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Examination of Mental Health and Family Relationship in Collegiate Athletes

Julia Hussey
hussej1@unlv.nevada.edu

EXAMINATION OF MENTAL HEALTH AND FAMILY RELATIONSHIPS IN COLLEGIATE ATHLETES

By

Julia Hussey

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Julia Hussey

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Department of Psychology

Daniel N. Allen, Ph.D.
Examination Committee Chair

Kathryn Hausbeck Korgan, Ph.D.
Graduate College Interim Dean

Bradley Donohue, Ph.D.
Examination Committee Member

Kimberly A. Barchard, Ph.D.
Examination Committee Member

Jennifer Keene, Ph.D.
Graduate College Faculty Representative

Abstract

Examination of Mental Health and Family Relationships in Collegiate Athletes

by

Julia Hussey

Dr. Daniel Allen, Committee Chair
Lincy Professor of Psychology
University of Nevada, Las Vegas

Athletes at the collegiate level frequently experience unique stressors that cause them to be at risk for a number of mental health difficulties, including depression, anxiety, and substance use. Current research in the field suggests that athletes are not as likely as their non-athlete peers to seek out psychological services for mental health difficulties. Social supports have been shown to impact athletes' mental health and sport performance. Specifically, family relationships appear to have an influence on athletes' level of stress and motivation, with positive family relationships showing decreases in athletes' worry as well as faster recovery following injury. Surprisingly, there is little research on the influence that family relationships have on athletes' mental health, depression, anxiety, and substance use. Therefore, the current study examines the extent to which collegiate athletes' ratings of their family relationships predict their ratings of mental health, depression, anxiety, and substance use. Self-reported depression, anxiety, and general mental health symptoms (from the SCL-90-R), drug and alcohol use (from the Timeline Followback), and reports of family relationships (from the Student Athlete Relationship Instrument, SARI) were collected from 85 student athletes at a southwestern university (intramural, n = 26; club sport, n = 12; NCAA Division I, n = 47). It was hypothesized that athletes' reports of greater mental health and substance use difficulties would be predicted by reports of more negative family relationships. Results indicated that all domains of negative family relationships (Poor Relationship and Lack of Support, General Pressure, Pressure to Quit or Continue Unsafely, and

Embarrassing Comments and Negative Attitude) predicted athletes' ratings of depression and general mental health concerns. Negative family relationships involving general pressure predicted athletes' reported anxiety and drug use. Alcohol use was not predicted by any of the family relationship domains, but general pressure did contribute a significant, albeit small, increase in the variance explained. ROC analyses indicated that the SARI provided good classification of athletes at risk for overall mental health concerns as well as depression and anxiety. The current results help to further understanding regarding the relationship between negative family relationships, specifically those that involve general pressure, and mental health outcomes in athletes.

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Chapter 1

Literature Review

An individual's experience in college typically involves opportunities for development of personal values and identities, as well as the fostering of new relationships (Howard, Shiraldi, Pineda, & Campanella, 2006). Collegiate athletes, however, experience different stressors than do their non-athlete counterparts, such as lack of energy, long periods of time spent away from family and school due to travel requirements, and competing responsibilities in athletic and other life domains (Brewer & Petrie, 2014; Donohue et al., 2015; Martin & Andersen, 2014; Parham, 1993; Rao & Hong, 2016; Waterhouse, Reilly, & Edwards, 2011). Intense physical exercise, typically undergone by collegiate athletes, can also lead to injuries, exhaustion (both mentally and physically), and burnout (Ferrante, Etzel, & Lantz, 1996; Parham, 1993). Other common stressors that athletes tend to experience include having relationships in multiple domains that require attention, financial difficulties due to lack of occupational opportunities, and academic requirements competing with the need to focus on sport performance (Birky, 2007; Ferrante et al., 1996; Parham, 1993). In addition to these unique stressors, collegiate athletes are at risk for a number of mental health difficulties, including depression, anxiety, and substance use, that may warrant the utilization of psychological services (Gorczynski, Coyle, & Gibson, 2017; Parcover, Mettrick, Parcover, & Griffin-Smith, 2009; Yang et al., 2007).

Depression

The rate of depression in collegiate athletes is estimated between 19.2 and 23.6%, which is markedly higher than in the non-athlete population (Du Preez et al., 2017; Storch, Storch, Killiany, & Roberti, 2005; Yang et al., 2007). Additionally, athletes may under-report symptoms of depression (Rao & Hong, 2016; Wolanin, Gross, & Hong, 2015; Yang et al., 2007). Indeed, athletes may have concerns regarding their coaches or teammates finding out that they are

experiencing depressive symptoms (Beauchemin, 2014; Watson, 2005). Athletes may portray themselves more favorably in an attempt to appear psychologically strong and ready for the next rigorous practice or competition (Glick & Horsfall, 2009; Lopez & Levy, 2013; Wolanin et al., 2015). Likewise, athletes may consider seeking psychological services for performance optimization or goal-setting, but would consider it embarrassing to seek services for a mental health concern, such as depression (Gulliver, Griffiths, & Christensen, 2012; Watson, 2005). Similarly, athletes are less likely to seek services for other mental health disorders because of stigma associated with mental health difficulties as well as lack of understanding that mental health symptoms can impact performance (Rice et al., 2016).

Athletic stressors, including general pressure, injury (which may result in termination of an athletic career), and performance that does not meet expectations, may impact the development of depression among collegiate athletes (Rao & Hong, 2016). Sport injury, in particular, has been a widely researched factor contributing to distress among athletes. Specifically, athletes who experienced injury reported significantly higher levels of depression than did those athletes who had not experienced an injury (Wolanin et al., 2015). Following injury, athletes may experience an interruption in social structure, a feeling of failure to fulfill role obligations, and negative effects on self-identity and feelings of worth (Rao & Hong, 2016). In addition to injury, elite athletes' who experienced feelings of failing to meet performance expectations also reported higher levels of depression (Hammond, Gialloreto, Kubas, & Davis, 2013). This finding illustrates that athletes may be more susceptible to depressive symptomatology following a perceived performance failure. These are important factors to consider in understanding the development of depression in athletes, suggesting that professionals should be wary of the potential for depression in collegiate athletes (Wolanin, Hong, Marks, Panchoo, & Gross, 2016; Yang et al., 2007).

Anxiety

The prevalence of anxiety in collegiate athletes is estimated to be between 6 and 20%; however, prevalence based on epidemiological study is difficult to determine due to the varying definitions and techniques to quantify anxiety symptoms in an athlete population (Patel, Omar, & Terry, 2010). Anxiety is a widely researched topic in the literature on athletes. Athletes may experience anxiety following an injury, and factors such as the severity of the injury and recovery time predict whether an athlete will experience slight or extreme symptoms (Covassin et al., 2014). An athlete's performance can also lead to heightened anxiety due to pressure from others as well as pressure from oneself (Kiovula, Hassmen, & Fallby, 2002; Stoeber, Otto, Pescheck, Becker, & Stoll, 2007). Sport-related anxiety can be broken into three main dimensions: cognitive anxiety, somatic anxiety, and self-confidence (Martens, Vealey, & Burton, 1990). In cognitive anxiety, athletes experience increased thoughts about performance failure. In somatic anxiety, athletes may be more aware of somatic symptoms and may perceive them negatively. Self-confidence is also included in the three dimensions of athlete anxiety in that athletes can experience thoughts and feelings that they are competent to give their best performance (Stoeber et al., 2007). Perfectionism has also been implicated in the development of anxiety in athletes (Koivula et al., 2002). Specifically, athletes who are more concerned about sport-related mistakes experience higher levels of anxiety, concentration difficulties, and more negative thoughts prior to competition (Frost & Henderson, 1991). Symptoms of anxiety can be debilitating and can interfere with sport performance, often prompting athletes to seek help for pre- and post-competition anxiety (Patel et al., 2010).

Substance Use

Misuse of alcohol and other substances is also of concern for student athletes. Compared to the general population of college students, collegiate athletes display greater misuse of alcohol

and other substances (Rao & Hong, 2016; Yusko, Buckman, White, & Pandina, 2008). Indeed, athletes are commonly referred for treatment due to substance use disorders (Glick & Horsfall, 2009). The most common substances that are utilized by athletes include alcohol, tobacco, stimulants, and marijuana (Hainline, Beall, & Wilfert, 2014). In regard to alcohol, collegiate athletes may engage in more frequent heavy episodes of drinking. A 2005 NCAA study reported that 75% of athletes reported consuming six to 10 or more drinks in one sitting in the past year (Martin & Andersen, 2014). This level of consumption is relatively common in athletes, with athletes on average consuming more drinks per week than non-athletes (Martens, Dams-O'Connor, & Beck, 2006). Heavy episodes of binge drinking also occur more often in athletes than in non-athletes, with 61% of male athletes and 43% of female athletes reporting binge drinking, compared to 50% and 36% of male and female non-athletes (Martens et al., 2006). There are also significant differences in the frequency of binge drinking in athletes—with athletes averaging 48 times in the past year, compared to 37 times for non-athletes (Yusko et al., 2008). Interestingly, athletes report consuming significantly more drinks on Saturday nights, compared to non-athletes' reports of drinking Thursday through Saturday (Yusko et al., 2008). This may be due to the fact that athletes may drink more heavily because they have more limited opportunities to do so (Yusko et al., 2008). Athletes also experience more severe negative consequences of alcohol consumption than non-athlete college students, including impaired psychomotor performance and speed, decreased attention, and memory and executive functioning deficits, which can negatively affect athletic performance (Hindmarch, Kerr, & Sherwood, 1991; Martens et al., 2006; Rao & Hong, 2016; Zamboanga, Rodriguez, & Horton, 2008).

Alcohol consumption may differ across sports and as a function of whether athletes are in or out of competitive season for their sport (Brewer & Petrie, 2014; Martens et al., 2006; Martin

& Andersen, 2014). Indeed, 65% of athletes report drinking less when they are in competitive season (Martens et al., 2006). Athletes and non-athletes are generally similar in terms of prevalence of illicit drug use; however, there appears to be significantly greater off-season use than in-season use among athletes (Yusko et al., 2008). This may be related to drug screening policies of collegiate competitive sport organizations, such as the National Collegiate Athletic Association (NCAA). Interestingly, however, prevalence of marijuana use among athletes is lower than that of the non-athlete population (Yusko et al., 2008). Reasons for lower prevalence of marijuana use are not known, but researchers posit that the harmful athletic effects of smoking (similar to those of smoking tobacco) may be related to these differences (Yusko et al., 2008).

