



Original research

Social cohesion and peer acceptance predict student-athletes' attitudes toward health-risk behaviors: A within- and between-group investigation



Scott Graupensperger^{a,*}, Alex J. Benson^b, Bethany C. Bray^c, M. Blair Evans^a

^a Pennsylvania State University, Department of Kinesiology, United States

^b University of Western Ontario, Department of Psychology, United States

^c Center for Dissemination and Implementation Science, University of Illinois at Chicago

ARTICLE INFO

Article history:

Received 3 November 2018

Received in revised form 5 June 2019

Accepted 8 July 2019

Available online 13 July 2019

Keywords:

Group dynamics

Peer influence

Alcohol

Concussion

Hazing

Multilevel modeling

ABSTRACT

Objectives: Collegiate student-athletes often engage in health-risk behaviors such as alcohol misuse and hazing, but the literature in this domain lacks evidence pertaining to how peers shape attitudes towards such behaviors. We investigated how peer acceptance and social cohesion relate to attitudes towards alcohol use, marijuana use, drinking and driving, playing through a concussion, performance enhancing substance use, and hazing.

Design: Cross-sectional survey.

Methods: Participants were 387 NCAA athletes from 23 intact teams. Multilevel modeling was used to examine the extent that health-risk attitudes clustered within teams and enabled us to disentangle individual-level and group-level effects of peer acceptance and social cohesion.

Results: Intraclass correlation coefficients revealed that health-risk attitudes clustered within teams. At the individual-level, student-athletes who perceived higher levels of peer acceptance, relative to teammates, held riskier attitudes towards alcohol use, playing through a concussion, and hazing. Meanwhile, those who perceived higher levels of social cohesion relative to teammates held less risky attitudes towards playing through a concussion. At the group-level, teams with greater peer acceptance held less risky attitudes towards playing through a concussion, whereas teams with greater social cohesion held riskier attitudes toward playing through a concussion.

Conclusions: These data indicated that health-risk behaviors may cluster within teams, and that peer acceptance and cohesiveness are differentially associated with attitudes toward risky behavior. Given that peer influence is a multilevel phenomenon, it is prudent that prevention efforts leverage social processes within teams, while reducing pressures to engage in risky behaviors.

© 2019 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved.

Practical implications

- NCAA sport teams are a powerful source of peer influence for student-athletes and play a key role in attitudes towards health-risk behaviors.
- Although social cohesion is a constructive group attribute in which individual perceptions of social cohesion may protect against health-risk attitudes, highly cohesive environments may also promote health-risk attitudes. Team leaders and stakeholders should foster cohesion in a way that does not center around

dysfunctional behaviors (e.g., alcohol use), and does not promote reckless self-sacrifice (e.g., playing through a concussion).

- In contrast, building an accepting team environment may reduce student-athletes' willingness to engage in health-risk behaviors, but stakeholders should take caution regarding individual members who are highly popular within the group. Specifically, those higher in peer acceptance (within the team) may hold riskier attitudes towards alcohol use, playing through a concussion, and engaging in hazing activities and may be central targets for prevention efforts.

1. Introduction

Adolescents' and emerging adults' attitudes towards health-risk behaviors like substance use and playing through injury often

* Corresponding author.

E-mail address: sag40@psu.edu (S. Graupensperger).

shape, or are shaped by, relationships with peers.^{1,2} Peers hold a particularly strong influence during these stages of development, which are marked by high sensitivity to social pressures whereby deviance and rule-breaking are used to achieve acceptance and social status.³ Athletes are exposed to opportunities to engage in health-risk behavior by virtue of their relative social status or risks that emerge from sport competition, with examples including alcohol misuse and concealing concussions to remain in play.^{4–6} Collegiate student-athletes engage in greater health-risk behavior than non-athlete college students.^{7,8} Athletes' health behaviors are influenced by perceptions of how other athletes, and especially teammates, feel about the behaviors (i.e., normative influence).^{5,9} For example, athletes who think that teammates endorse alcohol use or performance enhancing substance use are more likely to engage in these behaviors.⁹ Although interventions have targeted NCAA student-athletes' health-risk behaviors,¹⁰ researchers have yet to address underlying social processes that may facilitate attitudes towards such behavior within teams. Considering the value of health-risk prevention (e.g., alcohol use interventions; concussion awareness), this knowledge can provide critical support for translational researchers seeking to leverage the group environment in prevention efforts.

The social environment is highly relevant to athletes' personal behaviors and attitudes.^{11–13} Small groups are particularly influential and are distinct from other types of peer connections because they entail rich group processes and other shared characteristics that connect members (e.g., interdependence, roles, norms).¹⁴ Beyond the direct influence that group members have on one-another's attitudes (e.g., direct peer pressure), groups also provide a shared social ecology that influences behavior through the subjective perceptions that members develop regarding their group environment.^{2,5} These sources of peer influence are complex and have an enormous impact on athletes' behaviors, but are understudied outside of their effects on performance, members' attraction to the team, or members' commitment to sport.^{15,16} Accepting and cohesive peer-groups may mitigate pressures to engage in health-risk behavior (i.e., 'come as you are'), but may alternatively intensify such pressures (i.e., 'this is how we behave').¹⁷

Theorizing about social influences from sport groups demands considering the complexity of group environments across discrete levels of affiliation: (a) the individual, (b) interactions, (c) relationships, and (d) the group as a whole.^{12,18} These levels of influence represent sources of information, from which individuals derive a sense of the group environment's quality *along with* evaluations of where they are, as an individual, situated within the group. This contrast between peer group ecology and one's position within the group is evident in emerging perspectives and empirical evidence in sport, as well as in developmental and educational psychology.^{13,18} Considering how group perceptions may shift attitudes toward health-risk behavior, we expect that the extent to which groups influence an individual may transpire through emergent states reflecting feelings about the group environment as a whole or through evaluations of where one fits within the group based on interactions and relationships with teammates.

