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## Evaluating the SCL-90-R for Use in Collegiate Athletes

Elena Gavrilova

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EVALUATING THE SCL-90-R FOR USE IN COLLEGIATE ATHLETES

By

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## **Abstract**

Evaluating The SCL-90-R for Use in Collegiate Athletes

By

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The present study examines psychometric properties of the Symptom Checklist 90 – Revised (SCL-90-R; Derogatis, 1994) in collegiate athletes. The SCL-90-R is one of the most widely utilized measures of broad psychiatric distress. Current literature, however, suggests its factor structure varies across populations (Ardakani et al., 2016; Bakhshaie et al., 2011; Olsen et al., 2004; Ronan et al., 2000; Sereda & Dembitskyi, 2016; Smits et al., 2014; Urbán et al., 2016). Although the SCL-90-R has been previously utilized in studies involving athletes, the psychometric properties of this scale have yet to be investigated in this population. This study examined the SCL-90-R factor structure using confirmatory factor analysis (CFA) in 311 collegiate athletes. Several frequently reported factor structures were evaluated to determine best fit in this population, including the original nine factor, one-factor, eight-factor, and bi-factor models. Although none of the tested models reached reasonable or good fit based on the CFI criteria (Hu & Bentler, 1999), the bi-factor model was determined to demonstrate the best fit across RMSEA (.06) and AIC (55951) criteria. Explained common variance of the global factor is 73%, reflecting that the SCL-90-R has a stronger general global factor relative to the specific construct factors. In line with previous research, several items did not significantly load on the designated psychoticism (Bakhshaie et al., 2011; Cyr et al., 1985; Rief & Fichter, 1992; Rössler et al., 2007; Ruis et al., 2014) and anxiety (Clark & Friedman, 1983; Hoffmann & Overall, 1978; Holcomb et al., 1983; Rief & Fichter, 1992) subscales, suggesting possible low construct validity

and need for reformulation. Present study responds to a call from researchers to address the lack of validated measures of mental health and wellness in athletes (Breslin et al., 2017; Hill et al., 2016; Lundqvist, 2011; Moesch et al., 2018). Although the SCL-90-R remains to be clinically useful as it covers a wide range of psychological symptoms, is relatively easy to complete, and is a good tool for repeated measurement and symptom severity, future studies should examine revised symptom dimensions of the scale in clinical and non-clinical samples.

*Keywords:* SCL-90-R, athlete mental health, assessment, CFA

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## **Chapter 1**

### **Literature Review**

According to the U.S. Bureau of Labor Statistics (BLS), approximately 20 percent of the United States population participate in sports or exercise each day (2017). Sport and exercise engagement have been steadily increasing for the general population (U.S. BLS, 2017), in high school athletes (The National Federation of State High School Associations; NFHS, 2019), and in National Collegiate Athletics Association (NCAA) athletes (NCAA, 2019). Sport participation is especially high for the 15 to 24-year-old age group with nearly 30 percent engagement in daily exercise (U.S. BLS, 2017). In the United States approximately eight million athletes are involved in high school sports (NFHS, 2019), approximately half a million students participate in the NCAA (NCAA, 2019), about two million collegiate students participate in club sports (Pennington, 2008), and over eight million collegiate students are engaged at the intramural level (Dugan et al., 2014).

#### **Student-Athlete Unique Culture**

Student-athletes evidence a distinct culture (Carless & Douglas, 2013), and thus may experience mental health symptomology differently than their non-athlete counterparts (Castaldelli-Maia et al., 2019; Despres et al., 2008; Giannone et al., 2017). Many athletes find themselves in an identity conflict navigating between athlete and student identities (Despres et al., 2008; Pinkerton et al., 1989); often influencing high stress as compared to their non-athlete peers (Brown et al., 2014; Martens et al, 2006). Increased demands for high performance while juggling academic life, relationships, and later in life finances, become stressful and often lead to unique treatment needs. Therefore, it is important to assess the mental health of athletes. Indeed, athletes who evidence clinical levels of mental health symptomology are more likely to continue

to pursue treatment when compared to healthy and sub-clinical level athletes (Donohue, Gavrilova, et al., 2021), and tend to under-report mental health symptom severity (Brown et al., 2014).

It is important to acknowledge athlete types (i.e., NCAA, Club, Intramural) may differ in their competitiveness, levels of commitment, and requirements for participation. For instance, in the United States, NCAA athletes are defined as:

A student who, as of the day of the varsity team's first scheduled contest: (a) is listed as a team member; (b) practices with the varsity team and receives coaching from one or more varsity coaches; or (c) received athletically related student aid. Any student who satisfies one or more of the above criteria is a participant, including a student on a team the institution designates or defines as junior varsity, freshman, or novice, or a student who does not play in a scheduled contest, whether for medical reasons or to preserve eligibility (i.e., a redshirt; NCAA, 2019)

NCAA athletes can participate in one of the three NCAA divisions. Currently, Division III represents the largest number of schools (40%) across the United States, while Division I includes the most athletes (nearly 9000; NCAA, n.d.). An important component of NCAA, which highlights its difference from club and intramural sports, are the strictly defined rules and regulations. Specifically, to participate in NCAA sport, an athlete must comply with clearly specified academic standards (i.e., minimum GPA, course load requirements), ethical standards (i.e., honesty and sportsmanship), financial aid standards, and practice standards (i.e., maximum of 20 hours of training per week during a playing season and while school is in session; NCAA, 2009). Additionally, NCAA athletes are limited to four seasons of intercollegiate competition in any one sport (NCAA, 2020).

According to the National Intramural-Recreational Sports Association (NIRSA), club sports are defined as a “group of students that are voluntarily organized to further their common interests in an activity through participation and competition” (Lifschutz, 2012). Contrary to NCAA sports, club sports do not have a formally defined organizational structure (Lifschutz, 2012). In the United States, club sports may be attractive to athletes pursuing nontraditional sports that are not offered at the NCAA level (i.e., cycling, martial arts, etc.; Beidler et al., 2018). Although some clubs remain solely recreational, most are highly competitive. Club sports do not have consistent regulations for participation regarding academic or practice requirements. However, to be eligible to compete, club sport athletes in most colleges and universities in the United States, must be undergraduates with a minimum of half full-time enrollment status. Additionally, some limitations regarding competing at both, NCAA and club levels exist (NIRSA, 2016). Outside the U.S., competitive athletes across the world participate in club sports and do not have amateur athletic leagues that pay their tuition, such as the NCAA, thus club sports outside the United States are often recognized as “elite” or intramural depending on location or setting (Lorenz et al., 2013; Swann et al., 2015).

In the United States, intramural sports originated as student-led and sponsored athletic competitions (Stewart, 1992). Intramural sports are bound to compete within the university setting, as opposed to interinstitutional (i.e., occurring between universities) NCAA competitions. NIRSA established guidelines for the intramural sports, including traditional formats, staffing, rules, and variations (NIRSA, n.d). However, intramural sports are not bound to follow the NIRSA intramural sport rules. It is, of course, important to emphasize the extent of competitiveness varies across and within athlete types.

## **Student-Athlete Mental Health**

Historically, the mental health of athletes has been overlooked due to assumptions that athletes are not at the same risk of experiencing mental health challenges (Hughes & Leavey, 2012). Although some aspects of student-athletes' unique culture prove beneficial, such as protective effects of exercise and perceived higher levels of resilience, other aspects present a more detrimental impact on athletes' mental health (Despres et al., 2008). Participation in athletics may act as a buffer and protect against low levels of stress (Hudd et al., 2000; Kimball & Freysinger, 2003) and place athletes at a lower level of endorsement for marijuana use, suicidal ideation, and suicide attempts (Brown et al., 2014). However, athletic culture itself may present with additional unique stressors and place athletes at higher risk for developing alcohol use, eating, gambling, and sleep disorders (Breslin et al., 2018; Brown et al., 2014; Castaldelli-Maia et al., 2019; Kimball & Freysinger, 2003). Generally, at least 10 to 15 percent of collegiate student athletes evidence clinical levels of psychological distress (Watson, 2005). Moreover, there is evidence to suggest athletes may present, experience, and report symptoms of mental health differently than their non-athlete counterparts (Castaldelli-Maia et al., 2019; Despres et al., 2008; Giannone et al., 2017). Indeed, there are inherent factors that may lead collegiate athletes to under-report mental health symptom severity, including loss of playing time and negative perceptions from others.

### ***Depressive Disorders***

Depressive disorders are experienced by approximately seven percent of the United States adult population every year (American Psychiatric Association, 2013). In athletes, however, the prevalence of depressive disorders is unclear (McGuire, 2017). Some propose athletes' rates of depression are higher than those of the general population (Wolanin et al.,

2015), while others suggest athletes experience similar rates of depressive disorders (Rice et al., 2016; Wolanin et al., 2016; Yang et al., 2007). Some researchers shed light into those discrepancies by pointing out that athletes may be particularly reluctant to share mental health difficulties and/or underreport their symptoms (Brown et al., 2014). Moreover, a high likelihood of underreporting and minimizing symptoms of mental health overall has been found in this population due to stigma, fears of jeopardizing one's position of the team, and perceptions of weakness (Kaier et al., 2015; Watson, 2006). Additionally, it has been highlighted that athletes are often at a greater risk for developing depressive disorders following injury, retirement, or as a result of overtraining (Reardon, 2017). Indeed, some athletes are susceptible to traumatic brain injury and research indicates harmful associations between concussion and cognitive impairment and depression later in life (Deshpande et al., 2017).

To assess depression, Appaneal et al., (2009) recommend the use of easy to complete, self-report depression measures (i.e., the Beck Depression Inventory, the Center for Epidemiologic Studies Depression Scale) for athletes during preseason physical examination. Athletes scoring above the cutoff are then referred for further assessment. Indeed, researches have widely utilized such measures. For example, the Beck Depression Inventory-II (BDI-II; Beck et al., 1996) has been utilized in collegiate athletes (Donohue et al., 2018; Hammond et al., 2013), national and international level athletes outside the U.S. (Yavuz & Oktem, 2012), and professional dancers (Estanol et al., 2013). The BDI-II is a 21-item self-report measure of depressive symptoms severity. Although not validated in athletes, the BDI-II has been found to be reliable and valid in the general population of college students.

Another frequently utilized self-report depression measurement approach in athletes is the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a

20-item checklist of cognitive, affective, somatic, and behavioral facets of depression. Although not validated in athlete population, the CES-D has been utilized as a screener for depression in NCAA athletes (Divisions I & II; Appaneal et al., 2009; Wolanin et al., 2018; Yang et al., 2007), athletes from top-level teams outside the U.S. (Beable et al., 2017; Jensen et al., 2018), and retired high school and collegiate athletes (Deshpande et al., 2017; Giannone et al., 2017). Notably, Appaneal et al. (2009) established the CES-D cut-off scores for depression in athletes post injury. These authors determined sensitivity and specificity of the measure one-month post injury to be adequate (92% and 77% respectively; Appaneal et al., 2009).

The Patient-Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) is a 9-item self-report questionnaire designed to measure symptoms of depression in the general population. The PHQ-9 has been used in collegiate student athletes (Division II; McGuire, 2017) and elite rugby players from Australia (Du Preez et al., 2017), but has yet to be validated in athletes.

### ***Anxiety Disorders***

Rates of anxiety disorders for collegiate athletes in the literature are varied and inconclusive. Some research shows no difference in anxiety between athletes and non-athletes (Rice et al., 2016), while others provide evidence for athletes experiencing more identity-unique anxiety, such as performance and competition anxiety (Patel et al., 2010). In some instances anxiety can facilitate overall performance, at other times performance induced anxiety may lead to deterioration of performance or “choking” (Reardon, 2017). Our research team has proposed a model whereby athletes have intensified sensitivity to criticism in order to get an edge in performance, as compared with counterparts in the general competition (Donohue, Phrathep, et al., 2021).

The Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006), a common screener for GAD, is a 7-item self-report measure assessing symptoms of generalized anxiety disorder based on the Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> edition (DSM-V). Du Preez et al. (2017) utilized this measure to assess anxiety in their sample of elite rugby athletes. The GAD-7 has not been psychometrically validated in athletes.

The State and Trait Anxiety Inventory (STAI; Spielberger et al., 1983) is a two-scale measure with 20-items each. The STAI is commonly utilized to assess generalized anxiety, with scales for trait and state anxiety. Researchers can choose to administer either one, or both, of the scales. This measure has been utilized to assess trait and state anxiety of elite dancers (Estanol et al., 2013), collegiate swimmers (Tobar, 2012), NCAA athletes (Yang et al., 2007), and national and international level athletes outside the U.S. (Yavuz & Oktem, 2012). Giannone et al. (2017) additionally utilized one of the two scales to assess state anxiety in retiring collegiate athletes. However, this measure has yet to be psychometrically examined in athletes.

The Maudsley Obsessional-Compulsive Inventory (MOCI; Hodgson & Rachman, 1977) is a 30-item self-report measure examining symptoms related to Obsessive-Compulsive Disorder. The MOCI has been utilized to examine female athletes and non-athletes' psychopathological characteristics (Davis & Strachan, 2001). This measure has yet to receive psychometric evaluation in athletes.

### ***Eating Disorders***

Some investigators have found that collegiate student athletes are at an increased risk for eating disorders (Martinsen et al., 2014), while others have found no difference in the frequency of eating disorders between athletes and non-athletes (Somasundaram & Burgess, 2018).

The Eating Disorder Inventory (EDI; Gamer & Olmsted, 1984) is a 64-item self-report measure assessing eating-related psychopathology. Researchers have used this measure in a sample of female athletes and non-athletes (Davis & Strachan, 2001; Reinking & Alexander, 2005), female professional dancers (Estanol et al., 2013), female figure skaters (Monsma & Malina, 2004), and female NCAA athletes (McLester et al., 2014). The EDI has shown high internal consistency in a sample of female professional dancers, strong test-retest reliability at 12 months in female college athletes, and good convergent validity in female figure skaters (DiBartolo & Shaffer, 2002; Estanol et al., 2013; Monsma & Malina, 2004). However, psychometric properties of this measure in male athletes are currently unknown.

The Eating Attitudes Test-26 (EAT; Garner et al., 1982) is a 26-item self-report inventory measuring attitudes and beliefs about food that are related to Anorexia Nervosa. This inventory has been used in combination with other questionnaires of disordered eating symptomatology in collegiate female athletes (DiBartolo & Shaffer, 2002) and in a sample comparing collegiate female athletes to non-athletes (Somasundaram & Burgess, 2018). Voelker et al. (2018) additionally assessed eating disorder psychopathology utilizing this measure in a sample of male figure skaters. This questionnaire demonstrated high internal consistency in female college athletes and acceptable validity in male figure skaters ( $\alpha = .89$ ; Somasundaram & Burgess, 2018; Voelker et al., 2018). Validity and reliability of the EAT questionnaire in male collegiate athletes has not been established to date.

The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) is a 28-item self-report questionnaire measuring severity of disordered eating symptoms. The EDE-Q provides four subscales, including dietary restraint, eating concern, weight concern, and shape concern. This measure has been applied to evaluate eating disorder psychopathology across



regional, national, and international level athletes (Gomes et al., 2011), as well as elite female runners (Hulley et al., 2007). Darcy et al. (2013) conducted a confirmatory and exploratory factor analysis with athlete and non-athlete samples finding it to be a suitable measure of eating psychopathology for athletes. The EDE-Q has shown good reliability in a sample of Portuguese regional, national, and international level athletes, subscale alphas ranging from .69 to .90 (Gomes et al., 2011).

Setting Conditions for Anorexia Nervosa Scale (SCANS; Slade & Dewey, 1986) is a 40-item self-report designed to screen individuals at risk of developing an eating disorder. Parker et al. (1994) utilized SCANS to screen collegiate female runners for the presence of psychopathology specific to eating disorders. The SCANS has been validated for the use in college student population. However, no data is available for psychometric properties of this measure with athletes.

