. All varsity and club athletes at each campus were recruited to participate ($N = 1215$). Approximately 1000 of those recruited were varsity athletes. Of this sample, 263 varsity athletes completed baseline measures. The mean age of the sample was 19.99 ($SD = 1.52$) years and the majority of participants were female (75.7%). Participants identified as 85.2% Caucasian, 5% Asian American/Pacific Islander-American, 1.9% African American, 1.9% Hispanic/Latino(a), and 5.7% "other ethnicities." Approximately half (52.1%) of participants reported being in-season during baseline assessment.

2.2. Measures

2.2.1. Sport-related achievement motivation—Sport-related achievement was measured using the Sport Orientation Questionnaire (SOQ; Gill & Deeter, 1988). The SOQ consists of 25 items assessing sport-related achievement motivation on three subscales. The Competitiveness subscale is composed of 13 items and assesses the desire to strive for success and satisfaction in sport competition (e.g., "I enjoy competing against others" and "I am a determined competitor"). The Win Orientation subscale consists of 6 items that assess a desire and focus toward winning (e.g., "winning is important" and "I hate to lose"). The Goal Orientation subscale is a 6-item measure assessing the desire to reach self-referenced goals (e.g., "I set goals for myself when I compete"). Items are scored on a 5-point Likert-scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The SOQ has been shown to produce adequate test-retest reliability for all three subscales and has demonstrated good construct validity with moderate to high correlations with other measures of achievement motivation, suggesting that the SOQ assesses similar, yet distinct constructs related to achievement motivation (Gill & Deeter, 1988; Hanrahan & Biddle, 2002). Internal consistency for the present sample was .87, .84, and .78 for the Competitiveness, Win Orientation, and Goal Orientation subscales, respectively.

2.2.2. Alcohol use—A version of the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) was utilized to assess alcohol consumption. Participants were asked to estimate their typical alcohol consumption for each day of the week over the past 30 days. The DDQ allows one to calculate several alcohol use measures. In the present study we used average number of drinks per week (DPW) as our measure of alcohol use, which is common among other studies assessing college student drinking (e.g., Larimer et al., 2001; 2007; Marlatt et al., 1998)

2.2.3. Alcohol-related problems—Problems associated with alcohol use were assessed using the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler, Strong, & Read, 2005). The BYAACQ is a 24-item, self-report measure that assess whether participants have experienced alcohol-related consequences over a certain timeframe (past

three months in the present study) as a result of alcohol use. The measure was specifically designed to be relevant to college students or other young adults. Items include, “I have had a hangover,” “I have passed out from drinking,” and “The quality of my work or school work has suffered because of my drinking.” Dichotomous scoring yields a total score achieved by summing up the responses. The BYAACQ has demonstrated excellent reliability and validity, with scores demonstrating moderate to high correlation with other measures of alcohol-related problems (Kahler et al., 2005). Internal consistency in the present sample was .90.

2.3. Procedures

Enrollment procedures have been previously described (Martens et al., 2010), and will only be summarized here. Email addresses of varsity athletes at each institution were obtained by athletic department personnel at each university. A research assistant emailed each athlete at least twice and informed them that participation in the study involved completing a series of questionnaires and receiving feedback about alcohol use. Those who consented to participate clicked on a link which took them to our questionnaires, all of which were completed online. Participants received a \$20 gift card for completing the baseline questionnaires. IRB approval was obtained at each institution prior to data collection.

2.4. Data Analysis

In order to account for positively skewed data caused by the zero-inflated responses regarding alcohol use and related problems among college athletes, hierarchical Poisson regression analyses were used. Given the relatively large correlations between SOQ subscales, analyses were conducted separately for each subscale of the SOQ. For all analyses examining alcohol-related problems, overall alcohol use defined as DPW was included as a covariate. Given the positive skew of the DPW variable, a log-transformation was used when including DPW as a predictor. On step one of the regression analyses seasonal status, gender, and sport achievement variables were entered simultaneously. On the second step, two-way interaction terms were created between the SOQ subscales, gender, and seasonal status. All two-way interactions were entered simultaneously. Finally, three-way interaction terms were created among gender, seasonal status, and each of the three sport achievement subscales and entered on step three. Continuous predictor variables were mean-centered for all data analysis (Aiken & West, 1991).