Collegiate athletes' increased alcohol use can also cause an increase in use of other substances (McCabe, Brower, West, Nelson, & Wechsler, 2007). Conversely, steroid use may lead to an increase in use of alcohol, marijuana, and other drug use (Martin & Andersen, 2014). Substance and alcohol use can, consequently, cause mental and physical health problems including worsening of existing mental health difficulties and increased risk of cardiovascular events, such as heart attacks (Brewer & Petrie, 2014; Dhar et al., 2005; Hindmarch et al., 1991; Thompson & Sherman, 2007). As a result of substance-related impairments, athletes may experience difficulties in relationships, academic performance, increased occurrence of injury, and possible suspension from sport performance (Ford, 2007; Mottram, 2010). Despite these negative consequences, some athletes report positive consequences of substance use, including stress, pain, and anxiety relief, as well as increased relaxation and socialization effects (Evans, Weinberg, & Jackson, 1992; Martin & Andersen, 2014; Martens, Cox, & Beck, 2003).

Relationships

Research has shown that athletes' relationships with teammates and coaches are integral to athletic overall wellbeing as well as their ability to perform in sport (Butt, Weinber, & Culp,

2010; Raabe, Zakrajsek, & Readdy, 2016; Weiss, 2001). It is well-established that social support positively contributes to mental health (Barrera, 1986; Brewin, Andrews, & Valentine, 2000; Cohen & Wills, 1985; Finch, Okun, Pool, & Ruehlman, 1999; Lakey & Cronin, 2008; Raffaelli et al., 2012). In this same manner, it appears that familial relationships influence athletes' sport performance (Horn & Horn, 2007; Kaye, Frith, & Vosloo, 2015; Newmark & Bogacki, 2005; Tamminen & Holt, 2012; Ullrich-French & Smith, 2006), with athletes citing family members as being more influential to sport success and support after injury than other social supports (Covassin et al., 2014; Donohue et al., 2007). Support from parents appears to have an influence on athletes' level of stress and motivation, and positive family relationships appear to decrease worry, upset, and delays in injury recovery in athletes (Horn & Horn, 2007; Kaye et al., 2015; Newmark & Bogacki, 2005; Tamminen & Holt, 2012; Ullrich-French & Smith, 2006). Family can have a large influence on athletes because of the opportunity that the family has to create an environment that can motivate sport performance or become overly evaluative, negative, and threatening (Gould, Lauer, Rolo, Jannes, & Pennisi, 2008; O'Rourke, Smith, Smoll, Cumming, & Smith, 2011; Smoll & Smith, 2002). Parental pressure has, in fact, been shown to increase athletes' negative affect and anxiety about sport performance as well as increase athletes' likelihood to use performance-enhancing drugs (Erickson, Backhouse, & Carless, 2017; Sebire, Standage, & Vansteenkiste, 2009). However, there is a lack of research examining how family relationships, particularly in regards to sport specific situations, influence athletes' mental health, including depression, anxiety, and substance use disorders.

Therefore, the current study aims to identify the aspects of family relationships that predict collegiate athletes' mental health concerns, depression and anxiety symptoms, and substance use. Given the research available, it is hypothesized that athletes' perceptions of the quality of their family relationships will be related to their mental health concerns, depression,

anxiety, and substance use. Having a better understanding of this influence would serve to assist in identifying and integrating family members as social supports into treatment for collegiate athletes' mental health difficulties.

Chapter 2

Method

Participants

Participants included 85 student athletes (intramural, *n* = 26; club sport, *n* = 12; NCAA Division I, *n* = 47) from a southwestern state university, recruited to participate in a controlled treatment outcome study of a goal-oriented intervention, (either campus counseling or Family Behavior Therapy). Study inclusion criteria included that the athlete: (a) was 18 years old; (b) endorsed substance use in the past 4 months; (c) was anticipated to be enrolled in the university for the next 8 months; (d) had at least one adult significant other who was willing to participate in meetings; and (e) was currently not receiving any formal psychotherapy. Prior to treatment randomization in the controlled treatment outcome study, participants completed a pre-intervention assessment. Data for the current study were derived from this pre-intervention assessment. The study was approved by the local Institutional Review Board, all participants completed informed consent prior to the study taking place, and all study data were protected by a Certificate of Confidentiality from the federal government.

Measures

Participants were administered a pre-intervention assessment for the controlled treatment outcome study. Data included in the current study were collected during this pre-intervention assessment and reflected information about mental health, substance use, and family relationships. Mental health data for general mental health, anxiety, and depression were derived from the Symptom Checklist 90-revised (Derogatis, 1983). Substance use information was taken from Timeline Followback Assessment (Sobell, Maisto, Sobell, & Cooper, 1979). Family relationship information was obtained from the Student Athlete Relationship Instrument (Donohue, Silver, Dickens, Covassin, & Lancer, 2007).

Mental health and depression

Symptom Checklist 90 – Revised (SCL-90-R). The SCL-90-R (Derogatis, 1983) is a commonly utilized instrument that assesses the intensity of a wide range of symptoms of psychological problems for the week prior to assessment. The SCL-90-R assesses the extent to which mental health difficulties have been reported to occur on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). The SCL-90-R is comprised of nine subscales (i.e., Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism), an overall scale of psychological distress (Global Severity Index), a scale of intensity of symptoms (Positive Symptom Distress Index), and the total number of positively reported symptoms (Positive Symptom Total). Internal consistency for the SCL-90-R scales range from low (Cronbach's α = .77 for Psychoticism) to high (Cronbach's α = .90 for Depression; Derogatis, 1983). The SCL-90-R has high test-retest reliability between .80 and .90 (Derogatis, 1983).

Substance use

The Timeline Followback (TLFB). The TLFB (Sobell et al., 1979) is an assessment method that is used to determine self-reported alcohol and substance use. Participants are presented with a calendar on which important events are specified (e.g., holidays, birthdays). These events are used as memory anchor points around which participants are asked to recall instances of alcohol and substance use. The TLFB was used to assess the number of self-reported days of drug use, as well as the number of self-reported drinks consumed for the previous four months. Test-retest reliability for the TLFB ranges between .75 and .98 (Robinson, Sobell, Sobell, & Leo, 2014; Sobell, Sobell, & Klajner, 1986).

Relationships

Student Athlete Relationship Instrument (SARI). The SARI (Donohue et al., 2007) is a self-report measure that includes 63 items designed to assess sport-specific relationship problems of athletes with teammates, family members, coaches, and non-athlete peers. Athletes rate SARI items on a 7-point Likert scale from 1 (*extremely disagree*) to 7 (*extremely agree*). The 16 SARI family-related items have four domains (Donohue et al., 2007) that reflect Poor Relationship and Lack of Support (e.g., *I don't get enough encouragement from my family members*), General Pressure (e.g., *At least one of my family members puts too much pressure on me*), Pressure to Quit or Continue Unsafely (e.g., *At least one of my family members encourages me to take performance enhancers*), and Embarrassing Comments and Negative Attitude (e.g., *At least one of my family members consistently has a negative attitude with me*). The SARI family domains have high internal consistencies (Cronbach's α) between .87 and .96 (Donohue et al., 2007). Domain scores are computed by taking the average of the responses for each of the items in the domain (two, six, three, and two items, respectively). Scores for the four family domains were utilized in analyses in the current study.

Procedure

Participants for the randomized controlled treatment outcome study were recruited from the undergraduate population at a southwestern university. Additional information about recruitment strategies are provided in Donohue et al. (2016). Eligible participants were then scheduled for pre-intervention assessment consisting of a battery of assessment measures. Trained assessors operating independently from the treatment program collected this assessment data. Participants received $25 monetary compensation for their time.

Statistical Analyses

Data Screening. Before performing analyses to test the hypotheses of the current study, preliminary screening was accomplished. The data were inspected for univariate outliers using box plots. Univariate outliers were identified as scores that fell above or below 1.5 times the inner quartile range. Univariate outliers were adjusted to one unit greater than the next most extreme outlier (Tabachnick & Fidell, 2013). To identify multivariate outliers, Mahalanobis Distance and leverage statistics for each participant were calculated. Data were also inspected to determine that they met assumptions for multiple regression (e.g., linearity, normality, and homoscedasticity). Data were considered normally distributed if skewness values were less than +/- 1 and kurtosis values were less than +/- 1.5. Any variables that did not prove to be normally distributed were transformed based on transformation recommendations, using logarithmic or square root transformations (Tabachnick & Fidell, 2013). A correlation matrix was inspected to determine if multicollinearity was present. Linearity was assessed by examining scatterplots of the variables, and homoscedasticity was assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. Additional information about outliers and transformation are provided in the following sections for each variable.

General Mental Health, Depression, and Anxiety. To assess depression, the SCL-90-R Depression subscale was utilized. To assess anxiety, the Anxiety subscale was used. General mental health was examined using Global Severity Index of the SCL-90-R.

Substance use. To assess substance use, the self-reported number of drinks consumed as well as the self-reported days of all drug use (including cannabis and hard drugs) for the past four months from the TLFB was utilized.

Family relationships. Scores from the four SARI domains were used to operationalize family relationships according to Poor Relationship and Lack of Support, General Pressure, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude.

Analysis. Five separate hierarchical multiple regressions were performed to determine what aspects of family relationships predicted general mental health, depression, anxiety, self-reported alcohol use, and self-reported drug use. In all of these analyses, gender and sports status were entered in the first step of the regressions to control for any influence these variables could have on prediction of the criterion variables by the family relationship variables. Raw scores for the four family relationship domains on the SARI were used as predictors in these analyses, with SARI General Pressure domain score entered before the other SARI scores, based on the literature indicating that general pressure has the greatest impact on the criterion variables. It was hypothesized that all family relationship variables would significantly predict ratings of mental health, depression, anxiety, alcohol, and substance use.

In addition to these analyses, receiver operating characteristic analyses (ROC) were used to evaluate whether or not the SARI domains could be useful for identifying athletes who were at increased risk for negative mental health and substance use outcomes due to family problems. In this analysis, it was anticipated that the SARI General Pressure domain would provide the best discrimination between athletes with mental health and substance use issues, given that General Pressure has been identified in the literature as having the greatest impact on the mental health and substance use variables included in this study.

Chapter 3

Results

Preliminary Analyses

Demographic information is presented in Table 1. Examination of the distribution of the data suggested that in general, variables were normally distributed. Table 2 presents descriptive statistics for all variables.

***Depression and Anxiety*.** Descriptive statistics were calculated for the SCL-90-R Depression and Anxiety Subscales, and the Global Severity Index (GSI). No univariate outliers were identified in either the Depression or Anxiety subscale or in the GSI, and all subscales were approximately normally distributed.

