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Justin F. Hummer
Loyola Marymount University, jhummer@usc.edu

Joseph W. LaBrie
Loyola Marymount University, jlabrie@lmu.edu

Andrew Lac
Loyola Marymount University, andrew.lac@lmu.edu

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The prognostic power of normative influences among NCAA student-athletes[*]

Justin F. Hummer[1], **Joseph W. LaBrie**[*], and **Andrew Lac**[1]

Loyola Marymount University, Department of Psychology, 1 LMU Drive, Suite 4700, Los Angeles, CA 90045, United States

Abstract

This study evaluated the predictive power of perceived descriptive and injunctive norms on intercollegiate student-athlete alcohol consumption and attitudes toward drinking-related behaviors. The sample consisted of 594 NCAA student-athletes from two geographically opposite sites. Norms variables utilized a school and gender-specific athletic peer reference group. Results indicate that respondents reported greater perceived injunctive norms than actual attitudes, and greater perceived descriptive norms than actual alcohol use. Further, after accounting for demographics and alcohol motivations, perceived injunctive norms were the strongest predictors of athletes' attitudes with the final model explaining 54% of the variance. Similarly, perceived descriptive norms were among the strongest predictors of alcohol use with the final model explaining 69% of the variance. Future research may want to use both of these perceived norms constructs to create a more salient and targeted social norms intervention aimed at reducing risky behavior and permissive alcohol-related attitudes among this population. Utilizing this strong peer reference group as well as targeting both injunctive and descriptive norms may increase the power and saturation of prevention and intervention strategies.

Keywords

Social norms; Intercollegiate athlete; Alcohol; Gender; Intervention

1. Introduction

Heavy alcohol consumption and its associated negative consequences have wide-ranging detrimental effects on the health and well being of all students, including nondrinkers, and on the institutes of higher education themselves (Perkins, 2002; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994;Wechsler, Lee, Kuo, & Lee, 2000). Identifying strong predictors of drinking in high-risk groups serves to better inform the formation of prevention and intervention programs. National studies show that intercollegiate athletes consumed more alcohol, engaged in more frequent heavy episodic drinking [defined as having four

[*]Corresponding author. Tel.: +1 310 338 5238; fax: +1 310 338 7770.
[1]Fax: +1 310 338 7770.

(female) or five (male) drinks in one sitting], and experienced more negative alcohol-related consequences as compared with non-athletes (Leichliter, Meilman, Presley, & Cashin, 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). Despite the obvious physical requirements necessary for participation in intercollegiate athletics, a review by Martens, Dams-O'Conner and Beck (2006) noted that overall prevalence rates for alcohol consumption among athletes have been found to be between 80% and 87%; slightly higher than the rates of non-athletes. Rigorous training and dedication to a sport seem at odds with heavy alcohol use, yet may mirror the "work hard-play hard" attitude that many athletes embody. In addition to higher reported consumption and consequence levels, previous research found that student-athletes also engage in more alcohol-related high risk behaviors than non-athletes (Leichliter et al., 1998; Nattiv & Puffer, 1991; Nelson & Wechsler, 2001). By identifying the most salient factors influencing student-athletes' drinking behaviors, progress can be made in attempts to promote wellness and peak performance while minimizing negative consequences.

1.1. Factors influencing college student drinking

A number of variables influence college students' consumption of alcohol including demographic variables such as sex and ethnicity (Baer, Kivlahan, & Marlatt, 1995), alcohol accessibility (Hanson, 1974), drinking motives (i.e. social, conformity, coping, and mood enhancement) (Cooper, 1994), expectations about the effects of alcohol (Mackintosh, Earleywine, & Dunn et al., 2006), and previous drinking in high school (LaBrie et al., 2007). However, peer influence is a consistently strong predictor of college student drinking. In the context of college, peers are the major means of support and guidance for most students, exerting greater impact on behavioral decisions than biological, familial, or cultural influences (Berkowitz & Perkins, 1986; Borsari & Carey, 2001). One way peer influence works is through social norms, the beliefs students have about what other students are doing. Social norms theory with respect to drinking suggests that normative beliefs about student drinking, regardless of accuracy, influences individual drinking decisions. Misperceptions about drinking norms are well documented on college campuses (Berkowitz & Perkins, 1986; Perkins,1997; Perkins, Haines, & Rice, 2005) and have been found to be significantly related to individuals' own quantity and frequency of drinking (Clapp & McDonnell, 2001; Larimer, Turner, Mallett, & Geisner, 2004; Lewis & Neighbors, 2004).

In addition to perceptions of normative drinking behavior (also known as descriptive norms), perceptions about peers' acceptability of alcohol use exist as well. These are called injunctive norms (Cialdini, Reno, & Kallgren, 1990). Perceived injunctive norms are often erroneous and have been found to be correlated with personal drinking quantity, frequency, heavy drinking, and drinking to intoxication (Nagoshi, 1999; Perkins & Wechsler, 1996;Wood, Nagoshi, & Dennis, 1992). Thus, it is likely that perceived descriptive and injunctive norms independently influence students' drinking behaviors in the direction of heavier use.

