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EVALUATING THE RELATIONSHIP BETWEEN TEAM COHESION AND MENTAL
HEALTH IN NCAA ATHLETES

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Abstract

Objective: College student-athletes face unique stressors at a developmental stage marked by heightened prevalence of mental health problems such as anxiety, depression, and disordered eating. Given the value ascribed to membership in small groups, perceptions of group cohesion may be a critical aspect of athletes' social environment for promoting mental health in sports teams. The purpose of the current study was to determine the association between perceived group cohesion and self-reported perceptions of anxiety, depression, and disordered eating.

Methods: Athletes ($N = 124$) were recruited within their sport teams to complete an electronic survey. Participants completed measures of group cohesion (i.e., attraction to group-task, attraction to group-social, group integration-social, group integration-task), social support, anxiety, depression, and disordered eating. **Results:** Preliminary analyses generally revealed weak bivariate correlations between group cohesion and the three dependent variables, although depression had a moderate correlation with two cohesion subscales: attachment to group-task and group integration-social. Linear regressions examined the extent that four subscales of group cohesion predicted mental health issues. Whereas group cohesion was not a significant predictor of anxiety, depression and disordered eating behaviors were significantly predicted by group cohesion. Increases in cohesion were linked to lower perceptions of both depression and disordered eating with the strongest significant predictors being attachment to group-task and group integration-task. **Conclusions:** These findings highlight group cohesion as a predictor of mental health issues, and depression in particular. While these findings are preliminary, they point toward the potential role of group environments within mental health interventions.

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Personal reflection

I have run my entire life. I began running by following my mom around on her neighborhood runs, and this passion eventually led me to commit to run cross country and track and field at High Point University located in High Point, North Carolina. Besides the normal injuries, no major roadblocks had ever popped up in my running career. Small injuries occurred here and there that served more as speed bumps but everything had a diagnosis and a clear path to recovery. I was a healthy, happy, and eager 18-year-old freshman in August of 2015 when entering college. However, within the first couple weeks, my entire world was rocked. I was suddenly taken down by a mysterious illness that no doctor had an answer for. I could no longer keep up with my teammates and felt out of breath, shaky, and numb on every run. Paces that used to be easy and race times that I used to be ashamed of were now only happening on my good days. I would dread practice because I knew these feelings were inevitable. Things eventually started to turn in a positive direction as I learned to manage the symptoms, but at the end of my freshman year of college I was far behind the athlete I had entered the year as.

For numerous reasons, I transferred to Penn State for my sophomore year of college. I started the year as a member of the cross-country team, but my symptoms returned with a tremendous presence. After a month, I was no longer a member of the team. With this newly-found free time, I investigated these mysterious symptoms. I wanted to find an answer. The conclusion was drawn that I was suffering from an exercise-induced panic disorder. My body was not seeing running and exercising as a fun past time, but instead as a life or death situation and was taking all of the necessary steps in order to try and save my life. These physical symptoms were all a result of a mental illness, a mental illness that no one had recognized or

diagnosed after over a year of going to every type of doctor on the list. It amazed me that no one had thought to check for this, and that what I found with only a little bit of research had been so easily missed. Doctors, coaches and trainers were looking at my physical symptoms and were looking no deeper than the surface.

It was this experience that peaked my interest into mental health within college athletes. I spent the next several months searching for, reaching out to, and connecting with athletes around the country and listening to their struggles. I was amazed at how many athletes went through a similar situation as mine and felt that their mental health symptoms were passed-over by many in the process. They felt they were valued only as an athlete and not as a holistic person. If the athlete wasn't performing at the standards that were set for them, that they were recruited and expected to perform at, they were no longer important to their coach and to their team. As I looked for professional research into this area, I was shocked to see there wasn't much. While the NCAA had *recommendations* for protocol with mental health concerns in NCAA athletes, nothing was *required* for schools. Schools are not mandated to have anything in place in order to treat and address athletes with mental health concerns. There is a huge difference between the words recommended and required. To me, that didn't seem right. Athletes deserved more than this.

I wanted to investigate this area further, and it just happened to be to put me on a research path that hadn't been previously explored. I wanted to look at what aspects went into creating a positive team environment in college athletics and an environment that would reduce the likelihood of mental health concerns. More specifically, I wanted to look at how group cohesion within a team could affect the prevalence of the three most common mental health concerns:

anxiety, depression, and disordered concerns. While this area hadn't been specifically explored, there has been research done into what creates a positive and lasting team environment.

Introduction

Mental health issues are gaining increasing recognition in Western society as a widespread and typical experience throughout the lifespan. One example of this is the ‘Let’s Talk Day’ campaign, promoted through social media by the Bell Canada organization in February of 2019. Through promotion by recognized personalities across media, the campaign encouraged people to speak up about their mental health and to encourage others to do the same. Tracking the use of the hashtag *#BellLetsTalk*, there were 145,442,699 social media interactions during the campaign day in 2019 (Bell Let’s Talk, 2019). A further example is The Campaign to Change Direction, which aims to change the culture and stigma surrounding mental health and ensure that Americans facing mental health issues receive the care and support they need (The Campaign to Change Direction, 2019).

Mental health promotion is critical during transitions from youth to adulthood, in particular. Mental health challenges often present during the adolescent and emerging adulthood years, when individuals are experiencing numerous changes. The late teenage years and emerging adult years are also a time when mental health issues are particularly prevalent (i.e., 10-20% of Americans under the age of 18 experience mental health problems; Kieling, et al., 2011). Among the social and developmental forces that produce these issues, the transition to college places unique stressors at a time when mental health issues are already widespread (Kurkland & Sigel, 2013).

The emerging adulthood years, experiencing the transition from child to adult, can be a time of great stress and change. This experience is amplified when combined with the transition to college. Student-athletes face not only the typical hurdles experienced by non-athlete peers entering college, but the additional challenges such as adjusting to a new team, a new practice

schedule, and a new coach. A previous study found that the major stressors faced by freshmen student-athletes include training intensity, high performance expectations, interpersonal relationships, being away from home, and academics (Giacobbi et al., 2004).