### ***Substance Use Disorders***

Excessive alcohol consumption among student athletes has been previously documented (Martens et al., 2006). In comparing athletes and non-athletes in their consumption of alcohol, athletes, specifically intramural athletes, displayed more frequent drinking and alcohol-related consequences (Barry et al., 2015; Marzell et al., 2015). Reardon (2017) highlights the importance of substance use screening, specifically for athletes, as the substance use by athletes who have experienced concussion may lead to worsening cognitive functioning.

Perhaps most frequently utilized measure of alcohol consumption, the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) was utilized in studies to examine NCAA Division I (Cimini et al., 2015; Donohue et al., 2016), elite club Australian rugby players (Du Preez et al., 2017), professional, and retired athletes' alcohol intake (Gouttebauge et al.,

2015; Kilic et al., 2017; van Ramele et al., 2017). The AUDIT is a 10-item self-report questionnaire designed to assess alcohol related experiences. The AUDIT psychometric properties have been limited to internal reliability (Cimini et al., 2015).

Rutgers Alcohol Problem Index (RAPI; Neal et al., 2006) is a 23-item self-report measure of alcohol-related consequences. Cimini et al. (2015) have expanded this measure to create RAPI-A (athlete version) which incorporates student-athlete experiences with alcohol. The RAPI was found to demonstrate good internal and test-retest reliability (Cimini et al., 2015; Miller et al., 2002; Neal & Carey, 2004).

### ***Sleeping Disorders***

Research reports increased likelihood of insufficient sleep, sleep disturbance, and poor sleep practices among student-athletes as compared to their non-athlete counterparts (Brown et al., 2014; Castaldelli-Maia et al., 2019; Driller et al., 2017). The Patient-Reported Outcomes Measurement Information System (PROMIS®) Sleep Disturbance tool has been validated in the general population in collaboration with the National Institutes of Health (NIH; [www.nihpromis.org](http://www.nihpromis.org)). The PROMIS-SD (Yu et al., 2012) is a self-report measure designed to assess sleep-related disturbances. The PROMIS-SD is created from psychometrically validated item banks measuring specific domains (i.e., mental, social, and physical functioning). The PROMIS-SD item bank consist of four to 10 items that are rated on a five-point Likert-scale of either frequency (1 = never, 5 = always) or intensity (1 = not at all, 5 = very much). The PROMIS-SD demonstrated good validity and reliability in the general and clinical populations (Cella et al., 2010; Pilkonis et al., 2011). The PROMIS-SD short form was utilized in a sample of elite current and retired athletes (Kilic et al., 2017), as well as retired professional football

players (van Ramele et al., 2017). Although widely utilized and validated in several languages, the PROMIS-SD short form has not been validated for use in athletes.

### ***General Psychiatric Symptoms***

Some measures examine multiple psychiatric domains, which offer greater utility as screens than single domain questionnaires, such as those reviewed above. These measures are also more parsimonious in providing broad-based assessments of intervention outcomes than mental health symptom specific measures.

The General Health Questionnaire (GHQ-28; Goldberg, 1978) and its shorter version, GHQ-12 (Goldberg et al., 1997) are self-report measures of physiological symptoms, depression, anxiety, and social dysfunction. The GHQ-28 has been utilized to examine differences in mental health between athlete and non-athlete students (Bakhshalipour et al., 2016; Bano, 2014). The GHQ-12 has been utilized to examine mental health of athletes competing at international or national level in the UK, professional football players from Australia, Ireland, The Netherlands, New Zealand, Scotland and the USA, Britain's most successful female runners based on the rankings (Foskett & Longstaff, 2018; Gouttebarga et al., 2015; Hulley et al., 2007), as well as in retired elite athletes (Kilic et al., 2017; van Ramele et al., 2017). This measure is widely utilized and has been validated for use in more than 70 countries worldwide. However, no validity has been established for the use in athletes.

Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report scale encompassing three dimensions of depression, anxiety, and stress. De Francisco et al. (2016) utilized DASS-21 in adolescent and adult athletes. The investigators reported good internal consistency, although DASS-21 psychometric evaluation in athletes is yet to occur.

The Four-Dimensional Symptom Questionnaire (4DSQ; Terluin et al., 2006) is a 50-item self-report measure designed to assess distress, depression, anxiety, and somatization. The 4DSQ has been utilized in a sample of athletes competing at professional, international, or national level in the UK to assess distress and somatization alongside anxiety and depression (Foskett & Longstaff, 2018). The 4DSQ has yet to be psychometrically validated in athletes.

### ***Overall Well-Being***

Recently, more attention has been given to athlete's overall well-being in an effort to decrease stigma and focus on prevention of mental health difficulties (Donohue et al., 2018; Lundqvist, 2011; Moesch et al., 2018). The Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008) has been adapted for use with athletes, creating Sport Mental Health Continuum-Short Form (Sport MHC-SF; Foster, & Chow, 2019). The Sport MHC-SF is a 14-item measure of subjective, social, and psychological well-being in sport. The Sport MHC-SF has been validated in NCAA (Division II) athlete population. Differences in athlete and non-athlete population scores on MHC-SF or Sport MHC-SF have not been examined. The Sport MHC-SF demonstrated good reliability, internal consistency, as well as convergent and discriminant validity. Investigators highlight this measure's specificity to athletes and its easy and fast administration (Foster, & Chow, 2019). However, the Sport MHC-SF only examines psychological well-being as it relates to sport, the measure asks athletes to note "how often did your sport participation make you feel..." therefore leaving out mental health concerns related to other areas of life, such as academics, interpersonal relationships, employment, etc. Thus, questions presented by the measure target overall well-being rather than specific mental health domains, making it difficult to determine unique areas of difficulty.

The Mental Health Inventory (MHI; Veit & Ware, 1983) is a 38-item self-report inventory examining well-being and psychological distress. Cumming et al. (2012) utilized this measure with varsity level female athletes; finding acceptable levels of internal reliability. However, its validity has yet to be evaluated in collegiate athletes.

The Short Warwick Edinburgh Mental Well-Being Scale (SWEMWBS; Tennant et al., 2007) is a short, 14-item scale designed to monitor mental well-being, including positive affect, interpersonal relationships, and psychological functioning. Breslin et al. (2018) utilized this scale to monitor student athlete well-being to evaluate a mental health awareness program effectiveness. However, the SWEMWBS has yet to be validated for use in student athletes.

### **Athlete and Non-Athlete Comparisons of Mental Health**

A handful of studies focused on examining differences between athletes and non-athletes across mental health disorders. Eating disorder literature of those differences presents mixed results. Athletes tend to generally show less body dissatisfaction, disordered eating, and body image disturbance as compared to the general population (DiBartolo & Shaffer, 2002; Reinking & Alexander, 2005). However, multiple studies highlight the role of specific sport types (i.e., lean sports) in elevated rates of disordered eating (Reinking & Alexander, 2005). Additionally, much of the current literature only examines differences in disordered eating between female athletes and non-athletes, limiting our understanding of those differences in males.

Athletes also demonstrate higher levels of stress in relationships and responsibility domains, while non-athletes report having more stress than athletes in finances, academics, appearance, and social isolation (Wilson & Pritchard, 2005). In addition to stress, athletes generally report more difficulties with sleep as compared to non-athlete peers (Brown et al.,

2014; Castaldelli-Maia et al., 2019; Driller et al., 2017). These results again confirm the unique culture of athletics which presents with a variety of distinct stressors.

In regard to mood disorders, athletes tend to endorse fewer depressive symptoms as compared to non-athlete peers (Armstrong & Oomen-Early, 2009; Procto & Boan-Lenzo, 2010). Similar results have been found for symptoms of anxiety, with athletes typically reporting lower levels of anxiety as compared to non-athletes (Tahtinen & Kristjansdottir, 2018). However, some important gender differences regarding anxiety and depression symptomatology have been reported (Storch et al., 2005). Specifically, female athletes demonstrate significantly higher rates of social anxiety and depression as compared to male athletes, and all non-athletes (Storch et al., 2005). It is important to appreciate, however, that athletes may under-report their symptoms due to stigma (Brown et al., 2014; Kaier et al., 2015; Watson, 2006).

In the case of addictive behaviors, Primack et al. (2010) found that club and intramural athletes are more likely to use tobacco (through waterpipe but not cigarettes) as compared to non-athlete peers. Studies examining alcohol use show that athletes engage in binge drinking and endorse more alcohol-related negative consequences as compared to non-athlete peers (Barry et al., 2015; Ford, 2007; Yusko et al., 2008). Similar findings show that intramural and club athletes consume more than three drinks in one sitting at higher rates as compared to non-athletes (Marzell et al., 2015). Martin et al. (2016) additionally examined gambling behaviors of athletes and non-athletes, and found athletes engaged in higher rates of gambling in the last 12 months.

The results of studies in which researchers examined general mental health of athletes and non-athletes are mixed. Some researchers found no significant differences between female athletes and non-athletes on the measure of general emotional distress (Davis & Strachan, 2001). Others, however, have found that athletes (NCAA and recreational combined) report less severe

psychiatric symptoms as compared with their non-athlete undergraduate peers (Donohue et al., 2004). Though, these studies did not examine how different types of athletes may be impacted by mental health.

### **NCAA, Club, and Intramural Athlete Comparisons of Mental Health**

There are extant studies that have compared mental health symptoms among athlete groups, including club, intramural, NCAA, and professional athletes (Barry et al., 2015; Donohue et al., 2004; Marzell et al., 2015; Wilson, 2016). When looking at various athlete types we know that some substance use differences exist. Two studies previously examined patterns of alcohol consumption among club, intramural, and NCAA level athletes (Barry et al., 2015; Marzell et al., 2015). In these studies, intramural athletes displayed higher risk drinking (i.e., higher frequency drinking and blood alcohol concentration) as compared with athletes from other sport participation levels. Additionally, NCAA athletes report less use of tobacco as compared with club and intramural athletes (Primack et al., 2010). Other differences in addiction patterns have been found. Martin et al. (2016) demonstrated that males who participated in club and intramural sports evidenced higher rates of gambling, as compared with NCAA male athletes.

Reinking and Alexander (2005) suggest athletes participating in lean sports (i.e., sports that place a competitive or aesthetic worth on leanness, such as cross-country, swimming, gymnastics, and dance) display higher rates of disordered eating as compared to non-lean-sport athletes. Additionally, athletes participating in weight-class sports (i.e., wrestling) may be particularly at risk for development of eating psychopathology (Bratland-Sanda & Sundgot-Borgen, 2013).

Wilson (2016) found no differences between NCAA athletes and intramural athletes in depression and anxiety, and Donohue et al. (2004) found NCAA athletes and recreational

athletes evidence similar severity of psychiatric symptoms. Donohue et al. (2019) found Intramural athletes reporting significantly more problems in sport competition as compared to NCAA athletes. No significant differences were found between Club and NCAA, and Club and Intramural athlete groups.

As evident by the lack of literature in this area, there is still much to learn about what differences may exist between NCAA, Club, and Intramural athletes. Some argue that these groups are inherently different from one another, while others consider all three groups to be a part of the unique athlete culture. In Europe, for example, there is no equivalent to the NCAA. As a result, researchers examine mixed samples of regional, national, and international level athletes (Araujo & Scharhag, 2016; Gomes et al., 2011; Nicolas et al., 2014). Araujo and Scharhag (2016) recommend researchers clearly describe their athlete samples to permit adequate comparisons across athlete types and non-athletes; thus, informing mental health practice.

### **Screens of Student-Athlete Mental Health**

Assessment instruments play a critical role in the diagnosis and early prevention of mental health conditions. As reviewed above, only a limited number of mental health questionnaires have been validated in student-athletes.

Indeed, Lundqvist (2011) reports there is a lack of measures available to assess the well-being of athletes, while others have stressed the importance of developing assessment tools to adequately screen for mental health concerns in athletes (Breslin et al., 2017; Hill et al., 2016; Lundqvist, 2011; Moesch et al., 2018). Along these lines, there is some support that assessment measures for specific mental health disorders in college student populations may not be suited for collegiate student athletes, and that males may respond differently to these measures than



females (Darcy et al., 2013). There is also evidence that injured and non-injured NCAA and intramural athletes respond similarly to injury (Madsen et al., 2016; PROMIS). Nicolas et al. (2014) found that regional, national, and international athletes responded similarly to a measure of affective states (PANAS).

A few mental health screens have been specifically developed for use in collegiate athletes, one of them is the Sport Interference Checklist (SIC; Donohue et al., 2007). The SIC is designed to assess mental health factors negatively impacting athlete's training and competition performance, as well as life outside of sport. It consists of 40 items rated on a 7-point Likert-scale (1 = never, 7 = always) across training, competition, and life outside of sport subscales. The SIC is quick and easy to administer and has demonstrated high convergent validity with the SCL-90-R, high internal consistency, as well as good sensitivity and specificity (Scott 2018, 2020). Notably, the SIC can also be adapted to other unique populations and has been used with amateur and professional circus artists (Donohue et al., 2020).

The Athlete Psychological Strain Questionnaire (APSQ; Rice et al., 2020) is another scale measuring sources of stress that may be impacting athletes' mental health, including external coping, self-regulation, and performance. Designed specifically for use in athletes, the APSQ is a brief, self-report scale rated on a 5-point Likert-scale (1 = None of the time, 5 = All of the time). The APSQ has shown good reliability, convergent and divergent validity, sensitivity and specificity, as well as stable factor structure. Although APSQ has been evaluated for use in athletes, the original sample was exclusively male, therefore, generalizations to female athletes should be considered with caution. Further replication of the factor analysis is needed in a more diverse athlete sample. Designed to be a more general screen, the APSQ has limited ability to

detect difficulties in specific mental health domains (i.e., obsessive-compulsive, psychotic, or eating disorders, etc.).

The Symptom Checklist-90-Revised (SCL-90-R; Derogatis et al., 1994) is a commonly used inventory of general psychiatric functioning. Although psychometric properties of the SCL-90-R in collegiate athletes are unknown, Davis and Strachan (2001) compared Global Severity Index (GSI) scores between female athletes with non-athlete peers and Donohue et al. (2004) utilized SCL-90-R GSI scores to assess general psychiatric symptomatology in a sample of athletes and non-athletes, showing collegiate club and NCAA athletes demonstrated lower Global scores than the normative population.

Previous studies examining the SCL-90-R in non-athlete samples have found mixed factorial structure. Although scale developers originally proposed nine-factor model (Derogatis et al., 1994), others have determined single factor (Ardakani et al., 2016; Ronan et al., 2000; Smits et al., 2014), eight factor (Arrindell et al., 2006; Arrindell & Ettema, 2005), and bi-factor models to be optimal fits (Urbán et al., 2016).

### **SCL-90-R Original Nine-Factor Model**

In their original examination of the scale, authors performed confirmatory variation of factor analysis with a sample of 1,002 psychiatric outpatients (an orthogonal Procrustes procedure as well as varimax rotation), binding items to theoretically postulated structure (Derogatis & Cleary, 1977). Out of the total 90 items, Derogatis et al. (1994) proposed nine subscales (i.e., Somatization, Obsessive Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and one global scale (Global Severity Index). Proposed nine factors accounted for 53% of the variance. Seven out of 90 items (poor appetite, overeating, trouble falling asleep, etc.) were not included under any of

the primary symptoms subscales and, in fact, loaded on several of the dimensions. However, Derogatis and Cleary (1977) justified their inclusion due to clinical relevance.

Orthogonal Procrustes procedure results showed that all postulated items loaded significantly on Somatization, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism dimensions, while one item did not significantly load on Obsessive Compulsive and Interpersonal Sensitivity dimension each. Eight items loaded on additional, non-postulated factors, with moderate correlations between anxiety and phobic anxiety dimensions. It is important to note that there were significant differences between the results of an orthogonal Procrustes procedure and varimax rotation, with varimax results showing 14 items that failed to significantly load on the proposed dimension.