Social cohesion is perhaps the most salient indicator of a group's social ecology — entailing subjective appraisals of group attractiveness in terms of social involvement as well as how tightly integrated the team is pertaining to social objectives.¹⁵ Although sport researchers have primarily investigated positive effects of cohesion, there is an emerging interest in how cohesion may relate to detrimental outcomes as well.¹⁹ As it pertains to health-risk behaviors, there is early evidence that social cohesion in sport teams is positively linked to alcohol use,²⁰ but calls have been made to better understand how group perceptions may influence

athletes' attitudes and behaviors more broadly.^{11,15} It is nevertheless plausible that attraction to social elements of the group may relate to more accepting attitudes of risk taking behaviors that are common among athletes.¹⁷

Whereas group cohesion represents perceptions of the group environment, peer acceptance reflects perceptions of one's position within the group and is a powerful influence upon health risk behaviors in other domains. Peer acceptance reflects one's appraisal of how fellow group members feel about the individual and especially in relation to affiliation (e.g., being liked or accepted by in-group members). Although acceptance is often used interchangeably with the terms 'popularity' or 'social status', acceptance specifically entails perceptions of fitting into the social structure of a peer group based on relationships and interactions with those peers.²¹ Although not as often studied within sport groups, college students who report high levels of peer acceptance report increased health-risk behavior such as heavy drinking patterns.²² Indeed, a recent review indicates that students who are more connected within peer networks engage in more use of alcohol, cigarettes, marijuana, and non-medical prescription drugs, as well as greater engagement in gambling behaviors.²³ Similarly, longitudinal social network analyses reveal that the positive link between peer acceptance (derived from peer nomination) and alcohol use is temporally bidirectional: those who are more well-liked by in-group peers engage in increased alcohol use, and those who engage in greater alcohol use subsequently gain peer acceptance.²⁴ This link is evident for other forms of health-risk behavior as well, where 10th grade popularity positively predicted tobacco use and unsafe sexual behavior in 12th grade.²⁵ In this sense, risky behavior is reinforced by peers in that it can be a means of attaining acceptance and status,²⁶ especially when these behaviors are normative within the group they affiliate with (i.e., sport teams).

Alongside athletes' evaluations of their group's social unity and perceptions of how their teammates may feel about them, it is pertinent to consider athletes' appraisals of *themselves*. Global self-esteem, which reflects global value judgements about oneself, has a salient impact on emotions, attitudes, and behaviors — especially in relation to social influences of others.²⁷ For instance, esteem is a direct predictor of several health-risk behaviors including smoking, alcohol and drug use, as well as risky sexual behavior.²⁸ Those with low trait self-esteem are likely to feel less accepted within social groups.^{27,29} Furthermore, a rich body of evidence indicates that self-esteem is related to how susceptible an individual is to social influences.^{30,31} Given this evidence, it is prudent to consider how individuals' self-esteem relates to attitudes towards health-risk behaviors as well as perceptions of the team environment.

The current research investigated how attitudes toward prevalent health-risk behaviors in student-athletes relates to group environment perceptions. First, we examined the extent that attitudes toward health-risk behaviors cluster within teams. That is, do athletes within the same team share similar attitudes towards health-risk behaviors, relative to the attitudes of athletes from other groups? Second, we tested whether these attitudes are predicted by perceptions of peer acceptance and social cohesion, controlling for global self-esteem. Given our focus on the social ecology within these sport groups, we opted to focus on social cohesion pertaining to the social environment, rather than task cohesion, which reflects perceptions of unity towards sport-related goals and/or attraction to group task goals.¹⁹

Beyond evaluating the associations with acceptance and cohesion, we designed the current study to target advances related to: (a) variability in social influence across numerous health-risk behaviors, and (b) the multilevel nature of peer influence. Because of the paucity of research investigating potential harmful effects related to the social environment in sport groups, we opted to

examine student athletes' attitudes towards numerous health-risk behaviors. Examining various types of risk behaviors provides wider understanding of peer influences in sport and serves as an initial foundation for future targeted efforts involving specific behaviors. There is also an increasing understanding that constructs such as cohesion and peer acceptance should be conceptualized as multilevel constructs because effects may exist at both the individual- and group-levels.¹⁵ We sampled intact sport teams to compute group-level scores for peer acceptance and social cohesion within a multilevel framework. Capturing group-level perceptions of the peer environment advances previous work that focused solely on individuals' perceptions.¹⁵

Our ability to construct hypotheses was limited by the novelty of a multilevel and group-based approach to examining health-risk attitudes, alongside lack of theory to distinguish within- and between-group processes related to these attitudes. Although we expected that health-risk attitudes would cluster within groups (i.e., similarities in attitudes within groups), we hypothesized that health-risk attitudes would be associated with perceptions of the group environment, and that these associations would be stronger within groups than between groups. Regarding social cohesion, we expected that social cohesion would be positively associated with risky behavior at a within-group level,²⁰ but we did not form between-group hypotheses. The novelty of measuring peer acceptance in this context and competing expectations for how acceptance will impact attitudes precluded hypotheses at both the within- and between-group levels.

