Athlete identity, athlete-specific drinking motives, and alcohol-related behaviors among university student-athletes: Examining indirect pathways

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OBJECTIVE*: Alcohol use is commonly endorsed among university student-athletes. Athlete identity can influence the extent to which student-athletes consume alcohol, however, the pathway from athlete identity to alcohol use and related consequences remains unknown. As such, the present study tested whether athlete-specific drinking motives could help explain the association between athlete identity and alcohol use and related consequences.* METHOD: *Participants were 177 university student-athletes who completed a brief, online self-report questionnaire.* RESULTS: *Path analysis revealed a significant indirect pathway between social identification and alcohol consumption by way of positive reinforcement drinking motives (β =.10, p = .03). No other significant indirect effects emerged.* CONCLUSIONS: *Positive reinforcement motives may help explain some of the association between athlete identity and alcohol consumption among student-athletes. This knowledge may help psychologists identify specific types of athletes (e.g., high social identification, positive reinforcement drinkers) that may benefit from receiving alcohol-related prevention efforts..*

KEY WORDS: Alcohol consumption, athlete identity, drinking motives, negative drinking consequences, student-athlete.

It is well established that alcohol use is prevalent amongst university student-athletes. According to a 2018 NCAA survey, approximately 77% of athletes consumed alcohol in the prior year (National Collegiate Athletic Association [NCAA], 2018). Additionally, 36% of student-athletes reported drinking alcohol on a weekly basis, with 42% of those individuals reporting

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binge drinking, defined as consuming 4 or more drinks for women or 5 or more drinks for men in one sitting (NCAA, 2018). Heavy alcohol use among young adults is associated with negative drinking consequences and risky behaviors, such as driving under the influence or getting hurt or injured (Pitts et al., 2018). The risks associated with alcohol use reflect the need to better understand important psychosocial factors that might increase student-athletes' risk for alcohol use. As such, the present study considers the role of two such factors – athlete identity and athlete-specific drinking motives – in predicting drinking behaviors.

Athletic Identity

One psychosocial factor that might influence student-athlete drinking is athletic identity, conceptualized by Brewer and colleagues (1993) as the degree to which individuals self-identify as an athlete and how they perceive that they are viewed by others. Individuals who identify as an athlete will often adopt normative styles or behaviors specific to their team, such as an increase in alcohol consumption (Zhou, Heim, & O'Brien, 2015). This identity is associated with a strong level of self-concept and commitment to athletics, which can influence and guide how an athlete may perceive their role within the context of their environment (Grossbard et al., 2009).

Athletic identity is multidimensional and can be broken down into three constructs encompassing social, cognitive, and affective elements, namely: social identification, exclusivity, and negative affect (Brewer et al., 1993). Social identification refers to the extent to which an individual identifies with the athlete role. Individuals who score high on social identification typically demonstrate higher levels of overall athletic satisfaction compared to individuals who score high on exclusivity and negative affectivity (Burns et al., 2012). Exclusivity is the extent to which athletes' self-worth is determined solely by their performance in the athlete role. Individuals who have highly exclusive athletic identities are more likely to experience burnout, which could subsequently lead to negative health consequences (e.g., drinking; Foster & Huml, 2017). Negative affectivity captures the degree of an individual's emotional response to failing to fulfill the athlete role (Brewer et al., 1993). Student-athletes with higher levels of negative affectivity are more likely to endorse symptoms of anxiety or depression when they are unable to participate in sport (e.g., experiencing sport-related injuries or retirement; Schinke et al., 2018).

Students' athletic identity can influence their drinking behaviors, although findings on the relation between the two are inconsistent. Previous

research has demonstrated that those who score high on athletic identity also endorse high levels of alcohol consumption and sensation seeking traits associated with alcohol consumption (Arnold et al., 2020). Grossbard and colleagues (2009) found that athlete identity was positively correlated with weekly alcohol consumption but not negative drinking consequences. Athlete identity also moderated the relation between weekly alcohol consumption and negative drinking consequences. Thus, the association between weekly drinking and alcohol use was stronger when individuals reported lower versus stronger athletic identity (Grossbard et al., 2009). Conversely, other researchers (Zhou et al., 2015; Zhou, Heim, & Levy, 2015; Jones, 2015) found no correlation between athletic identity and alcohol consumption.

The mixed findings regarding the link between athlete identity and alcohol use may in part be the result of researchers measuring athletic identity as a unidimensional construct, despite it being best understood as a multidimensional construct. Measuring athlete identity as a unidimensional construct may mask nuanced relationships between its various constructs and alcohol-related outcomes. We can postulate unique associations between the constructs of athlete identity and alcohol use by drawing from related studies. For instance, a qualitative analysis of athletes' perceptions of alcohol consumption indicated that close social ties with their teams encouraged alcohol consumption, suggesting that individuals who may have high social identification as an athlete may be more likely to consume alcohol (Zhou & Heim, 2016). Findings from other work indicated that failure to fulfill one's athletic role to their own standard (e.g., injury) can negatively impact their perceived athletic identity, subsequently leading to alcohol consumption (Martens et al., 2006). These findings suggest the possibility that individuals with higher negative affectivity or exclusivity may be at risk for increased alcohol consumption.