3. Results

3.1. Sample Characteristics

Participants reported consuming an average of 6.52 ($SD = 9.10$) DPW, with male athletes reporting an average of 11.69 ($SD = 13.49$) DPW and female athletes reporting an average of 4.87 ($SD = 6.47$). These findings were similar to previous research using a nationally representative sample that found that athletes consume an average of 7.57 DPW, with male athletes consuming 9.85 and female athletes consuming 4.59 DPW (Leichliter et al., 1998). The average number of problems reported was 4.40 ($SD = 4.85$). There were a number of significant bivariate correlations between sport achievement subscales, seasonal status, gender, and the outcome variables (see Table 1).

3.2. Moderation Tests

3.2.1. DPW—On step one of the regression analysis, there were a number of main effects, but these effects were qualified by several moderated effects at step two and step three of the analysis (see Table 2). For Goal Orientation there was a statistically significant two-way interaction with gender, while for Competitiveness and Win Orientation there were statistically significant three-way interactions with gender and seasonal status. Since higher-order interaction effects supersede main or lower-order effects (e.g., Kirk, 1982; Pedhazur, 1997), the highest-order effect for each measure of achievement orientation is summarized below.

3.2.1.1. Competitiveness: On step three of the analysis there was a significant 3-way interaction for competitiveness ($B = .05, p = .003, 95\% \text{ CI } [.02, .09]$). Follow-up of this three-way interaction was examined via two-way interactions between seasonal status and competitiveness separately for men and women, which are plotted in Figure 1. Among men there was a significant interaction between Competitiveness and seasonal status ($B = .03, p = .017, 95\% \text{ CI } [.01, .06]$), such that the relationship between Competitiveness and alcohol use was stronger for in-season ($B = .07, SE = .01, p < .001$) athletes than off-season athletes ($B = .03, SE = .01, p = .006$). In contrast, there was not a significant interaction among female athletes for Competitiveness and seasonal status ($B = -.02, p = .086, 95\% \text{ CI } [-.04, .00]$).

3.2.1.2. Win Orientation: On step three of the analysis there was also a statistically significant three-way interaction for Win Orientation ($B = -.08, p = .015, 95\% \text{ CI } [-.15, -.02]$). Two-way interactions between seasonal status and Win Orientation were examined separately for men and women. As illustrated in Figure 2, the effect of seasonal status on the relationship between Win Orientation and DPW differed between men and women. Among men there was a significant interaction between Win Orientation and seasonal status ($B = -.12, p < .001, 95\% \text{ CI } [-.18, -.06]$), such that higher levels of Win Orientation was associated with less alcohol use for in-season athletes ($B = -.06, SE = .02, p = .003$) and associated with increased alcohol use among off-season athletes ($B = .06, SE = .02, p = .008$). Among female athletes there was a significant interaction between Win Orientation and seasonal status ($B = -.04, p = .013, 95\% \text{ CI } [-.07, -.01]$), such that the relationship between alcohol use and win orientation was stronger for in-season ($B = -.05, SE = .01, p < .001$) than off-season ($B = -.02, SE = .01, p = .074$) athletes.

3.2.1.3. Goal Orientation: On step three there was a significant three-way interaction among Goal orientation, seasonal status, and gender ($B = .14, p < .001, 95\% \text{ CI } [.07, .21]$). Follow-up two-way interactions were again examined separately for men and women (see Figure 3). Among men there was a significant interaction between Goal Orientation and seasonal status ($B = .06, p = .025, 95\% \text{ CI } [.01, .11]$), such that the relationship between alcohol use and Goal Orientation was stronger for in-season athletes ($B = .08, SE = .02, p < .001$) than for off-season athletes ($B = .02, SE = .02, p = .371$). Among female athletes there was a significant interaction between Goal Orientation and seasonal status ($B = -.08, p < .001, 95\% \text{ CI } [-.13, -.04]$), such that the relationship between alcohol use and Goal Orientation was stronger for off-season athletes ($B = .09, SE = .01, p < .001$) than for in-season athletes ($B = .01, SE = .02, p = .545$).