Similar to the discrepancies that exist in the general college population between perceived norms and drinking attitudes and behavior, subpopulations of students also misperceive the attitudes and behavior of their respective peer group. Research suggests that misperceptions

of proximal reference groups are more likely to influence drinking behavior than misperceptions of distal reference groups (Borsari & Carey, 2003; Korcuska & Thombs, 2003; Lewis & Neighbors, 2006). Aside from actual membership in structured-type groups (e.g. campus organizations), proximal reference groups are composed of several different identifying characteristics that fluctuate in levels of importance to an individual. Research with the general college student population has shown that perceptions of close friends' drinking is more strongly related to personal consumption than perceptions of drinking among the typical student (Baer, Stacy, & Larimer, 1991) and that gender-specific norms are stronger predictors of personal consumption than gender nonspecific or gender-opposite norms (Lewis & Neighbors, 2004).

1.1.1. Athlete-specific peer influence—Research specific to intercollegiate athletes examining the effects of peer influence in the form of perceived norms have yielded slightly mixed results. Thombs (2000) found that typical student norms were better predictors of athlete drinking than athlete-specific norms, whereas Martens, Dams-O'Conner and Beck (2006); Martens, Dams-O'Conner, Duffy-Paiement et al. (2006) corroborated previous nonathlete-specific research in that perceptions of close friends' drinking were strongly related to personal alcohol consumption. Moreover, perceived drinking among both athlete and nonathlete friends was related to personal alcohol consumption among female athletes but only the perception of athlete friends was related to male athletes' own alcohol use (Martens et al., 2006). Research conducted by Dams-O'Conner, Martin and Martens (2007) expanded on these findings by assessing the relationship between perceived drinking norms and personal alcohol consumption as a function of seasonal status, using four reference groups (closest athlete friend, closest nonathlete friend, typical athlete and typical nonathlete). Results showed that the strongest predictor of use for both in-season and off-season athletes was perceived norms of typical athletes. However, in all three studies, the focus was on descriptive norms, despite research indicating the importance of both descriptive and injunctive norms in predicting drinking (Larimer et al., 2004; Wood, Read, Palfai, & Stevenson, 2001). Only one study has investigated the effect of athlete status (athlete vs. nonathlete) on the relationship between injunctive norms (perceived approval of heavy episodic drinking by one's close friends) and heavy drinking (Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007). Results indicated that athletic participation was positively related to this injunctive norm, which, in turn, was related to heavy drinking. Further, intercollegiate student-athletes are known to exist in a somewhat isolated environment that is often over reliant on the inter-athletic community for both social support and social activity (Martens et al., 2006). Thus, it is important to understand the less overt mechanisms of influence acting on student-athletes' alcohol-related attitudes and decisions to use alcohol (i.e. perceived group-specific norms) and examine the strength of these relationships relative to other predictive factors.

1.1.2. Drinking motives—Drinking motives represent an important construct of study with athletes and alcohol. In more general college student populations, drinking motives have been found to be powerful predictors of drinking (e.g. Cooper, 1994), as well as moderators of intervention efficacy (e.g. LaBrie, Huchting et al., 2008). In an effort to understand the nature of these relationships among intercollegiate athletes, Martens et al.

(2003) set forth an empirical measurement using the Drinking Motives Measure (DMM; Cooper, 1994). This instrument measures the reasons an individual has for consuming alcohol and consists of four subscales: Social Motives, Enhancement Motives, Conformity Motives, and Coping Motives. Martens et al. found that three DMM factors (excluding the conformity motive) yielded a significant amount of variance accounted for in the alcohol use variables, with R^2 values ranging from .17 to .21.

1.1.3. Athlete-specific reasons for drinking—More recent research has sought to identify specific sport-related factors uniquely associated with intercollegiate athlete alcohol use. The Athlete Drinking Scale (ADS) was developed to categorize athletes' sport-related reasons for drinking into reliable and valid subscales (Martens, Watson, Royland, & Beck, 2005). Following an extensive exploratory factor analysis, three distinct subscales emerged: Positive Reinforcement, Team/Group, and Sport-Related Coping. Positive Reinforcement is related to using alcohol as a means of obtaining pleasure or a feeling of reward, generally related to one's activity as an athlete. Team/Group is related to using alcohol as a function of the environment of an athletic group. Lastly, Sport-Related Coping is related to drinking as a method of coping with sport-related problems. As a whole, this three-factor solution accounted for 61% of the initial variance in drinking, with Positive Reinforcement accounting for 42% of the initial variance alone. Due to the powerful predictive value of general and sport-related reasons for drinking among the intercollegiate athlete population, it seems a necessary and integral step to incorporate these constructs into new prediction models.