### **SCL-90-R One-Factor Model**

Ardakani et al. (2016) conducted Confirmatory Factor Analysis (CFA) on the Malaysian version of the SCL-90-R in 660 Malaysian normal male adults and patients with chronic disease. CFA failed to support the nine-factor structure of the SCL-90-R. Therefore, questioning the proposed multidimensional nature of the scale. Authors concluded that SCL-90-R is best utilized as a unidimensional measure of the overall psychological distress. Similar results were found in adult inpatient sample utilizing principal component analyses (Ronan et al., 2000) and Dutch psychiatric outpatient sample using a two-layer confirmatory hierarchical factor model (Smits et al., 2014). These studies suggest that much of the variance of the SCL-90-R is accounted by a strong general factor.

### **SCL-90-R Eight-Factor Model**

Arrindell and Ettema (2005) published the Dutch version of the SCL-90-R. Upon initial examination using a varimax rotation in a general population sample of 2,368 adults, factor

analysis resulted in eight instead of the original nine dimensions. Those were defined as Anxiety, Agoraphobia, Somatic Symptoms, Depression, Inadequacy of Thinking and Acting, Obsessive-Compulsive, Distrust and Interpersonal Sensitivity, Hostility, and Sleeping Problems (Arrindell & Ettema, 2005). Another study utilizing multiple group method of confirmatory analysis found that 93% of all items loaded on theoretically proposed subscale, with eight factors explaining 46% of the total variance (Arrindell et al., 2006).

The Dutch version of the SCL-90-R has since been utilized in a variety of samples, including female lumbopelvic pain patients (Arrindell et al., 2006), adults undergoing gender-affirming surgery (van de Grift et al., 2018), adult patients presenting to neurological outpatient clinic (Ruis et al., 2014), as well as adult patients with DSM-V anxiety disorders (Kunst et al., 2021).

### **SCL-90-R Bi-Factor Model**

Lastly, Urbán et al. (2016) found that a bi-factor model best fits the SCL-90-R multidimensional nature. Authors conducted CFA examining one-factor, nine-factor, second-order factor, and bi-factor models in two independent samples of 972 Hungarian inpatient adults and 1,902 Dutch inpatient and outpatient patients. In both samples, the bi-factor model with correlating nine specific factors resulted in best fit across chi-square, CFI, and RMSEA indices. Results confirming bi-factorial model of the SCL-90-R suggest that scores are influenced by at least two factors, general distress and a specific dimension factor.

Results of the aforementioned studies suggest samples may demonstrate unique SCL-90-R factor structures, necessitating further investigation of this scale in unique populations, such as collegiate athletes.

## **Chapter 2**

### **Aims of The Study**

The proposed study is an attempt to answer the call for much needed psychometrically validated measures of mental health symptomatology in NCAA, Club, and Intramural student athletes. Focusing on psychometric development of the SCL-90-R is important because this measure is one of the most widely used measures of comprehensive psychiatric functioning, and this measure has yet to be psychometrically examined in collegiate athletes. The present study offers an opportunity to investigate subtle distinctions in psychiatric symptomatology based on confirmatory factor analysis of the SCL-90-R. The primary aims of the current study are: (a) conduct a psychometric evaluation of the SCL-90-R in collegiate athletes, including an examination of its factor structure, and (b) examine how different athlete types (i.e., Intramural, Club, NCAA) respond to the resulting factors.

## **Chapter 3**

### **Method**

#### **Participants**

Current study includes 311 collegiate student-athletes from a Division I southwestern university who were interested in participating in goal-oriented psychological programming within the context of controlled clinical trial aimed at improving sport performance and performance in life (see Table 1). Participants represent a diverse ethnic background (White = 42%, Black/African American = 17%, Multiple/Other = 16%, Hispanic/Latino = 13%, Asian/Asian American = 8%, Pacific Islander = 4%). Half of the participants are women (50%) between 18 and 33 years of age (mean = 19.87 years). Most participants are freshman (36%) NCAA athletes (48%). Approximately half of the participants entered the study through the departmental research subject pool (52%). To enhance external validity, participants were not required to evidence psychiatric diagnoses to enter the study (Kessler et al., 1994).

#### **Inclusionary Criteria**

Inclusionary criteria included (a) full or part-time enrollment in the university; (b) at least 18 years of age; and (c) formally participating in sports (i.e., NCAA, Club, Intramural).

#### **Measures**

##### ***Demographics***

Demographic data was collected, including participants' age, gender, ethnicity, sport status (i.e., NCAA, Club, or Intramural), year in school, and referral type (i.e., athletic department, class presentation, research subject pool, or coach/teammate).

## ***SCL-90-R***

The Symptom Checklist 90 – Revised (SCL-90-R; Derogatis, 1994) was used as a measure of broad range of psychological problems and symptoms. The SCL-90-R is a 90-item self-report measure that assesses overall psychological distress over the past seven days. Participants are asked to rate the degree to which they have experienced each of the symptoms on the distress Likert scale from zero to four (0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, and 4 = Extremely) with higher scores indicating greater distress. The SCL-90-R can be interpreted at the symptom, dimension (i.e., across nine subscales), and/or global (i.e., Global Severity Index; GSI) levels. The SCL-90-R assesses symptoms across nine dimensions, including Somatization, Obsessive Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. The SCL-90-R is frequently utilized as a global measure of psychological distress, which is computed by summing all items and dividing them by 90, creating GSI. The SCL-90-R demonstrated acceptable convergent-discriminant validity, internal consistency, and test-retest reliability in non-athlete samples (Derogatis et al., 1976; Derogatis, 1979; Derogatis et al., 1994). The SCL-90-R requires 12 to 15 minutes to complete and its psychometric properties are good in non-athlete populations (Derogatis et al., 1976; Derogatis, 1979; Derogatis et al., 1994), including inpatient, outpatient, community, adolescent, brain tumor patients, fibromyalgia patients, chronic pain patients, and patients with diabetes. Norms for psychiatric outpatients, psychiatric inpatients, and adult and adolescent non-patients have been established (Derogatis et al., 1994). Cut off scores have been established for all nine subscales and GSI in the general population, outpatient, and inpatient samples (Schauenburg & Strack, 1999; Schmitz et al., 2000).

While original research on the SCL-90-R yielded nine factor structure (Derogatis & Cleary, 1977), other studies examining psychometric properties of the SCL-90-R have found mixed results in the original nine-factor model. Some studies determined a nine-factor model (Derogatis, 1994; Sereda & Dembitskyi, 2016; Tomioka et al., 2008), while others found eight-factors (Arrindell et al., 2006; Arrindell & Ettema, 2005), or one factor (Ardakani et al., 2016; Ronan et al., 2000; Smits et al., 2014). More recently, a bi-factor model was proposed (Urbán et al., 2016). These results suggest psychometric examination of the SCL-90-R is warranted in collegiate athletes, as consistent with recommendations by others (Breslin et al., 2017; Hill et al., 2016; Moesch et al., 2018).

## **Procedures**

Multiple methods of recruitment were utilized. Participants were recruited through the university research participation pool ( $n = 163$ ; 52%), promotion of goal-oriented programming for student athletes via classroom presentation ( $n = 97$ ; 31%), coaches and teammates ( $n = 38$ ; 12%), and athletic department ( $n = 13$ ; 4%). First, initial intake was conducted during which athletes were engaged in an interview designed to determine their interest in participating in psychological programming designed to assist athletes in accomplishing their goals. Athletes were screened for inclusionary criteria, underwent consented if qualified, and completed an assessment battery. A large battery of psychological measures was administered during three times points (baseline, 4-months post-baseline, and 8-months post-baseline). In this study, only the SCL-90-R (Derogatis, 1994) was utilized. The study was approved under exempt review by the university's Institutional Review Board.

## **Statistical Plan and Approach**

### ***Data Screening***



Descriptive statistics for demographic variables (i.e., age, gender, ethnicity, sport status, year in school, and referral type) were performed. Prior to addressing main aims of the study, the data was inspected for univariate and multivariate outliers by examining high leverage points. Data was evaluated for normality and linearity, Mardia's multivariate kurtosis test and multivariate skewness test were performed (Mardia, 1970). Multicollinearity of the data was assessed through a correlational matrix. Correlation values above .85 were considered multicollinear, which tends to indicate problematic discriminant validity (Cohen et al., 2003; Kline, 2015).

### ***Primary Analyses***

Confirmatory factor analysis (CFA) was performed on the SCL-90-R inventory. CFA was assessed using *Mplus* statistical software (Muthén & Muthén, 1998–2015; version 8.1) to determine the best fitting factor structure of the SCL-90-R using Maximum Likelihood as an estimator. The purpose of CFA is to identify factors that account for the variation and covariation among a set of indicators (Brown, 2015). CFA requires a priori hypotheses about factor-indicator correspondence and the number of factors (Kline, 2015). CFA was chosen due to the validated factor structure of the SCL-90-R in other populations (Ardakani et al., 2016; Ronan et al., 2000; Smits et al., 2014). Additionally, CFA analysis is preferred for measurement models that have well-established underlying theory (Hurley et al., 1997).

To identify adequacy of model fit, goodness-of-fit evaluation, comparative fit index (CFI; Bentler, 1990), root mean square error of approximation (RMSEA; Steiger, 1980), and Akaike information criterion (AIC; Akaike, 1987) were performed. These indexes examine important aspects of the model fit (Brown, 2015). CFI values above .95 represent good fit (Hu & Bentler, 1999). RMSEA values at or below .05 are indicative of close fit, values at or below .08 indicate

reasonable fit, and values at or above .10 represent unacceptable fit (Browne & Cudeck, 1992). AIC allows for direct comparison of competing models. Since AIC is not scaled between 0 and 1, relative model fit is determined by smaller value.

It is typically recommended that studies examining factor analysis collect a sample size of 300 or more (Tabachnick & Fidell, 2007). The current study meets this requirement. Finally, given potential preexisting differences between different sport levels (i.e., NCAA, Club, and Intramural) one-way analyses of variance (ANOVAs) were performed to compare response patterns on the SCL-90-R across these groups. Post-hoc analyses were performed to further examine significant differences.

### *Hypotheses*

The current study extends previous work of the SCL-90-R psychometric properties by examining the factorial structure of the SCL-90-R in collegiate athletes. It was hypothesized that (a) the SCL-90-R factor structure in collegiate athletes will differ from that of the general population with athletes reporting less psychological problems and symptoms. Given the inconsistent findings of the SCL-90-R factor structure in different populations, a single-factor loading was hypothesized to occur due to some previous studies finding unidimensional one-factor model being the best fit and GSI consistently being most supported in the literature. Other frequently reported factor structures were evaluated to determine best fit in this population, including original nine factor, eight-factor, and bi-factor models. Next, it was hypothesized that (b) NCAA, Club, and Intramural athletes will differ in their reports of mental health symptomatology as measured by the SCL-90-R. It was expected that Intramural and Club athletes will report more psychological problems and symptoms on the SCL-90-R as compared to NCAA athletes.

## Chapter 4

### Results

#### Data Screening and Descriptive Analyses

Data analyses were performed through Statistical Package for Social Sciences (SPSS) Version 26.0 for screening and descriptive analyses, and *Mplus* statistical software (Muthén & Muthén, 1998–2015; version 8.1) for confirmatory factor analysis. Data screening revealed no significant outliers.

Participant demographic information is presented in Table 1. Additionally, means and standard deviations of the SCL-90-R GSI *t*-scores for total sample and across athlete types can be found in Table 2.

#### Primary Analyses

##### *Hypothesis 1:*

It was hypothesized that the SCL-90-R factor structure in collegiate athletes will differ from that of the general population with athletes reporting less psychological problems and symptoms. We also proposed that the one-factor model will result in best fit. Mean raw score responses of the SCL-90-R were gathered from literature across different sample populations to examine if athletes generally report less psychological problems. Table 3 shows the SCL-90-R mean raw scores for the current sample of athletes in comparison to other populations. The first column presents the mean and standard deviation data of the current sample. Next, original SCL-90-R manual data for the USA Nonpatients (Derogatis, 1994), USA Outpatients (Derogatis, 1994), Danish community adult sample (Olsen et al., 2004), and German normal healthy adult sample (Franke, 1992, 1995, as cited in Schmitz et al., 2000.) is presented. Overall, mean

subscale values are higher in the current collegiate athlete sample as compared to the USA nonpatients, Danish community adults, and German normal healthy adult samples.

Table 4 presents correlational matrix for the SCL-90-R original subscales. All of the correlations were significant ( $ps < .01$ ). Correlation values ranged between .26 and .80. To evaluate the proposed one-factor model, CFA was performed utilizing *Mplus* statistical software (Muthén & Muthén, 1998–2015; version 8.1). CFA for one-factor, eight-factor, original nine-factor, and bi-factor models was performed. To measure overall model fit for CFA, multiple indices were used, including comparative fit index (CFI; Bentler, 1990), root mean square error of approximation (RMSEA; Steiger, 1980), and Akaike information criterion (AIC; Akaike, 1987). The results of these fit indices for each of the four models can be found in Table 5.

**One-Factor Model.** CFA results indicate that the one-factor model provided a poor fit for this sample of data. Although the overall chi-square was significant  $\chi^2(3915, N = 311) = 10043, p < .001$ , CFI did not meet the accepted value indicative of good fit (CFI = .54). As seen in Table 5, the one-factor model had largest RMSEA and AIC values, suggesting poor fit (RMSEA = .07; AIC = 62918).

**Eight-Factor Model.** Based on the CFA results, the eight-factor model showed significant chi-square value  $\chi^2(3131, N = 311) = 7359, p < .001$ . CFI did not meet the accepted value indicative of good fit (CFI = .63). RMSEA criteria demonstrated reasonable fit (RMSEA = .07). While AIC demonstrated a second-largest value (AIC = 56721), suggesting that eight-factor model fit is worse than the original nine-factor and bi-factor models.

**Original Nine-Factor Model.** Results of the CFA on the originally proposed nine-factor model showed a significant chi-square value  $\chi^2(3284, N = 311) = 7598, p < .001$ . However, CFI value revealed inadequate fit (CFI = .64). RMSEA criteria demonstrated reasonable fit (RMSEA

= .06). AIC comparison of competing models revealed the nine-factor relative model fit was larger than the bi-factor model (AIC = 56166).

**Bi-Factor Model.** Similar to other models, the bi-factor model chi-square test was significant  $\chi^2 (3237, N = 311) = 7289, p < .001$ . As shown in Table 5, none of the examined models reached CFI value above .95, which is indicative of good fit. However, the bi-factor model demonstrated the largest CFI value (CFI = .66). RMSEA criteria value was indicative of reasonable fit (RMSEA = .06). The bi-factor model was also closest to approaching close fit (>.5). When comparing relative model fit based on the AIC, the bi-factor model demonstrated the smallest value (AIC = 55951). Based on the results of fit indices, the bi-factor model was determined to be the best fitting model.

Factor loadings for the bi-factor model are presented in Table 6. Apart from item 16, all other items significantly load on the general distress factor (i.e., global factor). The significant factor loadings of the general global factor ranged from .05 to .88. As shown in the table, most of the items had strong loadings on their respective specific factors, with twenty-four items that did not significantly load on the relevant construct (items number 3, 6, 8, 14, 15, 16, 21, 22, 23, 26, 31, 32, 33, 41, 65, 71, 72, 73, 77, 78, 80, 85, 86, 88). Variance explained (sum of squared loadings) can be found in the bottom portion of Table 6. These values are used to determine explained common variance (ECV) index. The ECV is defined as the “ratio of variance explained by the general factor divided by the variance explained by the general plus the group factors” (Reise, 2012). In this data, ECV of the global factor is 73%, reflecting that the SCL-90-R has a stronger general global factor relative to the specific construct factors. The ECV for specific factors is also reported at the bottom of Table 6. Specific factors’ ECV values ranged from 6.4% to 1.3%, with psychoticism factor displaying least explained common variance.

***Hypothesis 2:***

Next, it was hypothesized that NCAA, Club, and Intramural athletes will differ in their reports of mental health symptomatology as measured by the SCL-90-R. It was proposed that Intramural and Club athletes will report more psychological problems and symptoms on the SCL-90-R as compared to NCAA athletes.