2. Method

All procedures were cleared by the lead author's institutional review board. A total of 200 coaches of National Collegiate Athletic Association (NCAA) divisions II and III teams in Pennsylvania, United States, were sent an e-mail describing our interest in investigating health-risk behaviors and attitudes in NCAA athletes. We requested that interested coaches respond by phone or e-mail to set up a time for researchers to visit with the team. Surveys were completed using electronic tablets during a session with all team members in attendance. Athletes were compensated for participation with a \$10 gift card. Data collection was part of a broader project that produced one other publication related to teammate influence,⁹ however, the current measures were exclusively used in this publication.

The sample comprised 387 student-athletes from 23 intact NCAA sport teams that compete in divisions II and III ($M_{\text{age}} = 19.71$; 44% male). On average, 83% of team members were in attendance. The types of sampled teams, based on their level of structural interdependence,³² were 17 integrated sport teams with a shared task and collective outcome (e.g., soccer; $n = 275$, 71%), four segregated sport teams with both individual and shared tasks and a collective outcome (e.g., baseball; $n = 74$, 19%), and two collective sport teams with no shared tasks and both individual and collective outcomes (e.g., cross-country running; $n = 38$, 10%). Teams ranged in size from 8 to 40 athletes ($M = 16.48$; $SD = 6.70$). Average tenure with the team was 1.93 seasons ($SD = 1.04$).

To account for demographics, we collected information pertaining to athletes' age, sex, and tenure with current team. Wording of several scales was modified slightly to refer to participants' current team and/or to student athletes. Whereas the scale to assess social cohesion is an established scale with support for validity in student-athlete populations, the remaining measures were either adapted from studies conducted with adolescent populations (i.e., peer acceptance and self-esteem) or were developed for the purpose of this study (i.e., health-risk attitudes). A full description of all items used in the scales is available in the online supplement.

In a preliminary step, focus group discussions with seven recently graduated NCAA athletes from different sports informed our decision to examine six health-risk behaviors: Alcohol consumption, marijuana use, drinking and driving, playing through a concussion, using performance enhancing substances, and hazing incoming teammates. The rationale for studying attitudes towards several behaviors simultaneously was to understand how peer acceptance and social cohesion relate to a range of common health-risk behaviors, and the extent that attitudes towards these behaviors clustered within teams. Six items were adapted from existing work on adolescent health-risk attitudes to reflect the risky behaviors identified above as being relevant to the lives of student-athletes.³³ Example items included: "It is okay for *student-athletes* to drive a car after consuming a few alcoholic drinks" and "It is okay for *student-athletes* to continue competing after being hit in the head and having concussion symptoms (e.g., dizziness, nausea)." Items were scored on a 7-point Likert-type scale: 1 ('*Absolutely Not OK*') to 7 ('*Absolutely OK*').

Global self-esteem was assessed as a relevant control variable. This four-item scale (e.g., "I have a lot to be proud of") forwarded from previous work in this domain,³⁴ was scored on a 7-point Likert-type scale ranging from 1 ('*Strongly Disagree*') to 7 ('*Strongly Agree*').

To assess peer acceptance, we modified a scale involving peer groups to refer specifically to participants' sport team.³⁴ For example: "I feel socially accepted by people *on this team*" where response options were scored on a 7-point Likert-type scale from 1 ('*Strongly Disagree*') to 7 ('*Strongly Agree*').

Items from the 18-item Group Environment Questionnaire were used to assess social cohesion.³⁵ Although the original scale includes items spanning both attraction to group and group integration dimensions, within task and social domains, we selected the nine items referring specifically to the social environment (i.e., social cohesion). Items from the attraction to group and group integration subscales were combined to create a composite social cohesion variable. Example items include "For me, this team is one of the most important social groups to which I belong" (attraction to group) and "Our team would like to spend time together in the off season" (group integration).³⁵ As our main interest was on social cohesion as a global construct and we did not have differential hypotheses for how the two highly correlated subscales (i.e., group attraction, group integration) would relate to the outcomes of interest, we created a composite social cohesion index. This decision aligns with a similar study that examined how hazing relates to social cohesion in university sport teams.³⁶ Items were scored using a 9-point Likert-type scale ranging from 1 ('*Strongly Disagree*') to 7 ('*Strongly Agree*').

Pertaining to the scales used to assess self-esteem, peer acceptance, and social cohesion, 0.3% of responses were missing, which were determined to be missing completely at random using Little's MCAR test: $\chi^2(85) = 13.63$, $p = 0.40$. Expectation maximization imputation procedures were conducted to replace missing values. Pertaining to the outcome variables (i.e., health-risk attitudes), one participant did not respond to the drinking and driving item, and one did not respond to the performance enhancing substance use item. Because these were single-item scales, missing values could not be imputed. Data were screened for violations of assumptions (e.g., multivariate normality) and outliers. No outliers were detected, though we note that for two health-risk attitude variables—drinking and driving and performance enhancing substance use—the majority of participants responded at the lowest end of the scale, resulting in positive skewness (i.e., 4.35 and 2.57, respectively). These two variables were transformed using a Box-Cox transformation to normalize their distributions; however, the results from the transformed models did not differ from those of

untransformed models. To provide consistency in the models, we retained and report untransformed models in all cases.