3.2.2. Alcohol-related Problems—After controlling for alcohol use by including DPW as a covariate, no significant effects were found for sport-related achievement motivation, seasonal status, or gender on alcohol-related problems, nor were there any interaction effects.

4. Discussion

The purpose of this study was to examine the relationship among three types of sport-related achievement motivation and alcohol-related outcomes. Interaction effects for each type of achievement motivation were observed. The results indicated that there was a relationship between all three SOQ subscales and alcohol use, but these relationships were moderated by both gender and seasonal status. Implications for these findings are discussed below.

The most important overall finding from this study is that specific sport-related achievement motivations were associated with alcohol use, but most of these relationships were moderated by other variables associated with alcohol use among intercollegiate athletes. Higher levels of Competitiveness were associated with greater alcohol consumption only among men, and although consumption was greater in the off-season, the relationship between Competitiveness and alcohol use was strongest when they were in their competitive seasons, suggesting that Competitiveness may serve as a risk factor for men. Competitiveness was associated with less alcohol use among both in- and off-season female athletes, suggesting that the trait may serve as a protective factor regarding alcohol-related outcomes among women. One explanation of our findings is that for men high in Competitiveness being in-season primes this trait, making it a more salient motivator for achievement in both athletic and non-athletic pursuits, such as drinking occasions. In contrast, Competitiveness may serve as a protective factor against drinking for women regardless of seasonal status because women are less likely to view alcohol consumption as a competitive activity. This is consistent with previous research that found competition to be a more important motivation for playing drinking games for men than for women (Johnson & Sheets, 2004).

The relationship between Win Orientation and alcohol use was moderated by seasonal status and gender such that greater orientation toward winning was associated with greater alcohol use among off-season male athletes and less use among in-season male athletes. Among female athletes, higher Win Orientation was associated with less alcohol use both in- and off-season; however this relationship was stronger for in-season athletes and non-significant for off-season athletes. These findings suggest that for male athletes who are more motivated to achieve because they highly value winning or being better than others in sport, in-season status may serve as a protective factor against heavy alcohol consumption, possibly as a means for facilitating better performance during competition. When these male athletes are in their off-season the desire to win and be better than others in competitive activity may shift from their respective sport to other activities, such as being able to consume more alcohol than others on drinking occasions. It is also possible that that off-season provides an opportunity for drinking heavily without it having a direct impact on athletic outcomes. In contrast, female athletes with a high Win Orientation may be more likely than males to believe that engaging in heavy alcohol use in the off-season will have

carryover effects into an athlete's subsequent season. Thus, female athletes with a high focus on winning may be more likely than males to see excessive alcohol use as having a negative effect on their ability to be successful as an athlete in the future, and therefore limit their drinking accordingly.

The relationship between Goal Orientation and alcohol use was moderated by both seasonal status and gender. For men, higher Goal Orientation was associated with greater alcohol use, but this relationship was stronger for in-season athletes. For women, higher Goal Orientation was also associated with more alcohol use; however the relationship was stronger for off-season athletes. These findings suggest that for male intercollegiate athletes who report higher levels of a desire to meet or beat personal bests or standards may be at increased risk for heavy alcohol consumption, especially during their season of competitive play. It may be that higher Goal Orientation extends beyond sport and is associated with areas outside of sport as well. For example, athletes may strive to "beat personal bests" in a drinking context. This finding is consistent with previous research that suggests that one reason for heavy alcohol consumption may include attempting to break personal drinking records (Martinez et al., 2010). Finally, for female athletes, higher desire to beat personal bests or standards was associated with increased alcohol use, but only in the off-season. This is consistent with findings from both Competitiveness and Win Orientation that suggest that being in-season is a protective factor against alcohol use in female athletes, but unlike Competitiveness and Win Orientation, off-season female athletes who have a stronger desire to beat personal bests do so in other contexts (i.e., drinking).