1.2. Specific aims and hypotheses

The present study was designed to examine the prognostic power of perceived descriptive and perceived injunctive norms on student-athlete alcohol consumption and attitudes while controlling for demographics and alcohol motivations that previous research has identified as strong predictors of alcohol use. These norms variables utilized a school- and gender-specific athletic peer reference group to maximize salience to the respondent. Several hypotheses are tested in this research. First, because we used alcohol-relevant motivation measures known to be independently related to student-athletes (i.e. DMM, ADS), we hypothesized that these measures would account for a significant proportion of the variance in alcohol use among the student-athlete sample. Next we anticipated that consistent with prior research, student-athletes would hold exaggerated perceptions of behavior and attitudes related to alcohol use within their reference groups. Finally, the main objective of this research was to investigate which particular variables most strongly contributed to explaining one's alcohol use behavior and attitudes toward drinking and estimate the total variance explained by these models. We hypothesized that after statistically controlling for all other relevant predictors in the study, perceived injunctive norms would best predict actual attitudes towards drinking whereas perceived descriptive norms would best predict alcohol-related behavior among intercollegiate athletes.

2. Method

2.1. Participants

A local institutional review board approved the current study, which was part of a larger social norms study. In total, 657 student-athletes from two sites were recruited to participate. Out of these, 610 athletes completed the study, yielding a recruitment rate of 90%. Due to 16 participants with incomplete survey data, a total of 594 student-athletes from a mid-size university on the west coast ($n = 286$) and the east coast ($n = 308$) were included in analyses. Participants from all 13 sports at these schools were represented: cheer (2.9%), basketball (7.1%), softball (2.0%), swimming (11.1%), track/cross country (13.0%), tennis (5.9%), water polo (4.4%), baseball (5.4%), golf (2.0%), crew (17.2%), soccer (12.8%), volleyball (4.4%), and lacrosse (12.0%). All athletes competed at the National Collegiate Athletic Association (NCAA) Division 1 level at their respective institutions. The mean age of respondents was 19.57 (SD = 1.33) and a slight majority were female (56.7%). The sample well-represented class years with 36.4% Freshmen, 23.6% Sophomores, 23.9% Juniors, 14.5% Seniors, and 1.7% Fifth year students. The racial identification of participants was primarily White (79.5%), with the remainder identified as Latino (6.6%), Black (5.1%), Asian (2.9%), Native American (0.8%), and Mixed/Other (5.1%). Approximately 61.1% of the athletes were reportedly in their season of sport at the time of assessment. Finally, the majority of the sample (82.5%) reported drinking at least once a month, on average.

2.2. Design and procedure

Permission was granted from the athletic director at both sites, prior to initiating the study and contacting athletic team coaches. Then, at the beginning of the spring 2007 semester, coaches from all athletic teams were contacted and introduced to the project. They were told that their teams were invited to participate in a study about alcohol use and that it would fulfill alcohol programming requirements from their respective Athletic Department. Every coach agreed to allow players the opportunity for participation and provided a team roster with members' email addresses. An electronic protocol explaining the parameters of the study, consent form, and link to the survey was emailed to each student athlete, who then electronically consented to the study before being directed to the survey itself. The consent form contained assurances of confidentiality, specifying that nothing about individual or specific team responses would be communicated to any administrative university personnel, including coaching staff. Finally, every participant and team was assigned a custom ID that was used throughout the duration of the study and the list of custom IDs was kept separate from the names at all times.

2.3. Measures

2.3.1. Demographics questionnaire—The survey began with an assessment of demographic variables including age, gender, class year, and race.

2.3.2. Drinking Motives Measure—Participants completed the 20-item Drinking Motives Measure (Cooper, 1994) which included subscales assessing Social (e.g., "To be sociable"), Enhancement (e.g., "Because you like the feeling"), Coping (e.g., "To forget your worries"), and Conformity (e.g., "Because your friends pressure you to drink") reasons

for drinking in the past month. Items were on a 1 (almost never/never) to 5 (almost always/ always) response format. Reliability tests revealed adequate reliability within subscales: Social ($\alpha = .94$), Enhancement ($\alpha = .91$), Coping ($\alpha = .87$), and Conformity ($\alpha = .89$).

2.3.3. Athlete Drinking Scale—The 19-item Athlete Drinking Scale (Martens et al., 2005) was administered to participants as a measure of sport-related reasons for intercollegiate athlete alcohol use. The ADS includes three subscales: (a) Positive Reinforcement ($\alpha = .94$; e.g., "After a game/match/meet, it is important for me to go out and celebrate with alcohol"), (b) Team/Group ($\alpha = .92$; e.g., "I feel pressure from my teammates to drink alcohol"), and (c) Sport-Related Coping ($\alpha = .85$; e.g., "I drink to help me deal with poor performances"). Responses were on a Likert scale from 1 (strongly disagree) to 6 (strongly agree).

2.3.4. Variations in question format—Before answering questions about drinking behavior and attitudes, participants were presented with the definition of a standard drink (defined as a drink containing one-half ounce of ethyl alcohol — one 12 oz. beer, 8 oz. of malt liquor, one 4 oz. glass of wine, or one 1.25 oz. shot).

Participants were asked questions regarding perceived injunctive norms, perceived descriptive norms, actual attitudes towards drinking, and actual alcohol use. The questions were organized either by attitudes (perceived injunctive norms and actual attitudes) or behaviors (perceived descriptive norms and actual alcohol use). In each ordering, there were five series, with each series containing two types of questions. The first type of question asked about what they thought were the attitudes (or behavior) of a typical student-athlete of their gender, while the second type asked about their own attitudes (or behavior). Every question assessing perceived injunctive or descriptive norms referenced the university and gender group to which the individual belonged (e.g. "a typical School Name:Gender athlete").