We used multilevel modeling to account for nesting within teams and to disentangle individual- and group-level effects. Separate models were fit for each of the six health-risk behavior attitudes. Null models were first computed to determine the level of independence, whereby intraclass correlation coefficients were computed to estimate the extent which health-risk attitudes cluster within groups. These values represent the percentage of total variability that is due to between-group variability. Final models included control variables (i.e., age, sex, tenure, and self-esteem) in which restricted maximum likelihood estimation was used to allow intercepts to vary at the group-level. The slopes were fixed due to lack of variance at the group-level. To obtain clean estimates of the relations at each level of analysis, fixed effects of peer acceptance and social cohesion were entered on the individual-level (i.e., Level-1; group-mean centered) as well as the group-level (i.e., Level-2; grand-mean centered).

3. Results

Descriptive statistics and bivariate correlations are presented in Table 1. Scale scored constructs all demonstrated adequate internal consistency: Self-esteem = 0.78; peer acceptance = 0.84; social cohesion = 0.79. Across behaviors, participants held relatively risky attitudes towards alcohol use (i.e., near the ceiling of the scale), moderate attitudes towards marijuana use, playing through a concussion, and hazing, and relatively low-risk attitudes towards drinking and driving and performance enhancing substance use. Intraclass correlation coefficients ranged between 3% and 12% (Table 2), indicating that health-risk attitudes cluster within groups at a meaningful level.

Six multilevel models are presented in Table 2. Considering control variables, men held riskier attitudes than women towards drinking and driving, playing through a concussion, and hazing. Age negatively predicted attitudes towards playing through a concussion, while tenure positively predicted attitudes towards alcohol use.

Considering key predictors, peer acceptance positively predicted attitudes towards alcohol use, playing through a concussion, and hazing at the individual-level (Level-1), whereas teams with higher peer acceptance means (Level-2) held *less* approving attitudes toward playing through a concussion relative to other teams. Social cohesion predicted attitudes toward playing through a concussion, such that those who reported stronger perceptions of group unity held less approving attitudes, while teams higher in social cohesion (Level-2) held riskier attitudes toward playing through a concussion, relative to other teams. The models predicting attitudes toward health-risk behaviors accounted for between 4–19% of the total variance.

4. Discussion

As we continue to gain an understanding of how peers influence health-risk behaviors, it is essential to explore how social processes within small groups relate to athletes' attitudes. Given our analyses demonstrated some homogeneity in health-risk attitudes from one group to another, a central finding from the current study is that several health-risk attitudes clustered within teams, even after controlling for variables like sex and team tenure. Whereas past research demonstrates that correlations in attitudes amongst peers often result from homophily (i.e., individuals form friendships with similar others),³⁷ the findings are notable because sport team members primarily associate due to shared task-related interests (i.e., sport).

Whereas peer acceptance and social cohesion were predictive of attitudes, the design of this study leaves open explanations pertaining to *influence* and *selection*. Despite limited evidence from sport-specific groups, alcohol researchers have found that social influences impact students' attitudes and behaviors during the transition to college through both selection and peer influence processes.³⁸ On one hand, when students join new peer groups they often begin to align their own attitudes with those of fellow group members.³⁸ When students transition to college, however, they have the opportunity to seek out and join new peer groups (i.e., recruitment into sport teams), and may select peer groups with similar attitudes. Although we anticipate that health-risk behaviors may not be a driving force when athletes select teams and schools, the nature of the recruitment process in collegiate sport may provide an opportunity for athletes to select team environments based on these features. More direct research is nevertheless needed to understand student athlete recruitment and the extent that similarity in attitudes towards various behaviors (e.g., alcohol use) factor into decisions to join a team.

Alongside the finding that team members' attitudes coalesced for attitudes towards health-risk behaviors, associations with peer acceptance or social cohesion were primarily evident in relation to alcohol use, playing through a concussion, and hazing behavior. Group cohesion is commonly considered to be a positive group attribute, but high cohesion in sport groups can also have negative consequences such as conformity to risky behavior.¹⁷ Although we expected associations with several attitudes, social cohesion was only significantly related to attitudes towards playing through a concussion. Specifically, athletes reporting higher social cohesion relative to their teammates held less risky attitudes toward playing through a concussion. As such, individual perceptions of social cohesion may be a protective factor in that perceptions of one's team being socially united can facilitate less permissive attitudes towards putting physical safety at risk.

In contrast to social cohesion, student-athletes' perceptions of peer acceptance within their group were *positively* associated with more approving attitudes towards alcohol use, playing through a concussion, and engaging in acts of hazing. Although peer acceptance differs slightly from peer status, these findings align with evidence that social status is related to adolescent risk-taking behavior.²⁴ Whereas much of the existing peer acceptance evidence base pertains to large networks (i.e., schools) or informal collectives (i.e., peer-defined social groupings), the current findings are novel because they emerge within small and formal groups featuring rich group processes that could make the association between acceptance and risky behavior more salient.¹⁴ At the individual-level, peer acceptance can either be gained through deviant behavior or can provide incentive for health-risk behavior. As one example related to alcohol use, those who reported greater perceptions of acceptance may be those who are more likely to attend social functions that involve alcohol use.²² Indeed, college students who drink more alcohol tend to report higher perceptions of 'fitting in' and popularity among peers.³⁹ Nevertheless, to our knowledge, the positive associations between perceptions of student-athletes' peer acceptance and risky attitudes towards playing through a concussion and engaging in hazing activities are novel. In high-level sport, playing through an injury is often glorified and viewed by athletes as a noble demonstration of conforming to sport cultural norms and proving allegiance to one's team.⁴⁰ As such, those who adhere to these sport cultural norms, such as willingness to play through a concussion,⁴⁰ may gain respect from teammates and feel a greater sense of peer acceptance.