It is perhaps not surprising that many collegiate student-athletes face mental health concerns. Surveys conducted by the National Collegiate Athletics Association (NCAA) identified that as many as 30% of collegiate student athletes reported feeling depressed within the previous year, while 50% of athletes reported that they had experienced overwhelming anxiety in the same period (Brown & Hainline, 2014). It should be noted that athletes don't necessarily experience *more* of these symptoms compared to their peers, as the overall prevalence of clinical depression and anxiety may be lower in athletes when compared to non-athletes (Weber et al., 2018). Nevertheless, athletes face *unique* stressors. Furthermore, there are particular mental health issues that athletes experience at high rates, compared to non-athletes. This is the case for eating disorders, where the prevalence is higher in athletes than non-athletes, and even higher in athletes who participate in sports favoring leanness (Reinking & Alexander, 2005). College student-athletes represent a critical population for studying mental health, both to support peak performance and to ensure this substantial segment of the student population experiences opportunities to thrive.

The mental and social challenges faced by college student-athletes are increasingly being recognized by the NCAA, the governing body of collegiate sports within the United States. The NCAA has traditionally struggled with its role in student-athlete mental health and what, if any, regulations it should put in place. In 2014, the NCAA published a document titled "*Mind, Body, And Sport - Understanding and Supporting Student-Athlete Mental Wellness.*" This publication came after years of research by the NCAA and represents a rich examination of personal stories

of athletes and descriptions of numerous mental illnesses. While this document was a large step in a positive direction for the NCAA, the document only suggests “Best Practices” and “Recommendations,” such as identifying members of a mental health service team, raising awareness of the mental health services available on campus, and crisis and risk management for athletic departments.

While prompting change in how we view mental health in the NCAA, the *Mind, Body, And Sport* report falls short of identifying the key social factors that impact an athlete’s well-being. A critical part of an athlete’s experience is based upon the relationships they develop with their teammates. Since an athlete is often spending several hours a day with this select group of people, team environments can be extremely impactful on a student’s well-being. Even athletes in individual sports cite their teams as important reasons to continue competing and describe how experiences with teammates even shaped the meaning they derived from their involvement (Evans, Eys, & Wolf, 2013). Meanwhile, negative teammate interactions are also common and can reduce social benefits delivered through sport. Considering the potential for sport to impact mental health in positive and negative ways, the current research examined the association between the group environments of sport teams and mental health. Critical to studying this topic, I will introduce the concept of ‘mental health’ prior to outlining the potential for teammates to exert substantial influences on one-another’s mental and affective states.

Mental Health and Social Influences in Sport.

For this research, it is important to define the terms mental health and wellbeing. The term wellbeing is defined as a general state of balance that can be impacted by life events or challenges (Dodge et al., 2012). Mental health is defined as an ability to positively cope with the changes and challenges of daily living and to create harmony and balance between body and

mind (Galderisi et al., 2015). Underlying this definition is the recognition that mental health entails both (a) experiencing few mental health issues, and (b) perceptions of wellbeing and positive affective experiences. Regarding the first component of this definition, mental health entails limited experiences with mental health issues, referring to conditions that affect cognition, emotion and behavior, such as anxiety and depression (Manderscheid et al., 2009). Meanwhile, the second component of mental health focuses on wellbeing, which entails a personal state of being comfortable and healthy as previously defined. A mentally healthy athlete is, thus, likely to be an individual who rarely experiences negative affective states or psychological and, also, someone who reports feelings of flourishing in everyday life.

Adopting such a comprehensive definition of mental health provides opportunities to consider several pathways for the influence of group environments. An athlete is often with their teammates for several hours a day, six or seven days a week. They travel together, eat together, experience the highs and lows associated with wins and losses together, and often socialize with each other. Beyond simply the sheer time spent together, the existence of rich interdependencies has led theorists to anticipate that teammates have substantial roles in relation to one-another's mental state. For instance, group members often share emotional states and engage in communal coping processes at a general level and may even engage in behaviors that more directly influence one-another's mental health (e.g., bystander behaviors and social support; Vella et al., 2018).

One construct that is likely to be associated with mental health is group cohesion, the most widely studied group-related construct in sport research (Evans et al., 2019). The concept of group cohesion can be formally defined as “a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or

for the satisfaction of member affective needs” (Carron, Brawley, & Widmeyer, 1998, p. 213).

While brief, this definition hints at several underlying features of group environments. First, as an instrumental and affective process, cohesion is not only a fundamental part of helping members achieve goals, but it also characterizes members’ positive and negative experience in a group. As a result, the measurement of cohesion demands the assessment of members’ subjective evaluations of the group. Cohesion is also multidimensional and encompasses the dimensions of group integration and attraction to group. Group integration is the “we” component, containing each member’s assessment about how united the group is as a whole. Individual attraction to the group is focused on the “me” aspect of the group, which incorporates an individual member’s involvement in the group and how membership impacts them (Evans et al.). Feelings about membership to the group and how the group impacts individual’s progress towards tasks are important parts of cohesion.

There is preliminary evidence that group cohesion may link to affective experiences within groups and, particularly, emotions. For example, perceptions of group cohesion have a direct relationship with precompetitive anxiety (Borrego, Cid, & Silva, 2012; Prapavessis & Carron, 1996). Considering how cohesion fits within the appraisals that generate anxiety, strong perceptions of group cohesion are expected to support perceptions of coping resources and capabilities. Despite strong conceptual support for an association, however, previous investigations are limited to competitive emotions and not the more persistent states. Researchers have yet to study the link between sport team group environments and broader states of mental health that extend beyond the sport context.

Disentangling Potential Links between Group Cohesion and Mental Health.

The current expectations are based on the idea that high group cohesion could be protective for mental, which leads to my proposal of two possible distinct pathways for this association. The first of these is a direct pathway, considering evidence that group memberships are essential for mental health and wellbeing. Teammate relationships – especially those that develop within a cohesive group – are a crucial source for belongingness and identification for individuals. For instance, Cruwys et al. (2013) demonstrated how individuals reporting membership in a social group experienced fewer depressive symptoms. The benefits of group identification are particularly evident for adolescents, for whom higher identification with a specific group predicted better mental health (Miller, Wakefield & Sani, 2015). Both of these scenarios exemplify the concept that a group satisfies social needs that are required for mental health.