2.3.5. Perceived injunctive norms and actual (individual) attitudes—Two items from the House Acceptability Questionnaire (Larimer, 1992) assessed acceptability of alcohol-related behaviors: "becoming intoxicated at a party," and "missing a class because you are intoxicated or hung-over." Three questions were created specific to the athletic culture. These assessed acceptability of "getting drunk during in-season," "drinking within three days of a match/game," and "initiating new members of the team with activities involving alcohol." Response options for these five items were as follows: 1 (Not acceptable), 2 (Hardly ever acceptable), 3 (Seldom acceptable), 4 (Neither not acceptable nor acceptable), 5 (Sometimes acceptable), 6 (Often acceptable), and 7 (Very acceptable). These five questions revealed adequate reliability for a "typical athlete" (perceived injunctive norms; $\alpha = .79$), and actual attitudes ($\alpha = .76$).

2.3.6. Perceived descriptive norms and actual (individual) alcohol use— Modifications of the CORE$^{©}$ survey questions assessed perceived descriptive norms and actual alcohol use. These items asked about quantity, frequency, maximum number of drinks at any one time, and heavy episodic drinking and were measured on a scale from 1 to 9, with higher values reflecting greater use. Please see Appendix A for a list of questions and

response options. These five questions revealed adequate reliability for a "typical athlete" (perceived descriptive norms; $\alpha = .85$) and actual alcohol use ($\alpha = .92$).

2.4. Composite variables

For analyses, individual responses from the five perceived injunctive and five perceived descriptive norms questions (asking about "a typical athlete") were averaged together to form a perceived injunctive norm composite and a perceived descriptive norm composite, respectively. Similarly the five questions asked of individual attitudes and individual drinking were each averaged to form an attitudes composite and alcohol use composite, respectively. These composite scores were used to parsimoniously condense analyses into one representative variable to provide a more robust examination of the impact of perceived norms on alcohol consumption and attitudes among student athletes. The distributional properties of these four composites show that they were approximately normal, with skewness levels of −.28 to .21. See Table 1 for a list of means for items comprising each composite, by gender.

3. Results

3.1. Analytic plan

To address the research hypotheses, several analyses were performed. First, we assessed if there were differences between in-season and out-season athletes on the composites of actual attitudes, actual behavior, perceived injunctive norms, and perceived descriptive norms. Then, a correlation matrix allowed for the examination of associations between the variables in the study.

Next, paired *t*-tests determined whether significant differences in means existed between the actual and perceived composites. If significant, misperception variables (defined as perceived minus actual) were computed, and then independent *t*-tests were undertaken to detect the extent of differences in misperception between male and female student-athletes.

Finally, to offer an overall predictive model of student-athletes' actual attitudes as well as actual alcohol use, two simultaneous hierarchical multiple regression models were estimated. The regression models were specified as follows: In Step 1, the demographic covariates of gender, race, class year, and season of sport were entered. The alcohol-related motives subscales of the Drinking Motives Measure and the Athlete Drinking Scale followed in Step 2. To determine if both types of perceived norms—injunctive and descriptive— further accounted for additional variance, they were entered in Step 3. Interaction terms involving gender and each of these two perceived norms were computed in Step 4. Prior to calculation of the interaction terms, these variables were standardized to minimize problems associated with multicollinearity. To probe significant interaction terms, the slopes of the graphs were evaluated with simple slope analyses, according to procedures put forth by Aiken and West (1991).

3.2. Season of sport differences

On actual drinking, out-season athletes (M = 3.72, SD = 1.61) reported significantly greater alcohol consumption than in-season athletes (M = 3.35, SD = 1.60), t(592) = 2.71, p<.01. Also, perceived descriptive norms were significantly higher in out-season athletes (M = 4.67, SD = 1.27) than in-season athletes (M = 4.31, SD = 1.15), t(592) = 3.48, p<.001. But no significant differences were found on actual attitudes, as a function of out-season (M = 3.02, SD = 1.18) and in-season (M = 3.03, SD = 1.21), t(592) = .12, ns; nor on perceived injunctive norms, as a function of out-season (M = 3.76, SD = 1.28) and in-season (M = 3.76, SD = 1.23), t(592) = .03, ns.

3.3. Correlation of variables

The correlation matrix of measured variables, by gender, is displayed in Table 2. In the male sample, actual drinking attitudes significantly correlated with all variables except class year and season of sport; actual alcohol use exhibited the same general pattern of associations. In the female sample, however, actual attitudes significantly correlated with all variables except for race, class year, and season of sport; actual alcohol use correlated with all variables except perceived injunctive norms and race.