Pertaining to attitudes towards hazing, initiation rituals and hazing represent a risky form of peer victimization in which new members are forced to prove their dedication to the group.⁴¹ Interpreting our current results, those with higher peer acceptance may

Table 1
Means, Standard Deviations, and Bivariate Correlations of Attitudes towards Health-Risk Behaviors and other Study Variables.

Variable	M	SD	Scale	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol use	5.42	1.61	1–7											
2. Marijuana use	2.91	1.86	1–7	0.43**										
3. Drinking and Driving	1.22	0.76	1–7	0.07	0.17**									
4. Playing through a concussion	2.33	1.42	1–7	0.12*	0.15**	0.34**								
5. P.E.S. use	1.59	1.21	1–7	0.05	0.12*	0.31**	0.25**							
6. Hazing	2.78	1.61	1–7	0.17**	0.18**	0.26**	0.28**	0.24**						
7. Sex (M=0, F=1)	–	–	–	0.04	0.02	–0.13*	–0.15**	–0.08	–0.27**					
8. Age	19.71	1.28	–	0.08	–0.04	0.10	–0.07	0.08	0.10	–0.23**				
9. Tenure	1.92	1.03	1–5	0.17**	–0.01	0.07	–0.02	0.04	0.13*	–0.16**	0.72**			
10. Self Esteem	5.47	0.91	1–7	–0.01	–0.07	–0.00	–0.00	–0.01	0.04	–0.21**	0.13*	0.17**		
11. Peer Acceptance	5.82	1.01	1–7	0.12*	0.02	0.04	0.11*	0.00	0.17**	–0.21**	0.01	0.10	0.35**	
12. Social Cohesion	6.72	1.39	1–9	0.11*	0.02	–0.06	0.05	0.02	0.10*	–0.17**	–0.08	0.08	0.15**	0.56**

Note: Variables 1–6 reflect participants' attitudes (higher scores indicate riskier attitudes). P.E.S.= performance enhancing substance.

* $p < 0.05$.
** $p < 0.01$.

Table 2
Coefficients for the Multilevel Models Predicting Attitudes towards Health-Risk Behaviors, whereby Intercepts Varied Randomly by Team (k=23).

Fixed Effects	Alcohol use b (SE)	Marijuana use b (SE)	Drinking & driving b (SE)	Playing through a concussion b (SE)	P.E.S. b (SE)	Hazing b (SE)
Level 1						
Intercept	5.23 (3.81)	–0.03 (0.39)	2.10 (1.48)	9.65 (2.55)	–0.70 (2.45)	2.17 (3.11)
Sex (M=0, F=1)	0.34 (0.36)	–0.04 (0.11)	–0.27 (0.13)†	–0.77 (0.21)***	–0.08 (0.21)	–0.79 (0.28)**
Age	–0.02 (0.09)	0.06 (0.13)	0.00 (0.04)	–0.17 (0.08)†	0.11 (0.07)	0.00 (0.09)
Tenure	0.31 (0.11)**	–0.17 (0.11)	0.03 (0.05)	0.10 (0.10)	–0.05 (0.09)	0.16 (0.11)
Self-esteem	–0.12 (0.09)	0.09 (0.12)	–0.01 (0.04)	–0.08 (0.08)	–0.05 (0.07)	–0.17 (0.09)†
Peer-Acceptance	0.20 (0.10)†	–0.05 (0.09)	0.07 (0.05)	0.25 (0.09)**	–0.02 (0.08)	0.26 (0.10)**
Social Cohesion	–0.01 (0.08)	0.13 (0.76)	–0.06 (0.04)	–0.15 (0.07)†	0.04 (0.06)	–0.06 (0.08)
Level 2						
Peer Acceptance Mean	0.03 (0.72)	0.07 (0.30)	–0.05 (0.23)	–0.98 (0.40)†	0.04 (0.40)	0.15 (0.52)
Social Cohesion Mean	0.04 (0.29)	–0.03 (0.39)	–0.06 (0.09)	0.38 (0.15)†	0.04 (0.15)	0.12 (0.20)
R ² (Conditional/Marginal)						
Overall	0.19/0.05	0.11/0.01	0.06/0.04	0.09/0.08	0.04/0.01	0.14/0.10
Level 1	0.17/0.05	0.10/0.01	0.06/0.03	0.08/0.06	0.04/0.01	0.13/0.09
Level 2	0.13/0.01	0.10/0.01	0.04/0.01	0.06/0.01	0.04/0.01	0.10/0.03
Null Model ICC	12%	11%	3%	5%	3%	9%
Final Model ICC	14%	10%	2%	1%	3%	4%

Note: P.E.S. = performance enhancing substance. Peer-acceptance and social cohesion were group mean centered at Level-1, and grand mean centered at Level-2. Null Model ICC = Intraclass Correlation Coefficients for the unconditional model without predictor variables entered. Final Model ICC = Intraclass Correlation Coefficients after adding the fixed-effects predictor variables.