To our knowledge, Meca and colleagues (2021) have been the only researchers to examine the multidimensional construct of athlete identity and its associations with alcohol consumption and negative drinking consequences. Results indicated that exclusivity was negatively associated with alcohol consumption and negative drinking consequences (Meca et al., 2021). The authors suggested that those with a strong, exclusive athlete identity (i.e., generally associated with greater athletic performance; Brewer et al., 1993) may be deterred from alcohol for fear of it impeding their athletic performance (Meca et al., 2021). Conversely, negative affectivity was positively related to alcohol consumption and negative drinking consequences. The authors noted that alcohol can commonly be considered a stress reliever, so it may be that individuals who are high in negative affectivity may con-

sume alcohol to cope with the stressors associated with being an athlete (e.g., constant evaluation of their performance; Lisha & Sussman 2010). Finally, social identification was positively associated with alcohol consumption but not with negative drinking consequences, though the results demonstrated a positive trend. Researchers (Meca et al., 2021; Zamboanga et al., 2019) have suggested that those who score high on social identification may be more inclined to consume alcohol if it is considered a social norm amongst the team, considering that individuals who endorse high social identification may be more strongly influenced by the behaviors of their teammates (Tajfel & Turner, 1986). It is evident that the link between athlete identity and alcohol consumption can vary depending on the construct of athlete identity being considered. Given the limited research on (a) athlete identity as a multidimensional construct and (b) its association with alcohol, more research in these specific areas is needed. Furthermore, Meca and colleagues (2021) suggest that there may be different mechanistic pathways (e.g., drinking motives) between athlete identity and alcohol use that should be explored to help explain the relation between the two.

Drinking Motives

Drinking motives are one of the strongest predictors of alcohol use amongst college athletes (Martens et al., 2006) and have been known to have a mediating role in the association between other psychosocial factors (e.g., environmental factors) and alcohol use (Martens & Martin, 2010). As such, drinking motives may help us understand the association between athlete identity and drinking. Studies suggest that drinking motives, as operationalized by Cooper (i.e., social, enhancement, coping, and conformity motives; 1994), tend to be uniquely associated with alcohol consumption and negative alcohol-related consequences among college athletes (Pitts et al., 2018).

Given the unique student-athlete culture (e.g., "work hard play hard" lifestyle), Martens and colleagues (2005) hypothesized there may be drinking motives unique to student-athletes. Their work identified three athlete-specific drinking motives: positive reinforcement (i.e., drinking to celebrate victories or celebrate with teammates), sport-related coping (i.e., drinking to deal with performance- or sport-related stress), and team/group (i.e., drinking to fit in with teammates; Martens et al., 2005). Positive reinforcement motives are generally positively correlated with alcohol use and alcohol related problems (Martens et al., 2003; Pitts et al., 2018). As qualitative analyses have revealed (Zhou & Heim, 2016), alcohol consumption is viewed

as crucial for social cohesion and group membership among student-athlete teams. Sport-related coping motives are also positively correlated with alcohol consumption and negative drinking problems (Martens et al., 2008; Martens et al., 2011). This is consistent with the broader literature indicating that drinking to cope is linked to negative alcohol-related problems (Merrill et al., 2014). Finally, team/group motives are positively correlated with both alcohol use and negative consequences (Pitts et al., 2018; Martens et al., 2011). Student-athletes may feel the urge to fit in with their teammates, thus conforming to perceived alcohol consumption norms (Doumas, 2013). Marten and colleagues (2011) identified that these athlete-specific drinking motives predict additional variance in student-athlete drinking behaviors above and beyond the effects of general drinking motives, which helps to explain the nuances between alcohol-related behaviors and student-athletes.

Athlete Identity and Drinking Motives: The Current Study

Theoretically, the unique links between the different elements of athlete identity and alcohol use (Meca et al., 2021) suggest different mechanistic pathways between athlete identity and alcohol use that should be explored. Given that drinking motives commonly act as mediators of the association between various psychosocial factors (i.e., environmental factors; Martens & Martin, 2010) and alcohol use, they seem to be a plausible pathway through which athlete identity might be more likely to endorse alcohol consumption and related behaviors. As such, we examined whether athlete identity is indirectly related to alcohol consumption and negative drinking consequences through its association with athlete drinking motives.

A path model (Figure 1) was tested to determine whether athlete drinking motives play an indirect role in the relation between athlete identity and both alcohol consumption and negative drinking consequences. Athlete identity (i.e., social identification, exclusivity, and negative affectivity) and athlete drinking motives (i.e., positive reinforcement, sport-related coping, and team/group motives) were tested as multidimensional constructs. Given that student-athletes who play team-based sports and those who are off-season report higher alcohol consumption and negative consequences than individual sport athletes and those who are in-season (Arnold, 2020; Mastroleo et al., 2018), we tested for differences in study variables across these groups and controlled for them where appropriate in the path model. In line with social identification theory, we hypothesized that: Students who endorsed higher social identification would report more positive reinforcement drinking mo-

Note: ADS = Athlete Drinking Motives; AIMS = Athlete Identity Measurement Scale; B-YAACQ = Brief Young Adult Alcohol Consequences Questionnaire; DDQ = Daily Drinking Questionnaire
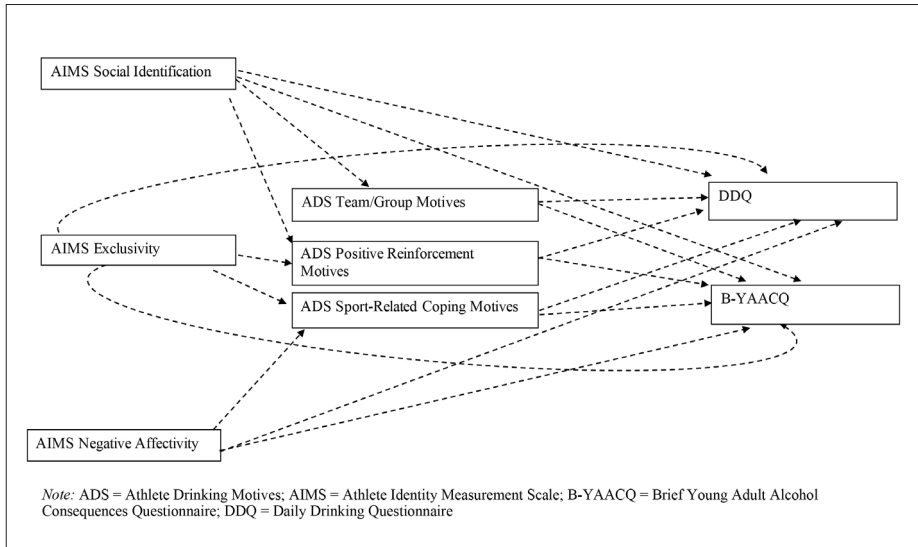
Fig. 1. - *Hypothesized Mediation Model.*