3.4. Misperceptions: perceived vs. actual

Next, we investigated whether athletes' perceptions concerning their peers' alcohol approval and behavior are discrepant with their own actual reports. Paired t-tests showed that respondents tend to report greater perceived injunctive norms than actual attitudes, and greater perceived descriptive norms than actual alcohol use (Table 3). As these patterns were demonstrated in the male as well as female sample, independent t-tests assessed whether misperception scores (perceived minus actual) statistically differed as a function of respondents' gender. No systematic gender-based mean differences were discovered on injunctive misperceptions, t(592) = 1.67, ns, or descriptive misperceptions, t(592) = .642, ns.

3.5. Model predicting actual attitudes

As shown in Table 4, each added block of variables in the hierarchical multiple regression explained a statistically significant proportion of variance in actual attitudes. Furthermore, the final model, taking into account all predictors, explained a substantial 54% of the variance in actual attitudes, F(15, 578) = 46.25, p<.001. In particular, the following variables were uniquely and significantly predictive in the final model: gender (β = .07, p<.05); Social Motives (β = .14, p<.05), Positive Reinforcement (β = .25, p<.001), Sport-Related Coping (β = .12, p<.05), and perceived injunctive norms (β = .49, p<.001).

3.6. Model predicting actual alcohol use

The regression model predicting actual alcohol use, presented in Table 5, shows that each successive block of variables was statistically significant, and that the final model explained a considerable 69% of the variance, F(15, 578) = 84.35, p<.001. Significant predictors included: gender (β = .10, p<.001), race (β = .07, p<.01), class year (β = .07, p<.01), season of sport (β = .05, p<.05), Social Motives (β = .23, p<.001), Enhancement Motives (β = .14 p<.001), Positive Reinforcement, (β = .33, p<.001), Team/Group (β = −.14, p<.01), Sports-

Related Coping, (β = .13, p<.001), perceived injunctive norms (β = −.09, p<.01), perceived descriptive norms (β = .32, p<.001), and gender×perceived descriptive norms (β = .09, p<.001). The significant interaction effect is depicted in Fig. 1, with gender serving as the moderator, and perceived descriptive norms plotted one standard deviation above and below the mean. Higher perceived descriptive norms were shown to be associated with more pronounced gender differences in actual alcohol use. Decomposition of this moderation effect via simple slope analyses reveals that the slopes for males (β = .61, p<.001) and females (β = .41, p<.001) differ significantly from zero.

4. Discussion

The present research evaluated the relationship between perceived gender-specific norms and actual alcohol use and attitudes among NCAA student-athletes at two sites. Perceptions of descriptive and injunctive norms exceed actual behavior and attitudes for both male and female student-athletes. In addition, this research demonstrates that after statistically controlling for all other relevant predictors in the study, perceived injunctive norms are the strongest predictor of student-athletes' attitudes towards drinking. The final prediction model for attitudes explains a sizeable 54% of the variance in individual attitudes. Similarly, perceived descriptive norms are among the strongest predictors of actual drinking behavior in this sample. The final model predicting actual alcohol use explains a substantial 69% of the variance in individual drinking.

The current study lends support to extant research by illustrating the salience of group- and gender-specific norms from a salient peer reference group, which may have positively impacted the predictive value of participants' perceived norms. This adds to the growing literature showing the importance of employing more proximal, rather than distal, reference group norms; as it appears proximal norms are more influential. The finding that athletes tend to overestimate the actual behavior and attitudes of their reference group is consistent with reports from research on the drinking norms of other groups of college students (see Perkins, 2002). These misperceptions in actual norms may incite higher risk alcohol use.

4.1. Implications and future research

It is important to note that these norms were among the strongest predictors of behavior and attitudes, over and above other previously identified strong predictors. Consequently, both of these perceived norms constructs (descriptive and injunctive) should be considered in research and interventions targeting risky drinking behavior and attitudes among intercollegiate student-athletes. Future research may want to use the findings from this and other studies to create a more salient and targeted social norms intervention for this population. Using group- and gender-specific norms as well as targeting both injunctive and descriptive norms may increase the power and saturation of the intervention. Given the quantity of existing research and resources devoted to the topic of social norms and its application to interventions in the collegiate environment, it seems practical to utilize this approach and construct, rather than other lesser predictors such as drinking motives. Larimer et al. (2004) found that correcting misperceptions of injunctive and descriptive norms reduced heavy alcohol use among other at-risk groups, such as Greek organizations. More

recent research shows that a targeted normative feedback intervention among high-risk student groups reduced drinking behavior compared to active control groups who received general student normative feedback (LaBrie, Hummer et al., 2008). This reduction in drinking was mediated by a change in misperceived group-specific norms. Further, other studies specifically targeting intercollegiate student-athletes using alcohol interventions were not successful in reducing drinking or were not able to demonstrate impact with sufficient program evaluation (Marcello, Danish, & Stolberg, 1989; Thombs & Hamilton, 2002; Tricker & Connolly, 1996), while one study has shown modest reductions in misperceived norms and drinking among student-athletes by using a social norms campaign (Perkins & Craig, 2006). Thus, interventions focused on reducing perceived gender-specific injunctive and descriptive norms may hold promise with this at-risk population.