† $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

come to value their own group more, believing that it is appropriate for new members to have to exert a 'cost' to join. Alternatively, those who feel more accepted by peers may have more permissive attitudes towards health-risk behaviors because they feel that they have more leeway pertaining to deviant behaviors given that their peer acceptance would be less jeopardized by deviance. As hazing can be exceedingly dangerous and is a pervasive issue among college peer groups, researchers should build upon this early evidence. Indeed, appropriate forms of initiation can be done in a safe and constructive manner, which can build positive bonds between teammates.⁴¹

It is also important to situate these results alongside of the group-level effects of social cohesion and peer acceptance that were found in the current study. Pertaining to the former, groups higher in social cohesion tended to hold riskier concussion attitudes. This is notable because it is counter to the effect found at the individual-level, and indicates that teams featuring high social cohesion may foster expectations that members should make bodily sacrifices for the benefit of the team. This finding is in line with early sport cohesion research, which found that athletes' willingness to make sacrifices for the team was linked to stronger cohesion perceptions.⁴² Cohesion in sport groups, though typically viewed

as a desirable team-level trait, is a complex attribute that may exact unintended pernicious pressures on athletes. Although the current research is focused on empirical and basic processes, the current findings encourage us to exert caution when considering the widespread applied efforts to help coaches and programs foster group cohesion. Applied research is needed to understand how and under which circumstances group cohesion may increase pressures to engage in health-risk behaviors. This is critical to inform how team leaders and stakeholders structure team building to minimize the potential for unintentionally increasing pressures to engage in health-risk behavior.

Examining ways in which an accepting group climate may relate to athletes' health-risk attitudes, we found that belonging to a more accepting team (i.e., high group-level peer acceptance) was associated with less risky attitudes towards playing through a concussion. Whereas student-athletes who reported greater acceptance from teammates—relative to other members—held riskier attitudes, being on a team with greater overall peer acceptance was related to less risky attitudes towards playing through a concussion. It is prudent to consider this finding alongside the group-level effect of social cohesion. Whereas a group environment in which members are highly cohesive may yield risk taking attitudes toward

self-sacrificial behavior, an environment in which members feel accepted by other ingroup members may protect against self-sacrificing norms of sport culture.

The current findings demonstrate that social influences should be considered in the disparate lines of prevention research related to the health-risk behaviors that were examined. Considering interest in concussion as a public health concern, behaviors surrounding sport-related concussions are a paramount focus for researchers in this domain.^{2,5} Concussion symptoms are often not observable by coaching and medical staff (e.g., dizziness, confusion), leaving much of the onus to report on the athlete themselves.^{5,43} Researchers revealed that student-athletes were less likely to report a concussion or remove oneself from play when they reported pressures from coaches, teammates, parents, and fans.⁵ Although not presently tested, it is plausible that a more accepting team environment reduces the pressures on athletes to play through concussion symptoms. Ultimately, the current findings are an early indication of a potentially negative effect of a cohesive group environment, though future work would be wise to further disentangle why and under what conditions group cohesion and peer acceptance may relate to health-risk attitudes.

It is also pertinent to consider theoretical distinctions to interpret contrasting associations related to peer acceptance and group cohesion. Whereas peer acceptance entails perceptions of fitting in and being well liked by peers, social cohesion reflected feelings that the team is a united social group to which one is drawn toward. This aligns with Smith's theoretical perspective (adapted from Rubin et al.¹⁸) that the social environment in sport entails multiple levels of affiliation that are increasingly complex: (a) the individual, (b) interactions, (c) relationships, and (d) the group as a whole.¹² Within this perspective, perceived peer acceptance is an affective response to an aggregation of interactions and relationships with teammates over time. Conversely, cohesion is an emergent state that reflects perceptions of the group as well as the individuals' feelings about their relationship to the group.^{15,19} This conceptual distinction enables us to better situate disparate findings between the two constructs at the individual- and group-levels.

Whereas peer acceptance positively predicted attitudes towards playing through a concussion, social cohesion had the opposite effect. Peer acceptance reflects affiliation in terms of an athlete's interactions and relationships with teammates, which may encourage playing through concussion as a means of gaining acceptance by demonstrating commitment. Alternatively, at the higher level of affiliation (i.e., the group), those with stronger perceptions of social cohesion may believe that the team would remain socially united regardless of whether bodily sacrifices were made by playing through concussion symptoms. At the group level, however, team environments that were rated as more socially cohesive may instead facilitate pressures to make such sacrifices in order to help the team. Although peer acceptance and social cohesion were positively correlated, the results taken as a whole demonstrate the value of disentangling the two constructs and to consider each at the individual- and group-levels.

The effects of social cohesion and peer acceptance on athletes' attitudes towards health risk behaviors highlight the importance of the social environment, especially considering that trait-level effects of self-esteem were non-significant. Self-esteem was added as a covariate given its documented role in relation to perceptions of peer acceptance as well as risk-taking behaviors.^{27–29} Zero-order correlations revealed a positive relation between self-esteem and peer acceptance but, contrary to our expectations, self-esteem was not directly related to attitudes of any health-risk behaviors. Our findings nevertheless revealed that aspects of the social environment relate to health-risk attitudes, even after accounting for individual differences in self-esteem.