tives and team/group motives, resulting in an indirect effect of social identification on alcohol use and alcohol-related problems. We also hypothesized that higher exclusivity would be associated with the drinking outcomes indirectly via positive reinforcement drinking motives and sport-related coping motives. Finally, we hypothesized that those who endorsed higher negative affectivity would report higher sport-related coping motives, which would then be linked to greater engagement in alcohol use and more endorsement of negative drinking consequences.

Method

Participants

Data for the current study were part of a larger study (Fitzpatrick & Olthuis, 2021) that sought to understand the correlates of various psychosocial factors on alcohol consumption among undergraduate students and student-athletes at a Canadian university. Participants were those from the larger study (N = 228) who identified as student-athletes, defined as students who were participating in university-affiliated varsity or club sports. Participants who did not complete study measures pertaining to model predictors (n = 48) and indirect effect variables (n = 3) were removed from the dataset, resulting in a final analytic sample of 177 participants. Little's Missing Values Analysis was not significant, $\chi^2(53)$ = 59.52, p = .250, indicating the missingness was completely random.

PROCEDURE

To recruit participants for the larger study, coaches of varsity and club sports teams within the university were contacted via email to set up an agreed upon time to meet with student-athletes before or after a training session. The researcher then attended the team's training session and informed student-athletes about the study. Interested athletes signed a consent form giving permission to the researcher to send them information via email about the study in addition to a link to a self-report online survey. The 20- to 30-minute online survey included measures of alcohol use, attitudes, and behaviors and was completed via secure online survey software. Student-athletes were given $10 as compensation for participation and were entered into a draw to win 1 of 5 $50 gift cards to a sports merchandise store. An electronic debriefing form was provided after completion of the online questionnaire. Study procedures were approved by the Research Ethics Board (REB# 2017-136) of the university.

MEASURES

Demographics. Student-athletes reported their age, gender, and race/ethnicity. Participants were also asked to identify what year of university they were currently in, if their sport was classified as a club or varsity sport and team or individual sport, and if they were in-season or off-season.

Athletic Identity Measurement Scale (AIMS). The AIMS (Brewer et al., 1993) assesses the extent to which an individual identifies as an athlete. Participants are presented with 10 items and asked to indicate how much they agree or disagree with each statement ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The AIMS includes three subscales: social identity (e.g., "most of my friends are athletes"; α = .84), exclusivity (e.g., "sport is the only important thing in my life; α = .88), and negative affectivity (e.g., "I feel bad about myself when I do poorly in sport"; α = .74; Brewer et al., 1993). Subscales are scored by summing the items within each subscale. The AIMS has good test-retest reliability (*r* = .89) and convergent and divergent reliability (Brewer et al., 1993). In the present study, internal reliability is good for social identity (α = .79) and exclusivity (α = .81) but considered poor for negative affectivity (α = .52).

Athletic Drinking Scale (ADS). The ADS is used to measure sport-related reasons for alcohol use (Martens et al., 2008). Participants are presented with 19-items representing different motives for alcohol use and are asked to indicate the extent to which they endorse each item using a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The ADS includes three subscales: positive reinforcement (e.g., "I drink to have a good time with my teammates"; α = .89), team/group (e.g., "I drink to "fit in" with my teammates"; α = .89); and sport-related coping (e.g., "I drink to help me deal with poor performances"; α = .78). Each subscale is scored by summing the items within the subscale. In the current study, internal consistency for positive reinforcement (α = .89) and team/group (α = .88) is considered good, and sport-related coping (α = .66) is considered acceptable. Research demonstrates this scale to have good convergent and concurrent validity (Martens et al., 2008).

Daily Drinking Questionnaire (DDQ). The DDQ is a 4-item questionnaire designed to measure a participant's average consumption of alcohol within a typical week over the past

month (Collins et al., 1985). The questionnaire asks participants to report on their quantity and frequency of alcohol consumption by presenting them with a weekly calendar and asking them to report how much they typically drank on each day of the week over the past month. In the current study, total weekly alcohol consumption was scored by summing quantity of drinks consumed per week.

Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ). The B-YAACQ (Kahler et al., 2005) assesses negative consequences of alcohol use experienced within the past month. The 24-item measure presents participants with a series of possible consequences they may have experienced due to alcohol use (e.g., "I have driven a car when I knew I had too much to drink to drive safely"). Participants report whether they experienced each item by checking "yes" or "no" to each question. Responses were coded as "yes" = 1 and "no" = 0 for a total possible score of 24. The B-YAACQ demonstrates good test-retest reliability over a 6-week period (Kahler et al., 2008) and good internal consistency, α = .83 (Kahler et al., 2005). In the current study, the B-YAACQ has excellent internal consistency (α = .91).