Interestingly, there were no effects for sport achievement motivation, seasonal status, and gender on alcohol-related problems after controlling for alcohol use. Previous research examining similar risk factors has been equivocal. For example, our findings are consistent with previous research examining sport achievement motivation that found Competitiveness to be associated to alcohol use, but not related problems (Serrao et al., 2008), while other studies have found that competitive motivations for playing drinking games was associated alcohol-related problems (Johnson & Sheets, 2004). Similar to other studies examining athlete and non-athlete samples, alcohol use was a significant predictor of alcohol-related problems. Therefore, it is possible that there exists an indirect relationship through which sport achievement motivation affects alcohol use, which in turn, affects alcohol-related problems; such a question would be best addressed in a longitudinal design. Further research examining sport achievement motivation is necessary to better understand potential mediators or moderators of the relationship between achievement motivations and alcohol-related problems among intercollegiate athletes.

These findings have important implications for athletic performance. First, the moderating effects of both gender and seasonal status on the relationship between Competitiveness and alcohol use suggests that for male athletes, being in-season may make competitive orientation more salient for both athletic and non-athletic activities including alcohol consumption. Similarly, being in-season may make the desire to beat personal bests more salient for athletic pursuits, as well as, drinking contexts. Conversely, male athletes high in Win Orientation consume significantly less alcohol during their season of play, suggesting that this may protect against heavy alcohol consumption and the subsequent negative effects

on performance. For female athletes, higher levels of Competitiveness and Win Orientation are associated with less alcohol consumption, and these relationships were stronger during the season of competitive play. Conversely, female athletes higher in Goal Orientation are more likely to consume alcohol in the off-season. Being more competitive and more oriented toward winning may indicate that the alcohol use is less of a concern, and may not be as important of a factor with regards to athletic performance for women; however, for female athletes who are more oriented toward beating personal bests or standards, the off-season may serve as a period during which achievement pursuits are directed toward drinking contexts.

Taken together, athletes may benefit from feedback regarding their alcohol use in the off-season, as athletes tend to consume more alcohol outside their season of competitive play. This is especially true for male athletes high in Win Orientation and female athletes higher in Goal Orientation. However, male athletes higher in Competitiveness may benefit from feedback focusing on alcohol use and its effects on athletic performance delivered during their season of play as a means of reducing risk for heavy alcohol use during the season of competitive play when alcohol's effects on athletic performance are most meaningful.

There are limitations to the current investigation. The sample included only varsity intercollegiate athletes, making it difficult to determine if our findings generalize to other student athletes (e.g., recreational or club teams) or non-athlete groups. Given research on alcohol use and athletic involvement (Hildebrand et al., 2001; Leichliter et al., 1998), it is possible that these findings may differ in non-varsity or non-athlete samples. The sample also contained an over-representation of female athletes with almost 76% of the sample being women, compared to the approximately 41% to 46% of female student athletes nationally (NCAA, 2012), limiting generalizability of findings. Further, the data collected were cross-sectional, making the direction of the observed relationships impossible to definitively determine. Also, the cross-sectional nature of the data makes it difficult to rule-out the influence of other variables. For example, men who select into athletics may be higher in sensation seeking and Competitiveness, and thus be heavier drinkers. Also, information for athletes who did not complete baseline assessment was unavailable, making it difficult to determine the representativeness of the final sample. Finally, the current sample reported fairly low levels of alcohol consumption this may be due to the over-representation of female athletes in this sample who report less alcohol consumption than male athletes (Leichliter et al., 1998). Alternatively, it is possible that those who responded to the survey are those who consume less alcohol and where therefore more likely to participate. Either of these explanations potentially limit the generalizability of these results. Future research should look to replicate and extend these findings with a more inclusive sample of athletes, equal numbers of male and female athletes, and utilizing longitudinal designs to capture repeated measures of the same athlete across seasonal status.

5. Conclusions

Despite these limitations, the results of the current investigation provided novel and important information regarding the relationship between sport achievement motivation, seasonal status, gender, and alcohol use. Given the effect of alcohol on related problems and

athletic performance, it is important to understand those risk factors unique to intercollegiate athlete alcohol use. As such, this is the first study to examine the relationship of a variety of sport-related achievement motivations as risk factors for alcohol use among this unique population. Future research should focus on replicating these findings and extending them to include potential protective factors that may serve to mediate these relationships.