Several limitations must be considered. As with all cross-sectional studies employing self-report data, causality cannot be inferred. When studying high-risk and prohibited behaviors (e.g., substance use), attitudes are often measured in place of actual engagement because participants are hesitant to report such behavior.⁴⁴ Although attitudes strongly predict behavior, future research should examine the extent that student-athletes report actually engaging in health-risk behaviors. As it pertains to measurement, although the health risk attitude items were adopted from established scales, we employed single item measures to examine attitudes towards six behaviors. The items may also lack relevant details such as information regarding the quantity of alcohol use or instructions pertaining to underage drinking. Future researchers applying these findings to a more confined set of behaviors should adopt more detailed measures within those domains. As peer acceptance and social cohesion constructs demonstrated potential commonality ($r=0.56$), future projects should take additional steps to reduce common source biases to fully disentangle these conceptually distinct constructs. For instance, peer acceptance is well-measured through sociometric evaluations where acceptance could be derived through aggregate responses from all peers. Consideration is also needed for how the present results may differ within more individualized sport settings, which was not currently able to be determined given that the sample entailed 17 integrated sport teams and only 4 segregated and 2 collective sport teams.³² Because group influences may vary across sport types, future research in this domain should sample a wider variety of sport types (i.e., more individualized sports) to address these questions. Finally, we note that there were potential floor effects for attitudes towards drinking and driving and performance enhancing substance use (i.e., most participants reported the lowest response option). This is a well-documented issue in self-report designs involving explicitly prohibited behaviors (e.g., doping),⁴⁴ and may require researchers to utilize alternative methodologies.

5. Conclusion

Understanding group-level factors associated with student-athletes' attitudes towards health-risk behavior may inform behavioral interventions aimed at this at-risk population as well as similar adolescent peer-groups (e.g., fraternities/sororities). Stakeholders should work to create accepting group environments designed to protect against pressures to engage in health-risk behavior. Given the clustering of health-risk attitudes, interventions conducted within groups and even led by fellow teammates may establish group norms for acceptable and unacceptable behavior. Although our measurement of attitudes precludes comparing one behavior to another, behaviors enacted within teams (or enacted by teams) demonstrated the strongest associations with teammate-related perceptions and often had higher intraclass correlations. For instance, alcohol use may be more common within group settings than other health-risk behaviors, and hazing involves a cluster of behaviors exclusively within the group. As such, researchers and practitioners designing group-based interventions may be wise to consider the scope of behaviors for which groups are most relevant.

Acknowledgments

This research was funded by an NCAA Graduate Student Research Grant awarded to the first author to support the study of intercollegiate athletics. Additionally, the first author is supported by NIH's National Center for Advancing Translational Sciences (TL1TR002016) and National Institute for Drug Abuse (T32 DA017629). This work is also supported by NIH Award #: P50-

DA039838. No funding sources were involved in any phase of the research. All findings and conclusions represent the views of the authors, and do not represent the views of the NCAA or the NIH.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.jsams.2019.07.003>.