STATISTICAL ANALYSIS

All analyses were conducted using SPSS and MPlus. To identify which covariates should be included in the proposed model, we used *t*-tests to compare means for gender, season, and type of team across drinking motives, alcohol consumption, and negative drinking consequences. For the same reason, participants' age was also correlated with drinking motives, alcohol consumption, and negative drinking consequences. Next, correlations among study variables were calculated. Finally, path analyses were conducted via Mplus to test the proposed model fit (Figure 1). We followed recommended guidelines to evaluate model fit (Kline, 2011), including that the chi-square statistic should not be significant (p > .05), Standardized Root Mean Square Residual (SRMR) should be ≤ .08, Root Mean Square Error of Approximation (RMSEA) should be ≤ .08, and Comparative Fit Index (CFI) should be ≥ .90.

Results

PRELIMINARY ANALYSIS

The dataset was screened for outliers (Tabachnick & Fidell, 2019). Three outliers were identified on the DDQ (i.e., total alcohol consumption = 88, 76, and 70 drinks per week). Outliers were winsorized (to 44 drinks per week; Kennedy et al., 1992). Normality was tested by examining skewness, kurtosis, and histograms for evidence of non-normal data (Tabachnick & Fidell, 2019). Assumptions of normality that were violated were examined to assess whether non-normality was expected. Total alcohol consumption violated normality with skewness of 1.59 and kurtosis of 2.53 (George & Mallery, 2010) so we used a Robust Maximum Likelihood (MLR) estimator to account for non-normal data.

DEMOGRAPHICS

Characteristics of the sample (67% women; 86% White; M_{age} = 19.82, SD = 1.90) are presented in Table 1. The majority of participants were in-season (63%) and on a team-based sport (90%).

DESCRIPTIVE STATISTICS

Means and standard deviation for study variables are presented in Table 2. Mean differences in gender (i.e., men/women), season (i.e., on/off), and type of team (i.e., individual/team) were calculated across drinking motives, alcohol consumption, and drinking consequences to determine if the demographic

TABLE I
Demographics of Student-athletes

Demographics	N (%)
Gender	
Male	57 (32%)
Female	120 (68%)
Year of University	
1	56 (31%)
2	44 (25%)
3	36 (20%)
4	20 (11%)
5	11 (6%)
6+	2 (1%)
Ethnicity	
White/Euro Canadian	153 (86%)
Black/African Canadian	10 (5%)
Asian/Asian Canadian	11 (6%)
Hispanic/Hispanic Canadian	1 (.6%)
Indigenous	1 (.6%)
Season	
In	112 (63%)
Off	63 (36%)
Type of Sport	
Team	160 (90.4%)
Individual	15 (8.5%)

variables covaried with mediator and outcome variables. Positive reinforcement motives were significantly different by gender, $t(175) = 2.23$, $p < .05$, with men more strongly endorsing positive reinforcement motives. Moreover, positive reinforcement motives, $t(173) = -2.96$, $p < .05$, team/group motives $t(173) = -3.98$, $p < .001$, sport-related coping motives, $t(173) = -3.65$, $p < .001$, and alcohol consumption, $t(173) = -2.23$, $p < .05$) were significantly different by season, with off-season athletes consuming more alcohol and endorsing all drinking motives to a greater extent. There were no significant differences in drinking motives, alcohol consumption, or negative drinking consequences by sport type. Age was correlated with mediator and outcome variables to determine whether covariance was present across age and the mediator and outcome variables. No significant correlations emerged so age was not included in the path analysis model.

Correlations amongst study variables are reported in Table 3. AIMS subscales were significantly correlated with one another but not with alcohol consumption or alcohol-related problems. Social identification was correlated with positive reinforcement motives, and both exclusivity and negative affectivity were correlated with sport-related coping motives. Finally, drinking motives were significantly correlated with one another and alcohol consumption but not with drinking consequences.

Tests of Model Fit

Path analyses were used to test the proposed model (Figure 1). In light of the identified differences in study variables by season and gender, we con-

TABLE II
Means and Standard Deviations of Study Variables

Variables	M (SD)
AIMS Social Identification	18.00 (3.17)
AIMS Exclusivity	15.97 (5.61)
AIMS Negative Affectivity	10.32 (2.76)
ADS Positive Reinforcement Motives	29.97 (9.92)
ADS Team/Group Motives	16.11 (7.70)
ADS Sport-Related Coping Motives	5.24 (2.50)
DDQ	9.81 (9.96)
B-YAACQ	12.39 (6.45)

Note: ADS = Athlete Drinking Scale; AIMS = Athlete Identity Measurement Scale; B-YAACQ = Brief Young Adult Alcohol Consequences Questionnaire; DDQ = Daily Drinking Questionnaire

TABLE III
Correlations Among Study Variables

	AIMS Social Identity	AIMS Exclusivity	AIMS Negative Affectivity	ADS Positive Reinforcement Motives	ADS Team/ Group Motives	ADS Sport-related Coping Motives	BYAACQ	DDQ
AIMS Social Identity	1							
AIMS Exclusivity	.460***	1						
AIMS Negative Affectivity	.403**	.595***	1					
ADS Positive Reinforcement Motives	.189*	.040	.114	1				
ADS Team/ Group Motives	-.004	.043	.128	.632***	1			
ADS Sport-Related Coping Motives	.071	.174*	.173*	.537***	.562***	1		
B-YAACQ	-.101	-.102	-.112	.110	-.030	-.098	1	
DDQ	-.020	.066	.070	.500*	.252*	.310*	.118	1

Note:* $p <.05$ ** $p < .01$ ***$p < .001$; ADS = Athlete Drinking Scale; AIMS = Athlete Identity Measurement Scale; B-YAACQ = Brief Young Adult Alcohol Consequences Questionnaire; DDQ = Daily Drinking Questionnaire

trolled for season and gender on positive reinforcement motives, alongside season on sport-related coping motives, team/group motives, and alcohol consumption. Test of model fit was deemed good: $\chi^2(9) = 10.496$, $p = .312$; RMSEA = .031, CFI = .994, TLI = .976, and SRMR = .040.