Regarding the second pathway, I anticipate that teammates in cohesive groups may also be sensitive to others' emotional states and actively respond to one another. This responsiveness may entail positive behaviors (e.g., social support), matched with fewer negative behaviors (e.g., antisocial behaviors). The value of peer social support is evident when considering the association between social support and sport burnout. In research with collegiate athletes, Defreese and Smith (2013) reported that athletes' value both types of social support: perceived and received. In addition, low satisfaction with support provision was shown to be associated with higher burnout in athletes. In a similar vein, Al-Yaaribi and Kavussanu (2017) demonstrated how prosocial behavior among teammates (i.e., voluntary behavior intended to help another individual or the group), buffered the stress experienced in a sport and decreased

burnout within teams. Although focused on sport-specific burnout and satisfaction, these studies provide evidence for how teammate interactions could impact mental health.

Despite progress demonstrating the role of teammate behavior and group membership, we nevertheless lack evidence regarding the more specific link between group cohesion and mental health. There is, however, early evidence that group cohesion can affect mental health within a *military setting*. One study surveyed U.S. marines before and after deployment – where cohesion is critical to success – and revealed that high within-unit cohesion was associated with lower likelihood of violation of military code and more pride in their service (Breslau, Stedji, & Vaughan, 2016). Another similar study examined unit cohesion within the armed forces in the United Kingdom, revealing that unit cohesion was associated with a lower risk of mental health disorders (Preez et al., 2011). While a military group differs in many respects from an athletic team, the construct of cohesion in these groups shares parallels. A sports team works together through a finite period of time for on key shared tasks, and features many of the group processes that are critical in military contexts (e.g., shared identity; leadership; member turnover).

Along with military units, *educational psychology* research provides further evidence for a potential link between group cohesion and mental health. The community-based environment of most classrooms can have a substantial influence on a child or young adult's well-being. A study by Oberle (2018) evaluated the relationship between the environment in a classroom and early adolescent emotional well-being, integrating students' perceptions of supportiveness and a prosocial classroom climate. Oberle (2018) reported that students in highly supportive classroom environments reported increased emotional well-being. A classroom environment shares several similarities to an athletic environment in ways such as how students in a classroom must work

together with guidance from their teacher, so these findings may similarly extend to team environments.

While there are noted positive effects of group environments, it is also important to consider that there are also negative effects that emerge when group members exclude others or demonstrate antisocial behaviors. This is particularly evident when considering the experiences of group members who are also minorities. For instance, African American college student-athletes often report difficulties adjusting to college and the campus environment, which can alter the student's mental health and change their interactions with their teammates (Sadberry & Mobley, 2013). The results showed that Black student-athletes had low levels of cohesion with higher levels of depression and anxiety symptoms (Sadberry & Mobley, 2013). A similar finding showed that teams where there were strong behavioral heterosexist attitudes present among teammates had lower perceived team cohesion (Mullin, 2016). Negative consequences of high cohesion may also emerge when cohesion is based around negative norms, such as disordered eating. Pressure by teammates, a feeling of needing to fit with teammates, or pressure to meet performance expectations can all be risk factors for disordered eating and eating disorders (Bratland-Sanda & Sundgot-Borgen, 2013). The negative impacts of group cohesion are important to consider: as cohesion may decrease anxiety and depression symptoms, there may be a different significant relationship with disordered eating; where cohesion increases, disordered eating may also increase.

The Current Study.

This study was conducted to further the evidence base on student-athlete mental health within the NCAA. More specifically, the study sought to investigate how perceptions of group cohesion within competitive intercollegiate sport teams is associated with mental health (i.e.,

anxiety and depression) as well as disordered eating symptoms. The hypothesis for this study was that there would be a negative association between group cohesion and each of the mental health constructs evaluated. I did not form hypotheses regarding associations with specific subscales of group cohesion. Nevertheless, evidence regarding the value of group belongingness for individuals (e.g., Cruwys et al., 2013) suggested that attraction to group subscale items in relation to both task and social cohesion may be stronger predictors of mental health symptoms. As a descriptive study being the first to link elite sport team environments with generalized mental health, this may provide an impetus to study peer influences in a context where a focus has traditionally entailed the role of coaches, support staff, and organizational policy. The implications from this research include shaping the strategies and policies that the NCAA and member institutions introduce to support mental health.

Methods

The current thesis employed a cross-sectional survey design with college student-athletes, to provide preliminary evidence regarding key associations among constructs in the social environment and related to athlete mental health. This section outlines the study sample, recruitment, survey procedures, and the analysis approach. Appendix A includes survey measures employed within the current study.

Participants.

Participants who completed this study were all currently attending college and participating in a sport at the collegiate level. For this survey, there were 124 total participants. The sample was primarily composed of athletes competing in cross country/track and field ($n = 36$), soccer ($n = 32$), basketball ($n = 16$) and volleyball ($n = 10$). Several participants indicated

that they participated in multiple sports. Fifty percent of participants identified as female. On average, participants reported they had been a member of their sport team for about two and a half years ($M = 2.39$ $SD = 1.39$). Twenty participants reported that they had previously been diagnosed with a mental health condition such as, but not limited to, anxiety, depression, or an eating disorder. All participants were over the age of 18 and spoke English.

Procedures.

Two approaches were used to recruit participants. The in-person approach entailed contacting coaches of collegiate sport teams around the central Pennsylvania area via phone and email for permission to attend a group meeting to conduct the study. If the study was conducted in person, it was done with the athletes in a group session either before or after practice. The researcher was present to explain the purpose of the study was to look at the link between group cohesion and mental wellbeing in NCAA athletes. To bolster participation beyond the four coaches who invited me to meet with their group, an alternative recruitment method was implemented. The online approach entailed contacting collegiate sport team coaches across the country through email and over the phone and inviting them to forward the email to their athletes to participate in the survey. This method allowed the study to reach more athletes, increasing the number of overall participants.