Given little support for the presence of nine unique dimensions, only SCL-90-R GSI mean *t*-scores for the whole sample, as well as NCAA, Club, and Intramural groups are reported in Table 2. Results of analysis of variance (ANOVAs) yielded significant differences in response patterns across groups. Post-hoc analyses were performed to further examine those differences. Overall, results indicate significant group differences on Global Severity Index (NCAA:  $M = 53.95$ ,  $SD = 10.33$  vs. Intramural:  $M = 59.78$ ,  $SD = 8.71$  and Club:  $M = 61.97$ ,  $SD = 9.04$ ),  $F(2, 297) = 16.80$ ,  $p < .001$ , such that NCAA athletes endorsed significantly less symptoms than Club and Intramural athletes. Club and Intramural athletes did not significantly differ in their SCL-90-R GSI *t*-scores.

## **Chapter 5**

### **Discussion**

The purpose of this study was to examine the SCL-90-R factor structure in NCAA, Club, and Intramural student athletes. In recent years, the scientific community urged for the use of psychometrically validated measures of mental health symptomatology in collegiate athletes. This is even more important due to lack of consensus surrounding the “gold standard” for screening mental health in this population.

In this study, we wanted to explore whether the currently published nine-factor model of the SCL-90-R scale is appropriate for this sample. To our knowledge, this is the first study to investigate confirmatory factor analysis (CFA) of the SCL-90-R in collegiate athletes. This investigation is advantageous since SCL-90-R is a comprehensive and one of the most commonly utilized measures of psychiatric functioning. In conducting this study, we hope to advance our knowledge of collegiate athlete endorsement of global psychiatric symptomatology on the SCL-90-R, as well as provide clinicians and researchers with a validated measure of the general psychiatric functioning.

Several of the SCL-90-R factor models were examined for fit, including the original and currently published nine-factor model, as well as other models found by researchers investigating the SCL-90-R (i.e., one global factor, eight-factor, and bi-factor models). In line with the most stable finding from previous research, we proposed that one global factor will result in the best fit (Ardakani et al., 2016; Ronan et al., 2000; Smits et al., 2014).

Our findings revealed that the bi-factor model outperformed alternative models of the SCL-90-R. The bi-factor model was determined to demonstrate the best fit across RMSEA and AIC criteria. However, none of the tested models reached reasonable (.90) or good (.95) fit based

on the CFI criteria (Hu & Bentler, 1999). This suggests that none of the tested models provided a good fit for the data. One possible explanation of these inconsistent findings could be examination of a non-clinical sample in the present study. Previous research supporting the bi-factorial structure of the SCL-90-R involved inpatient and outpatient samples (Urbán et al., 2016).

Several reasons may explain why the bi-factor model exhibited higher fit indices than other models. First, bi-factor modeling allows each item to load on a general global factor and only one specific construct factor, suggesting the SCL-90-R items demonstrate both, a single common factor (i.e., general psychological distress) and specific construct factors (i.e., depression, somatization, etc.) to some extent. Recently, the scientific community investigated multidimensional complexity of psychometric scales (Reise et al., 2010; Reise, 2012), suggesting that bi-factor modeling can resolve some of the important problems in conceptualizing and measuring psychological constructs that appear multidimensional in nature (Reise, 2012). This implies that the scores of some psychometric self-report scales, including the SCL-90-R, are influenced by at least two factors, general distress and a specific construct factor. In our data, the bi-factor model is likely to display a better fit to the general one factor model due to a relatively small degree of multidimensionality. Specifically, the general factor explained roughly two thirds of the common variance, whereas specific construct factors accounted for roughly one third of the explained common variance.

Additionally, inconsistencies in the SCL-90-R factor structure may be reflective of the differences in population samples. Indeed, collegiate athletes are considered to be a unique population which has been found to be qualitatively different from the general sample control group (Darcy et al., 2013; Sundgot-Borgen et al., 2004). As extensively reviewed in the literature



review section, athletes may deny or minimize symptoms on the SCL-90-R due to a variety of reasons, including stigma and worries related to jeopardizing their athletic career, even though those symptoms may be interfering with their performance and life in general. Collegiate athletes may also differ from other populations in the kinds of symptoms they report. Thus, unique sample differences may have contributed to inadequate fit of the bi-factor model compared to previous findings by Urbán et al. (2016).

Results of the best-fitting model show that all but one item (#16, hearing voices) loaded on the general distress factor. Notably, item 16 did not load on either the general distress factor or the designated psychoticism construct factor. This could be due to low psychoticism construct validity, as four out of ten items in this subscale did not show significant factor loadings. The psychoticism subscale also accounted for the least amount of explained common variance (1.3%). Notably, nearly identical results were found by the scale developers, with only four of the ten items loading significantly on this factor (Cyr et al., 1985). Authors proposed an item alteration which has not been conducted to date. Other studies additionally raised questions regarding uncertain validity of the SCL-90-R psychoticism symptom dimension. One exploratory factor analysis study yielded re-organized psychoticism and paranoid ideation dimensions into “schizotypal signs” and “schizophrenia nuclear symptoms” (Rössler et al., 2007), while Bakhshaie et al. (2011) have suggested the paranoid ideation and psychoticism subscales remain separated though some items were removed to improve construct validity. In another study, items from the original subscales of interpersonal sensitivity, paranoid ideation, and psychoticism were reformulated and combined to comprise a new Distrust and Interpersonal Sensitivity subscale (Ruis et al., 2014). In addition, authors concluded that psychoticism and paranoid ideation dimensions should be reformulated (Rief & Fichter, 1992). On one hand, these

inconsistent findings raise concerns regarding the validity of the psychoticism symptom dimension and prompt the need for re-analysis. On the other hand, these discrepancies may also be reflective of the considerable sample differences across studies (i.e., age, socio-cultural background, and socioeconomic status), highlighting the need for the SCL-90-R to be validated before use in unique populations.

Results of the CFA analyses also suggest that the anxiety subscale may be unstable. While some initial research supported anxiety subscale as a unique construct (Derogatis, 1994), the results of the present study show a high number of items that did not load on the designated factor. Six out of ten items in the anxiety subscale did not reach statistical significance and accounted for 2.15 percent of the explained common variance. These findings are consistent with Rief and Fichter (1992) who examined the ability of the SCL-90-R to identify and discriminate between anorexia nervosa, dysthymia, and anxiety disorders. In their study, as well as some earlier studies (Clark & Friedman, 1983; Hoffmann & Overall, 1978; Holcomb et al., 1983), authors encountered difficulty reproducing anxiety factor, suggesting it be merged with phobic anxiety factor. Holcomb et al. (1983) also noted that some of the SCL-90-R items could be related to multiple constructs (i.e., anxiety and interpersonal sensitivity), and thus would not emerge as separate factors in their analyses. Therefore, researchers should be cautious when interpreting anxiety and psychoticism subscales as valid constructs of specific and unique dimension.

The nine-factor model that was initially proposed by the scale developers (Derogatis, 1994) demonstrated second-to-best fit in our study, outperforming one-factor and eight-factor models. Other studies similarly failed to confirm the nine-factor structure, raising concerns about the SCL-90-R postulated dimensions. Many reached consensus that the SCL-90-R is a measure

of general distress, rather than distinct dimensions of psychopathology (Cyr et al., 1985; Hoffmann & Overall, 1978). Contradicting those studies, Rief and Fichter (1992) confirmed different profile shapes of the SCL-90-R in different diagnostic groups (i.e., dysthymia, anxiety, and anorexia nervosa). Overall, these inconsistencies may suggest an outdated conceptualization of mental health used in the SCL-90-R. Published in 1994, the scale is yet to be updated. Moreover, current gold standard self-report measures, such as The Achenbach System of Empirically Based Assessment (ASEBA) or the PROMIS, tend to reflect the DSM-V criteria to assist with diagnostic clarity (Rescorla & Achenbach, 2004; NIH).

Results of this study support the idea that the general distress global factor remains of clinical value as it has accounted for roughly two thirds of the explained common variance. Consequently, the subscale scores contributed to one third of the explained common variance. This may suggest that the SCL-90-R is best to be utilized as a unitary screening tool, a measure of severity of symptoms, or as a measure of change over time, rather than a diagnostic tool with distinct dimensions (Bergly et al., 2014; Schmitz et al., 1999; Urbán et al., 2016). Indeed, the SCL-90-R may be useful at highlighting problem areas, such as elevated negative affect, which could signal to the provider to further evaluate those concerns for the purposes of a clear diagnosis (i.e., differential diagnosis of major depressive disorder vs. adjustment disorder with depressed mood).

Although the ANOVA results indicate significant differences between NCAA, Club, and Intramural athletes across the SCL-90-R GSI, it is unlikely that combining these subgroups affected results of the confirmatory factor analysis. It is reasonable to assume that there would be some variation between NCAA athletes and recreational sport athletes, as described in earlier

sections of this paper. Separate examination of NCAA, club, and intramural athlete subgroups may be an area of focus in future research.

In summary, we present the confirmatory factor analysis on the SCL-90-R in collegiate student athletes. To our knowledge, there has been no studies examining the SCL-90-R factorial structure in this unique population. In this study, the SCL-90-R demonstrated a small degree of multidimensionality explaining the better fit of the bi-factor model over the hypothesized one-general factor model. The difficulty reproducing at least two constructs, prompts a revision of the SCL-90-R, which has also been suggested by other researchers (Bakhshaie et al., 2011; Clark & Friedman, 1983; Hoffmann & Overall, 1978; Holcomb et al., 1983; Rief & Fichter, 1992; Rössler et al., 2007). Although the SCL-90-R remains to be clinically useful as it covers a wide range of psychological symptoms, is relatively easy to complete, and is a good tool for repeated measurement and symptom severity, future studies should examine revised symptom dimensions of the scale. An exploratory factor analysis, followed by a confirmatory factor analysis, post item reformulation is needed to determine if the bi-factor model is robust and if more variance is explained by the specific constructs (i.e., increased multidimensionality) after the revisions. Another implication of these results is that more research is needed on the factor patterns of symptoms with collegiate athletes, since the current bi-factor model differs from previously proposed factor structures in the general population.

### **Limitations**

Although there is a plethora of literature in the area of CFA and its use in measurement development and examination, it is important to note that the nature of CFA is of finding “good fit” which does not by definition equivalent to a “correct” or “true” model, but only a plausible

model. This study examined a limited number of models, therefore other models that fit the data at better or approximately the same level of goodness-of-fit may exist.

Overall, results of the CFA analyses provide some support for the multidimensional nature of the SCL-90-R. However, some items failed to load significantly on their proposed construct, with psychoticism factor explaining the least amount of common variance. The results of this study are based on a unique sample of collegiate athletes and should be considered with caution. Consequently, transfer to other populations should be validated empirically.

Given past factor analysis findings of the SCL-90-R in non-athlete samples, this study only examined previously found factor structures (i.e., one factor, nine-factor, eight-factor, and bi-factor models). Future research may examine other factorial models in this population, as well as explore anxiety and psychoticism subscale validity. Furthermore, examination of NCAA, Club, and Intramural athlete subgroups may be an area of focus in the future research. Replication of the bi-factor model of the SCL-90-R in a variety of samples will be needed to provide further support for the validity of this structure.

## References

- Akaike, H. (1987). Factor analysis and AIC. *Psychometrika*, 52(3), 371-386.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Appaneal, R. N., Levine, B. R., Perna, F. M., & Roh, J. L. (2009). Measuring postinjury depression among male and female competitive athletes. *Journal of Sport & Exercise Psychology*, 31(1), 60-76. <https://doi.org/10.1123/jsep.31.1.60>
- Araújo, C. G. S., & Scharhag, J. (2016). Athlete: a working definition for medical and health sciences research. *Scandinavian Journal of Medicine & Science in Sports*, 26(1), 4-7. <https://doi.org/10.1111/sms.12632>
- Ardakani, A., Seghatoleslam, T., Habil, H., Jameei, F., Rashid, R., Zahirodin, A., ... & Arani, A. M. (2016). Construct validity of symptom checklist-90-revised (SCL-90-R) and general health questionnaire-28 (GHQ-28) in patients with drug addiction and diabetes, and normal population. *Iranian Journal of Public Health*, 45(4), 451-459.
- Armstrong, S., & Oomen-Early, J. (2009). Social connectedness, self-esteem, and depression symptomatology among collegiate athletes versus nonathletes. *Journal of American College Health*, 57(5), 521-526. <https://doi.org/10.3200/JACH.57.5.521-526>
- Arrindell, W. A., & Ettema, J. H. M. (2005). Symptom checklist: handleiding bij multidimensionale psychopathologie-indicator [Symptom checklist: manual of the multidimensional psychopathology indicator]. *Amsterdam: Harcourt Test Publishers*.
- Arrindell, W. A., Barelds, D. P., Janssen, I. C., Buwalda, F. M., & van der Ende, J. (2006). Invariance of SCL-90-R dimensions of symptom distress in patients with peri partum

- pelvic pain (PPPP) syndrome. *British Journal of Clinical Psychology*, 45(3), 377-391.  
<https://doi.org/10.1348/014466505X68924>
- Bakhshaie, J., Sharifi, V., & Amini, J. (2011). Exploratory factor analysis of SCL90-R symptoms relevant to psychosis. *Iranian Journal of Psychiatry*, 6(4), 128.
- Bakhshalipour, V., Sareshkeh, S. K., Zivdar, Z., & Toubia, N. (2016). The comparison of mental health between male athlete and non-athlete students in Islamic Azad University Branches of Guilan Province. *Sport Scientific & Practical Aspects*, 13(2), 25-29.
- Bano, R. P. (2014). Physical activities and its effect on students' mental health: A comparative study between athlete and non-athlete students. *Indian Journal of Health & Wellbeing*, 5(7), 34-37.
- Barry, A. E., Howell, S. M., Riplinger, A., & Piazza-Gardner, A. K. (2015). Alcohol use among college athletes: do intercollegiate, club, or intramural student athletes drink differently?. *Substance Use & Misuse*, 50(3), 302-307. <https://doi.org/10.3109/10826084.2014.977398>
- Beable, S., Fulcher, M., Lee, A. C., & Hamilton, B. (2017). SHARPSports mental Health Awareness Research Project: Prevalence and risk factors of depressive symptoms and life stress in elite athletes. *Journal of Science and Medicine in Sport*, 20(12), 1047-1052.  
<https://doi.org/10.1016/j.jsams.2017.04.018>
- Beck, A.T., Steer, R.A., & Brown, G. (1996). *Beck depression inventory II manual*. San Antonio, TX: The Psychological Corporation.
- Beidler, E., Bretzin, A. C., Hanock, C., & Covassin, T. (2018). Sport-related concussion: knowledge and reporting behaviors among collegiate club-sport athletes. *Journal of Athletic Training*, 53(9), 866-872. <https://doi.org/10.4085/1062-6050-266-17>

- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238-246. <https://doi.org/10.1037/0033-2909.107.2.238>
- Bergly, T. H., Nordfjærn, T., & Hagen, R. (2014). The dimensional structure of SCL-90-R in a sample of patients with substance use disorder. *Journal of Substance Use*, *19*(3), 257-261. <https://doi.org/10.3109/14659891.2013.790494>
- Bratland-Sanda, S., & Sundgot-Borgen, J. (2013). Eating disorders in athletes: overview of prevalence, risk factors and recommendations for prevention and treatment. *European Journal of Sport Science*, *13*(5), 499-508. <https://doi.org/10.1080/17461391.2012.740504>
- Breslin, G., Haughey, T., O'Brien, W., Caulfield, L., Robertson, A., & Lawlor, M. (2018). Increasing athlete knowledge of mental health and intentions to seek help: The State of Mind Ireland (SOMI) Pilot Program. *Journal of Clinical Sport Psychology*, *12*(1), 39-56. <https://doi.org/10.1123/jcsp.2016-0039>
- Breslin, G., Shannon, S., Haughey, T., Donnelly, P., & Leavey, G. (2017). A systematic review of interventions to increase awareness of mental health and well-being in athletes, coaches and officials. *Systematic Reviews*, *6*, 177. <https://doi.org/10.1186/s13643-017-0568-6>
- Brown, G. T., Hainline, B., Kroshus, E., & Wilfert, M. (2014). *Mind, body and sport: Understanding and supporting student-athlete mental wellness*. Indianapolis, IN: NCAA.
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). The Guilford Press.
- Browne, M. W., & Cudeck, R. (1992). Alternative Ways of Assessing Model Fit. *Sociological Methods & Research*, *21*(2), 230. <https://doi-org.ezproxy.library.unlv.edu/10.1177/0049124192021002005>