DIRECT EFFECTS

Analyses (Table 4) indicated that social identification was positively associated with positive reinforcement motives ($\beta = 0.17$, $p = .016$). Positive reinforcement motives were positively associated with alcohol consumption

(β = .58, *p* < .001) and drinking consequences (β = .29, *p* = .004) but sport-related coping motives were negatively associated with drinking consequences (β = -.18, *p* = .036).

INDIRECT EFFECTS

Results indicated one significant indirect path (Table 5). That is, social identification was indirectly associated with alcohol consumption through

TABLE IV
Direct Effects of Athlete Identity, Drinking Motives, and Alcohol Consumption, and Athlete Identity, Drinking Motives, and Negative Consequences

Parameter	*B*	SE	β	95% CI
Direct Effects				
Social Identification → Positive Reinforcement	2.41*	.07	.17	.03-.31
Social Identification → Team/Group Motives	.129	.06	.01	-.12-.13
Social Identification → Alcohol Consumption	-1.86	.08	-.15	-.31-.01
Social Identification → Drinking Consequences	-1.47	.07	-.10	-.24-.03
Exclusivity → Positive Reinforcement	-1.24	.06	-.07	-.19-.04
Exclusivity → Sport-Related Coping	1.65	.07	.12	-.02-.27
Exclusivity → Alcohol Consumption	.87	.09	.08	-.10-.25
Exclusivity → Drinking Consequences	-.11	.10	-.01	-.19-.19
Negative Affectivity → Sport Related Coping	.55	.07	.04	-.10-.18
Negative Affectivity → Alcohol Consumption	.26	.10	.03	-.17-.22
Negative Affectivity → Drinking Consequences	-.52	.09	-.05	-.24-.11
Positive Reinforcement → Alcohol Consumption	7.91***	.07	.58	.43-.72
Positive Reinforcement → Drinking Consequences	2.89**	.10	.29	.09-.49
Sport Related Coping → Alcohol Consumption	.69	.09	.06	-.12-.25
Sport Related Coping → Drinking Consequences	-2.09*	.09	-.19	-.35- -.01
Team/Group Motives → Alcohol Consumption	-1.81	.09	-.16	-.34-.01
Team/Group Motives → Drinking Consequences	-1.01	.10	-.10	-.30-.10
Covaried Effects				
Positive Reinforcement ←→ Team/Group Motives	12.79***	.05	.61	
Positive Reinforcement ←→ Sport-Related Coping	9.28***	.06	.52	
Team/Group Motives ←→ Sport-Related Coping	7.67***	.07	.52	
Residual Variances				
Positive Reinforcement	25.31***	.04	.92	
Team/Group Motives	22.19***	.04	.92	
Sport-Related Coping	22.10***	.04	.91	
Alcohol Consumption	14.51***	.05	.71	
Drinking Consequences	25.32***	.04	.93	

≠*Note:* *p* < .05 ** *p* < .01 ***p* < .001

TABLE V
Indirect Effects of Athlete Identity, Drinking Motives, and Alcohol Consumption, and Athlete Identity, Drinking Motives, and Negative Consequences

Parameter	B	SE	β
Social Identification → Positive Reinforcement → Alcohol Consumption	2.21*	.04	.10
Social Identification → Team/Group Motives → Alcohol Consumption	-.13	.01	-.00
Social Identification → Positive Reinforcement → Drinking Consequences	1.69	.03	.05
Social Identification → Team/Group Motives → Drinking Consequences	-.13	.01	-.00
Exclusivity → Positive Reinforcement → Alcohol Consumption	-1.22	.04	-.04
Exclusivity → Sport-Related Coping → Alcohol Consumption	.67	.01	.01
Exclusivity → Positive Reinforcement → Drinking Consequences	-1.11	.02	-.02
Exclusivity → Sport-Related Coping → Drinking Consequences	-1.31	.02	-.02
Negative Affectivity → Sport Related Coping → Drinking Consequences	-.54	.01	-.01
Negative Affectivity → Sport Related Coping → Alcohol Consumption	.39	.01	.00

Note: $^*p < .05$ $^{**}p < .01$ $^{***}p < .001$

positive reinforcement motives ($\beta = .01$, $p = .027$). All other hypothesized indirect effects were not significant.

Discussion

Building on previous research examining alcohol consumption within student-athlete populations, the current study tested whether athlete identity was indirectly associated with alcohol use and related consequences by way of athlete-specific drinking motives. In line with our first hypothesis, results showed that there was a significant indirect effect on the relation between the social identification aspect of athlete identity and alcohol consumption through positive reinforcement drinking motives. Contrary to our hypotheses, however, none of the other proposed indirect pathways emerged as significant.