All athletes – regardless of completing the survey online or in person – were provided with information for informed consent via the first page of the survey. All athletes completed the survey using their personal devices (i.e., cellphones and personal tablets) using a link to the study. The survey was completed through Qualtrics and took an average time of 7 minutes and 19 seconds to complete.

Ethics.

Ethical approval was obtained from the Penn State Institutional Review Board prior to subject recruitment and consent was obtained from all participants (see Appendix A). All study materials stated that the survey was voluntary and that there will be no way for others to know their responses. Of note, to reduce pressure from researchers, teammates, or coaches to participate, coaches left the area where surveys were completed, and the voluntary nature of the study was emphasized. Along with this, the first page of the survey explained the research in detail and informed participants of the risks of participating.

The consent process took place once individuals clicked on the link to the online survey. Individuals were presented with an informed consent statement according to the template for exempt research and provided implied consent by advancing in the survey. The consent statement indicated that participation, or lack of participation, was anonymous and that individuals may withdraw from participating at any time. Electronic devices were used so that no hard-copy evidence of participants' responses was immediately available. Regarding risks of participation, one concern was that completing items relating to mental health problems may have led individuals to become more aware of problems in themselves or others. To address this risk, all participants received a mental health awareness resource upon completion of the survey (Appendix C).

Measures.

Demographic Information. Participants reported their gender, sport, and the number of years they have been a member of their sport team. Items were also included for participants to self-identify as having past experiences with clinical diagnoses related to anxiety, depression, or disordered eating (i.e., yes or no items reflecting each pre-existing condition).

Group Environment Questionnaire. Group cohesion was assessed using the 18-item Group Environment Questionnaire (Estabrooks & Carron, 2000). Participants use each item to rank their experiences in the group on a 9-point Likert-type scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). The items address four dimensions. Four items measured attractions to the group task (e.g., I'm happy with my team's desire to win). Five items measured attractions to the group-social (e.g., I enjoy being a part of the social activities of this team). Five items measured group-integration-task (e.g., Our team is united in trying to reach its goals for performance). Four items measured group integration-social (e.g., Our team members often party together). Beyond initial scale validation, continued research efforts support the validity of the four-dimensional factor structure and the reliability of scale items (Eyes & Brawley, 2018).

Social Supportive Behaviors. The Inventory of Socially Supportive Behaviors, or ISSB, was used to measure received social support (Finch et al., 1997). The short-form was utilized in this study, which includes 19 items. The items address six categories of social support functions: Material aid, behavioral assistance, intimate interaction, guidance, feedback, and positive social interaction (Finch, et al., 1997), and items were revised so that participants described social support from teammates. For the purpose of this research, a generalized overall composite of items was utilized. For each item, participants reported how often during the past week their teammates engaged in varying forms of support, on a 4-point Likert-type scale from 0 (*not at all*) to 3 (*every day*). Sample items include "Made it clear what it was expected of you," "Expressed interest and concern in your well-being," and "Gave or loaned you \$25." Continued research supports the multidimensional factor structure and reliability of the scale items. This scale is not commonly used in sport but has been validated in several other settings (Barrera & Baca, 1990).

Anxiety. Participants completed the Generalized Anxiety Disorder – 7 (GAD-7) (Spitzer, 2006), as a self-report tool indicating symptoms of generalized anxiety. Participants completed seven items, responding to prompts like “In the past 7 days, I felt uneasy” and “In the past 7 days, I had difficulty calming down.” For each item, the participant reported how often they experienced the symptoms on a 5-point Likert-type scale from 1 (*never*) to 5 (*always*). This measure has demonstrated reliability and is predictive of other clinical measures of generalized anxiety (Spitzer et al., 2006), although values on this scale are not necessarily representative of clinical symptomology. Research continues to prove validity and reliability for this measure beyond initial scale validation. The timeframe of the measure was adapted for consistency with other survey measures, so the instruction asked the participant to focus on the last seven days.

Depression. A brief 8-item depression survey was adapted from the Patient-Reported Outcomes Measurement Information System (PROMIS; Jensen, 2011) to identify depression symptoms in the preceding seven days. This scale includes prompts such as “In the past seven days, I felt worthless” and “In the past seven days, I felt like a failure.” Similar to the short form anxiety measure, the participant is asked to rank each item on a 5-point Likert-type scale from 1 (*never*) to 5 (*always*). This short-form of this measure is reliable and performs as well or better than similar measures when used to evaluate depressive symptoms (Amtmann et al., 2014).

Disordered Eating. The EAT – 26 is the most widely used measure for evaluating disordered eating symptoms. As mentioned previously, the EAT – 26 does not diagnose disordered eating but instead identifies the extent of related nonclinical and symptoms. The participant is asked to rank items on the scale from *rarely* to *always*. Items include prompts such as “I vomit after I have eaten” and “I am aware of the calorie content of the foods I eat.” The measure is commonly used as a screening tool to assess eating disorder risk in groups such as

high school students, college students, and athletes (Garner, 1998). Through research and in comparison to similar measures, the EAT – 26 was valid and reliable in an athletic population. While the EAT – 26 does have subscales, for the purpose of this research a generalized overall composite of items was utilized. In addition to initial scale validity, continued research provides support for the reliability of the measure (Pope, Gao, Bolter, & Pritchard, 2014).

Planned Analysis. An initial step when managing responses provided through online surveys entails examining the quality of responses. To do so, I considered unusual response time or response patterns. Those who completed the survey in under 3 minutes were deemed not valid due to the quick response time based on pilot testing with students prior to conducting the study. Furthermore, participants who selected the same response to all items on scales were also removed (i.e., selected 9 to all items on GEQ). Incomplete surveys were removed. Study data was also examined to consider the extent that the assumptions of conducting regression were met. The novelty of studying the proposed relationships also meant that descriptive analyses were critical to probe the associations among the network of variables within this study. As such, I reported bivariate correlations and descriptive data.