4.2. Limitations

Limitations exist in this study. First, the survey data are based on self-report and subject to error. However, studies reveal that self-report survey data are generally reliable and valid (Babor, Steinberg, Del Boca, & Anton, 2000; Midanik, 1988). Further, participants were repeatedly assured of confidentiality and told that none of their responses would be released to coaches or school administrators, as this was expected to increase participants' confidence to honestly report in their assessment. Secondly, the cross-sectional design of the research precludes strong inferences of causation. Future research should attempt to replicate the strength of the observed relationships using longitudinal data. Finally, results from the regression model show that perceived injunctive norms and Team/Group motives negatively predict individual drinking behavior. These results are in contrast to the correlation matrix (Table 2), which indicates that these variables are instead positively correlated with drinking behavior. A likely explanation, as put forth by Neighbors and colleagues (2007), who also exhibited a similar pattern of findings, albeit in a study on gambling, is that such results are due to the false uniqueness effect (Sus, Wan, & Sanders, 1988). That is, respondents who reported lower drinking behavior perceived themselves as unique in that they viewed their peers as more approving of alcohol consumption. Note that the items of perceived injunctive norms and Team/Group motives, in essence, measure the concept of peer approval of alcohol. This effect did not emerge, however, until alcohol-relevant covariates were statistically controlled for in the model.

4.3. Conclusion

This research extends previous work aimed at using perceived norms in the formation of prediction models of intercollegiate athlete alcohol use and attitudes. Previous research has shown that gender-specific norms are the most powerful predictor of drinking behavior, but this is the first study to show this relationship among student-athletes after controlling for other powerful covariates. Also, this study is the first to put forth a prediction model for injunctive norms among an intercollegiate student-athlete sample. Although future research is needed to empirically evaluate the impact that correcting such norms may have on subsequent behavior and attitudes, the current findings help lay the groundwork for future prevention and intervention strategies among this population.

Appendix A

Participant drinking behavior and perceptions of normative drinking

Series 1	
Questions	Responses
	1) Never — six times a year
a. How often does a *typical School Name:Gender athlete* consume alcohol?	2) Once a month
	3) Twice a month
	4) Once a week
	5) Twice a week
b. How often do *you* consume alcohol?	6) Three times a week
	7) Four times a week
	8) Five to six times a week
	9) Everyday
Series 2	
Questions	Responses
	1) None
a. How many drinks, on average, does a *typical School Name: Gender athlete* consume during a typical drinking occasion?	2) 1–2
	3) 3
	4) 4
	5) 5–6
	6) 7–8
b. How many drinks, on average, do *you* consume during a typical drinking occasion?	7) 9–10
	8) 11–12
	9) 13 or more
Series 3	
Questions	Responses
	1) None
a. How many drinks does a *typical School Name:Gender athlete* drink each week?	2) 1–2
	3) 3–5
	4) 6–8
	5) 9–10
b. How many drinks do *you* drink each week?	6) 11–14
	7) 15–18
	8) 19–21
	9) 22 or more
Series 4	
Questions	Responses
	1) None

Questions	Responses
a. Within the past 30 days, what is the maximum number of drinks the *typical School Name:Gender athlete* consumed during one occasion?	2) 1–3
	3) 4–6
	4) 7–9
	5) 10–12
	6) 13–15
	7) 16–18
	8) 19–21
b. Within the past 30 days, consider the one occasion where you drank the most. How much did *you* drink?	9) 22 or more

Series 5

Questions	Responses
	1) None
a. Over the past two weeks, how many times has a *typical School Name:Gender athlete* had 5 or more drinks in a two hour period?	2) 1 time
	3) 2 times
	4) 3 times
	5) 4 times
	6) 5 times
	7) 6 times
b. Over the past two weeks, how many times have *you* had 5 or more drinks in a two hour Period?	8) 7–9 times
	9) 10 or more times