The main finding in the present study is that the social identification aspect of athlete identity had a significant indirect effect on alcohol consumption by way of positive reinforcement drinking motives. Social identification theory suggests that individuals who socially identify as an athlete are more likely to align their thoughts and behaviors with their teammates due to the perceived importance of being a group member (Tajfel & Turner,

1986). Individuals who socially identify more strongly as an athlete may be more inclined to celebrate victories with teammates through alcohol (Martens et al., 2003). Previous research has shown that such positive reinforcement drinking motives are associated with increased alcohol use (Martens et al., 2003; Pitts et al., 2018). This indirect pathway illustrates how a stronger social identification with the athlete role may act as a risk factor for increased alcohol consumption. Although the present findings did not reveal a significant indirect path from social identification through positive reinforcement motives to negative drinking consequences, positive reinforcement motives were significantly associated with negative alcohol consequences. This finding is consistent with previous literature suggesting that student-athletes who are motivated to drink to celebrate their victories are more likely to report more negative drinking consequences (Pitts et al., 2018; Martens et al., 2008, 2011). Together, findings suggest that being aware of the extent to which students socially identify as an athlete may help clinicians identify athletes who may benefit from receiving alcohol prevention and intervention efforts.

Contrary to our hypotheses, we did not find an indirect relation between social identification as an athlete identity and alcohol use or consequences via team/group motives. Results suggest that when drinking motives that play a larger contribution to alcohol use are considered (i.e., positive reinforcement; Pitts et al., 2018), team/group motives may play less of a role in predicting alcohol-related outcomes. This finding is supported by research suggesting that externally generated motives (i.e., team/group motives to fit in with the expectations of others) are less likely to be associated with alcohol use than internally generated motives (i.e., positive reinforcement motives to celebrate one's victory after hard work; Martens et al., 2011).

Another unexpected finding in the present study was that exclusivity was not indirectly related to alcohol consumption or negative drinking consequences through positive reinforcement motives. Bivariate correlations also revealed no significant relations between exclusivity and each of positive reinforcement motives, alcohol consumption, and alcohol-related consequences. Prior research indicates that individuals who identify exclusively as an athlete are less likely to consume alcohol, possibly because of its potential impact on athletic performance (Meca et al., 2021; Doumas 2013). As such, it was predicted that these athletes may be averse to the positive associations of alcohol consumption (e.g., drinking to celebrate victories) and thus endorse fewer positive reinforcement motives and less drinking. While it is unclear why a lack of association between exclusivity and alcohol use outcomes emerged in the present study in contrast to prior findings (Meca et al., 2021), the non-significant relation between exclusivity and positive reinforcement

motives suggests that other factors may contribute to the relation between exclusivity and alcohol use.

Results also indicated that exclusivity was not indirectly related to alcohol consumption through its association with sport-related coping motives. Bivariate correlations did, however, reveal that exclusivity and negative affectivity were both positively correlated with sport-related coping motives, and sport-related coping motives were positively correlated with alcohol consumption. When faced with adverse sport-related events (e.g., due to injury or poor performance), those who identify strongly as an athlete to the exclusion of anything else may be more strongly negatively affected than those whose identity is composed of other aspects beyond their status as an athlete. Consequently, students who exclusively identify as an athlete may resort to alcohol consumption to help cope with adverse sport-related events (Martens et al., 2008, 2011). Similarly, student-athletes who are highly impacted by negative sport-related events may also resort to alcohol consumption as a method to cope (Doumas, 2013). Despite these significant bivariate correlations, it may be that in the multivariate model the pathways from exclusivity and negative affectivity via sport-related coping motives did not account meaningfully for levels of alcohol consumption because of the presence of other drinking motives of more salience to student-athlete drinking (i.e., positive reinforcement). The non-significant relation between sport-related coping motives and alcohol consumption adds to the existing mixed literature as to whether sport-related coping motives are significantly associated with alcohol use (Martens et al., 2011) or not (Pitts et al., 2018). More research is needed to better understand for whom and in what circumstances sport-related coping motives lead to increased alcohol use.

As with alcohol consumption, neither negative affectivity nor exclusivity had an indirect effect on negative drinking consequences through their association with sport-related coping motives. However, direct effects indicate that student-athletes who endorsed sport-related coping motives were significantly less likely to endorse negative drinking consequences. This finding contradicts prior research which has found both a positive association (Martens et al., 2008) and no association (Pitts et al., 2018; Martens et al., 2011) between sport-related coping motives and negative drinking behaviors. While this finding was unexpected, it does appear to fall within an existing body of research suggesting the link between sport-related coping motives and negative drinking consequences is unclear (Martens et al., 2008; Martens et al., 2011; Pitts et al., 2018). The present findings suggest that student-athletes may consume alcohol to help cope with negative thoughts, performance, and/or stress, but may not drink enough to produce negative

repercussions (Pitts et al., 2018). Whether this is intentional (i.e., athletes recognize that risky drinking can impair athletic performance; Doumas, 2008) or fortuitous on the part of athletes remains unclear. Given the inconsistent findings across studies, further research is needed to help understand and consolidate the impact that sport-related coping motives play on the relationship between athlete identity and negative drinking consequences.

Finally, the present findings support the exploration of athletic identity as a multidimensional construct. Previous research reported contradicting findings on the relationship between athlete identity and alcohol-related outcomes when measured as a unidimensional construct, with some reporting a positive relationship (Arnold et al., 2020; Grossbard et al., 2009) and some reporting no relationship (Zhou et al., 2015). The current research suggests that the elements of athlete identity may have unique relations with mechanistic factors (i.e., drinking motives) that might link athlete identity to drinking and would be missed when examining it as a unidimensional construct. As such, examining athletic identity as a multidimensional construct can help to facilitate a greater understanding of the relationship between athletic identity and student-athlete drinking behaviors.