- Carless, D., & Douglas, K. (2013). "In the boat" but "selling myself short": Stories, narratives, and identity development in elite sport. *The Sport Psychologist*, 27(1), 27-39.  
<https://doi.org/10.1123/tsp.27.1.27>
- Castaldelli-Maia, J. M., e Gallinaro, J. G. D. M., Falcão, R. S., Gouttebauge, V., Hitchcock, M. E., Hainline, B., ... & Stull, T. (2019). Mental health symptoms and disorders in elite athletes: a systematic review on cultural influencers and barriers to athletes seeking treatment. *British Journal of Sports Medicine*, 53(11), 707-721.  
<http://dx.doi.org/10.1136/bjsports-2019-100710>
- Cella, D., Riley, W., Stone, A., Rothrock, N., Reeve, B., Yount, S., ... & Cook, K. (2010). Initial adult health item banks and first wave testing of the patient-reported outcomes measurement information system (PROMIS™) network: 2005–2008. *Journal of Clinical Epidemiology*, 63(11), 1179. <https://doi.org/10.1016/j.jclinepi.2010.04.011>
- Cimini, M. D., Monserrat, J. M., Sokolowski, K. L., Dewitt-Parker, J. Y., Rivero, E. M., & McElroy, L. A. (2015). Reducing high-risk drinking among student-athletes: the effects of a targeted athlete-specific brief intervention. *Journal of American College Health*, 63(6), 343-352. <https://doi.org/10.1080/07448481.2015.1031236>
- Clark, A., & Friedman, M. J. (1983). Factor structure and discriminant validity of the SCL-90 in a veteran psychiatric population. *Journal of Personality Assessment*, 47(4), 396-404.  
[https://doi-org.proxy.ulib.uits.iu.edu/10.1207/s15327752jpa4704\\_10](https://doi-org.proxy.ulib.uits.iu.edu/10.1207/s15327752jpa4704_10)
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*, (3rd ed). Lawrence Erlbaum Associates Publishers.

- Cumming, S. P., Smith, R. E., Grossbard, J. R., Smoll, F. L., & Malina, R. M. (2012). Body size, coping strategies, and mental health in adolescent female athletes. *International Journal of Sports Science & Coaching*, 7(3), 515-526. <https://doi.org/10.1260/1747-9541.7.3.515>
- Cyr, J. J., J. M. McKenna-Foley, & E. Peacock. (1985). Factor structure of the SCL-90-R: is there one?. *Journal of Personality Assessment*, 49(6), 571-578. [https://doi.org/10.1207/s15327752jpa4906\\_2](https://doi.org/10.1207/s15327752jpa4906_2)
- Darcy, A. M., Hardy, K. K., Crosby, R. D., Lock, J., & Peebles, R. (2013). Factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in male and female college athletes. *Body Image*, 10(3), 399-405. <https://doi.org/10.1016/j.bodyim.2013.01.008>
- Davis, C., & Strachan, S. (2001). Elite female athletes with eating disorders: A study of psychopathological characteristics. *Journal of Sport & Exercise Psychology*, 23(3), 245-253. <https://doi.org/10.1123/jsep.23.3.245>
- De Francisco, C., Arce, C., del Pilar Vílchez, M., & Vales, Á. (2016). Antecedents and consequences of burnout in athletes: Perceived stress and depression. *International Journal of Clinical and Health Psychology*, 16(3), 239-246. <https://doi.org/10.1016/j.ijchp.2016.04.001>
- Derogatis, L. R. (1979). Symptom Checklist-90-Revised (SCL-90-R). *Lyndhurst, NJ: NCS Pearson*.
- Derogatis, L. R. (1994). *SCL-90-R: symptom checklist-90-R: Administration, scoring & procedures manual* (3rd ed.). Minneapolis, MN: National Computer Systems, Inc.
- Derogatis, L. R., & Cleary, P. A. (1977). Confirmation of the dimensional structure of the SCL-90: A study in construct validation. *Journal of Clinical Psychology*, 33(4), 981-989.

[https://doi.org/10.1002/1097-4679\(197710\)33:4<981::AID-JCLP2270330412>3.0.CO;2-](https://doi.org/10.1002/1097-4679(197710)33:4<981::AID-JCLP2270330412>3.0.CO;2-0)

0

- Derogatis, L. R., Lipman, R. S., & Covi, L. (1973). SCL-90: an outpatient psychiatric rating scale—preliminary report. *Psychopharmacol Bull*, 9(1), 13-28.
- Derogatis, L. R., Rickels, K., & Rock, A. (1976). The SCL-90 and the MMPI: A step in the validation of a new self-report scale. *British Journal of Psychiatry*, 128, 280–289.  
<https://doi.org/10.1192/bjp.128.3.280>
- Deshpande, S. K., Hasegawa, R. B., Rabinowitz, A. R., Whyte, J., Roan, C. L., Tabatabaei, A., ... & Small, D. S. (2017). Association of playing high school football with cognition and mental health later in life. *JAMA Neurology*, 74(8), 909-918.  
<https://doi:10.1001/jamaneurol.2017.1317>
- Despres, J., Brady, F., & McGowan, A. S. (2008). Understanding the Culture of the Student-Athlete: Implications for College Counselors. *The Journal of Humanistic Counseling, Education & Development*, 47(2), 200-211. <https://doi.org/10.1002/j.2161-1939.2008.tb00058.x>
- DiBartolo, P. M., & Shaffer, C. (2002). A comparison of female college athletes and nonathletes: Eating disorder symptomatology and psychological well-being. *Journal of Sport & Exercise Psychology*, 24(1), 33-41. <https://doi.org/10.1123/jsep.24.1.33>
- Donohue, B., Covassin, T., Lancer, K., Dickens, Y., Miller, A., Hash, A., & Genet, J. (2004). Examination of psychiatric symptoms in student athletes. *The Journal of General Psychology*, 131(1), 29-35. <https://doi.org/10.3200/GENP.131.1.29-35>
- Donohue, B., Galante, M., Maietta, J., Lee, B., Paul, N., Perry, J. E., ... & Allen, D. N. (2019). Empirical development of a screening method to assist mental health referrals in

collegiate athletes. *Journal of Clinical Sport Psychology*, 13(4), 561-579.

<https://doi.org/10.1123/jcsp.2018-0070>

Donohue, B., Gavrilova, E., Danlag, A., Perry, J., Kuhn, C., Allen, D., & Benning, S. A. (2021).

Comprehensive Examination of Collegiate Athletes' Utilization of Goal Oriented Psychological Assessment and Intervention Services. *Psychology in the Schools*, 58(3), 458-474. <https://doi.org/10.1002/pits.22458>

Donohue, B., Gavrilova, Y., Galante, M., Burnstein, B., Aubertin, P., Gavrilova, E., ... &

Benning, S. D. (2020). Empirical development of a screening method for mental, social, and physical wellness in amateur and professional circus artists. *Psychology of Aesthetics, Creativity, & the Arts*, 14(3), 313. <https://doi.org/10.1037/aca0000199>

Donohue, B., Gavrilova, Y., Galante, M., Gavrilova, E., Loughran, T., Scott, J., ... & Allen, D.

N. (2018). Controlled Evaluation of an Optimization Approach to Mental Health and Sport Performance. *Journal of Clinical Sport Psychology*, 1-42.

<https://doi.org/10.1123/jcsp.2017-0054>

Donohue, B., Loughran, T., Pitts, M., Gavrilova, Y., Chow, G. M., Soto-Nevarez, A., &

Schubert, K. (2016). Preliminary development of a brief intervention to prevent alcohol misuse and enhance sport performance in collegiate athletes. *Journal of Drug Abuse*, 2(3). <https://doi.org/10.21767/2471-853X.100035>

Donohue, B., Phrathep, D., Stucki, K. B., Kowal, I., Breslin, G., Cohen, M., ... & Allen, D. N.

(2021). Adapting an evidence-supported optimization program for mental health and sport performance in collegiate athletes to fit youth from ethnic/racial minority and low-income neighborhoods: A National Institutes of Health stage model feasibility study. *The*

*International Journal of Psychiatry in Medicine*, 0(0) 1–22.

<https://doi.org/10.1177/00912174211006547>

Donohue, B., Silver, N. C., Dickens, Y., Covassin, T., & Lancer, K. (2007). Development and initial psychometric evaluation of the sport interference checklist. *Behavior Modification*, 31(6), 937-957. <https://doi.org/10.1177/0145445507303827>

Driller, M. W., Dixon, Z. T., & Clark, M. I. (2017). Accelerometer-based sleep behavior and activity levels in student athletes in comparison to student non-athletes. *Sport Sciences for Health*, 13(2), 411-418. <https://doi.org/10.1007/s11332-017-0373-6>

Du Preez, E. J., Graham, K. S., Gan, T. Y., Moses, B., Ball, C., & Kuah, D. E. (2017). Depression, anxiety, and alcohol use in elite rugby league players over a competitive season. *Clinical Journal of Sport Medicine*, 27(6), 530-535.

<https://doi.org/10.1097/JSM.0000000000000411>

Dugan, J. P., Torrez, M. A., & Turman, N. T. (2014). *Leadership in intramural sports and club sports: Examining influences to enhance educational impact*. Corvallis, OR: NIRSA.

Estanol, E., Shepherd, C., & MacDonald, T. (2013). Mental skills as protective attributes against eating disorder risk in dancers. *Journal of Applied Sport Psychology*, 25(2), 209-222.

<https://doi.org/10.1080/10413200.2012.712081>

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire?. *International Journal of Eating Disorders*, 16(4), 363-370.

[https://doi.org/10.1002/1098-108X\(199412\)16:4<363::AID-EAT2260160405>3.0.CO;2-](https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-)

[%23](#)

- Ford, J. A. (2007). Alcohol use among college students: A comparison of athletes and nonathletes. *Substance Use & Misuse*, 42(9), 1367-1377.  
<https://doi.org/10.1080/10826080701212402>
- Foskett, R. L., & Longstaff, F. (2018). The mental health of elite athletes in the United Kingdom. *Journal of Science & Medicine in Sport*, 21(8), 765-770.  
<https://doi.org/10.1016/j.jsams.2017.11.016>
- Foster, B. J., & Chow, G. M. (2019). Development of the Sport Mental Health Continuum—Short Form (Sport MHC-SF). *Journal of Clinical Sport Psychology*, 13(4), 593-608.  
<https://doi.org/10.1123/jcsp.2017-0057>
- Gamer, D.M., & Olmsted, M.P. (1984). *Eating disorder inventory manual*. Lutz, FL: Psychological Assessment Resources, Inc.
- Garner, D., Olmsted, M., Bohr, Y., & Garfinkel, P. (1982). The Eating Attitudes Test: Psychometric features. *Psychological Medicine*, 12, 871-878. <https://doi-org.ezproxy.library.unlv.edu/10.1017/S0033291700049163>
- Giannone, Z. A., Haney, C. J., Kealy, D., & Ogrodniczuk, J. S. (2017). Athletic identity and psychiatric symptoms following retirement from varsity sports. *International Journal of Social Psychiatry*, 63(7), 598-601. <https://doi.org/10.1177/0020764017724184>
- Goldberg, D. P. (1978). *Manual of the General Health Questionnaire*. Windsor. England: NEFR Publishing.
- Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine*, 27(1), 191-197.  
<https://doi.org/10.1017/S0033291796004242>

- Gomes, A. R., Martins, C., & Silva, L. (2011). Eating disordered behaviours in Portuguese athletes: The influence of personal, sport, and psychological variables. *European Eating Disorders Review*, 19(3), 190-200. <https://doi.org/10.1002/erv.1113>
- Gouttebauge, V., Frings-Dresen, M. H. W., & Sluiter, J. K. (2015). Mental and psychosocial health among current and former professional footballers. *Occupational Medicine*, 65(3), 190-196. <https://doi.org/10.1093/occmed/kqu202>
- Hammond, T., Gialloreti, C., Kubas, H., & Davis IV, H. H. (2013). The prevalence of failure-based depression among elite athletes. *Clinical Journal of Sport Medicine*, 23(4), 273-277. <https://doi.org/10.1097/JSM.0b013e318287b870>
- Hill, A., MacNamara, Á., Collins, D., & Rodgers, S. (2016). Examining the role of mental health and clinical issues within talent development. *Frontiers in Psychology*, 6, 2042. <https://doi.org/10.3389/fpsyg.2015.02042>
- Hodgson, R. J., & Rachman, S. (1977). Obsessional-compulsive complaints. *Behaviour Research & Therapy*, 15(5), 389-395. [https://doi.org/10.1016/0005-7967\(77\)90042-0](https://doi.org/10.1016/0005-7967(77)90042-0)
- Hoffmann, N. G., & Overall, P. B. (1978). Factor structure of the SCL-90 in a psychiatric population. *Journal of Consulting & Clinical Psychology*, 46(6), 1187. <https://doi.org/10.1037/0022-006X.46.6.1187>
- Holcomb, W. R., Adams, N. A., & Ponder, H. M. (1983). Factor structure of the Symptom Checklist-90 with acute psychiatric inpatients. *Journal of Consulting & Clinical Psychology*, 51(4), 535. <https://doi.org/10.1037/0022-006X.51.4.535>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>

- Hudd, S. S., Dumlao, J., Erdmann-Sager, D., Murray, D., Phan, E., Soukas, N., & Yokozuka, N. (2000). Stress at college: effects on health habits, health status and self-esteem. *College Student Journal*, 34(2), 217.
- Hughes, L., & Leavey, G. (2012). Setting the bar: athletes and vulnerability to mental illness. *The British Journal of Psychiatry*, 200(2), 95-96.  
<https://doi.org/10.1192/bjp.bp.111.095976>
- Hulley, A., Currie, A., Njenga, F., & Hill, A. (2007). Eating disorders in elite female distance runners: Effects of nationality and running environment. *Psychology of Sport & Exercise*, 8(4), 521-533. <https://doi.org/10.1016/j.psychsport.2006.07.001>
- Hurley, A. E., Scandura, T. A., Schriesheim, C. A., Brannick, M. T., Seers, A., Vandenberg, R. J., & Williams, L. J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior*, 18(6), 667-683. [https://doi-org.ezproxy.library.unlv.edu/10.1002/\(SICI\)1099-1379\(199711\)18:6<667::AID-JOB874>3.0.CO;2-T](https://doi-org.ezproxy.library.unlv.edu/10.1002/(SICI)1099-1379(199711)18:6<667::AID-JOB874>3.0.CO;2-T)
- Jensen, S. N., Ivarsson, A., Fallby, J., Dankers, S., & Elbe, A. M. (2018). Depression in Danish and Swedish elite football players and its relation to perfectionism and anxiety. *Psychology of Sport & Exercise*, 36, 147-155.  
<https://doi.org/10.1016/j.psychsport.2018.02.008>
- Kaier, E., Cromer, L. D., Johnson, M. D., Strunk, K., & Davis, J. L. (2015). Perceptions of mental illness stigma: Comparisons of athletes to nonathlete peers. *Journal of College Student Development*, 56(7), 735-739. <https://doi-org.ezproxy.library.unlv.edu/10.1353/csd.2015.0079>