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Highlights

- The relationship between sport achievement motivation and alcohol use was examined
- Athletes completed self-report measures of achievement motivation and alcohol use
- Competitiveness was related to increased alcohol use among off-season male athletes
- Win Orientation was related to increased alcohol use among off-season male athletes
- Goal Orientation was related to increased alcohol use among in-season male and off-season female athletes

Figure 1. Three-way interaction between Competitiveness, Gender, and Seasonal Status on average drinks per week. Interactions reported separately for male and female athletes. Competitiveness was mean centered. Low and High values represent one standard deviation below and above the centered mean.

Figure 2. Three-way interaction between Win Orientation, Gender, and Seasonal Status on average drinks per week. Interactions reported separately for male and female athletes. Win Orientation was mean centered. Low and High values represent one standard deviation below and above the centered mean.

Figure 3. Three-way interaction between Goal Orientation, Gender, and Seasonal Status on average drinks per week. Interactions reported separately for male and female athletes. Goal Orientation was mean centered. Low and High values represent one standard deviation below and above the centered mean.

Table 1

Summary of Bivariate Correlations for Men and Women Examining Seasonal Status, Scores on the SOQ, and Dependent Variables

Measure	1	2	3	4	5	6
1. Season	--	.04	-.04	-.04	.11	.08
2. Competitiveness	-.22	--	.61***	.40***	-.09	-.03
3. Win	-.56***	.54***	--	.20**	-.12	-.10
4. Goal	-.10	.66***	.30*	--	.15*	.15*
5. DPW	.24	.23	-.16	.09	--	.64***
6. Problems	.36**	.09	-.25*	-.03	.58***	--

Note.

Correlations for men are presented below the diagonal. Correlations for women are above the diagonal. Bivariate correlations of continuous variables are presented with mean centered values. Gender was coded as 1 = men, 2 = women. Season = seasonal status (coded as 1 = in-season, 2 = off-season); Competitiveness = Competitiveness subscale of the SOQ; Win = Win Orientation subscale; Goal = Goal Orientation subscale; DPW = typical drinks per week; Problems = Alcohol-related problems assessed using the PBSS.

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.

Table 2

Parameter Estimates for Interaction and Main Effects for Drinks per Week at Each Step of the Analyses.

	B	SE	Wald Chi-Square	Exp(B)	Sig.
Competitiveness					
<i>Step 1</i>					
Season	−0.40	0.05	63.36	0.67	***
Gender	0.89	0.05	278.70	2.42	***
Competitiveness	0.00	0.00	1.05	1.00	
<i>Step 2</i>					
Season × Gender	−0.47	0.11	18.97	0.63	***
Season × Competitiveness	0.00	0.01	0.01	1.00	
Gender × Competitiveness	0.08	0.01	80.67	1.08	***
<i>Step 3</i>					
Gender × Season × Competitiveness	0.05	0.02	8.64	1.06	**
Win Orientation					
<i>Step 1</i>					
Season	−0.36	0.05	51.24	0.70	***
Gender	0.74	0.05	183.36	2.10	***
Win Orientation	−0.03	0.01	23.73	0.97	***
<i>Step 2</i>					
Season × Gender	−0.42	0.12	11.86	0.66	**
Season × Win Orientation	−0.05	0.01	15.15	0.95	***
Gender × Win Orientation	0.03	0.01	3.59	1.03	
<i>Step 3</i>					
Gender × Season × Win Orientation	−0.08	0.03	5.95	0.92	*
Goal Orientation					
<i>Step 1</i>					
Season	−0.44	0.05	78.15	0.64	***
Gender	0.92	0.05	337.54	2.50	***
Goal Orientation	0.06	0.01	47.82	1.06	***
<i>Step 2</i>					
Season × Gender	−0.22	0.10	4.59	0.80	*
Season × Goal Orientation	−0.02	0.02	1.98	0.98	
Gender × Goal Orientation	−0.02	0.02	1.01	0.98	
<i>Step 3</i>					
Gender × Season × Goal Orientation	0.14	0.03	16.73	1.15	***

Note.

Reported values are from separate analyses for each SOQ subscales. Gender was coded as 1 = men, 2 = women. Season = seasonal status (coded as 1 = in-season, 2 = off-season).

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.