Limitations

The present study must be considered in the context of several limitations. First, using cross sectional data limits our ability to draw conclusions about directionality or causality. Second, our sample size was predominantly female and Caucasian, limiting generalizability of findings. Third, self-report surveys as used in the present study run the risk of self-report biases when reporting alcohol consumption. However, we ensured confidentiality via anonymous data collection, and research suggests that self-reporting alcohol consumption under these conditions demonstrates good reliability (Babor et al., 2000). Fourth, internal reliability for the negative affectivity subscale of the AIMS in the current study was low ($\alpha = .52$), suggesting that the results related to this subscale should be interpreted with caution. Low reliability on this scale may be the result of the subscale being comprised of only two items.

Conclusion

To our knowledge, this is the first study seeking to understand the role that athlete drinking motives play in the relation between athlete identity and both alcohol consumption and negative drinking consequences. The tested

model revealed that social identification as an athlete has an indirect effect alcohol consumption via positive reinforcement drinking motives. While both positive reinforcement motives and sport-related coping motives were directly associated with negative drinking consequences, these motives did not play a role in explaining the association between athlete identity and negative drinking consequences. Results suggest that the association between athlete identity and alcohol-related behaviors can vary depending on the aspect of athletic identity being considered and that positive reinforcement motives may be the most relevant athlete-specific drinking motive when it comes to understanding the relation between athlete identity and alcohol-related behaviors.

The results of the present study are important as they may help sport and/or clinical psychology practitioners identify specific types of athletes that may benefit from prevention or intervention efforts aimed at reducing alcohol consumption and negative repercussions associated with alcohol. For instance, a student-athlete who more strongly socially identifies as an athlete may benefit from receiving prevention interventions more than a student-athlete who exclusively identifies as a student-athlete. This is because the current results suggest that having a stronger (vs. weaker) social identification as an athlete may act as a risk factor for increased alcohol consumption, whereas the degree to which a student-athlete identified exclusively with the athlete role was not associated with drinking behaviours. Given that interventions are most effective towards people who partake in the specific behaviours targeted by the intervention (i.e., alcohol consumption; Michie et al., 2011), student-athletes with a greater risk of alcohol consumption (i.e., higher social identification) are more likely to benefit from the interventions than those who are not at risk (i.e., higher exclusivity). Future research could benefit from examining whether other psychosocial factors, including drinking motives (e.g., general coping motives; Cooper et al., 1995), university-related stress (Knettel et al., 2021), or environmental factors such as team cohesion (Zamboanga et al., 2008), can help explain the indirect relationship between athletic identity and drinking behaviors.

REFERENCES

Arnold, Z. (2020). The impact of alcohol consumption on academic success and athletic identity in collegiate student-athletes. *Journal of Amateur Sport*, *6*(2), 84-106. https://doi.org/10.17161/jas.v6i2.10570

Babor, T. F., Steinberg, K., Anton, R., & Del Boca, F. K. (2000). Talk is cheap: Measuring drinking outcomes in clinical trials. *Journal of Studies on Alcohol, 61*(1), 55-63. https://doi.org/10.15288/jsa.2000.61.55

Brewer, B. W., Van Raalte, J. L., & Linder, D. E. (1993). Athletic identity: Hercules' muscles or achilles' heel? *International Journal of Sport Psychology, 24*(2)*, 237-254.

Burns, G. N., Jasinski, D., Dunn, S. C., & Fletcher, D. (2012). Athlete identity and athlete satisfaction: The nonconformity of exclusivity. *Personality and Individual Differences, 52*(3), 280-284. https://doi.org/10.1016/j.paid.2011.10.020

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

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

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology*, *69*(5), 990-1005. https://doi.org/10.1037//0022-3514.69.5.990

Doumas, D. M. (2013). Alcohol-related consequences among intercollegiate student-athletes: The role of drinking motives. *Journal of Addictions and Offender Counseling*, *34*(1), 51-64. https://doi.org/10.1002/j.2161-1874.2013.00014.x

Fitzpatrick, S. K., & Olthuis, J. V. (2021). Alcohol and athletics: A study of Canadian student-athlete risk. *Journal of Clinical Sport Psychology,* 1-19 https://doi.org/10.1123/jcsp.2020-0062

Foster, S. J. L., & Huml, M. R. (2017). The relationship between athletic identity and academic major chosen by student-athletes. *International Journal of Exercise Science, 10*(6), 915-925.

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference.* Pearson.

Grossbard, J. R., Geisner, I. M., Mastroleo, N. R., Kilmer, J. R., Turrisi, R., & Larimer, M. E. (2009). Athletic identity, descriptive norms, and drinking among athletes transitioning to college. *Addictive Behaviors*, *34*(4), 352-359. https://doi.org/10.1016/j.addbeh.2008.11.011

Jones, J. A. (2015). Risk factors for alcohol abuse among college athletes. *Journal of Clinical Sport Psychology*, *9*(1), 76-96. https://doi.org/10.1123/jcsp.2015-0006

Kahler, C. W., Hustad, J., Barnett, N. P., Strong, D. R., & Borsari, B. (2008). Validation of the 30-day version of the Brief Young Adult Alcohol Consequences Questionnaire for use in longitudinal studies. *Journal of Studies on Alcohol and Drugs*, *69*(4), 611-615. https://doi.org/10.15288/jsad.2008.69.611

Kahler, C. W., Strong, D. R., & Read, J. P. (2005). Toward efficient and comprehensive measurement of the alcohol problems continuum in college students: The Brief Young Adult Alcohol Consequences Questionnaire. *Alcoholism: Clinical and Experimental Research*, *29*(7), 1180-1189. https://doi.org/10.1097/01.alc.0000171940.95813.a5

Kennedy, D., Lakonishok, J., & Shaw, W. H. (1992). Accommodating outliers and nonlinearity in decision models. *Journal of Accounting, Auditing & Finance*, *7*(2), 161-190. https://doi.org/10.1177/0148558X920070020

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. Guilford Press.