***Substance Use*.** Descriptive statistics were calculated for the number of drinks reported and days of drug use reported on the TLFB. Initial analysis of the number of drinks variable (TLFB Drinks) revealed eight univariate outliers. Six out of eight were adjusted. Following adjustment of outliers, a square root transformation of TLFB Drinks was completed, resulting in a normal distribution. Initial analysis of the days of drug use (TLFB Drugs) revealed 12 univariate outliers. Eleven out of 12 outliers were adjusted. Following adjustment of outliers, a logarithmic transformation of TLFB Drinks was completed, resulting in a more normal distribution.

***Family Relationships*.** Descriptive statistics were analyzed for the four domains of the SARI. Initial analysis of the first and second domains—Poor Relationship and Lack of Support (PRLS), and General Pressure (GP)—revealed normal distributions with univariate outliers. (see Table 2). Initial analysis of the third domain—Pressure to Quit or Continue Unsafely (PQCU)—revealed one univariate outlier, which was adjusted. Following adjustment of the outlier, PQCU was still non-normally distributed, so a square root transformation of PQCU was completed,

resulting in normal distribution of PQCU. Initial analysis of the fourth domain—Embarrassing Comments and Negative Attitude (ECNA)—revealed one univariate outlier, which was adjusted. Following adjustment of the outlier, ECNA was still non-normally distributed, so a square root transformation of ECNA was completed, resulting in normal distribution.

Singularity and multicollinearity. A matrix of the variables used in all analyses was determined not to be singular. Table 3 presents a correlation matrix for all variables used in analysis. All variables were correlated < 0.90, suggesting that multicollinearity is not present.

Linearity, homoscedasticity, and multivariate outliers. The pair-wise relationships between all variables were determined to be linear, and there was homoscedasticity. Mahalanobis Distances ranged from 2.41 to 18.50 (critical value χ^2 with $p < .001$ is 22.45), indicating no multivariate outliers. Two points of data had high leverage; however, both points were not considered to be influential based on Cook's Distance values < 1 and were therefore maintained in the analyses.

Primary Analyses

Mental health. A hierarchical multiple regression analysis was used to determine if the addition of general family pressure (SARI domain 2; GP) and then other negative aspects of family relationships (SARI domains 1, 3, and 4; PRLS, PQCU, and ECNA) improved the prediction of severity of reported mental health symptoms (SCL-90-R GSI) over and above gender and sport status alone. See Table 4 for full details on the regression models. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict GSI (Step 3) was statistically significant ($p < .001$), and the addition of GP, PRLS, PQCU, and ECNA to the prediction of GSI (steps two and three) led to statistically significant increases in R^2 ($p < .001$ and $p < .05$, respectively).

Depression. A hierarchical multiple regression analysis was used to determine if the addition of general family pressure (SARI domain 2; GP) and then other negative aspects of family relationships (SARI domains 1, 3, and 4; PRLS, PQCU, and ECNA) improved the prediction of severity of reported depression (SCL-90-R Depression) over and above gender and sport status alone. See Table 5 for full details on the regression models. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict Depression (Step 3) was statistically significant ($p < .001$), and the addition of GP, PRLS, PQCU, and ECNA to the prediction of depression (steps two and three) led to statistically significant increases in R^2 ($p < .001$ and $p < .05$, respectively).

Anxiety. A hierarchical multiple regression analysis was used to determine if the addition of general family pressure (SARI domain 2; GP) and then other negative aspects of family relationships (SARI domains 1, 3, and 4; PRLS, PQCU, and ECNA) improved the prediction of severity of reported anxiety (SCL-90-R Anxiety) over and above gender and sport status alone. See Table 6 for full details on the regression models. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict Anxiety (Step 3) was statistically significant ($p < .001$). The addition of General Pressure to the prediction of anxiety (step two) led to a statistically significant increase in R^2 ($p < .001$); however, the addition of PRLS, PQCU, and ECNA (step three) did not lead to a statistically significant increase in R^2 ($p > .05$).

Substance use - alcohol. A hierarchical multiple regression analysis was used to determine if the addition of general family pressure (SARI domain 2; GP) and then other negative aspects of family relationships (SARI domains 1, 3, and 4; PRLS, PQCU, and ECNA) improved the prediction of number of drinks consumed in the past four months (TLFB Drinks)

over and above gender and sport status alone. See Table 7 for full details on the regression models. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict TLFB Drinks (Step 3) was not statistically significant ($p > .05$). The addition of General Pressure to the prediction of TLFB Drinks (step two), however, led to a statistically significant increase in R^2 ($p < .05$), but the addition of PRLSPQCU, and ECNA (step three) did not ($p > .05$).

Substance use - drugs. A hierarchical multiple regression analysis was used to determine if the addition of general family pressure (SARI domain 2; GP) and then other negative aspects of family relationships (SARI domains 1, 3, and 4; PRLS, PQCU, and ECNA) improved the prediction of days of reported drug use in the past four months (TLFB Drugs) over and above gender and sport status alone. See Table 8 for full details on the regression models. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict TLFB Drugs (Step 3) was not statistically significant ($p > .05$); however, the model for Step 2 was statistically significant ($p < .05$). The addition of GP (step two), PRLS, PQCU, and ECNA (step three) did not lead to a statistically significant increase in R^2 ($p > .05$).

Untransformed Data

The same hierarchical regression analyses were used to determine if use of the untransformed, rather than transformed, variables (namely, PQCU, ECNA, TLFB Drinks, and TLFB Drugs) changed any of the regression results. Only one analysis revealed differences—TLFB Drinks. The full model of gender, sport status, General Pressure, Poor Relationship and Lack of Support, Pressure to Quit or Continue Unsafely, and Embarrassing Comments and Negative Attitude to predict TLFB Drinks (Step 3) was statistically significant, $R^2 = .17$, $F(7, 77)$

= 2.29, $p < .05$, adjusted $R^2 = .10$. The addition of General Pressure to the prediction of TLFB Drinks (Step 2) led to a statistically significant increase in R^2 of .05, $F(1,80) = 4.31$, $p < .05$. The addition of PRLS, PQCU, and ECNA to the prediction of TLFB Drinks (Step 3), however, did not lead to a statistically significant increase in R^2, which remained .17, $F(3, 77) = 1.15$, $p > .05$. Thus, in this analysis using untransformed data, the addition of General Pressure caused the model to be significant, whereas when the transformed data were used, the model was not significant. Due to the considerable skewness and kurtosis of the untransformed TLFB Drinks, however, generalization of the untransformed results beyond this sample should be considered with caution. The significance result from the transformed data (see substance use section above) likely provide a more true picture of the relationship between the criterion and predictor variables in the population.

Internal consistency. The SARI was employed to measure different, underlying constructs, namely, domains of negative family relationships. Cronbach's alpha for internal consistency ranged from .55 to .84. See Table 9 for details on internal consistency. While PRLS, GP, and ECNA demonstrated acceptable internal consistency ($\alpha > .7$), internal consistency for PQCU was poor, indicating that items on this domain were not consistent in the current sample.

ROC Analyses. In an effort to determine whether the SARI would provide a useful method to identify athletes who were at risk for negative mental health outcomes due to family relationship problems, receiver operating characteristic (ROC) analyses were performed for the four SARI family relationship variables. Substance abuse variables were not included in the ROC analyses given the nonsignificant results of the regression analyses and limitations within data including skewness and kurtosis. Because the SARI domain for General Pressure was most predictive of mental health symptom severity, depression, and anxiety, it was predicted to have better discrimination than the other SARI domains. In these analyses, participant scores on each

SCL-90-R domain were split, with T-scores less than or equal to 55 indicating low concern and T-scores over 55 indicating high concern for the clinical symptoms reported. This cut-off was selected because it divided participants into two groups that were approximately equal in size. Differences in sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were examined for the SARI domains. Specifically, sensitivity represents the ratio of true positive cases over true positive and false negative cases, and specificity is the ratio of true negative cases over true negative and false positive cases (Stojanovic et al., 2014). The PPV is an accuracy statistic that indicates how many identified positive cases actually have the condition in question (e.g., depression), whereas the NPV provides the accuracy statistic that indicates how many identified negative cases actually do not have the condition in question (Stojanovic et al., 2014). Area under the ROC curve (AUC) was used as a measure of each domain's ability to distinguish between low concern and high concern athletes, with AUC of 0.50 indicating chance classification and 1.00 indicating perfect classification (Hosmer, Lemeshow, & Sturdivant, 2013). Larger AUCs in this instance demonstrate increased ability of the SARI domain to discriminate between the low and high concern groups for the specified concern (i.e., depression, anxiety, and mental health symptom severity). AUCs for each of the SARI domains were compared using the method described by Hanley and McNeil (1983). Optimal cut scores were identified using Youden's Index, which is sensitivity + specificity – 1 (Fluss, Faraggi, & Reiser, 2005). Tables 10 through 12 present details on comparisons of the AUCs for each SARI domain.

Figure 1 presents ROC curves for the SCL-90-R Depression subscale, and Table 13 presents the sensitivity, specificity, PPV, NPV, number of correct classifications, and Diagnostic Likelihood Ratios (DLR) for each domain in the analysis. DLRs represent how many times more (or less) likely an individual who has a condition (e.g., depression) would be to report a certain

score on an assessment measure (Deeks & Altman, 2004). DLRs can be used to determine the presence of a disorder based on a test result. DLRs greater than 1 are associated with the presence of the disorder, with higher DLRs indicating stronger associations (Deeks & Altman, 2004). Asymptotic significance levels indicated that all SARI domains (PRLS, GP, PQCU, and ECNA) provided significantly better classifications than chance. When the AUCs were compared, the SARI domains PRLS and GP did not differ from each other, but they demonstrated significantly higher classification accuracy compared to SARI domains PQCU and ECNA. Results indicate that, in identifying athletes of high concern for depression, the SARI GP domain had the highest AUC of .85. A cut score of 2.17 on SARI domain GP (which is considered optimal based on Youden's Index), correctly classified 34 athletes as high concern and 34 athletes as low concern for depression, and incorrectly classified only 17 athletes. A score of 2.17 on GP yields a positive diagnostic likelihood ratio (DLR) of 3.65, indicating that athletes who are high concern for depression will be 3.65 times more likely to report a GP score of 2.17.

Figure 2 presents ROC curves for the SCL-90-R Anxiety subscale, and Table 14 presents the sensitivity, specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), number of correct classifications, and DLRs for each domain in the analysis. For the prediction of anxiety, the SARI domain PRLS had the highest AUC of .78, with all SARI domains providing significantly better classifications than chance based on asymptotic significance. Comparisons demonstrated that SARI domains PRLS and GP did not differ from each other, but had higher classification accuracy than SARI domains PQCU and ECNA, which did not differ from each other.