- Kessler, R. C., McGonagle, K. A., Zhao, S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry*, 51(1), 8-19. <https://doi:10.1001/archpsyc.1994.03950010008002>
- Keyes, C.L.M., Wissing, M., Potgieter, J.P., Temane, M., Kruger, A., & van Rooy, S. (2008). Evaluation of the mental health continuum-short form (MHC-SF) in Setswanaspeaking South Africans. *Clinical Psychology & Psychotherapy*, 15, 181–192. <https://doi:10.1002/cpp.572>
- Kilic, Ö., Aoki, H., Haagensen, R., Jensen, C., Johnson, U., Kerkhoffs, G. M., & Gouttebauge, V. (2017). Symptoms of common mental disorders and related stressors in Danish professional football and handball. *European Journal of Sport Science*, 17(10), 1328-1334. <https://doi.org/10.1080/17461391.2017.1381768>
- Kimball, A., & Freysinger, V. J. (2003). Leisure, stress, and coping: The sport participation of collegiate student-athletes. *Leisure Sciences*, 25(2-3), 115-141. <https://doi.org/10.1080/01490400306569>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling (Methodology in the social sciences)*. The Guilford Press.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606-613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Kunst, L. E., Maas, J., van Balkom, A. J., van Assen, M. A., Kouwenhoven, B., & Bekker, M. H. (2021). Group autonomy enhancing treatment versus cognitive behavioral therapy for anxiety disorders: A cluster-randomized clinical trial. *Depression & Anxiety*, 1– 13. <https://doi.org/10.1002/da.23231>

- Lifschutz, L. (2012). Club sports: Maximizing positive outcomes and minimizing risks. *Recreational Sports Journal*, 36(2), 104-112. <https://doi.org/10.1123/rsj.36.2.104>
- Lorenz, D. S., Reiman, M. P., Lehecka, B. J., & Naylor, A. (2013). What performance characteristics determine elite versus nonelite athletes in the same sport?. *Sports Health*, 5(6), 542-547. <https://doi.org/10.1177/1941738113479763>
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression, Anxiety and Stress Scales* (2nd ed.). Sydney, Australia: Psychology Foundation.
- Lundqvist, C. (2011). Well-being in competitive sports—The feel-good factor? A review of conceptual considerations of well-being. *International Review of Sport & Exercise Psychology*, 4(2), 109-127. <https://doi.org/10.1080/1750984X.2011.584067>
- Madsen, L. P., Evans, T. A., Snyder, K. R., & Docherty, C. L. (2016). Patient-Reported Outcomes Measurement Information System physical function item bank, version 1.0: physical function assessment for athletic patient populations. *Journal of Athletic Training*, 51(9), 727-732. <https://doi.org/10.4085/1062-6050-51.11.06>
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57(3), 519-530. <https://doi.org/10.1093/biomet/57.3.519>
- Martens, M. P., Dams-O'Connor, K., & Beck, N. C. (2006). A systematic review of college student-athlete drinking: Prevalence rates, sport-related factors, and interventions. *Journal of Substance Abuse Treatment*, 31(3), 305-316. <https://doi.org/10.1016/j.jsat.2006.05.004>
- Martin, R. J., Nelson, S. E., & Gallucci, A. R. (2016). Game on: Past year gambling, gambling-related problems, and fantasy sports gambling among college athletes and non-athletes. *Journal of Gambling Studies*, 32(2), 567-579. <https://doi.org/10.1007/s10899-015-9561-y>

- Martinsen, M., Bahr, R., Børresen, R. U. N. I., Holme, I., Pensgaard, A. M., & Sundgot-Borgen, J. (2014). Preventing eating disorders among young elite athletes: a randomized controlled trial. *Medicine & Science in Sports & Exercise*, *46*(3), 435-447. <https://doi-org.ezproxy.library.unlv.edu/10.1249/MSS.0b013e3182a702fc>
- Marzell, M., Morrison, C., Mair, C., Moynihan, S., & Gruenewald, P. J. (2015). Examining drinking patterns and high-risk drinking environments among college athletes at different competition levels. *Journal of Drug Education*, *45*(1), 5-16. <https://doi.org/10.1177/0047237915575281>
- McGuire, L. C., Ingram, Y. M., Sachs, M. L., & Tierney, R. T. (2017). Temporal changes in depression symptoms in male and female collegiate student-athletes. *Journal of Clinical Sport Psychology*, *11*(4), 337-351. <https://doi.org/10.1123/JCSP.2016-0035>
- McLester, C. N., Hardin, R., & Hoppe, S. (2014). Susceptibility to eating disorders among collegiate female student-athletes. *Journal of Athletic Training*, *49*(3), 406-410. <https://doi.org/10.4085/1062-6050-49.2.16>
- Miller, E. T., Neal, D. J., Roberts, L. J., Baer, J. S., Cressler, S. O., Metrik, J., & Marlatt, G. A. (2002). Test-retest reliability of alcohol measures: Is there a difference between internetbased assessment and traditional methods? *Psychology of Addictive Behaviors*, *16*, 56-63. <https://doi.org/10.1037/11855-013>
- Moesch, K., Kenttä, G., Kleinert, J., Quignon-Fleuret, C., Cecil, S., & Bertollo, M. (2018). FEPSAC position statement: mental health disorders in elite athletes and models of service provision. *Psychology of Sport & Exercise*, *38*, 61-71. <https://doi.org/10.1016/j.psychsport.2018.05.013>

- Monsma, E. V., & Malina, R. M. (2004). Correlates of eating disorders risk among female figure skaters: a profile of adolescent competitors. *Psychology of Sport & Exercise*, 5(4), 447-460. [https://doi.org/10.1016/S1469-0292\(03\)00038-4](https://doi.org/10.1016/S1469-0292(03)00038-4)
- Muthén, L. K. et Muthén, BO (1998-2015). *Mplus user's guide* (7th ed.). Los Angeles, CA, US: Muthén et Muthén.
- National Collegiate Athletics Association [NCAA]. (2009). *Defining Countable Athletically Related Activities*. <http://www.ncaa.org/sites/default/files/Charts.pdf>
- National Collegiate Athletics Association [NCAA]. (2019). *1981-82 – 2018-19 NCAA sports sponsorship and participation rates report*. [https://ncaaorg.s3.amazonaws.com/research/sportpart/2018-19RES\\_SportsSponsorshipParticipationRatesReport.pdf](https://ncaaorg.s3.amazonaws.com/research/sportpart/2018-19RES_SportsSponsorshipParticipationRatesReport.pdf)
- National Collegiate Athletics Association [NCAA]. (2020). *Summary of NCAA Eligibility Regulations – NCAA Division I*. [https://ncaaorg.s3.amazonaws.com/compliance/d1/2020-21D1Comp\\_SummaryofNCAAREgulations.pdf](https://ncaaorg.s3.amazonaws.com/compliance/d1/2020-21D1Comp_SummaryofNCAAREgulations.pdf)
- National Intramural-Recreational Sports Association [NIRSA]. (2016). *Player Eligibility Requirements*. <http://play.nirsa.net/nirsa-championship-series/player-eligibility-requirements/>
- National Intramural-Recreational Sports Association [NIRSA]. (n.d.). *Intramural Sport Rules*. <https://nirsa.net/nirsa/sport-rules/>
- Neal, D. J., & Carey, K. B. (2004). Developing discrepancy within self-regulation theory: Use of personalized normative feedback and personal strivings with heavy-drinking college students. *Addictive Behaviors*, 29, 281-297. <https://doi.org/10.1016/j.addbeh.2003.08.004>

- Neal, D. J., Corbin, W. R., & Fromme, K. (2006). Measurement of alcohol-related consequences among high school and college students: application of item response models to the Rutgers Alcohol Problem Index. *Psychological Assessment, 18*(4), 402-414.  
<https://doi.org/10.1037/1040-3590.18.4.402>
- Nicolas, M., Martinent, G., & Campo, M. (2014). Evaluation of the psychometric properties of a modified Positive and Negative Affect Schedule including a direction scale (PANAS-D) among French athletes. *Psychology of Sport & Exercise, 15*(3), 227-237.  
<https://doi.org/10.1016/j.psychsport.2014.01.005>
- Olsen, L. R., Mortensen, E. L., & Bech, P. (2004). The SCL-90 and SCL-90R versions validated by item response models in a Danish community sample. *Acta Psychiatrica Scandinavica, 110*(3), 225-229. <https://doi.org/10.1111/j.1600-0447.2004.00399.x>
- Parker, R. M., Lambert, M. J., & Burlingame, G. M. (1994). Psychological features of female runners presenting with pathological weight control behaviors. *Journal of Sport and Exercise Psychology, 16*(2), 119-134. <https://doi.org/10.1123/jsep.16.2.119>
- Patel, D. R., Omar, H., & Terry, M. (2010). Sport-related performance anxiety in young female athletes. *Journal of Pediatric & Adolescent Gynecology, 23*(6), 325-335.  
<https://doi.org/10.1016/j.jpag.2010.04.004>
- Pennington, B. (2008). Rapid rise of college club teams creates a whole new level of success. *New York Times*, p. B11. [https://search-proquest-com.ezproxy.library.unlv.edu/docview/897158959?rfr\\_id=info%3Axri%2Fsid%3Aprimo](https://search-proquest-com.ezproxy.library.unlv.edu/docview/897158959?rfr_id=info%3Axri%2Fsid%3Aprimo)
- Pinkerton, R. S., Hinz, L. D., & Barrow, J. C. (1989). The college student-athlete: Psychological considerations and interventions. *Journal of American College Health, 37*(5), 218-226.  
<https://doi.org/10.1080/07448481.1989.9939063>

- Primack, B. A., Fertman, C. I., Rice, K. R., Adachi-Mejia, A. M., & Fine, M. J. (2010). Waterpipe and cigarette smoking among college athletes in the United States. *Journal of Adolescent Health, 46*(1), 45-51. <https://doi.org/10.1016/j.jadohealth.2009.05.004>
- Proctor, S. L., & Boan-Lenzo, C. (2010). Prevalence of depressive symptoms in male intercollegiate student-athletes and nonathletes. *Journal of Clinical Sport Psychology, 4*(3), 204-220. <https://doi.org/10.1123/jcsp.4.3.204>
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385-401. <https://doi.org/10.1177/014662167700100306>
- Reardon, C. L. (2017). Psychiatric comorbidities in sports. *Neurologic Clinics, 35*(3), 537-546. <https://doi.org/10.1016/j.ncl.2017.03.007>
- Reinking, M. F., & Alexander, L. E. (2005). Prevalence of disordered-eating behaviors in undergraduate female collegiate athletes and nonathletes. *Journal of Athletic Training, 40*(1), 47-51.
- Reise, S. P. (2012). The rediscovery of bifactor measurement models. *Multivariate Behavioral Research, 47*(5), 667-696. <https://doi.org/10.1080/00273171.2012.715555>
- Reise, S. P., Moore, T. M., & Haviland, M. G. (2010). Bifactor models and rotations: Exploring the extent to which multidimensional data yield univocal scale scores. *Journal of Personality Assessment, 92*(6), 544-559. <https://doi.org/10.1080/00223891.2010.496477>
- Rescorla, L. A., & Achenbach, T. M. (2004). The Achenbach System of Empirically Based Assessment (ASEBA) for Ages 18 to 90 Years. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults* (pp. 115–152). *Lawrence Erlbaum Associates Publishers.*

- Rice, S. M., Parker, A. G., Mawren, D., Clifton, P., Harcourt, P., Lloyd, M., ... & Purcell, R. (2020). Preliminary psychometric validation of a brief screening tool for athlete mental health among male elite athletes: the athlete psychological strain questionnaire. *International Journal of Sport & Exercise Psychology*, 18(6), 850-865. <https://doi.org/10.1080/1612197X.2019.1611900>
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: a narrative systematic review. *Sports Medicine*, 46(9), 1333-1353. <https://doi.org/10.1007/s40279-016-0492-2>
- Rief, W., & Fichter, M. (1992). The Symptom Check List SCL-90-Rand and Its Ability to Discriminate between Dysthymia, Anxiety Disorders, and Anorexia Nervosa. *Psychopathology*, 25(3), 128-138. <https://doi.org/10.1159/000284763>
- Ronan, G. F., Dreer, L. E., & Dollard, K. M. (2000). Measuring patient symptom change on rural psychiatry units: utility of the symptom checklist-90 revised. *The Journal of Clinical Psychiatry*, 61(7), 493-497. <https://doi.org/10.4088/jcp.v61n0706>
- Rössler, W., Riecher-Rössler, A., Angst, J., Murray, R., Gamma, A., Eich, D., ... & Gross, V. A. (2007). Psychotic experiences in the general population: a twenty-year prospective community study. *Schizophrenia Research*, 92(1-3), 1-14. <https://doi.org/10.1016/j.schres.2007.01.002>
- Ruis, C., van den Berg, E., van Stralen, H. E., Huenges Wajer, I. M., Biessels, G. J., Kappelle, L. J., ... & van Zandvoort, M. J. (2014). Symptom Checklist 90–Revised in neurological outpatients. *Journal of Clinical & Experimental Neuropsychology*, 36(2), 170-177. <https://doi.org/10.1080/13803395.2013.875519>

- Ryan, H., Gayles, J. G., & Bell, L. (2018). Student-athletes and mental health experiences. *New Directions for Student Services*, 2018(163), 67-79. <https://doi.org/10.1002/ss.20271>
- Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88(6), 791-804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>
- Schauenburg, H., & Strack, M. (1999). Measuring psychotherapeutic change with the symptom checklist SCL 90 R. *Psychotherapy & Psychosomatics*, 68(4), 199-206. <https://doi.org/10.1159/000012333>
- Schmitz, N., Hartkamp, N., & Franke, G. H. (2000). Assessing clinically significant change: Application to the SCL-90-R. *Psychological Reports*, 86(1), 263-274. <https://doi.org/10.2466/pr0.2000.86.1.263>
- Schmitz, N., Kruse, J., Heckrath, C., Alberti, L., & Tress, W. (1999). Diagnosing mental disorders in primary care: the General Health Questionnaire (GHQ) and the Symptom Check List (SCL-90-R) as screening instruments. *Social Psychiatry & Psychiatric Epidemiology*, 34(7), 360-366. <https://doi.org/10.1007/s001270050156>
- Scott, J. A. (2018). Examination of a Screening Tool for Athletes' Mental Health and Its Direct Implications to Sport Training and Competition (Doctoral dissertation, University of Nevada, Las Vegas).
- Scott, J. A. (2020). Examination of Factors Reported by Athletes to Interfere with Their Lives Outside of Sports (Doctoral dissertation, University of Nevada, Las Vegas).



- Sereda, Y., & Dembitskyi, S. (2016). Validity assessment of the symptom checklist SCL-90-R and shortened versions for the general population in Ukraine. *BMC Psychiatry, 16*(1), 1-11. <https://doi.org/10.1186/s12888-016-1014-3>
- Slade, P. D., & Dewey, M. E. (1986). Development and preliminary validation of SCANS: A screening instrument for identifying individuals at risk of developing anorexia and bulimia nervosa. *International Journal of Eating Disorders, 5*(3), 517-538. [https://doi.org/10.1002/1098-108X\(198603\)5:3<517::AID-EAT2260050309>3.0.CO;2-6](https://doi.org/10.1002/1098-108X(198603)5:3<517::AID-EAT2260050309>3.0.CO;2-6)
- Smits, I. A., Timmerman, M. E., Barelids, D. P., & Meijer, R. R. (2015). The Dutch symptom checklist-90-revised: Is the use of the subscales justified? *European Journal of Psychological Assessment, 31*(4), 263–271. <https://doi-org.ezproxy.library.unlv.edu/10.1027/1015-5759/a000233>
- Somasundaram, P., & Burgess, A. M. (2018). The role of division iii sports participation in the relationship between perfectionism and disordered eating symptomology. *Journal of Clinical Sport Psychology, 12*, 57-74. <https://doi.org/10.1123/jcsp.2017-0013>
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the state-trait anxiety inventory*. Palo Alto: CA, Consulting Psychologists Press.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine, 166*(10), 1092-1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Steiger, J. H. (1980). *Statistically based tests for the number of common factors*. In the annual meeting of the Psychometric Society. Iowa City, IA.
- Stewart, R. E. (1992). A brief history of the intramural movement. *Recreational Sports Journal, 17*(1), 12-14.