Knettel, B. A., Cherenack, E. M., & Bianchi-Rossi, C. (2021). Stress, anxiety, binge drinking, and substance use among college student-athletes: a cross-sectional analysis. *Journal of Intercollegiate Sport*, *14*(2). https://doi.org/10.17161/jis.v14i2.14829

Lisha, N. E., & Sussman, S. (2010). Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: a review. *Addictive behaviors*, *35*(5), 399-407. https://doi.org/10.1016/j.addbeh.2009.12.032

Martens, M. P., Cox, R. H., & Beck, N. C. (2003). Negative consequences of intercollegiate

athlete drinking: The role of drinking motives. *Journal of Studies on Alcohol*, *64*(6), 825-828. https://doi.org/10.15288/jsa.2003.64.825

Martens, M. P., Dams-O'Connor, K., & Beck, N. C. (2006). A systematic review of college student-athlete drinking: Prevalence rates, sport-related factors, and interventions. *Journal of substance abuse treatment*, *31*(3), 305-316. https://doi.org/10.1016/j.jsat.2006.05.004

Martens, M. P., Labrie, J. W., Hummer, J. F., & Pedersen, E. R. (2008). Understanding sport-related drinking motives in college athletes: Psychometric analyses of the Athlete Drinking Scale. *Addictive Behaviors*, *33*(7), 974-977. https://doi.org/10.1016/j.addbeh.2008.03.001

Martens, M. P., & Martin, J. L. (2010). College athletes' drinking motives and competitive seasonal status: Additional examination of the athlete drinking scale. *Addiction Research and Theory*, *18*(1), 23-32. https://doi.org/10.3109/16066350902867882

Martens, M. P., Pedersen, E. R., Smith, A. E., Stewart, S. H., & O'Brien, K. (2011). Predictors of alcohol-related outcomes in college athletes: The roles of trait urgency and drinking motives. *Addictive Behaviors*, *36*(5), 456-464. https://doi.org/10.1016/j.addbeh.2010.12.025

Martens, M. P., Watson, J. C., Royland, E. M., & Beck, N. C. (2005). Development of the athlete drinking scale. *Psychology of Addictive Behaviors*, *19*(2), 158-164. https://doi.org/10.1037/0893-164X.19.2.158

Mastroleo, N. R., Barnett, N. P., & Bowers, K. M. (2018). Association between sex, race/ethnicity, season, day of week, and alcohol use and related risks in college student-athletes and nonathletes. *Journal of American College Health*, *67*(5), 422-432. https://doi.org/10.1080/07448481.2018.1484367

Meca, A., Allison, K., Kubilus, R., Olthuis, J. V., Merrill, J. E., Zamboanga, B. L., Wyrick, D., Milroy, J. J., & Carr, K. (2021). Dimensions of athletic identity and their associations with drinking behaviors among a national sample of university athletes in the United States. *Journal of Youth and Adolescence*, *50*(12), 2363-2373. https://doi.org/10.1007/s10964-021-01503-2

Merrill, J. E., Wardell, J. D., & Read, J. P. (2014). Drinking motives in the prospective prediction of unique alcohol-related consequences in college students. *Journal of Studies on Alcohol and Drugs*, *75*(1), 93-102. https://doi.org/10.15288/jsad.2014.75.93

Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation Science, 6*(42). https://doi.org/10.1186/1748-5908-6-42

National Collegiate Athletic Association [NCAA]. (2018). NCAA national study of substance use habits of college student-athletes. Author.

Pitts, M., Chow, G. M., & Donohue, B. (2018). Relationship between general and sport-related drinking motives and athlete alcohol use and problems. *Substance Use and Misuse*, *54*(1), 146-155. https://doi.org/10.1080/10826084.2018.1512624

Schinke, R. J., Stambulova, N. B., Si, G., & Moore, Z. (2018). International society of sport psychology position stand: Athletes' mental health, performance, and development. *International Journal of Sport and Exercise Psychology*, *16*(6), 622-639. https://doi.org/10.1080/1612197X.2017.1295557

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (6th ed.). Pearson.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations* (2nd., pp. 7-24). Nelson-Hall Publishers.

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

Zamboanga, B. L., Rodriguez, L., & Horton, N. J. (2008). Athletic involvement and its relevance to hazardous alcohol use and drinking game participation in female college athletes: A preliminary investigation. *Journal of American College Health, 56*(6), 651-656. https://doi.org/10.3200/JACH.56.6.651-656

Zhou, J., Heim, D., & Levy, A. (2015). Sports participation and alcohol use: Associations with sports-related identities and well-being. *Journal of Studies on Alcohol and Drugs, 77*(1), 170-179. https://doi.org/10.15288/jsad.2016.77.170

Zhou, J., Heim, D., & O'Brien, K. (2015). Alcohol consumption, athlete identity, and happiness among student sportspeople as a function of sport-type. *Alcohol and Alcoholism, 50*(5), 617-623. https://doi.org/10.1093/alcalc/agv030

Zhou, J. & Heim, D. (2016). A qualitative exploration of alcohol use among student sportspeople: A social identity perspective. *European Journal of Social Psychology*, *46*(5), 581-594. https://doi.org/10.1002/ejsp.2195