Regressions. Primary analyses entailed conducting linear regressions to predict each of the three proposed dependent variables: Anxiety, depression, and disordered eating behavior. The regressions used four predictors, which were subscales of the GEQ: Attraction to group – social, attraction to group – task, group integration – task, and group integration – social.

Results

Preliminary analyses and data cleaning were first conducted. Although 135 participants started the survey, 11 responses were either incomplete or were deemed not valid and removed from further analysis – leaving 124 responses as the survey sample. One entailed a highly unusual response pattern, three were incomplete, and seven responses were removed due to a response time of under three minutes. Prior to replacing missing values, it was inferred that data was missing completely at random, as Little's (1988) MCAR statistic did not reject the null hypothesis that missing values diverged from randomness, $\chi^2(299) = 258.06, p = .96$. Due to this, missing values were replaced for each variable using the participant subscale mean. Finally, internal consistency of scales and subscales are reported within Table 1. Cronbach's alpha values for the four group cohesion subscales (i.e., attachment to group – social, attachment to group – task, group integration – task, and group integration – social) were deemed acceptable, as were the values for depression, anxiety, and disordered eating.

Descriptive analyses.

Bivariate correlations were examined to consider the associations among the broader network of variables included in this study (see Table 1). Subscales of the GEQ were considered in relation to their mean and standard deviation and demonstrated similar patterns to previously published research involving intercollegiate sport teams (Evans & Eys, 2015). Notably, responses were nearing the ceiling of the scale, including attachment to group – social ($M = 7.04, SD = 1.81$), attachment to group – task ($M = 6.86, SD = 1.63$), and group integration – social ($M = 6.46, SD = 1.94$). Group integration – task was comparatively lower ($M = 5.98, SD = 1.64$). GEQ subscales demonstrated moderate and positive correlations with Socially Supportive Behavior ($M = 2.09, SD = .64$) across all four subscales.

As would be expected, the mental health measures of anxiety ($M = 2.41, SD = 1.01$), depression ($M = 1.72, SD = .87$), and disordered eating ($M = 1.64, SD = .52$) were positively correlated with one another. Anxiety showed moderate to strong correlations with both depression ($r = .69$) and disordered eating ($r = 0.41$), and depression was moderately correlated with disordered eating ($r = .38$).

Anxiety, depression, and disordered eating were each individually analyzed with the four subscales of the GEQ and with social support behaviors. However, the socially supportive behavior inventory showed no significant correlation with anxiety, depression, or disordered eating. Anxiety was negatively correlated with two GEQ subscales: Attachment to group – task and group integration – task were weakly negatively correlated with anxiety. With the Group Environment Questionnaire subscales depression was moderately negatively correlated with attachment to group – task and group integration – task. Weak correlations were evident between both depression and attachment to group – social along with depression and group integration – social. Disordered eating was weakly correlated with both attachment to group – task and group integration – task.

Linear Regressions.

Separate linear regressions were conducted to examine the extent that the four group cohesion subscales predicted anxiety (Regression 1), depression (Regression 2), and disordered eating (Regression 3). Whereas the model predicting anxiety was not significant [$R^2 = .04, p = .07$], significant results for Regressions 2 and 3 are described below.

Predicting Depression. Significant results when predicting depression, $R^2 = .16, F(4, 115) = 6.59, p < .001$, demonstrated that variance in responses to the GEQ accounted for roughly 16% of variance in depression. A closer examination reveals that two group cohesion subscales

were significant predictors of depression. Attachment to group – task was negatively associated with depression, $B = -.20$ ($SE = .06$). Group integration – task also predicted depression, $B = -.10$ ($SE = .07$). This result is significant, showing that evaluation of team cohesion was a predictor of depressive symptoms.

Predicting Disordered Eating. Significant results when predicting disordered eating, $R^2 = .08$, $F(4, 114) = 3.68$, $p = .007$, showing variance in responses to the GEQ accounted for roughly 8% of variance in disordered eating. When the subscales of the GEQ were examined, group integration – task showed a significant negative correlation, $B = -.10$ ($SE = .04$). This result is significant, showing that evaluation of team cohesion was a predictor of disordered eating habits.

Discussion

While the link between group cohesion and individual mental health has been examined in some settings, the current research is the first to explore this association in collegiate athletics. College level student-athletes face numerous challenges that the average college student may not experience. During this period of time, teammates are a relatively stable group of people, and a student-athlete likely spends a large amount of time each week with them as they progress through their academic and athletic career. Preliminary findings from this research demonstrate that team cohesion is associated with aspects of mental health. Group cohesion perceptions predicted both depression and disordered eating, with the group integration – task and attachment to group – task showing particularly strong relationships. The findings of this study mostly align with hypotheses, along with research in other contexts where cohesion was negatively associated with mental health symptoms (e.g., Military: Perez et al., 2011). While preliminary, these findings align with arguments that belonging to close-knit groups, especially during transitional periods such as adolescence and early adulthood, is protective for mental health (Miller, Wakefield, & Sani, 2015).

When interpreting the results, a critical observation is that group cohesion was associated with anxiety, depression, and disordered eating in different ways. The strongest relationship in this research occurred between team cohesion and depression, with a significant amount of variability in a student-athlete's depression being accounted for by task-oriented aspects of group cohesion. These results are supported by past evidence that belonging to a group can protect against future depression as well as alleviate current symptoms of depression (Cruwys et al., 2013). Separately, disordered eating was predicted by group cohesion. Contrary to previous

findings in this area (Borrego, Cid, & Silva, 2012; Prapavessis & Carron, 1996), the association between anxiety and team cohesion did not reach significance. There were also similarities in the associations of these mental health facets with cohesion: namely, associations were typically weak. Nevertheless, it is important to realize that the generalized mental health conditions shaped by a myriad of elements in an individual's life. As a result, the magnitude of the associations with group cohesion should be considered alongside a recognition that sport teams are one of many social contexts that impact mental health.