- Storch, E. A., Storch, J. B., Killiany, E. M., & Roberti, J. W. (2005). Self-reported psychopathology in athletes: a comparison of intercollegiate student-athletes and non-athletes. *Journal of Sport Behavior*, 28(1), 86-97.
- Sundgot-Borgen, J., Torstveit, M. K., & Skårderud, F. (2004). Eating disorders among athletes. *Tidsskrift for den Norske lægeforening: tidsskrift for praktisk medicin, ny række*, 124(16), 2126-2129.
- Swann, C., Moran, A., & Piggott, D. (2015). Defining elite athletes: Issues in the study of expert performance in sport psychology. *Psychology of Sport & Exercise*, 16, 3-14.  
<https://doi.org/10.1016/j.psychsport.2014.07.004>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5<sup>th</sup> ed.). Boston, MA: Allyn and Bacon.
- Tahtinen, R. E., & Kristjansdottir, H. (2018). The influence of anxiety and depression symptoms on help-seeking intentions in individual sport athletes and non-athletes: the role of gender and athlete status. *Journal of Clinical Sport Psychology*, 13(1), 134-151.  
<https://doi.org/10.1123/jcsp.2017-0028>
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... & Stewart-Brown, S. (2007). The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health & Quality of Life Outcomes*, 5, 63. <https://doi.org/10.1186/1477-7525-5-63>
- Terluin, B., van Marwijk, H. W., Adèr, H. J., de Vet, H. C., Penninx, B. W., Hermens, M. L., ... & Stalman, W. A. (2006). The Four-Dimensional Symptom Questionnaire (4DSQ): a validation study of a multidimensional self-report questionnaire to assess distress,

- depression, anxiety and somatization. *BMC Psychiatry*, 6, 34.  
<https://doi.org/10.1186/1471-244X-6-34>
- The National Federation of State High School Associations. (2019). *2018-19 High School Athletics Participation Survey*. [https://www.nfhs.org/media/1020412/2018-19\\_participation\\_survey.pdf](https://www.nfhs.org/media/1020412/2018-19_participation_survey.pdf)
- Tobar, D. A. (2012). Trait anxiety and mood state responses to overtraining in men and women college swimmers. *International Journal of Sport & Exercise Psychology*, 10(2), 135-148. <https://doi.org/10.1080/1612197X.2012.666399>
- Tomioka, M., Shimura, M., Hidaka, M., & Kubo, C. (2008). The reliability and validity of a Japanese version of symptom checklist 90 revised. *BioPsychoSocial Medicine*, 2(1), 1-8.  
<https://doi.org/10.1186/1751-0759-2-19>
- U.S. Bureau of Labor Statistics. (2017). *Sport & Exercise, 2003-2015*.  
<https://www.bls.gov/spotlight/2017/sports-and-exercise/home.htm>
- Uphill, M., Sly, D., & Swain, J. (2016). From mental health to mental wealth in athletes: Looking back and moving forward. *Frontiers in Psychology*, 7, 935.  
<https://doi.org/10.3389/fpsyg.2016.00935>
- Urbán, R., Arrindell, W. A., Demetrovics, Z., Unoka, Z., & Timman, R. (2016). Cross-cultural confirmation of bi-factor models of a symptom distress measure: Symptom Checklist-90-Revised in clinical samples. *Psychiatry Research*, 239, 265-274.  
<https://doi.org/10.1016/j.psychres.2016.03.039>
- van de Grift, T. C., Elaut, E., Cerwenka, S. C., Cohen-Kettenis, P. T., & Kreukels, B. P. (2018). Surgical satisfaction, quality of life, and their association after gender-affirming surgery:

- a follow-up study. *Journal of Sex & Marital Therapy*, 44(2), 138-148.  
<https://doi.org/10.1080/0092623X.2017.1326190>
- van Ramele, S., Aoki, H., Kerkhoffs, G. M., & Gouttebarga, V. (2017). Mental health in retired professional football players: 12-month incidence, adverse life events and support. *Psychology of Sport & Exercise*, 28, 85-90.  
<https://doi.org/10.1016/j.psychsport.2016.10.009>
- Veit, C. T., & Ware, J. E. (1983). The structure of psychological distress and well-being in general populations. *Journal of Consulting & Clinical Psychology*, 51(5), 730-742.  
<https://doi.org/10.1037/0022-006X.51.5.730>
- Voelker, D. K., Petrie, T. A., Reel, J. J., & Gould, D. (2018). Frequency and psychosocial correlates of eating disorder symptomatology in male figure skaters. *Journal of Applied Sport Psychology*, 30(1), 119-126. <https://doi.org/10.1080/10413200.2017.1325416>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality & Social Psychology*, 54(6), 1063-1070.
- Watson, J. C. (2005). College student-athletes' attitudes toward help-seeking behavior and expectations of counseling services. *Journal of College Student Development*, 46(4), 442-449. <https://doi.org/10.1353/csd.2005.0044>
- Watson, J. C. (2006). Student-athletes and counseling: Factors influencing the decision to seek counseling services. *College Student Journal*, 40(1), 35-42.
- Wilson, G., & Pritchard, M. (2005). Comparing sources of stress in college student athletes and non-athletes. *Athletic Insight: The Online Journal of Sports Psychology*, 7(1), 1-8.

- Wilson, M. (2016). Differences in Depression, Anxiety, and Life Satisfaction between Intercollegiate Athletes, Intramural Participants, and Non-Athletes. Masters Theses & Specialist Projects. Paper 1739. <http://digitalcommons.wku.edu/theses/1739>
- Wolanin, A., Gross, M., & Hong, E. (2015). Depression in athletes: prevalence and risk factors. *Current Sports Medicine Reports*, 14(1), 56-60.  
<https://doi.org/10.1249/JSR.0000000000000123>
- Wolanin, A., Hong, E., Marks, D., Panchoo, K., & Gross, M. (2016). Prevalence of clinically elevated depressive symptoms in college athletes and differences by gender and sport. *British Journal of Sports Medicine*, 50(3), 167-171. <http://dx.doi.org/10.1136/bjsports-2015-095756>
- Yang, J., Peek-Asa, C., Corlette, J. D., Cheng, G., Foster, D. T., & Albright, J. (2007). Prevalence of and risk factors associated with symptoms of depression in competitive collegiate student athletes. *Clinical Journal of Sport Medicine*, 17(6), 481-487.  
<https://doi.org/10.1097/JSM.0b013e31815aed6b>
- Yavuz, H. U., & Oktem, F. (2012). The relationship between depression, anxiety and visual reaction times in athletes. *Biology of Sport*, 29(3).  
<https://doi.org/10.5604/20831862.1003444>
- Yu, L., Buysse, D. J., Germain, A., Moul, D. E., Stover, A., Dodds, N. E., ... & Pilkonis, P. A. (2012). Development of short forms from the PROMIS™ sleep disturbance and sleep-related impairment item banks. *Behavioral Sleep Medicine*, 10(1), 6-24.  
<https://doi.org/10.1080/15402002.2012.636266>
- 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), 281-290.

<https://doi.org/10.3200/JACH.57.3.281-290>

## Appendix

**Table 1**

*Participant Demographic Characteristics with Numbers Shown as Mean (SD; Range) or Frequency (%), (N = 311)*

Demographics	Total (N = 311)		
	<i>M</i>	<i>SD</i>	<i>Range</i>
Age in Years	19.87	1.92	(18-33)
	<i>λ</i>	<i>%</i>	
Gender			
Female	156	50.2	
Male	155	49.8	
Ethnicity			
White/Caucasian	129	41.5	
Black/African American	54	17.4	
Other (multiple or not listed)	51	16.4	
Hispanic/Latino	39	12.5	
Asian/Asian American	26	8.4	
Pacific Islander	12	3.9	
Level of Sport Participation			
NCAA	150	48.2	
Intramural	125	40.2	
Club	36	11.6	
Year in School			
Freshman	112	36.0	
Sophomore	92	29.6	
Junior	66	21.2	
Senior	41	13.2	
Referral Type			
Class Credit/Subject Pool	163	52.4	
Presentation	97	31.2	
Coach/Teammate	38	12.2	
Athletic Department	13	4.2	

**Table 2**

*SCL-90-R Global Severity Index t-Scores across Sport Level in Athletes with Numbers Shown as Mean (SD), (N = 300)*

SCL-90-R Subscale	All Athletes <i>n</i> = 300 mean ( <i>SD</i> )	NCAA <i>n</i> = 147 mean ( <i>SD</i> )	Intramural <i>n</i> = 121 mean ( <i>SD</i> )	Club <i>n</i> = 32 mean ( <i>SD</i> )	Statistic (One-way ANOVA)	<i>p</i>	Group differences
GSI, Global Severity Index	57.16 (10.07)	53.95 (10.33)	59.78 (8.71)	61.97 (9.04)	<i>F</i> = 16.80	.00	NCAA vs. Club NCAA vs. Intramural

*Note.* NCAA = National Collegiate Athletic Association; GSI = SCL-90-R Global Severity Index. Estimated *t*-scores are based on

Derogatis, 1994 for individuals in the community who are not currently patients. *t*-scores for 11 participants were not available.



**Table 3**

*SCL-90-R raw scores in Athletes Compared to Other Samples with Numbers Shown as Mean (SD), (N = 311)*

SCL-90-R Subscale	Athletes <i>n</i> = 311 mean ( <i>SD</i> )	Norms, USA Nonpatients <sup>1</sup> <i>n</i> = 974 mean ( <i>SD</i> )	Norms, USA Outpatients <sup>2</sup> <i>n</i> = 1002 mean ( <i>SD</i> )	Norms, Danish <sup>3</sup> <i>n</i> = 1153 mean ( <i>SD</i> )	Norms, Germany <sup>4</sup> <i>n</i> = 1006 mean ( <i>SD</i> )
1. Somatization	.60 (.46)	.36 (.42)	.87 (.75)	.49 (.53)	.35 (.30)
2. Obsessive-compulsive	.94 (.71)	.39 (.45)	1.47 (.91)	.63 (.61)	.47 (.38)
3. Interpersonal Sensitivity	.64 (.61)	.29 (.39)	1.41 (.89)	.54 (.56)	.41 (.38)
4. Depression	.78 (.68)	.36 (.44)	1.79 (.94)	.59 (.63)	.40 (.38)
5. Anxiety	.41 (.44)	.30 (.37)	1.47 (.88)	.44 (.51)	.29 (.32)
6. Hostility	.51 (.53)	.30 (.40)	1.10 (.93)	.34 (.41)	.31 (.34)
7. Phobic anxiety	.19 (.35)	.13 (.31)	.74 (.80)	.13 (.34)	.14 (.22)
8. Paranoid ideation	.68 (.65)	.34 (.44)	1.16 (.92)	.46 (.59)	.35 (.37)
9. Psychoticism	.34 (.47)	.14 (.25)	.94 (.70)	.22 (.32)	.18 (.24)
GSI, Global Severity Index	.60 (.45)	.31 (.31)	1.26 (.68)	.45 (.43)	.33 (.24)

*Note.* <sup>1</sup>Derogatis, 1994 Raw Score Mean and Standard Deviations for adult individuals in the community who are not currently patients, mean age = 46.0; <sup>2</sup>Derogatis, 1994 Raw Score Mean and Standard Deviations for adult psychiatric outpatients, mean age = 31.2; <sup>3</sup>Olsen et al., 2004 Raw Score Mean and Standard Deviations for adult Danish citizens, age range = 20–79; <sup>4</sup>Franke, 1992, 1995, as cited in Schmitz et al., 2000 Raw Score Mean and Standard Deviations for German normal healthy college students, mean age = 34.0.

**Table 4***SCL-90-R Construct Correlation Matrix (N = 311)*

<b>SCL-90-R Subscale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1. Somatization	-								
2. Obsessive-compulsive	.55**	-							
3. Interpersonal Sensitivity	.49**	.67**	-						
4. Depression	.51**	.73**	.80**	-					
5. Anxiety	.59**	.67**	.67**	.74**	-				
6. Hostility	.42**	.48**	.51**	.53**	.56**	-			
7. Phobic anxiety	.26**	.35**	.39**	.41**	.53**	.33**	-		
8. Paranoid ideation	.47**	.61**	.69**	.67**	.62**	.50**	.49**	-	
9. Psychoticism	.48**	.65**	.73**	.80**	.69**	.47**	.39**	.70**	-

*Note.* SCL-90-R = Symptom Checklist-90-Revised. N = 311. \*\* p < .01 (2-tailed).

**Table 5***Results of Fit Indices (N = 311)*

Models	$\chi^2$ (df)	CFI	RMSEA [90% CI]	AIC
1	10043 (3915)	.54	.071 [.069, .073]	62918
8	7359 (3131)	.63	.066 [.064, .068]	56721
9	7598 (3284)	.64	.065 [.063, .067]	56166
B9*	7289 (3237)	.66	.063 [.062, .065]	55951

*Note.*  $\chi^2$  = chi-square statistic. df = degrees of freedom. CFI = comparative fit index. RMSEA = root mean-square error of approximation. RMSEA [90% CI] = root mean-square error of approximation 90% confidence interval. AIC = Akaike's information criterion; B = bifactor with a general factor, and numbers represent the number of specific factors.

\* indicates the best fitting model

**Table 6***Standardized Factor Loadings of the Bifactor Model of SCL-90-R in Athletes (N = 311)*

Item number & Short descriptor	$\lambda$ SOM	$\lambda$ O-C	$\lambda$ I-S	$\lambda$ DEP	$\lambda$ ANX	$\lambda$ HOS	$\lambda$ PHOB	$\lambda$ PAR	$\lambda$ PSY	$\lambda$ General
1. Headaches	<b>.38</b>									<b>.21</b>
4. Faintness	<b>.35</b>									<b>.15</b>
12. Pains in heart/chest	<b>.30</b>									<b>.24</b>
27. Pains in lower back	<b>.30</b>									<b>.44</b>
40. Nausea	<b>.22</b>									<b>.34</b>
42. Soreness of muscles	<b>.36</b>									<b>.20</b>
48. Trouble getting breath	<b>.34</b>									<b>.28</b>
49. Hot/cold spells	<b>.21</b>									<b>.19</b>
52. Numbness	<b>.24</b>									<b>.18</b>
53. Lump in throat	<b>.21</b>									<b>.18</b>
56. Weakness of body	<b>.39</b>									<b>.44</b>
58. Heavy arms/legs	<b>.24</b>									<b>.28</b>
3. Unpleasant thoughts		-.02								<b>.77</b>
9. Trouble remembering		<b>.58</b>								<b>.47</b>
10. Worried about sloppiness		<b>.42</b>								<b>.51</b>
28. Feeling blocked		<b>.42</b>								<b>.71</b>
38. Doing things slowly		<b>.35</b>								<b>.46</b>
45. Having to double-check		<b>.43</b>								<b>.53</b>
46. Difficulty deciding		<b>.34</b>								<b>.68</b>
51. Mind going blank		<b>.48</b>								<b>.42</b>
55. Trouble concentrating		<b>.55</b>								<b>.63</b>
65. Repeating same actions		.09								<b>.27</b>
6. Feeling critical of others			.13							<b>.41</b>
21. Feeling shy opposite sex			.05							<b>.40</b>
34. Feeling easily hurt			<b>.20</b>							<b>.59</b>
36. Others are unsympathetic			<b>.21</b>							<b>.58</b>
37. People dislike you			<b>.60</b>							<b>.55</b>
41. Feeling inferior to others			.06							<b>.59</b>
61. Uneasy when people are watching			<b>.32</b>							<b>.66</b>
69. Self-conscious with others			<b>.29</b>							<b>.77</b>
73. Uncomfortable eating/drinking in public			.03							<b>.10</b>
5. Loss of sexual interest				<b>.10</b>						<b>.27</b>
14. Low energy/slow				-.14						<b>.64</b>
15. Thoughts of ending life				.04						<b>.19</b>