Figure 3 presents ROC curves for the SCL-90-R Global Severity Index, and Table 15 presents the sensitivity, specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), number of correct classifications, and Diagnostic Likelihood Ratios (DLR) for each

domain in the analysis. For overall severity of symptoms, the SARI domain GP had the highest AUC of .79, with all SARI domains providing significantly better classification than chance based on asymptotic significance. Again, SARI domains PRLS and GP did not differ from each other, but had higher classification accuracy than SARI domains PQCU and ECNA.

Chapter 4

Discussion

Collegiate athletes are at risk for a number of mental health difficulties, including depression, anxiety, and substance misuse (Gorczynski et al., 2017; Parcover et al., 2009; Yang et al., 2007). By the nature of their participation in sports, athletes face a set of unique stressors relative to other college students (Brewer & Petrie, 2014; Donohue et al., 2015; Martin & Andersen, 2014; Parham, 1993; Rao & Hong, 2016; Waterhouse et al., 2011). Because of these stressors, athletes have a higher incidence of depression and anxiety relative to non-athlete peers, as well as greater misuse of substances (Du Preez et al., 2017; Martens et al, 2006; Patel et al., 2010; Yusko et al., 2008). Family relationships impact the development of these maladaptive symptoms and behaviors, and general pressure, which can be conceptualized as both internal and external pressure for performance, has also been shown to be associated with the development of mental health difficulties in this population (Erickson et al., 2017; Kiovula et al., 2002; Rao & Hong, 2016; Sebire et al., 2009; Stoeber et al., 2007). Because past research on athletes' family relationships has shown that negative family relationships can impact athletes' wellbeing and athletes rate their families as most influential to their sport success, when familial relationships are strained, poorer outcomes can be expected (Covassin et al., 2014; Donohue et al., 2007; Horn & Horn, 2007; Kaye et al., 2015; Newmark & Bogacki, 2005; Tamminen & Holt, 2012; Ulrich-French & Smith, 2006). The present study was designed to identify aspects of family relationships that predicted collegiate athletes' mental health concerns, depression and anxiety symptoms, as well as substance misuse. The importance of this research is based on the recognition that athletes' unique stressors and their family relationships, including high expectations and pressure from family, may impact their wellbeing. Given the available research,

it was hypothesized that athletes' perceptions of the quality of their family relationships would be related to their mental health, depression, anxiety, and substance use.

In regard to mental health outcomes in college athletes, prior research has demonstrated that general pressure may impact development of depressive symptoms among collegiate athletes, resulting in a markedly higher prevalence rate relative to non-athlete peers (Du Preez et al., 2017; Rao & Hong, 2016). Consistent with this finding, the current results indicate that general pressure from family members contributed a significant amount of variance to the model of athlete depression, suggesting that as family pressure increases athletes experience more severe symptoms of depression Other aspects of family relationships also appear to predict athletes' depressive symptoms suggesting that negative family relationships in general are predictive of increased depression symptoms. The negative impact of poor family relationships on depressive symptoms occur even after important demographic variables are considered, including gender and sport status.

Prior research has also shown that family relationships involving general pressure to perform increase self-reported athlete anxiety (Kiovula et al., 2002; Stoeber et al., 2007), which is consistent with the current results. In line with these prior findings, the current results indicate that negative family relationships associated with general pressure significantly predict higher ratings of anxiety in collegiate athletes above and beyond gender and sport status differences. General pressure was the only SARI domain that led to a significant increase in the variance explained, demonstrating that other aspects of negative family relationships (lack of support, pressure to quit or continue unsafely, and negative attitudes) did not contribute a significant amount of variance to athlete anxiety after general pressure was considered. It is important to remember that while not significant in the regression model, other aspects of family relationships may indeed be important predictors of anxiety and other negative outcomes. For this model,

however, the variance they contributed to the prediction of anxiety was shared with general pressure, and so they did not improve prediction. Results of the ROC analysis, which are discussed in greater detail later, are consistent with this suggestion, given that all SARI domains provided better than chance classification when athletes were divided into high and low anxiety groups. Most past research investigating athlete anxiety has focused on pressure from others, perfectionism, and sport injury (Covassin et al., 2014; Koivula et al., 2002; Stoeber et al., 2007), so general pressure from family members, specifically, has not yet been extensively examined. The current results advance understanding in this area.

Although psychopathology in the athlete population has been vastly researched, severity of overall mental health concerns in athletes as a function of family relationships has not. Results from the current study provide new insight into the relationship between family function and mental health in athletes, finding that negative family relationships do indeed predict greater severity of athletes' overall mental health concerns. General pressure from family members was the strongest predictor of general mental health, demonstrating that athletes' severity of reported mental health symptoms increased in accordance with the amount of pressure that they felt from their family. Other domains, including lack of support, pressure to quit or continue unsafely, and negative attitude, also predicted athletes' severity of mental health symptoms reported, although not to as great of an extent as general pressure. These results apply even after demographic differences, such as gender and sport status, are considered.

In regard to substance use behaviors, previous research has suggested that athletes may be more likely to use substances and engage in binge drinking behaviors because of pressure and social influences from others (Martens et al., 2006; Turrisi, Mastroleo, Mallett, Larimer, & Kilmer, 2007; Zamboanga et al., 2008). Interestingly, the current study results suggest that negative family relationships were not predictive of athletes' reported alcohol use in this sample;

however, general pressure from family contributed a significant, albeit small, increase in the variance explained. The combination of gender, sport status, and general pressure did significantly predict athletes' reported drug use. It does appear that general pressure may be a factor that influences athletes' use patterns, although the results are less consistent than is the case for mental health outcomes. These results appear to be consistent with past research that showed pressure from family may lead to positive attitudes towards performance enhancing drug use (PED; Madigan, Stoeber, & Passfield, 2016); however, results are inconsistent with research suggesting that other family relationship domains (e.g., poor relationship with family) increase substance use.

One possible reason for the discrepancy could be that past studies have utilized different methods for identifying athletes' relationships with parents and family members, while the current study utilized a sport-specific measure of athlete relationships. For example, Erickson and colleagues (2017) utilized qualitative interviews with collegiate athletes to identify that athletes who maintained strong, supportive relationships with parents were less likely to report use of PEDs. Parents appear to have an influence on athletes' attitudes towards doping in sports due to their own attitudes around the subject. Parents who disapprove of PED use may deter their athlete from use because of their influence on the development of athletes' values regarding PED use (Blank et al., 2015; Erickson et al., 2017). Research on family influence on substance and alcohol use in the non-athlete population have also demonstrated that positive relationships and increased parental monitoring are associated with a decrease in problematic use patterns (Fischer, Forthrun, Pidcock, & Dowd, 2007; Ford, 2007; Lee, 2011; Strunin et al., 2015). Additionally, in the general college population, individual characteristics such as psychosocial maturity (e.g., ability to cope with negative emotions in a positive and healthy way) may also reduce substance use (Fischer et al., 2007). It is also the case that, while similar factors may

predict increased use of PEDs, alcohol, and non-PED illicit substance use in athletes, there is also reason to expect that use of PEDs would be predicted by unique factors, since the motivation for using PEDs is different from use of alcohol and other substances (Madigan et al., 2016).

Lack of consistent findings when family relationships were examined for substance use variables may also be at least partly accounted for by the study inclusion criteria. While some participants were identified for problematic use as indicated by a substance use diagnosis, most were not. The inclusion criteria that athletes report substance use in the past four months may have caused a restriction of range in the substance data utilized for analyses, as indicated by low self-reported use in many athletes. Given that there can be serious consequences if an athlete is caught using illicit drugs or misusing alcohol, under-reporting may have occurred in this sample. Based on use patterns, however, the current sample was representative of the alcohol and drug use patterns of collegiate athletes reported in epidemiological studies (Martens et al., 2006; Martin & Andersen, 2014; Yusko et al., 2008), and so the current results might be expected to generalize to the college athlete population. No studies to date have attempted to identify aspects of family relationships that affect student athlete alcohol and substance use problems. Although the current study did not consistently demonstrate that family relationships predict athletes' reports of alcohol use, frequency and amount of use is still a concern in this population, and so future investigation of this topic in a larger sample would be beneficial in clarifying the impact that pressure from family can have on athletes' use patterns.

In addition to identifying family relationship predictors of mental health and substance use outcomes, the current study also demonstrated that family relationships, as measured by the SARI, are useful for identifying student athletes who are at increased risk for elevations in depression, anxiety and general mental health symptoms. ROC analyses suggest that the SARI

domains of Poor Relationship and Lack of Support and General Pressure provided good discrimination between low and high-risk athletes as indicated by AUCs greater than .74. Additionally, all SARI domains significantly improved classification over chance classification rates. The current study operationalized low and high-risk athletes using a median split on the anxiety, depression, and general mental health scores (T-scores less than or equal to 55, and those greater than 55) given that a limited number of participants in the current sample had SCL-90-R scores that were in the clinically elevated range (T-scores greater than 70). Increased discrimination may be obtained when more athletes with clinically elevated symptoms are utilized in this type of analysis. In any case, optimal cut-off scores for identifying at-risk athletes should be made based on several factors, so the cut scores identified in the current study should not be considered universal. When selecting appropriate cut scores, it is important to consider the cost for possible incorrect identification of at-risk athletes, the base rate of depression, anxiety, and general mental health concerns in the population, the referral question or the purpose of screening, and the incremental validity added to prediction of at-risk athletes. Taking these factors into consideration, the current results suggest that the SARI may be useful as a screening measure to identify athletes at risk for increased mental health difficulties that could require further evaluation or treatment. For example, the SARI could be used as a systematic screening measure to determine whether an athlete should be referred for concern of depression based on a cut score of 2.17 on the domain of GP. An athlete who is of concern for having depression is 3.65 times more likely to report a score of 2.17. Using this likelihood ratio of 3.65, a practitioner can determine the post-test probability (based on pre-test prevalence rates of depression in the population) that this athlete is struggling with symptoms of depression. In this way, the diagnostic accuracy of the SARI particularly useful in determining those athletes that are at risk for development of mental health concerns.

Currently, the most widely utilized systematic health screening measure for collegiate athletes is the Pre-participation Examination (PPE). Results of the PPE may disqualify the athlete from participating in sports or provide direction for necessary accommodations required for participation. Best practice for the PPE is to include a screening for mental health concerns; however, a recent report indicates that the PPE is likely under-utilized and that there is high variability among institutions that implement the examination, with less than half including screening for mental health concerns (Kroshus, 2016; National Collegiate Athletic Association [NCAA], 2013). Screening for mental health concerns in the collegiate athlete population has specific challenges in that symptoms of mental health disorders (e.g., fatigue, rigorous exercise, nutritional specifications) may be adaptive in sport participation, and not indicative of a mental disorder (Kroshus, 2016). Due to the prevalence and comorbidity of athletes' mental health concerns, screening measures specific to this population are of great importance.