Beyond consideration of the variability across dependent variables, it is also key to draw attention toward varying results depending on subscales of group cohesion. As a reminder, group cohesion varies across four dimensions based on the context (i.e., task or social) and upon the form of cohesion (i.e., attachment to group or group integration). One observation is that significant predictors in regressions were predominately from the task domain. This may be due to the fact that college athletic teams are often a type of group that is driven by a goal of winning games; a task.

Another observation is that attachment to group - task was a notable predictor of depression. This subscale can be specifically defined as "a group member's feelings about personal involvement in relation to shared group goals and productivity" (Whitton & Fletcher, 2014). Examples of the items that make up this subscale are, "I'm happy with my team's desire to win," and "This team gives me enough opportunities to improve my personal performance." Although social connections may intuitively most closely connected to mental health, social identity theory supports an argument that belonging to highly valued groups is critical for numerous positive psychosocial states (e.g., Esteem; Cruwys et al., 2014). According to the Social Identity Theory, social relationships can go far beyond simple bonds and friendships, and

merely belonging to a group has a fundamental impact on a person's understanding and evaluation of *who they are* and *what they are able to do* (Cruwys et al., 2014). Especially when an individual feels united with a group in working towards a common task, these feelings may be a crucial resource for social identification and mental health.

The findings from this research showed only a weak correlation between the social aspects of group cohesion and depression. This finding may be described by the idea that social relationships, among athletes are less impactful on an individual's mental health. This could be confirmed by the lack of correlations between social supportive behavior and mental health. More generally, the impact is due to the individual feeling that they belong to a group that is meeting their task needs (i.e., they believe they're receiving enough playing time, they are contributing to the group, that the group works well together). It is also possible that social influences and social support from teammates are more essential for an athlete's evaluation of positive states, such as flourishing, which were not measured here. This can be linked back to the previously mentioned Social Identity Theory, where the social element is a stepping stone to larger task driven needs.

Several past studies have evaluated sport-related anxiety in relation to group cohesion, and revealed strong associations. For instance, Wolf et al. (2015) demonstrated that athletes perceiving greater team cohesion experienced lower precompetitive anxiety, a form of sport-related anxiety (Wolf et al., 2015). In this and similar existing research, precompetitive emotional states are measured prior to a stressful sport situation (Ford et al., 2017). Meanwhile, general anxiety was evaluated in the current research, which is affected by many aspects in an individual's life outside of their sport, and this likely accounts for the differences in findings. It is possible that cohesion may be a stronger predictor of specific sport-related anxiety states, than

more generalized forms of anxiety. If the link between cohesion and general anxiety was to be further explored, state specific measures may be necessary to see how cohesion at any given week may impact anxiety during that same time period compared to other periods of time.

Limitations and future directions.

When interpreting these findings, limitations should be considered. First, the cross-sectional design limited attempts to claim causality and reduces the opportunity to compare the effects that occurred over a period of time. Ideally, the study would have been conducted at several different time points to produce stronger evidence regarding causality. Furthermore, the small sample size and limited number of different sport teams limits the statistical power of the results. The limited sample size precluded any efforts to consider key control variables or moderators of the associations tested in this study (e.g., gender, sport type).

Building on the limitations of this study, there are several possible future pathways that can help correct these limitations. Group cohesion has not been considered by the NCAA in relation to mental wellbeing, so the management of group environments could be a future avenue for prevention. Considering that there is limited evidence regarding how team environments could be integrated within mental health prevention, it is critical to conduct research to examine potential teammate roles in existing or future interventions. Future research should evaluate if changes within a team, or changes in specific elements within a team would be an effective avenue to decrease mental-health symptoms. Changes to be researched could include increased team-wide mental-health education programs or possibly a peer mentor system where younger teammates are paired with other teammates. Both of these elements would aim to increase overall cohesion.

The findings from this research can have important implications for the NCAA, considering potential amendments to existing strategies. Group oriented education and cohesion building could be woven into this preexisting element. Currently, the University of Michigan is one of the leaders in the treatment and research of student-athlete mental wellness, through their Athletes Connected program (Athletes Connected, 2017). This program is currently using a small group made up of athletes from varying teams to encourage them to speak with their teammates on mental wellness. All members of teams are welcome to attend the sessions, and athletes reported that they were more likely to speak with a variety of people about their mental health, including teammates. The research in this study would support a possible expansion of the group on a team-based levels, where teams are brought together to encourage to speak on mental health. As of right now, the program is open to all athletes and incorporates athletes from varying teams, but the intervention is not specifically done within a team. This could also be implemented and studied as an intervention approach within teams where there are individuals with mental health concerns.

Conclusion.

The findings from this research show that group cohesion can be a significant predictor of mental health. Moving forward, research should build on this foundation by completing a similar study using a longitudinal model over the current cross-sectional design, or even by considering experimental approaches to test causality. Research should also focus to a greater extent upon the task-based elements of group cohesion in a more complete manner as this was the element of cohesion with the strongest impact on mental health. This research does show that there are several ways that groups can be used for possible mental health prevention, including possibly improving task elements of group cohesion and mental health awareness through groups.

Table 1. Bivariate correlations and descriptive statistics (*M*, *SD*) for key study variables

Construct	1	2	3	4	5	6	7	8
1. Anxiety	[.93]							
2. Depression	.69**	[.95]						
3. Disordered Eating	.41**	.38**	[.91]					
4. Socially Supportive Behavior	-.04	-.12	-.01	[.93]				
5. Attachment to group - task	-.21*	-.41*	-.22*	.20*	[.72]			
6. Attachment to group - social	-.13	-.22*	-.06	.45**	.55**	[.87]		
7. Group integration - task	-.20*	-.32*	-.22*	.43**	.62**	.61*	[.81]	
8. Group integration - social	-.06	-.19*	-.01	.40**	.57**	.72**	.67**	[.87]
<i>M</i>	2.41	1.72	1.64	2.09	6.86	7.04	5.99	6.46
<i>(SD)</i>	(1.01)	(.87)	(.52)	(.64)	(1.63)	(1.81)	(1.65)	(1.94)

Note. Cronbach's alpha values, indicating internal consistency of scale-scored variables, is presented on the diagonal and in brackets.