References

- Teunissen HA, Kuntsche E, Scholte RHJ et al. Friends' drinking norms and male adolescents' alcohol consumption: the moderating role of performance-based peer influence susceptibility. *J Adolesc* 2016; 53:45–54.
- Kroshus E, Kubzansky LD, Goldman RE et al. Norms, athletic identity, and concussion symptom under-reporting among male collegiate ice hockey players: a prospective cohort study. *Ann Behav Med* 2015; 49:95–103.
- Webber TA, Soder HE, Potts GF et al. Neural outcome processing of peer-influenced risk-taking behavior in late adolescence: preliminary evidence for gene x environment interactions. *Exp Clin Psychopharmacol* 2017; 25:31–40.
- Taylor EA, Ward RM, Hardin R. Examination of drinking habits and motives of collegiate student-athletes. *J Appl Sport Manag* 2017; 9:56–77.
- Kroshus E, Garnett B, Hawrilenko M et al. Concussion under-reporting and pressure from coaches, teammates, fans, and parents. *Soc Sci Med* 2015; 134:66–75.
- Buckman JF, Farris SG, Yusko DA. A national study of substance use behaviors among NCAA male athletes who use banned performance enhancing substances. *Drug Alcohol Depend* 2013; 131:50–55.
- Turrisi R, Mastroleo NR, Mallett KA et al. Examination of the mediational influences of peer norms, environmental influences, and parent communications on heavy drinking in athletes and nonathletes. *Psychol Addict Behav* 2007; 21:453–461.
- Yusko DA, Buckman JF, White HR et al. Alcohol, tobacco, illicit drugs, and performance enhancers: a comparison of use by college student athletes and nonathletes. *J Am Coll Health* 2008; 57:281–290.
- Graupensperger SA, Benson AJ, Evans MB. Everyone else is doing it: the association between social identity and susceptibility to peer influence in NCAA athletes. *J Sport Exerc Psychol* 2018; 40:117–127.
- Fearnow-Kenney M, Wyrick DL, Milroy JJ et al. The effects of a web-based alcohol prevention program on social norms, expectancies, and intentions to prevent harm among college student-athletes. *Sport Psychol* 2016; 30:113–122.
- Eys M, Bruner MW, Martin LJ. The dynamic group environment in sport and exercise. *Psychol Sport Exerc* 2019; 42:40–47.
- Smith AL. Youth peer relationships in sport, in *Social Psychology in Sport*, Jowett S, Lavallee D, editors, Champaign, IL, Human Kinetics, 2007, p. 41–54.
- Smith AL. A case for peer-focused efforts to understand and promote physical activity in young people. *Kinesiol Rev* 2019; 8:32–39.
- Eys MA, Evans MB. Group dynamics in sport, exercise, and physical activity contexts, in *Advances in Sport and Exercise Psychology*, 4th ed., Horn T, Smith AL, editors, Champaign, IL, Human Kinetics, 2018.
- Eys MA, Brawley LR. Reflections on cohesion research with sport and exercise groups. *Soc Personal Psychol Compass* 2018; 12:1–15.
- Martin L, Bruner M, Eys M et al. The social environment in sport: selected topics. *Int Rev Sport Exerc Psychol* 2014; 7:87–105.
- Rovio E, Eskola J, Kozub SA et al. Can high group cohesion be harmful? *Small Gr Res* 2009; 40:421–435.
- Rubin KH, Bukowski WM, Parker JG. Peer interactions, relationships, and groups, in *Handbook of Child Psychology: Social, Emotional, and Personality Development*, 6th ed., Eisenberg N, editor, New York, Wiley, 2006, p. 571–645.
- Evans MB, Graupensperger S, Wolf SA. Group cohesion and team building, in *The Routledge International Encyclopedia of Sport and Exercise Psychology*, Hackfort D, Schinke RJ, editors, Routledge, 2019, in press.
- Zamboanga BL, Rodriguez L, Horton NJ. Athletic involvement and its relevance to hazardous alcohol use and drinking game participation in female college athletes: a preliminary investigation. *J Am Coll Health* 2008; 56:651–656.
- Weiss MR, Stuntz CP. A little friendly competition: peer relationships and psychosocial development in youth sport and physical activity contexts: a lifespan perspective, in *Developmental Sport and Exercise Psychology: A Lifespan Perspective*, Weiss MR, editor, Morgantown, WV, Fitness Information Technology, 2004, p. 165–196.
- Maggs JL. Alcohol use and binge drinking as goal-directed action during the transition to postsecondary education, in *Health Risks and Developmental Transitions during Adolescence*, Maggs JL, Horrelmann K, editors, New York, NY, Cambridge University Press, 1997, p. 345–371.
- Rinker DV, Krieger H, Neighbors C. Social network factors and addictive behaviors among college students. *Curr Addict Reports* 2016; 3:356–367.
- Van Ryzin MJ, DeLay D, Dishion TJ. Being well-liked predicts increased use of alcohol but not tobacco in early adolescence. *Addict Behav* 2016; 53:168–174.
- Mayeux L, Sandstrom MJ, Cillessen AHN. Is being popular a risky proposition? *J Res Adolesc* 2008; 18:49–74.
- Balestrieri SG, Meisel MK, Clark MA et al. U.S. college students' social network characteristics and perceived social exclusion: a comparison between drinkers and nondrinkers based on past-month alcohol use. *J Stud Alcohol Drugs* 2018; 79:862–867.
- Leary MR, Baumeister RF. The nature and function of self-esteem: sociometer theory. *Adv Exp Soc Psychol* 2000; 32:1–62.
- Wild LG, Flisher AJ, Bhana A et al. Associations among adolescent risk behaviours and self-esteem in six domains. *J Child Psychol Psychiatry Allied Discip* 2004; 45:1454–1467.
- Felson RB. The (somewhat) social self: how others affect self-appraisals, in *Psychological Perspectives on the Self*, Suls J, editor, Hillsdale, NJ, Erlbaum, 1993, p. 1–26.
- Dielman TE, Campanelli PC, Shope JT et al. Susceptibility to peer pressure, self-esteem, and health locus of control as correlates of adolescent substance abuse. *Health Educ Behav* 1987; 14:207–221.
- Rhodes N, Wood W. Self-esteem and intelligence affect influenceability: the mediating role of message reception. *Psychol Bull* 1992; 111:156–171.
- Evans MB, Eys MA, Bruner MW. Seeing the “we” in “me” sports: the need to consider individual sport team environments. *Can Psychol Can* 2012; 53(4):301–308.
- Elek E, Miller-Day M, Hecht ML. Influences of personal, injunctive, and descriptive norms on adolescent substance use. *J Drug Issues* 2006; 22:147–171.
- Daniels E, Leaper C. A longitudinal investigation of sport participation, peer acceptance, and self-esteem among adolescent girls and boys. *Sex Roles* 2006; 55:875–880.
- Carron A, Widmeyer WN, Brawley L. The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *J Sport Psychol* 1985; 7:244–266.
- Lafferty ME, Wakefield C, Brown H. “We do it for the team”–Student-athletes' initiation practices and their impact on group cohesion. *Int J Sport Exerc Psychol* 2017; 15:438–446.
- Kandel DB. Similarity in real-life adolescent friendship pairs. *J Pers Soc Psychol* 1978; 36:306–312.
- Abar CC, Maggs JL. Social influence and selection processes as predictors of normative perceptions and alcohol use across the transition to college. *J Coll Stud Dev* 2010; 51:496–508.
- Borsari B, Murphy JG, Barnett NP. Predictors of alcohol use during the first year of college: implications for prevention. *Addict Behav* 2009; 32:2062–2086.
- Sanderson J, Weathers M, Snedaker K et al. “I was able to still do my job on the field and keep playing”: an investigation of female and male athletes' experiences with (Not) reporting concussions. *Commun Sport* 2017; 5:267–287.
- Van Raalte JL, Cornelius AE, Linder DE et al. The relationship between hazing and team cohesion. *J Sport Behav* 2007; 30:491–507.
- Prapavessis H, Carron AV. Sacrifice, cohesion, and conformity to norms in sport teams. *Gr Dyn Theory, Res Pract* 1997; 1:231–240.
- Moreau MS, Langdon J, Buckley TA. The lived experience of an in-season concussion amongst NCAA Division I student-athletes. *Int J Exerc Sci* 2014; 7:62–74.
- Elbe AM, Brand R. Ethical dilemma training – a new approach to doping prevention, in *Psychology of Doping in Sport*, Barkoukis V, Lazarus L, Tsorbatzoudis T, editors, Abingdon, Routledge, 2015, p. 165–180.