Although research has indicated that low levels of social support are a risk factor for poor mental health outcomes, none of the screening measures currently suggested in the literature includes an assessment of family relationships (Rice et al., 2016; Steiner, Pyle, Brassington, Matheson, & King, 2003; Trojian, 2016). Athletes may be less likely to report mental health concerns on measures designed to detect psychopathology; however, they may be more likely to report family relationship problems, which supports the use of the SARI when considering screening measures for mental health concerns in athletes (Gulliver et al., 2012; Kroshus, 2016; Rice et al., 2016; Watson, 2005). Systematic implementation of sport-specific screening measures to identify at-risk athletes would serve to decrease health burden, facilitate referral to services, and decrease the negative impact that mental health concerns can have on performance. Comprehensive understanding of the relationship between mental health and family relationships in athletes can serve to advance management of care in this population. The current results

indicate that the SARI's classification of athletes at risk for depression, anxiety, and general mental health concerns is beneficial in advancing understanding in this area and demonstrating utility in predicting mental health outcomes in this population.

Overall, general pressure from family members did play a prominent role in predicting athletes' reports of mental health severity, depression, and anxiety, and a smaller role in predicting substance misuse in the current study. General pressure has been theorized by many to play a role in the development of mental health difficulties in an athlete population; however, clarification of what general pressure entails has yet to be completed (Erickson et al., 2017; Kiovula et al., 2002; Rao & Hong, 2016; Sebire et al., 2009; Stoeber et al., 2007). In the current context, general pressure from family members may include pressure to participate in a sport that the athlete does not want to participate in, over-protectiveness, disagreement about sport-related decisions, and high expectations from family members. Conceptually, the strong role that general pressure plays in predicting overall mental health, depression, and anxiety may be due to the fact that athletes receive pressure from multiple sources (e.g., coaches, fans, and self), and family pressure may add to the already high expectations that many athletes experience. Statistically, the GP domain of the SARI also demonstrates strong correlations with SARI domains PRLS and PQCU, indicating that it may be a more general index of family problems and may include variance associated with these domains. Research regarding mental health in student athletes has been a rapidly growing area in the past 10 years, and the interaction between internal and external pressures that result in negative mental health outcomes in athletes is an important area that requires further investigation.

The current results help elucidate the relationship between general pressure as well as other negative family relationship domains and mental health outcomes. These results occurring above and beyond demographic differences in gender and sport status suggests that these results

are generalizable across these domains. Knowledge in this area can serve to further the development of interventions for athletes by helping to identify potentially problematic family patterns that may be utilized in treatment planning. In the college population, family-based interventions are beneficial in treating a variety of mental health difficulties (Haber & Merck, 2010; Parcover et al., 2009). As athletes' families are typically involved at some level in their sport participation, these relationships may be of interest for integration into treatment for this population. Indeed, families have the opportunity to create a motivational environment for their player, rather than a negative, overly evaluative one rife with pressure (Erickson et al., 2017; Gould et al., 2008; O'Rourke et al., 2001; Sebire et al., 2009; Smoll & Smith, 2002). Identifying aspects of family relationships that contribute to poorer mental health is a first step in developing interventions that target these poor outcomes. Athletes who are identified by coaches or teammates as struggling are typically referred to a campus counseling center for one-on-one intervention. Because of the stigma that they may feel regarding mental health and toughness, athletes are more likely to seek services related to performance concerns or goal-setting (Butt, Weinberg, & Culp, 2010; Gulliver et al., 2012; Watson, 2005). Clearly, interventions that target this population need to be specific to the uniqueness of the stressors associated with sport performance. Researchers suggest that athletic coaches and mental health professionals work as a team in identifying at-risk players and tailoring treatment for sport-related mental health concerns (Parcover et al., 2009; NCAA, 2013). Screening athletes is an important step in this process, and identifying aspects of an athlete's life that may impact the development of difficulties is imperative.

This was the first study to explicitly examine the impact that family relationships have on collegiate athletes, and the results provide a significant contribution to the literature. Given that family members influence athletes' ratings of mental health symptom severity, depression, and

anxiety, the SARI may provide an efficient and effective screening measure to identify family relationship problems and support recommendations for family member participation in mental health intervention. Inclusion of family members in treatment is likely to improve the outcomes for student athletes who are struggling with difficulties in these domains. There may be other important predictors of outcomes that were not investigated in the current study, such as personality factors (e.g., perfectionism) that may warrant further investigation and might provide greater understanding of the relationship between family relationships and mental health concerns identified here. More research into family relationships in the collegiate athlete populations is certainly needed. Having a better understanding of the role that family plays in collegiate athletes' lives would serve to assist in improving the outcomes in this population. The current research furthers understanding in this area by identifying aspects of family relationships, such as general pressure, that may help to improve mental health outcomes in this population.

Appendix A: Tables

Table 1

Participant Demographic Characteristics

Variable	Mean (SD)	N (%)
Age	20.4 (2.2)	
Gender		
Male		44 (51.8)
Female		41 (48.2)
Ethnicity		
White		34 (40.0)
Black/African American		17 (20.0)
Hispanic/Latino		18 (21.2)
Asian American		9 (10.6)
Pacific Islander		2 (2.4)
Multiple/Other		5 (5.9)
Sport status		
Intramural		26 (31.0)
Club Sport		12 (14.0)
NCAA Division I		47 (55.0)

Table 2

Descriptive Statistics

Scale	Mean (SD)	Skewness (SE)	Kurtosis (SE)
SCL-90-R			
Depression T-score	55.2 (13.3)	0.34 (0.26)	-0.46 (0.52)
Anxiety T-score	50.7 (13.0)	0.72 (0.26)	-0.31 (0.52)
GSI T-score	55.9 (12.7)	0.18 (0.26)	-0.24 (0.52)
TLFB Drinks – untransformed	45.1 (37.5)	3.06 (0.26)	11.00 (0.52)
TLFB Drinks – square root transformation	6.2 (2.7)	0.39 (0.26)	-0.62 (0.52)
TLFB Drugs – untransformed	31.0 (5.9)	2.70 (0.26)	6.87 (0.52)
TLFB Drugs – logarithmic transformation	0.4 (0.6)	0.82 (0.26)	-1.11 (0.52)
SARI			
PRLS	2.4 (1.4)	0.62 (0.26)	-0.83 (0.52)
GP	2.6 (1.4)	0.65 (0.26)	-0.46 (0.52)
PQCU – untransformed	1.6 (0.9)	2.48 (0.26)	9.60 (0.52)
PQCU – square root transformation	1.2 (0.3)	0.98 (0.26)	-0.26 (0.52)
ECNA – untransformed	2.1 (1.5)	1.23 (0.26)	0.55 (0.52)
ECNA – square root transformation	1.4 (0.5)	0.85 (0.26)	-0.69 (0.52)

Note. SARI = Student Athlete Relationship Instrument. PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). GP = SARI Domain 2 (General Pressure). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

Table 3

Correlations Among Predictor and Criterion Variables

Scale	Depression	Anxiety	GSI	TLFB Drinks	TLFB Drugs	PRLS	GP	PQCU	ECNA
Depression [a]	1	.82	.92	.22	.13	.50	.50	.41	.30
Anxiety [a]		1	.84	.15	.02	.50	.50	.38	.34
GSI [b]			1	.27	.08	.51	.50	.41	.32
TLFB Drinks				1	.06	.28	.22	.09	.12
TLFB Drugs					1	-.03	.08	.18	.12
GP						1	.66	.44	.44
PRLS							1	.32	.68
PQCU								1	.50
ECNA									1

Note. PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). GP = SARI Domain 2 (General Pressure). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude). SARI = Student Athlete Relationship Instrument.

[a]SCL-90-R Subscale T-score. [b] SCL-90-R Global Severity Index T-score.

Table 4

Hierarchical Multiple Regression Predicting SCL-90-R Global Severity Index

Variable	Step 1	Step 2	Step 3
	β	β	β
Gender	-.07	-.19	-.18
Sport Status (NCAA)	-.07	.01	.10
Sport Status (Club)	.28*	.24*	.26*
GP		.51**	.40*
PRLS			.24
PQCU			.21*
ECNA			-.16
R^2	.12	.36	.45
Adjusted R^2	.08	.33	.40
F	3.56*	11.23**	8.86**
$\Delta R^{2\,a}$	.12	.24	.09
$F^{\,b}$	3.56*	30.36**	4.00*

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

[a] = change in R^2. [b] = F value associated with a change in R^2.

*$p < .05$. **$p < .001$.

Table 5

Hierarchical Multiple Regression Predicting SCL-90-R Depression

Variable	Step 1	Step 2	Step 3
	β	β	β
Gender	-.07	-.18	-.17
Sport Status (NCAA)	-.11	-.03	.06
Sport Status (Club)	.21	.17	.18
GP		.52**	.47*
PRLS			.19
PQCU			.24*
ECNA			-.22
R^2	.09	.34	.43
Adjusted R^2	.06	.31	.37
F	2.67	10.36**	8.18**
$\Delta R^{2\,a}$	.09	.25	.09
$F^{\,b}$	2.67	30.50**	3.82*

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

[a] = change in R^2. [b] = F value associated with a change in R^2.

*$p < .05$. **$p < .001$.

Table 6

Hierarchical Multiple Regression Predicting SCL-90-R Anxiety

Variable	Step 1	Step 2	Step 3
	β	β	β
Gender	-.07	-.18	-.18
Sport Status (NCAA)	-.11	-.04	.04
Sport Status (Club)	.19	.15	.16
GP		.51**	.39**
PRLS			.24
PQCU			.13
ECNA			-.10
R^2	.08	.33	.39
Adjusted R^2	.05	.30	.33
F	2.46	9.84**	6.90**
$\Delta R^{2\,a}$	.08	.25	.06
$F^{\,b}$	2.46	29.37**	2.33

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

[a] = change in R^2. [b] = F value associated with a change in R^2.

*$p < .05$. **$p < .001$.

Table 7

Hierarchical Multiple Regression Predicting No. of Drinks (TLFB)

Variable	Step 1	Step 2	Step 3
	β	β	β
Gender	-.15	-.21	-.23
Sport Status (NCAA)	-.02	.02	.06
Sport Status (Club)	.06	.04	.05
GP		.27*	.05
PRLS			.27
PQCU			-.09
ECNA			.11
R^2	.04	.10	.14
Adjusted R^2	.00	.06	.06
F	0.98	2.31	1.82
$\Delta R^{2\,a}$	.04	.07	.04
$F^{\,b}$	0.98	6.10*	1.16

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

[a] = change in R^2. [b] = F value associated with a change in R^2.

*$p < .05$. **$p < .001$.