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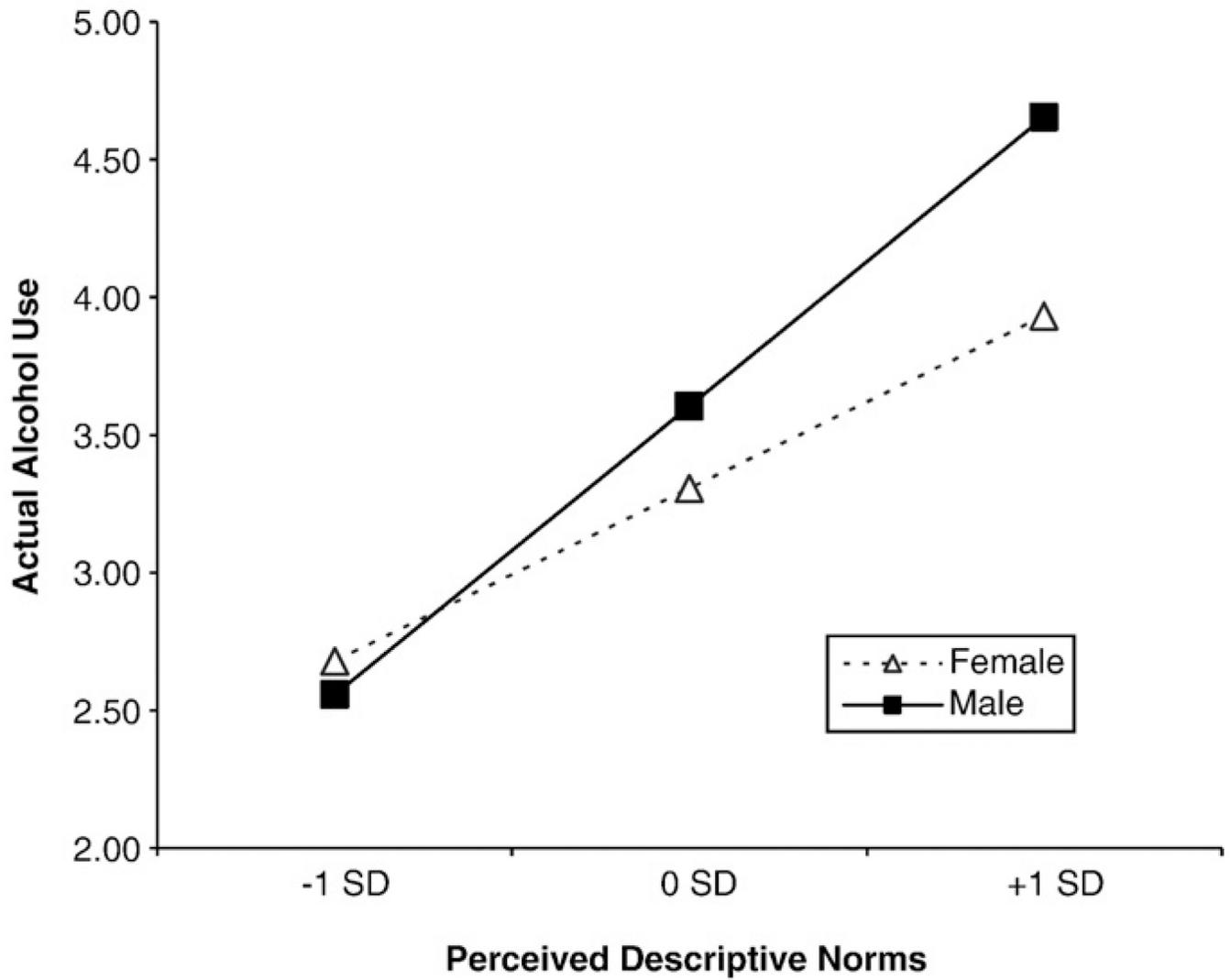
Fig. 1.
Gender moderating the effect of perceived descriptive norms on actual alcohol use.

Table 1

Means and standard deviations for responses by gender.

Descriptive norms	Male athletes		Female athletes	
	Perception of typical male athlete	**Actual alcohol use**	**Perception of typical female athlete**	**Actual alcohol use**
1. Frequency (1 = never to 6× a year; 9 = everyday)	4.58 (1.20)	3.76 (1.72)	4.42 (1.07)	3.50 (1.50)
2. Average drinks per occasion (1 = none; 9 = 13 or more)	5.57 (1.72)	4.84 (2.26)	4.70 (1.29)	3.88 (1.69)
3. Drinks per week (1 = none; 9 = 22 or more)	5.27 (2.06)	4.18 (2.52)	4.26 (1.62)	3.14 (1.71)
4. Peak drinks in past 30 days (1 = none; 9 = 22 or more)	5.22 (1.78)	4.17 (2.19)	4.18 (1.42)	3.13 (1.47)
5. Heavy episodic events in past 2 weeks (1 = none; 9 = 10 or more times)	3.64 (1.61)	2.77 (1.85)	3.17 (1.26)	2.08 (1.28)
Injunctive norms	Perception of typical male athlete	Actual attitudes	Perception of typical female athlete	Actual attitudes
(1 = never acceptable; 7 = very acceptable)				
1. Becoming intoxicated at a party	5.13 (1.58)	4.67 (1.78)	5.15 (1.53)	4.65 (1.71)
2. Missing a class because you are intoxicated or hung-over	3.12 (1.57)	2.26 (1.43)	2.98 (1.56)	1.86 (1.12)
3. Getting drunk during in-season	4.01 (1.61)	3.42 (1.78)	3.81 (1.66)	3.13 (1.71)
4. Drinking within three days of a match/game	3.10 (1.80)	2.40 (1.71)	2.94 (1.67)	2.08 (1.52)
5. Initiating new members of the team with activities involving alcohol	4.02 (1.91)	3.44 (1.95)	3.48 (1.97)	2.61 (1.81)

Note: See Appendix A for a full list of descriptive normative questions and response options.

Table 2

Correlation matrix of variables.