ATG = Attraction to Group; GI = Group Integration; T = Task; S = Social

** $p < 0.01$ level; * $p < 0.05$.

Table 2. Results for linear regressions.

Construct	Unstandardized Coefficients		Standardized Coefficients	<i>p</i> -value
	<i>B</i>	(<i>SE</i>)	β	
Dependent Variable: Anxiety				
Constant	3.39	(.43)		.00
ATG_T	-.11	(.07)	-.19	.13
ATG_S	-.03	(.08)	-.06	.67
GI_T	-.12	(.09)	-.20	.15
GI_S	.12	(.08)	.23	.12
Dependent Variable: Depression				
Constant	3.23	(.35)		.000
ATG_T	-.20	(.06)	-.38	.001
ATG_S	-.001	(.06)	-.001	.993
GI_T	-.11	(.07)	-.20	.128
GI_S	.08	(.06)	.17	.215
Dependent Variable: Disordered Eating Behavior				
Constant	2.09	(.22)		.000
ATG_T	-.07	(.04)	-.23	.056
ATG_S	.02	(.04)	.07	-.634
GI_T	-.10	(.04)	-.32	.020
GI_S	.08	(.04)	.30	.043

Appendix A: Survey

What is the purpose of this study?

The objective of this study is to explore how cohesion within a team, whether it be cohesion around positive or negative norms, influences the mental well-being of team members. For the purpose of this study, mental well-being will include symptoms of common mental health disorders: anxiety, depression and eating disorders.

Why are we conducting this study?

This study is aimed at helping us understand group dynamics and cohesion. Understanding how the group cohesion of a team may influence the presence of mental health symptoms of anxiety, depression, and eating disorders, this research will help us evaluate how group interactions can impact an individual well-being.

Who can participate in this study?

Male and female participants that are at least 18 years of age and fluent in English, as well as currently a part of a competitive sport team that represents their college or university in outside competition.

How long will this survey take?

This survey should take no more than between 5 and 10 minutes for you to complete.

Will you be able to identify which answers are mine?

The survey will be confidential, and you will not be asked for any personal identification information. It is plausible that, in the process of completing and submitting survey responses, that participants will be identified through their responses directly or through deductive identification (i.e., reviewing website of sport teams). To minimize risks to confidentiality, we:(a) Are using implied consent so there is no need for acquiring names or signatures. (b) Are utilizing electronic survey methods, where by clicking the 'submit' button, sends the survey response so they are no longer accessible (compared to paper/pen responses that are completed as a hard copy) (c) Have limited the demographic and potentially identifying information to every extent possible, to reduce opportunities for deductive identification.

What are the risks to completing this survey? It is plausible that, when completing items related to mental health problems, that surveys may lead individuals to become more aware of mental health problems in themselves or others. To address this risk, we have prepared a mental health resource that all participants will be handed upon completion of the survey.

Can I see the results of the study?

The study investigators listed in this form will compose an executive summary of the study's findings, 1-2 pages in length, which will be posted online for those that are interested and provided to all participating team coaches. The summary will include results from the sample as

a whole – not individuals – and will not contain any demographics (e.g., team names) so that participants are not put at additional risk.

Your participation in this study is completely voluntary. You may end participation at any point, as well as choose not to answer certain questions.

This research was approved by Penn State IRB.

Researcher: Janelle Rothacker

Email: jmr6493@psu.edu

Head Advisor: Dr. Blair Evans

Email: mbe132@psu.edu

I have read and understand the information above, and I agree to participate in the research.

- Yes
- No

If No was selected, the survey skipped to the final page.

Please select your gender.

- Male
- Female

What sport do you participate in? _____

How many full years have you been a member of this team? Do not include the 2018-2019 school year.

- 0
- 1
- 2
- 3
- 4
- 5
- 6

Our team members often party together.									
Our team would like to spend time together in the off season.									
Our team members do not agree on team training plans.									
If members of our team have problems in practice, everyone wants to help them so we can get back together again.									
Members of our team stick together outside of practice and competitions.									
Our team members communicate freely about each athlete's responsibility during competition or practice.									

During the past week, how often did your teammates do these activities for you, to you, or with you:

	Not at all	Once or twice	Several times	About every day
Gave you some information on how to do something.				
Helped you understand why you didn't do something well.				
Suggested some action you should take.				
Gave you feedback on how you were doing without saying it was good or bad.				
Made it clear what was expected of you.				
Told you what he/she did in a situation that was similar to yours.				
Told you that he/she feels close to you.				
Let you know that he/she will always be around if you need help.				
Told you that you are OK just the way you are.				
Expressed interest and concern in your well-being.				

Comforted you by showing you some physical affection				
Told you that he/she would keep the things you talk about private.				
Agreed that what you wanted to do was the right thing.				
Did some activity together to help you get your mind off things				
Gave or loaned you over \$25				
Provided you with a place to stay.				
Loaned you or gave you something (a physical object) that you needed.				
Pitched in to help you do something that needed to get done				
Went with you to someone who could take action.				

Now, the following items ask about how you have felt over the past seven days. Please respond to each question or statement by selecting one circle per row.

In the past 7 days...

	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
I felt uneasy.					
I felt nervous.					
Many situations made me worry.					
As disturbed My worries overwhelmed me.					
I felt tense.					
I had difficulty calming down.					
I had sudden feelings of panic.					
I felt nervous when my normal routine was disturbed.					

Please respond to each question or statement by selecting one circle per row.

In the past 7 days...

	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
I felt depressed.					
I felt hopeless					
I felt that nothing could cheer me up.					
I felt that my life was empty.					
I felt worthless.					
I felt unhappy.					
I felt I had no reason for living.					
I felt that nothing was interesting.					

Please select a response for each of the following statements.