Table 8

Hierarchical Multiple Regression Predicting Days of Drug Use (TLFB)

Variable	Step 1	Step 2	Step 3
	β	β	β
Gender	-.08	-.11	-.11
Sport Status (NCAA)	-.18	-.15	-.19
Sport Status (Club)	.14	.13	.13
GP		.16	.23
PRLS			-.13
PQCU			-.05
ECNA			.03
R^2	.10	.12	.13
Adjusted R^2	.06	.08	.05
F	2.82*	2.72*	1.68
$\Delta R^{2\,a}$	.10	.03	.01
$F^{\,b}$	2.82*	2.28	0.37

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

[a] = change in R^2. [b] = F value associated with a change in R^2.

*$p < .05$. **$p < .001$.

Table 9

Internal Consistency of the SARI Family Domains

SARI Domain	No. of items in Domain	Cronbach's alpha
PRLS	5	0.85
GP	6	0.83
PQCU	3	0.55
ECNA	2	0.71

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

Table 10

Receiver Operating Characteristic (ROC) Area Under the Curve (AUC) Differences between SARI Domains for Classification of SCL-90-R Depression Scores

Domain	AUC	95% CI of AUC	SE of AUC	*p**
PRLS	.80	.71 - .89	.05	< .001
GP	.85	.76 - .93	.04	< .001
PQCU	.67	.56 - .78	.05	< .001
ECNA	.65	.54 - .76	.06	.01

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

*indicates asymptotic significance level.

Table 11

Receiver Operating Characteristic (ROC) Area Under the Curve (AUC) Differences between SARI Domains for Classification of SCL-90-R Anxiety Scores

Domain	AUC	95% CI of AUC	SE of AUC	*p**
PRLS	.78	.69 - .88	.05	< .001
GP	.75	.64 - .86	.05	< .001
PQCU	.64	.52 - .76	.06	.01
ECNA	.62	.49 - .74	.06	.03

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

*indicates asymptotic significance level.

Table 12

Receiver Operating Characteristic (ROC) Area Under the Curve (AUC) Differences between SARI Domains for SCL-90-R Global Severity Index

Domain	AUC	95% CI of AUC	SE of AUC	*p**
PRLS	.77	.67 - .87	.05	< .001
GP	.79	.69 - .89	.05	< .001
PQCU	.65	.54 - .76	.06	< .001
ECNA	.67	.56 - .78	.06	< .001

Note. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude).

*indicates asymptotic significance level.

Table 13

Classification Accuracy Statistics for SCL-90-R Depression

	Score [a]	TP	FP	TN	FN	Sn	Sp	PPV	NPV	DLR
PRLS	1.00	38	19	25	3	.93	.57	.67	.89	2.15
	1.40	**36**	**16**	**28**	**5**	**.88**	**.64**	**.69**	**.85**	**2.41**
	3.00	18	6	38	23	.44	.86	.75	.62	3.22
	4.00	11	2	42	30	.27	.95	.85	.58	5.90
	5.40	0	0	44	41	0	1	-	.52	-
GP	1.00	39	30	14	2	.95	.32	.57	.88	1.40
	2.17	**34**	**10**	**34**	**7**	**.83**	**.77**	**.77**	**.83**	**3.65**
	3.00	22	4	40	19	.54	.91	.85	.68	5.90
	5.00	4	0	44	37	.10	1	1	.54	-
	6.33	0	0	44	41	0	1	-	.52	-
PQCU	**1.00**	**26**	**16**	**28**	**15**	**.63**	**.64**	**.62**	**.65**	**1.74**
	1.67	17	7	37	24	.41	.84	.71	.61	2.61
	2.00	13	3	41	28	.32	.93	.81	.59	4.65
	3.00	4	0	44	37	.10	1	1	.54	-
	6.33	0	0	44	41	0	1	-	.52	-
ECNA	1.00	24	16	28	17	.59	.64	.60	.62	1.61
	1.50	**24**	**13**	**31**	**17**	**.59**	**.70**	**.65**	**.65**	**1.98**
	3.00	14	5	39	27	.34	.89	.74	.59	3.00
	5.00	4	1	43	37	.10	.98	.80	.54	4.29
	7.00	0	0	44	41	0	1	-	.52	-

Note. TP = number of true positive classifications. FP = number of false positive classifications. TN = number of true negative classifications. FN = number of false negative classifications. Sn = Sensitivity. Sp = Specificity. PPV = Positive Predictive Value. NPV = Negative Predictive Value. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude). DLR = Diagnostic Likelihood Ratio; The probability of a high concern athlete being correctly classified into the high concern group for depression.

[a] Bolded scores represent the optimal cut score as determined by Youden's Index.

Table 14

Classification Accuracy Statistics for SCL-90-R Anxiety

	Score [a]	TP	FP	TN	FN	Sn	Sp	PPV	NPV	DLR
PRLS	**1.00**	**29**	**28**	**27**	**1**	**.96**	**.49**	**.51**	**.96**	**1.90**
	2.00	23	20	35	7	.77	.64	.53	.83	2.11
	3.00	13	11	44	17	.43	.80	.54	.72	2.17
	4.00	9	4	51	21	.30	.93	.69	.71	4.13
	5.40	0	0	55	30	0	1	-	.65	-
GP	1.00	28	41	14	2	.93	.26	.41	.88	1.25
	1.83	**28**	**25**	**30**	**2**	**.93**	**.55**	**.53**	**.94**	**2.05**
	3.00	16	10	45	14	.53	.82	.62	.76	2.93
	5.00	2	2	53	28	.07	.96	.5	.65	1.83
	6.33	0	0	55	30	0	1	-	.65	-
PQCU	1.00	19	23	32	11	.63	.58	.45	.74	1.51
	1.33	**17**	**17**	**38**	**13**	**.57**	**.69**	**.50**	**.75**	**1.83**
	2.00	9	7	48	21	.30	.87	.56	.70	2.36
	3.00	3	1	54	27	.10	.98	.75	.67	5.50
	6.33	0	0	55	30	0	1	-	.65	-
ECNA	1.00	17	23	32	13	.57	.58	.43	.71	1.36
	2.00	**15**	**14**	**41**	**15**	**.50**	**.75**	**.52**	**.73**	**1.96**
	3.00	11	8	47	19	.37	.86	.58	.71	2.52
	5.00	3	2	53	27	.10	.96	.60	.66	2.75
	7.00	0	0	55	30	0	1	-	.65	-

Note. TP = number of true positive classifications. FP = number of false positive classifications. TN = number of true negative classifications. FN = number of false negative classifications. Sn = Sensitivity. Sp = Specificity. PPV = Positive Predictive Value. NPV = Negative Predictive Value. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude). DLR = Diagnostic Likelihood Ratio; The probability of a high concern athlete being correctly classified into the high concern group for anxiety.

[a] Bolded scores represent the optimal cut score as determined by Youden's Index.

Table 15

Classification Accuracy Statistics for SCL-90-R Global Severity Index

	Score [a]	TP	FP	TN	FN	Sn	Sp	PPV	NPV	DLR [b]
PRLS	1.00	35	22	24	4	.90	.52	.61	.86	1.88
	1.40	**33**	**19**	**27**	**6**	**.85**	**.59**	**.63**	**.82**	**2.05**
	3.00	18	6	40	21	.46	.87	.75	.66	3.54
	4.00	11	2	44	28	.28	.96	85	.61	6.49
	5.40	0	0	46	39	0	1	-	.54	-
GP	1.00	37	32	14	2	.95	.30	.54	.88	1.36
	1.83	**35**	**18**	**28**	**4**	**.90**	**.61**	**.66**	**.88**	**2.29**
	3.00	19	7	39	20	.49	.85	.73	.66	3.2
	5.00	4	0	46	35	.10	1	1	.57	-
	6.33	0	0	46	39	0	1	-	.54	-
PQCU	1.00	24	18	28	15	.62	.61	.57	.65	1.57
	1.67	**16**	**8**	**38**	**23**	**.41**	**.83**	**.67**	**.62**	2.36
	2.00	12	4	42	27	.31	.91	.75	.61	3.54
	3.00	3	1	45	36	.08	.98	.75	.56	3.54
	6.33	0	0	46	39	0	1	-	.54	-
ECNA	1.00	23	17	29	16	.59	.63	.58	.64	1.6
	2.00	**22**	**7**	**39**	**17**	**.56**	**.85**	**.76**	**.70**	**3.71**
	3.00	14	5	41	25	.36	.89	.74	.62	3.30
	5.00	4	1	45	35	.10	.98	.80	.56	4.72
	7.00	0	0	46	39	0	1	-	.54	-

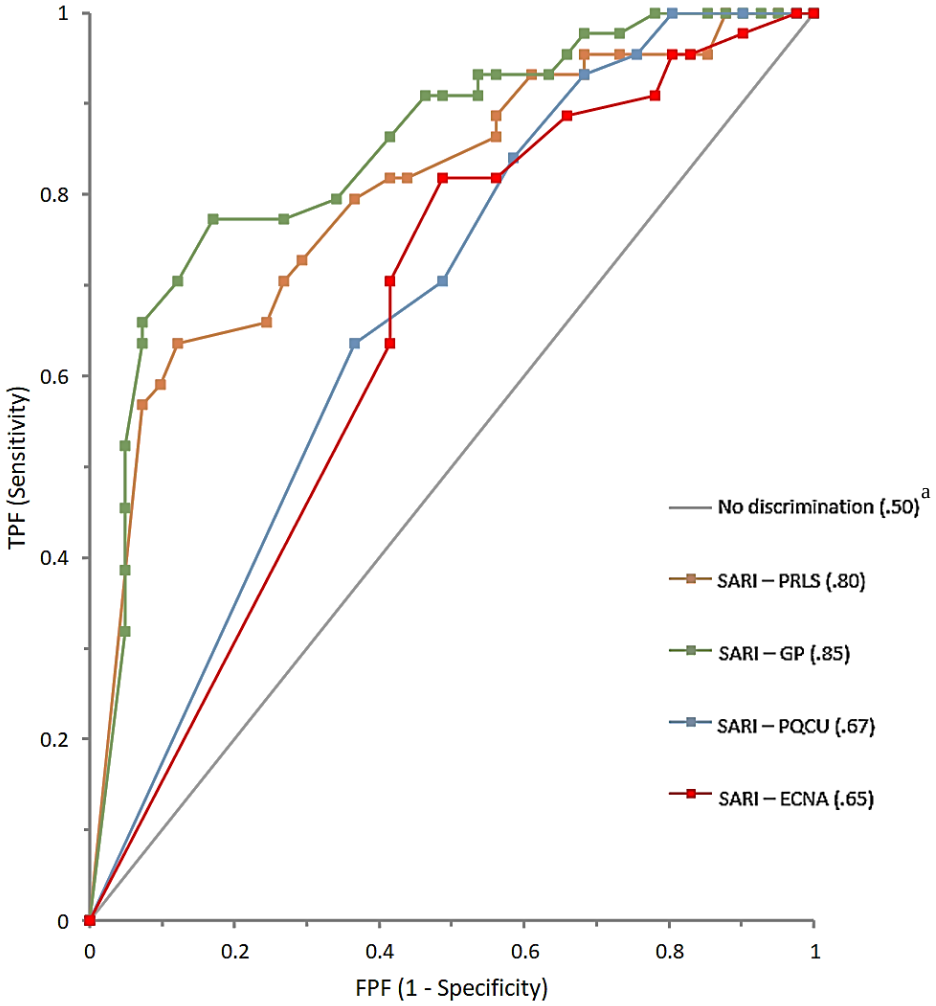
Note. TP = number of true positive classifications. FP = number of false positive classifications. TN = number of true negative classifications. FN = number of false negative classifications. Sn = Sensitivity. Sp = Specificity. PPV = Positive Predictive Value. NPV = Negative Predictive Value. SARI = Student Athlete Relationship Instrument. GP = SARI Domain 2 (General Pressure). PRLS = SARI Domain 1 (Poor Relationship and Lack of Support). PQCU = SARI Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = SARI Domain 4 (Embarrassing Comments and Negative Attitude). DLR = Diagnostic Likelihood Ratio; The probability of a high concern athlete being correctly classified into the high concern group for overall symptoms.