Type	Variable	1	2	3	4	6	7	8	9	10	11	12	13	14	15
Actual	1. Attitudes	–	.55	.50	.27	.07	.09	.03	.21	.44	.11	.45	.55	.33	.27
	2. Alcohol use	.60	–	.08	.41	.20	.05	.14	.42	.66	.17	.61	.66	.27	.31
Perceived	3. Injunctive norms	.63	.26	–	.43	.02	.14	–.01	–.06	.08	–.02	.10	.10	.11	.00
	4. Descriptive norms	.37	.61	.46	–	.12	.03	.17	.16	.22	.02	.16	.27	.18	.09
Demographics	6. Race (Caucasian)	.20	.26	.10	.18	–	.03	.02	.06	.13	.05	.07	.16	.09	.09
	7. Class year	.10	.10	.02	–.06	–.11	–	–.08	–.11	.01	–.14	.00	.03	–.04	–.05
	8. Season of sport (out-season)	–.06	.08	.00	.11	–.07	–.15	–	.02	.08	.02	.01	.04	.04	–.02
Drinking motives	9. Coping	.30	.35	.16	.14	.08	.01	–.06	–	.60	.58	.58	.40	.39	.47
Measure	10. Social	.46	.67	.25	.40	.17	.04	.09	.51	–	.42	.83	.60	.33	.29
	11. Conformity	.26	.23	.24	.14	.01	–.03	.01	.76	.33	–	.39	.22	.51	.37
	12. Enhancement	.51	.67	.30	.42	.11	.04	.01	.53	.82	.40	–	.62	.35	.35
Athlete drinking	13. Positive reinforcement	.49	.70	.26	.39	.26	.10	.05	.41	.65	.28	.69	–	.61	.57
Scale	14. Team/group	.44	.45	.33	.29	.15	–.06	.10	.47	.37	.54	.41	.68	–	.70
	15. Sport-related coping	.39	.42	.17	.16	.17	–.03	–.05	.59	.32	.49	.37	.58	.77	–

Note: Correlations below the diagonal are from the male sample, and above the diagonal are from the female sample. Reference group for race is non-Caucasian; for season of sport is in-season.

For males, correlations above /.12/ are significant, $p < .05$.

For females, correlations above /.10/ are significant, $p < .05$.

Table 3

Misperceptions: differences between perceived and actual.

Gender	Perceived injunctive norms		Actual attitudes		Paired t-test	Cohen's d	Perceived descriptive norms		Actual alcohol use		Paired t-test	Cohen's d
	M	(SD)	*M*	(SD)			*M*	(SD)	*M*	(SD)		
Male	3.89	(1.28)	3.24	(1.28)	14.05***	0.51	4.86	(1.33)	3.95	(1.86)	9.80***	0.56
Female	3.67	(1.22)	2.86	(1.10)	12.72***	0.70	4.14	(1.05)	3.15	(1.30)	9.47***	0.84

*
p<.05.

**
p<.01.

***
p<.001.

Table 4

Hierarchical multiple regression predicting actual attitudes.

Predictor	At step		Final model		
	R^2	R^2 total	B	SE	β
Step 1: Demographics	.05 ***	.05 ***			
Gender (Male)			.09	.04	.07 *
Race (Caucasian)			.04	.09	.01
Class year			.03	.03	.03
Season of sport (out-season)			−.04	.07	−.02
Step 2: Alcohol motives	.29 ***	.34 ***			
Drinking motives measure					
Coping			−.03	.07	−.02
Social			.13	.05	.14 *
Conformity			−.09	.08	−.06
Enhancement			.11	.06	.11
Athlete drinking scale					
Positive reinforcement			.23	.05	.25 ***
Team/group			−.01	.06	−.01
Sport-related coping			.13	.05	.12 *
Step 3: Perceived norms	.20 ***	.54 ***			
Perceived injunctive norms			.59	.04	.49 ***
Perceived descriptive norms			−.07	.04	−.06
Step 4: Interactions	.00	.54 ***			
Gender×perceived injunctive norms			.07	.04	.06
Gender×perceived descriptive norms			−.01	.04	−.01

Note. Reference group for gender is female; for race is non-Caucasian; for season of sport is in-season.

*
p<.05.

**
p<.01.

***
$p<.001.$

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Table 5

Hierarchical multiple regression predicting actual alcohol use.

Predictor	At step		Final model		
	R^2	R^2 total	B	SE	β
Step 1: Demographics	.13 ***	.13 ***			
Gender (Male)			.15	.04	.10 ***
Race (Caucasian)			.27	.10	.07 **
Class year			.09	.03	.07 **
Season of sport (out-season)			.16	.08	.05 **
Step 2: Alcohol motives	.47 ***	.60 ***			
Drinking motives measure					
Coping			−.01	.08	−.01
Social			.30	.06	.23 ***
Conformity			−.07	.08	−.03
Enhancement			.19	.06	.14 **
Athlete drinking scale					
Positive reinforcement			.42	.05	.33 ***
Team/group			−.21	.07	−.14 **
Sport-related coping			.20	.06	.13 ***
Step 3: Perceived norms	.08 ***	.68 ***			
Perceived injunctive norms			−.14	.04	−.09 **
Perceived descriptive norms			.52	.05	.32 ***
Step 4: Interactions	.01 ***	.69 ***			
Gender×perceived injunctive norms			.01	.04	.01
Gender×perceived descriptive norms			.15	.04	.09 ***

Note. Reference group for gender is female; for race is non-Caucasian; for season of sport is in-season.

*
$p<.05$.

**

$p<.01.$

***

$p<.001.$