	Rarely	Sometimes	Often	Usually	Always
I avoid eating when I am hungry.					
I find myself preoccupied with food.					
I have gone on eating binges where I feel that I may not be able to stop.					
I cut my food into small pieces.					
I am aware of the calorie content of foods that I eat.					
I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc).					
I often feel that others would prefer that I ate more.					
I vomit after I have eaten.					
I feel extremely guilty after eating.					
I am preoccupied with a desire to be thinner.					
I think about burning up calories when I exercise.					
Other people think that I am too thin.					

I am preoccupied with the thought of having fat on my body.					
I take longer than others to eat my meals.					
I avoid foods with sugar in them.					
I eat diet foods.					
I feel that food controls my life.					
I display self-control around food.					
I feel that others pressure me to eat.					
I give too much time and thought to food.					
I feel uncomfortable after eating sweets.					
I engage in dieting behavior.					
I like my stomach to be empty.					
I have the impulse to vomit after meals					
I enjoy trying new rich foods.					

Thank you for participating in this research. We appreciate your time and contribution. Please grab a hard copy of the additional resources provided.

If you would like to contact the researchers:

Janelle Rothacker
jmr6493@psu.edu

Dr. Blair Evans
mbe13@psu.edu

Appendix B: Recruitment Emails

Recruitment Email to Coaches: In Person Survey

Hello,

My name is Janelle Rothacker, and I am an undergraduate student at Penn State University in the Department of Kinesiology. I am in the process of conducting research in the area of sport psychology through the university as part of my senior thesis. I am specifically contacting you to ask if you would allow me to invite your athletes to complete a short survey.

From start to finish, the instructions and survey will take around 20 minutes to complete. We will meet with your group before or after a team practice or meeting. We will gather your team members in a meeting room or classroom where they will have the opportunity to complete a survey. There are no requirements or work necessary on your end, and this is a one-time survey.

The overarching purpose behind our research is to better understand the tough situations that college athletes commonly face. Specifically, we want to better understand how cohesion within a team can affect the mental wellbeing of the athletes on that team.

Please do not hesitate to contact me if you have any questions about our research. All parts of the study have been approved by the Penn State IRB. I would greatly appreciate your participation in this research.

Thanks!

Sincerely, Janelle Rothacker

jmr6493@psu.edu

(518) 796-3090

Recruitment Email to Coaches: Survey Link

Hello,

My name is Janelle Rothacker, and I am an undergraduate student at Penn State University in the Department of Kinesiology. I am in the process of conducting research in the area of sport psychology through the university as part of my senior thesis. I am specifically contacting you to ask if you would pass along this message to your athletes inviting them to complete a short survey.

From start to finish, the survey will take under 10 minutes to complete. There are no requirements or work necessary on your end, and this is a one-time survey. The survey can be accessed through this link: https://pennstate.qualtrics.com/jfe/form/SV_3CSnxe3u6r2TC6h

The overarching purpose behind our research is to better understand the tough situations that college athletes commonly face. Specifically, we want to better understand how cohesion within a team can affect the mental wellbeing of the athletes on that team.

Please do not hesitate to contact me if you have any questions about our research. All parts of the study have been approved by the Penn State IRB. I would greatly appreciate your participation in this research.

Thanks!

Sincerely, Janelle Rothacker

jmr6493@psu.edu

(518) 796-3090

Appendix C: Resource Provided at End of Study

This study includes questions about several potentially upsetting topics, such as anxiety, depression, and disordered eating. The questions in this study are in no way meant to diagnose any of these conditions. However, if you feel you need additional resources after completing this survey, possible resources are provided below. In addition, many colleges and universities provide counseling and psychological services on campus that are available to students.

The NCAA provides several resources specifically for college athletes. These can be found on <http://www.ncaa.org/sport-science-institute/mental-health-educational-resources>.

More information about anxiety, depression, symptoms of these conditions, and how to seek treatment can be found on the Anxiety and Depression Association of America website, www.adaa.org.

More information about eating disorders and disordered eating can be found on the National Eating Disorder Association website, www.NEDA.org.

For immediate help:

NIMH's National Anxiety Hotline	(888) 826-9438
National Suicide Prevention Lifeline.....	1-800-273-8255
National Hopeline Network.....	1-800-784-2433
National Eating Disorder Helpline.....	1-800-931-2237

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Academic Vita of Janelle Rothacker

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EDUCATION:

Pennsylvania State University **University Park, PA**
Schreyer Honors College & College of Health and Human Development **2016-2019**
Kinesiology (Movement Science Option)
Honors: Kinesiology

High Point University **High Point, NC**
Congdon School of Health Sciences **Fall 2015 – Spring 2016**
Coursework in Exercise Science

EMPLOYMENT AND SPORT EXPERIENCE:

Lab Team Member

Fall 2017 – Present

University Park, PA

- Collaborated with Dr. Blair Evans to find, review and analyze literature on collegiate - student-athlete mental health in order to create a literary database for future research
- Identified gaps in current student-athlete mental health research and possible pathways for future survey-based research

C3 Sports Sport Operation and Facility Management Intern

January, 2019

State College, PA

- Coordinated, programmed, and managed a 50,000 sq ft athletic facility as well as the athletes that utilized it
- Developed social media, participated in management and marketing meetings to grow the facility program

Journalist, Onward State

February 2017 – Present

University Park, PA

- Wrote articles about student athletics and student life that are viewed by over 25,000 people on a weekly basis
- Interviewed subjects and attended events on and off campus to create comprehensive feature articles

Tutor, Morgan Academic Center at Penn State University

University Park, PA

September 2017 - October 2018

- Tutor students in Kinesiology, Statistics, Physiology, Sport History and Ethics, and Nutrition
- Developed individualized education plans to fit student-athletes and their hectic schedules
- Collaborated with student-athletes to design effective study plans

AWARDS AND ACTIVITIES:

Weber Family Memorial Scholarship

2017 – 2018

- Awarded to student studying Kinesiology at Penn State University that shows promise in research and academia

The Evan Pugh Scholar Award

2019

- Award to seniors in the top 0.5% of their graduating class

Student Athlete at High Point University

2015 – 2016

- Committed 20-30 hours per week to practice, weight training, travel, competition, and meetings