[a] Bolded scores represent the optimal cut score as determined by Youden's Index.

Appendix B: Figures

Figure 1

Receiver Operating Characteristic Curves for SCL-90-R Depression Scores

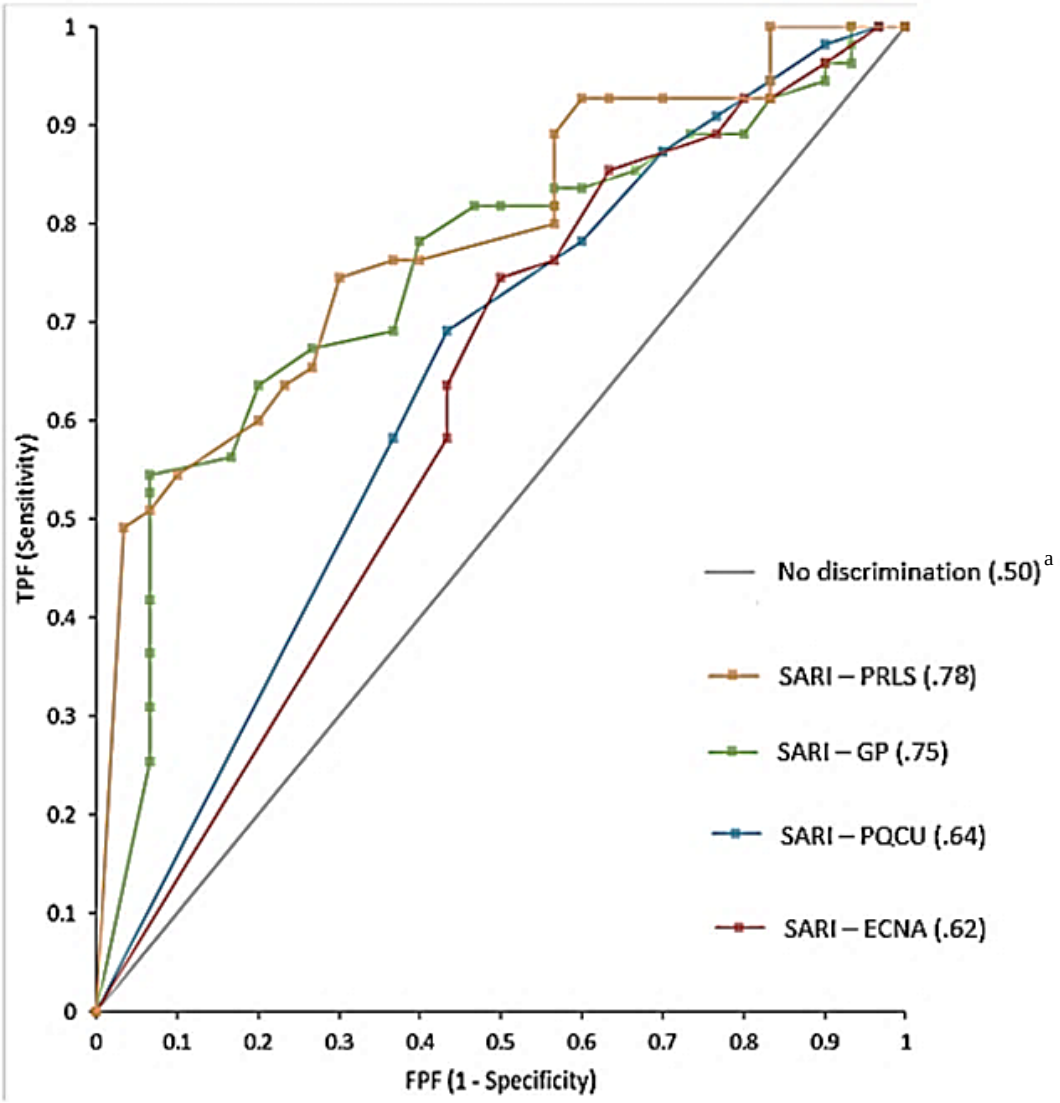


Note. SARI = Student Athlete Relationship Instrument. PRLS = Domain 1 (Poor Relationship and Lack of Support). GP = Domain 2 (General Pressure). PQCU = Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = Domain 4 (Embarrassing Comments and Negative Attitude). TPF = True Positive Fraction. FPF = False Positive Fraction.

[a] Parenthetical values indicate Area Under the Curve (AUC) for each domain.

Figure 2

Receiver Operating Characteristic Curves for SCL-90-R Anxiety Scores

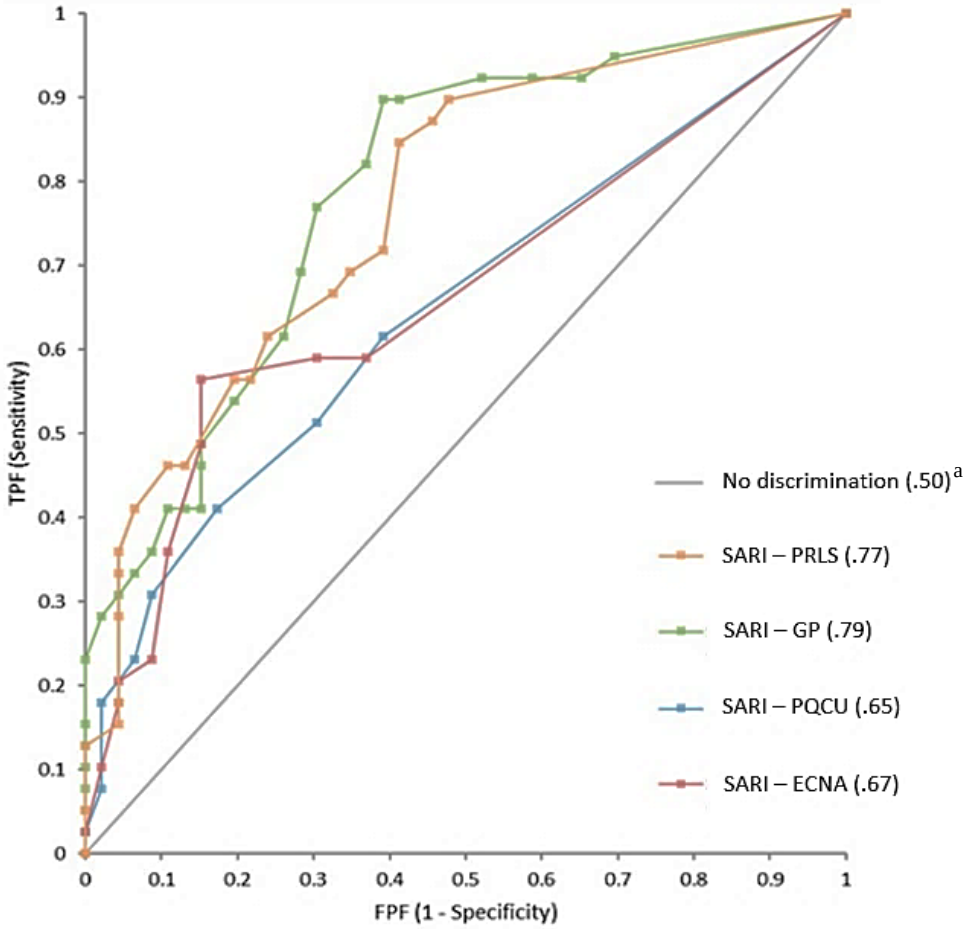


Note. SARI = Student Athlete Relationship Instrument. PRLS = Domain 1 (Poor Relationship and Lack of Support). GP = Domain 2 (General Pressure). PQCU = Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = Domain 4 (Embarrassing Comments and Negative Attitude). TPF = True Positive Fraction. FPF = False Positive Fraction.

[a] Parenthetical values indicate Area Under the Curve (AUC) for each domain.

Figure 3

Receiver Operating Characteristic Curves for SCL-90-R Global Severity Index (GSI) Scores



Note. SARI = Student Athlete Relationship Instrument. PRLS = Domain 1 (Poor Relationship and Lack of Support). GP = Domain 2 (General Pressure). PQCU = Domain 3 (Pressure to Quit or Continue Unsafely). ECNA = Domain 4 (Embarrassing Comments and Negative Attitude). TPF = True Positive Fraction. FPF = False Positive Fraction.

[a] Parenthetical values indicate Area Under the Curve (AUC) for each domain.

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Yusko, D. A., Buckman, J. F., White, H. R., & Pandina, R. J. (2008). Alcohol, tobacco, illicit drugs, and performance enhancers: A comparison of use by college student athletes and nonathletes. *Journal of American College Health, 57*(3), 281-289.

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

Curriculum Vitae

Julia Elizabeth Hussey
hussej1@unlv.nevada.edu

Current **Graduate Student in Clinical Psychology**, *Neuropsychology Research Program*
University of Nevada, Las Vegas (UNLV)

2015 **Bachelor of Science in Psychology**, *Cum Laude, University Honors*
Loyola University New Orleans

RESEARCH EXPERIENCE

Assessment Coordinator
Family Research and Services – University of Nevada, Las Vegas (UNLV)
Supervisors: Daniel Allen, Ph.D. & Bradley Donohue, Ph.D.
06/2016 – 08/2017

Coordinated and administered double blind assessments for pre, post, and follow up data for "Evaluation of Family Behavior Therapy in Collegiate Athletes" funded by grant 1R01DA031828-01A1. This included administration of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID).

CLINICAL / PRACTICUM EXPERIENCE

Practicum Student & Front Desk Graduate Assistant
The PRACTICE: UNLV Community Mental Health Training Clinic – Las Vegas, NV
Supervisors: Kristen Culbert, Ph.D. & Stephen D. Benning, Ph.D.
08/2017 – Present

Delivered evidence-based assessment and therapy services to clients from the Las Vegas community.

Neuropsychological Testing Technician
Neuropsychology Center of Louisiana, LLC – Baton Rouge, LA
Supervisor: Darlyne Nemeth, Ph.D., M.P., M.P.A.P.
05/2015 – 06/2016

Administered and scored neuropsychological tests. Prepared reports (data entry) including behavioral observations. Ran drug interactions for medication management appointments. Presentation preparation and office management.

Psychological Testing Technician
New Orleans Psychological Services (NOLAPs) – New Orleans, LA
Supervisors: Carissa Bokelberg, Psy.D., Michelle Niemeier, Ph.D.
05/2014 – 08/2015

Undergraduate Practicum in Applied Psychology
New Orleans Psychological Services (NOLAPs) – New Orleans, LA
Supervisors: Carissa Bokelberg, Psy.D., Michelle Niemeier, Ph.D.
01/2014 – 05/2014

PROFESSIONAL / SERVICE WORK

APAGS Convention Committee
American Psychological Association of Graduate Students (APAGS)
10/2017 – Present

Prepare programming for APA Convention, foster professional development for trainee members of APA, facilitate trainee involvement in APAGS events at Convention. Two-year term.

Campus Ambassador Program (CAP)
American Psychological Association (APA)
09/2017 – Present

Serve as the bridge between APA and peers by hosting campus events, sharing advocacy information, and promoting student affiliate membership within APA.

NAN Student Committee
National Academy of Neuropsychology (NAN)
12/2016 – Present

Committee Member: advocate and promote the needs and professional development of NAN student members. Communications subcommittee member, Conference subcommittee member. Three-year term.

Advocacy Coordinating Team (ACT)
University of Nevada, Las Vegas (UNLV) – Department of Psychology
12/2016 – Present

Team member: assist in coordinating events for the campus community regarding advocacy topics (e.g., Social Justice Forum, PsychTalks)

Outreach Undergraduate Mentoring Program (OUMP)
University of Nevada, Las Vegas (UNLV) – Department of Psychology
11/2016 – Present

Mentor for undergraduate students from under-represented backgrounds in areas of psychology including applying to graduate school

Clinical Psychology Student Committee (CSC)
University of Nevada, Las Vegas (UNLV) – Department of Psychology
08/2016 – 05/2016

Organizing events for students throughout the semester and assisting in facilitating a working relationship among faculty and students. Secretary: minutes at meetings and disseminating pertinent information to the clinical graduate students.

American Psychological Association of Graduate Students (APAGS)
Ambassador Program – Washington DC & Denver, CO
08/2014 & 08/2016

Guided convention attendees to events, monitored APAGS events & panels during Conventions.

Learning Disabilities Conference – Organizing Committee
Greater Baton Rouge Learning Disabilities Coalition
01/2016

Committee meetings, planning, etc. Created promotional materials (flyers, postcards, etc.) for advertising to conference attendees.

10th Anniversary Hurricane Katrina Wellness Workshops
Louisiana Psychological Association
08/ 2015

Assisted in organizing 3 community mental health workshops in New Orleans to assuage anniversary reactions

PUBLICATIONS

Encyclopedia of Clinical Neuropsychology

Hussey, J., Allen, D. N. (in press). Halstead Reitan Neuropsychological Battery. In J. Kreutzer, J. Deluca, B. Caplan (Eds.), *Encyclopedia of clinical neuropsychology* (2nd ed., pp. TBD). New York, NY: Springer Publishing.

PRESENTATIONS

National Academy of Neuropsychology (NAN) – October 2017

Hussey, J., Call, E., Strong, M., Strauss, G., & Allen, D. N. (2017, October). *Intrusion and repetition errors on the emotional verbal learning test (EVLT) in schizophrenia.* Poster session presented at the 37th Annual Conference of the National Academy of Neuropsychology, Boston, MA.

Hussey, J., Becker, M., Call, E., Juarez, N., Kinsora, T., Ross, S., & Allen, D. N. (2017, October). *Effects of native language on ImPACT baseline scores.* Poster session presented at the 37th Annual Conference of the National Academy of Neuropsychology, Boston, MA.

Call, E., **Hussey, J**., Strauss, G., & Allen, D. N. (2017, October). *Factor structure of the emotional verbal learning test (EVLT) in a schizophrenia population.* Poster session presented at the 37th Annual Conference of the National Academy of Neuropsychology, Boston, MA.

American Psychological Association (APA) – August 2017

Hussey, J., Donohue, B., Paul, N., Plant, C., & Allen, D. (2017, August). *Influence of family relationships on mental health in student athletes.* Poster session presented at the 125th Annual Meeting of the American Psychological Association, Washington DC.

Nemeth, D. G., Pastrana, F., **Hussey, J.**, & Olivier, T. (2017, August). Step four: Making it meaningful. In D. G. Nemeth (Chair), *Neurocognitive & affective rehabilitation: Making it a personal & meaningful experience.* Symposium conducted at the 125th Annual Meeting of the American Psychological Association, Washington DC.

American Academy of Pediatric Neuropsychology (AAPdN) – April 2017

Hussey, J., Call, E., Mayfield, J., & Allen, D. N. (2017, April). *Factor analysis of D-KEFS trail making test in a pediatric TBI sample.* Poster session presented at the Annual Convention of the American Academy of Pediatric Neuropsychology, Las Vegas, NV.

Call, E., **Hussey, J.**, Mayfield, J., & Allen, D. N. (2017, April). *Predictors of D-KEFS trail making test performance in children with traumatic brain injury (TBI).* Poster session presented at the Annual Convention of the American Academy of Pediatric Neuropsychology, Las Vegas, NV.

Coleman, L., Wooten, K, **Hussey, J.**, & Nemeth, D. G. (2017, April). *Executive functioning in children: Observer-reporting vs. objective data.* Poster session presented at the Annual Convention of the American Academy of Pediatric Neuropsychology, Las Vegas, NV.

Wooten, K., Coleman, L., **Hussey, J.**, & Nemeth, D. G. (2017, April). *The use of objective vs. subjective measures of executive functions in children.* Poster session presented at the Annual Convention of the American Academy of Pediatric Neuropsychology, Las Vegas, NV.

International Neuropsychological Society (INS) – February 2017

Hussey, J., Nemeth, D. G., & Olivier, T. (2017, February). *Meaningful recovery via long-term integrated care: A case study on West Nile Encephalitis.* Poster session presented at the 45th Annual Meeting of the International Neuropsychological Society, New Orleans, LA.

National Academy of Neuropsychology (NAN) – October 2016

Hussey, J., & Nemeth, D. G. (2016, October). *Using working memory data to encourage appropriate attention deficit/hyperactivity disorder (ADHD) interventions.* Poster session presented at the 36th Annual Conference of the National Academy of Neuropsychology, Seattle, WA.

Paul, N., Emami, A., **Hussey, J.**, Mayfield, J., & Allen, D. N. (2016, October). *Executive functions predicting social cognition in adolescents with traumatic brain injury.* Poster session presented at the 36th Annual Conference of the National Academy of Neuropsychology, Seattle, WA.

American Psychological Association- Division 40 Symposium (APA- Div. 40) – August 2016

Nemeth, D. G., Pastrana, F., & **Hussey, J**. (2016, August). Meaningful recovery via long-term integrated care: A case study on West Nile Encephalitis. In D. G. Nemeth (Chair), *Creative, non-computerized approaches to restoring brain behavior functions and social skills.* Symposium conducted at the 124th Annual Convention of the American Psychological Association, Denver, CO.

Louisiana Psychological Association (LPA) – May 2016

Nemeth, D. G., Pastrana, F., Volz, J., & **Hussey, J**. (2016, May). The 504 Process. In D. G. Nemeth (Chair), *Interventions for children with neurological/neurodevelopmental disorders including ADHD, LD, BD & the 504 process.* Symposium conducted at the Annual Convention of the Louisiana Psychological Association, Kenner, LA.

Tyson, T., Weydert, J., **Hussey, J**., & Nemeth, D. G. (2016, May). *Faculty anxiety and the current academic climate.* Poster session presented at the Annual Convention of the Louisiana Psychological Association, Kenner, LA.

Gale, S., Coleman, L., **Hussey, J**., & Pastrana, F. (2016, May). *Collegiate faculty fear and anxiety in the current legal climate.* Poster session presented at the Annual Convention of the Louisiana Psychological Association, Kenner, LA.

Southeastern Psychological Association (SEPA) – March 2016

Hussey, J., Olivier, T., & Nemeth, D. G. (2016, March). *Cognitive rehabilitation and its effects on a geriatric West Nile Encephalitis survivor.* Poster session presented at the 62nd Annual Meeting of the Southeastern Psychological Association, New Orleans, LA.

International Neuropsychological Society (INS) – February 2016

Olivier, T., Pastrana, F., Nemeth D. G., & **Hussey, J**. (2016, February). *Effectiveness of a comprehensive cognitive rehabilitation protocol with a neurologically-compromised adolescent.* Poster session presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA.

Loyola University New Orleans Honors Thesis Symposium – May 2015

Hussey, J., & Dupuis, E. (2015, May). *Does deviance pay in mate selection?* Poster session presented at the 2nd Annual Honors Thesis Symposium at Loyola University New Orleans, New Orleans, LA

Southeastern Psychological Association – March 2015

Hussey, J., & Dupuis, E. (2015, March). *Does deviance pay in mate selection?* Poster session presented at the 61st Annual Meeting of the Southeastern Psychological Association, Hilton Head, SC.

AWARDS AND SCHOLARSHIPS

Graduate Funds Access Award ($2000), UNLV	2017
1st place presentation ($200), Graduate & Professional Student Association, UNLV	2017
Travel Awards, Graduate & Professional Student Association, UNLV	2016-2017

AFFILIATIONS/MEMBERSHIPS

American Psychological Association, Graduate student member
American Psychological Association of Graduate Students (APAGS), Member
APA, Division 12 – Society of Clinical Psychology, Student Member
APA, Division 40 – Society for Clinical Neuropsychology, Student Member
Nevada Psychological Association, Student Member
National Academy of Neuropsychology (NAN), Student Member, Student Committee Member
International Neuropsychological Society (INS), Student Member
Psi Chi: National Honor Society in Psychology, Member