20. Crying easily	<b>.19</b>		<b>.48</b>
22. Feeling trapped	.03		.52
26. Blaming yourself	.08		.85
29. Feeling lonely	<b>.65</b>		<b>.88</b>
30. Feeling blue	<b>.41</b>		.72
31. Worrying too much	-.03		.80
32. No interest in things	-.10		.71
54. Hopeless about future	<b>.23</b>		.73
71. Everything is an effort	.03		.59
79. Feeling worthless	<b>.11</b>		.76
<hr/>			
2. Nervousness	<b>.51</b>		<b>.43</b>
17. Trembling	<b>.10</b>		.12
23. Suddenly scared	.04		.27
33. Feeling fearful	-.02		.45
39. Heart pounding/racing	<b>.45</b>		.39
57. Feeling tense	<b>.25</b>		.51
72. Spells of terror/panic	.06		.24
78. Can't sit still/restless	.02		.45
80. Something bad is going to happen	-.07		.59
86. Frightening thoughts	-.07		.21
<hr/>			
11. Easily annoyed		<b>.19</b>	<b>.58</b>
24. Temper outbursts		<b>.35</b>	.37
63. Urges to harm someone		<b>.34</b>	.23
67. Urges to break things		<b>.40</b>	.32
74. Arguing frequently		<b>.39</b>	.20
81. Shouting/throwing		<b>.33</b>	.18
<hr/>			
13. Afraid on the street		<b>.44</b>	.14
25. Afraid to go out alone		<b>.31</b>	.12
47. Afraid of public transport		<b>.17</b>	.05
50. Having to avoid things/places/ activities		<b>.33</b>	.26
70. Uneasy in crowds		<b>.12</b>	.33
75. Nervous when alone		<b>.26</b>	.27
82. Afraid to faint in public		<b>.06</b>	.06
<hr/>			
8. Others are to blame			.04
18. Most people can't be trusted			<b>.33</b>
43. Feeling watched			<b>.13</b>
68. Having beliefs that others do not share			<b>.20</b>
76. Not getting enough credit			<b>.22</b>
83. People will take advantage			<b>.77</b>

7. Someone can control your thoughts										<b>.33</b>	<b>.37</b>
16. Hearing voices										-.00	.01
35. Others knowing your private thoughts										<b>.11</b>	<b>.41</b>
62. Thoughts not your own										<b>.38</b>	<b>.28</b>
77. Feeling lonely with others										-.02	<b>.76</b>
84. Thoughts about sex that bother you										<b>.15</b>	<b>.24</b>
85. You should be punished										.08	<b>.25</b>
87. Something is wrong with your body										<b>.11</b>	<b>.44</b>
88. Never feeling close to another person										-.06	<b>.59</b>
90. Something is wrong with your mind										<b>.16</b>	<b>.71</b>
$(\sum\lambda^2)$	1.10	1.65	0.65	0.74	0.55	0.70	0.51	0.81	0.34		18.62
Explained common variance %	4.27	6.44	2.55	2.89	2.15	2.71	2.00	3.15	1.31		72.54

*Note:* SOM: Somatization; O-C: Obsessive-Compulsive; I-S: Interpersonal Sensitivity; DEP:

Depression; ANX: Anxiety; HOS: Hostility; PHOB: Phobic Anxiety; PAR: Paranoid Ideation;

PSY: Psychoticism. **Boldfaced** factor loadings are significant at least  $p < .05$ .  $\lambda$  is a factor

loading.

## Curriculum Vitae

ELENA GAVRILOVA

lena.rin14@gmail.com

### EDUCATION

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<b>Pre-Doctoral Internship</b>	<b>Indiana University School of Medicine</b> (APA-Accredited), Integrated Care Track Indianapolis, IN	July 2021-Present
<b>Ph.D.</b>	<b>Clinical Psychology</b> University of Nevada, Las Vegas (APA-Accredited) Dissertation: <i>Evaluating the SCL-90-R for use in collegiate athletes.</i> Chair: Brad Donohue, Ph.D.	Expected 2022
<b>M.A.</b>	<b>Clinical Psychology</b> University of Nevada, Las Vegas (APA-Accredited) Thesis: <i>Empirical justification for supportive other involvement in collegiate athletes' mental health intervention.</i> Chair: Brad Donohue, Ph.D.	Dec. 2019
<b>B.A.</b>	<b>Psychology, Minor in Sociology</b> University of Nevada, Las Vegas	May 2016

### AWARDS & SCHOLARSHIPS

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• Sterling Scholarship (2020-2021)	\$5000
• Patricia Sastaunik Scholarships (2019-2020; 2020-2021)	\$5000
• Summer Doctoral Research Fellowship (2020)	\$7000
• Conference Travel Award (2019)	\$350
• College of Liberal Arts Doctoral Student Summer Research Stipend (2019)	\$3000
• Outstanding Poster Presentation (2nd place), GPSA Research Forum (2019)	\$125
• Graduate & Professional Student Association Book Scholarship (2019)	\$150
• Rebel Research & Mentorship Program Award (2018-2019)	\$2500
• Graduate Funds Access Awards (2017-2018; 2019-2020; 2020-2021; 2021-2022)	\$8000
• Outstanding Poster Presentation (2nd place), NPA Conference (2017)	\$100

### OUTSTANDING HONORS & ACCOMPLISHMENTS

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• Mentorship Certification	2019
• Two Division I University Swimming Records, UNLV	2016
• Undergraduate Dean's Honor List	2013-2016
• Full Athletic Scholarship, UNLV	2013-2016

- Mountain West Scholar-Athlete 2014-2015
- Academic All-Mountain West 2013-2015
- The Honorable Mention Scholar All-American 2014
- Student-Athlete Academic Achievement 2014
- Russian National Silver Medalist, Swimming 2010

## **CLINICAL PRACTICA**

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*Psychology Intern, Indiana University School of Medicine*

July 2021-Present

### **Integrated Primary Care (CHOICE Program)**

Supervisors: Jenifer Vohs, Ph.D., Lezlie Blackford, Ph.D., Sarah Landsberger, Ph.D.

- Providing time-limited (8-10 sessions), evidence-based individual therapy to adults presenting to primary care clinic.
- Consulting and coordinating care with psychiatrists, residents, nurse practitioners, social workers, behavioral health clinicians, and office staff.
- Conducting psychiatric triage and managing referral pool to assess fit for services.

### **Adult Solid Organ Transplant** Supervisors: Anahli Patel, Ph.D., Rachel Holmes Ph.D.

- Conducting diagnostic assessments, pre-transplant evaluations, post-transplant intervention, and providing consultation to different specialty medical teams in both an outpatient and inpatient hospital setting.
- Co-facilitating transplant support group.
- The patient population is organ transplant candidates, recipients, and donors.

### **Pediatric GI Healthy Weight Management** Supervisors: Elaine Gilbert Psy.D.

- Conducting research informed care for children and adolescents referred by their GI providers for a multitude of presenting issues including non-adherence, coping with chronic medical conditions, somatic and functional conditions, pain management, encopresis, as well as comorbid anxiety and mood issues.
- Conducting brief assessment of patients with GI symptoms.
- Designed psychoeducational handouts to assist with treatment adherence.

### **Adult Outpatient Clinic** Supervisors: Danielle Henderson Ph.D.

- Providing evidence-based and individualized psychotherapy for variety of presenting concerns, including mood and anxiety disorders, PTSD, and ADHD.
- Emphasis is placed on incorporating social factors into diagnostic assessments and treatment plan.

*Advanced Psychology Trainee, VA Southern Nevada Healthcare System* July 2019-June 2021

### **Primary Care Mental Health Integration (PCMHI)** Supervisor: Elizabeth Briggs, Psy.D.

- Implemented brief, evidence-based treatments for variety of presenting concerns, including depression, anxiety, chronic pain, substance misuse, sleep problems, grief, trauma, psychological adjustment to a medical condition, and noncompliance.
- Provided brief, same-day initial visits for primary care patients, including warm handoffs, brief functional assessment, and facilitation of referrals to specialty mental health services.



- Collaborated with medical doctors, psychiatrists, nurse practitioners, physician assistants, pharmacists, nutritionists, and social workers in providing holistic care to Veterans.
- Implemented measurement-based care, utilizing various tools to assess treatment outcomes.
- Created a curriculum for and co-facilitated the Sleep Hygiene and Stress Management groups.
- Co-facilitated behavioral health modules of a virtual Adult Interdisciplinary Weight Management MOVE! group.
- Facilitated weekly meditation and relaxation training for primary care clinic staff members.

### **Behavioral Health Interdisciplinary Program (BHIP)**

Supervisors: Michelle Flores, Ph.D., Ariel Gonzalez, Psy.D.

- Implemented evidence-based treatments (e.g., CPT, PE, CBT for Depression) with Veterans suffering from PTSD and other co-occurring psychological diagnoses and health conditions.
- Collaborated with psychiatrists, social workers, and nurse practitioners.
- Implemented screening and treatment monitoring assessments.
- Co-facilitated Seeking Safety, Depression Management, and Women's Coping Skills psychotherapy groups.

### ***Academic Success Center (ASC)***

June 2020-May 2021

University of Nevada, Las Vegas, NV

#### **Interdisciplinary Department/School Clinic**

Supervisor: Michelle Paul, Ph.D.

- Conducted psychodiagnostic and neuropsychological assessments using a battery of psychometrically validated tests and measures for students in need of academic accommodations.
- Participated in the Disability Resource Center (DRC) case-review meetings regarding interpretation of documentation and recommendations for accommodation.
- Engaged in interviewing, scoring, interpretation, integrated report writing, differential diagnosis, and provision of feedback to patients.

### ***Psychology Trainee, Department Community Mental Health Clinic***

July 2018-Aug. 2019

University of Nevada, Las Vegas, NV

#### **Group Psychotherapy Clinic**

Supervisors: Amelia Black, Ph.D., Noelle Lefforge, Ph.D.

- Co-facilitated weekly skills-based CBT psychotherapy group.
- Provided pre-treatment preparation to incoming group members.
- Provided case management as adjunct to group psychotherapy to prevent patient drop-out and improve patient engagement, as well as management of acute symptoms (e.g., suicidality).

#### **Psychology Trainee, The PRACTICE**

Supervisors: Carolina Meza-Perez, Psy.D, Rachele Diliberto, Ph.D, & Michelle Paul, Ph.D

- The PRACTICE was the 2019 recipient of the Association of Psychology Training Clinic's (APTC) Clinic Innovations Award in Training; this national award recognizes

one training clinic annually for its leadership in innovations that impact students training.

- Provided individual & family skill-based interventions (CBT, DBT, ERP, FBT) for patients presenting with anxiety, obsessive-compulsive, conduct, and trauma-related disorders.

#### **Assessment & Testing Clinic**

Supervisor: Michelle Paul, Ph.D.

- Conducted psychodiagnostic and neuropsychological assessments using a flexible battery of psychometrically validated tests and measures with adults referred from the community.
- Responsibilities included interviewing, scoring, interpretation, integrated report writing, differential diagnosis, and provision of feedback to patients.

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### **SUPPLEMENTAL CLINICAL TRAINING**

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#### **Psychology Trainee, The Optimum Performance Program in Sports**

Summer 2017

University of Nevada, Las Vegas

Supervisor: Brad Donohue, Ph.D.

- In a research setting, co-facilitated team workshops for UNLV student-athletes on various topics, including motivation, thought management, goal-setting, focus, communication, and team cohesion.

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### **CLINICAL SUPERVISION TRAINING & EXPERIENCE**

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#### **Supervisor-in-Training**

Summer 2020

Department Community Mental Health Clinic, UNLV

Supervisor: Michelle Paul, Ph.D.

- Supervised a junior clinical psychology doctoral student while enrolled in a supervision course.
- Monitored caseload of junior clinician, documented weekly supervision sessions, and reviewed supervisee's videotaped sessions and documentation.
- Received weekly individual and group supervision of supervision from a licensed clinical psychologist, including digital video review, and weekly case rounds.
- Implemented emerging philosophy of supervision that integrates competency-, and psychotherapy-based frameworks, as well as developmental and discrimination models.

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### **RESEARCH EXPERIENCE**

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#### **Family Research & Services**

June 2015-November 2021

University of Nevada, Las Vegas, NV

Advisor: Brad Donohue, PhD.

*Evaluating the SCL-90-R for use in collegiate athletes* (Doctoral Dissertation).

- Conducted confirmatory factor analysis on the measure of broad psychiatric distress in collegiate athletes. Examined mental health differences between NCAA, Club, and Intramural athletes.

*Empirical justification for supportive other involvement in collegiate athletes' mental health intervention* (Master's Thesis).

- Examined influence of significant others on mental health and sport performance of collegiate athletes attending family-based psychological intervention.
- Manuscript submitted for publication.

***Evaluation of Family Behavior Therapy in collegiate athletes*** (NIDA grant, 1R01DA031828).

- As Recruitment & Data Coordinator, responsible for recruitment & engagement of study participants, tracking participants through the study, presenting bi-weekly status reports in staff meetings, overseeing data collection, entry, and storage, and ensuring compliance with legal and ethical standards for data management.
- Responsibilities included clinic maintenance, training of research personnel, data analysis, toxicology screens, creation of standardized protocols, quality assurance of assessment & intervention records, and dissemination efforts through publications & conference presentations.
- Developed and presented evidence-based team workshops for student-athletes on various topics, including motivation, thought management, goal-setting, focus, and cohesion.
- Created and managed the clinic website.

***Controlled evaluation of brief motivational interventions.***

- As Project Coordinator, assisted in development and implementation of a randomized controlled trial examining the efficacy of two motivational interventions in college students.
- Developed study assessments using the Qualtrics survey software, maintained participant records, and scheduling.

***Recruitment methods to assist enrollment into treatment outcome research*** (Alcohol Beverage Medical Research-funded; recruitment into R01 grant, 1R01DA031828).

- Responsibilities included consenting participants, maintaining data collection, entry, & analysis, as well as dissemination of study findings.
- Designed promotional & recruitment materials to increase engagement.

***Development of cost-effective performance programs for Cirque du Soleil & National Circus School*** (Cirque du Soleil and National Circus School funded).

- Project focused on evaluation of mental, social, and physical health factors in circus performers and development and pilot evaluation of a program tailored for this population.
- Responsibilities included data entry and dissemination of study findings at professional conferences and through publications in refereed journals.

## **GRANT INVOLVEMENT**

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**Riley Exercise and Activity program for Determined Youth: READY Program** \$1800  
Riley Pediatric Gastrointestinal Internal Grant. Lead: Elaine Gilbert, Psy.D., HSPP  
*Role: Psychology Resident*

**Family Behavior Therapy for Youth Athletes** (National Institute on Drug Abuse, NIDA PA-18-055)

Controlled evaluation of an optimization approach to prevention and intervention of substance use disorders in ethnically/racially diverse youth in low income neighborhoods who participate in community-based sport organizations (i.e., YMCAs or Police Athletic League)

*Role: Assisted with preparation & submission of grant proposal (2019)*

**Family Behavior Therapy for Collegiate Athletes** \$1,998,000

NIDA 1R01DA031828 (2012-2017). PI: Brad Donohue, Ph.D.

*Role: Recruitment & Data Coordinator*

**Mental Health Programming for Cirque du Soleil & National Circus School** \$30,000

Funding agencies: Cirque du Soleil and National Circus School (2015-2016). PI: Brad Donohue, Ph.D.

*Role: Research Assistant*

**Effect of Recruitment Strategies on Enrollment into Treatment Outcome Research** \$10,000

Funding Agency: Alcohol Beverage Medical Research Foundation (2014-2015). PI: Brad Donohue, Ph.D.

*Role: Recruitment Coordinator*

## **PEER-REVIEWED PUBLICATIONS**

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### *Peer-Reviewed Journal Publications*

**Gavrilova, E.**, Donohue, B., Kalita, J., Paul, M., Pharr, J., & Allen, D. (In press). Empirical justification for significant other involvement when conducting mental health intervention with collegiate athletes. *Sport Social Work Journal*.

Donohue, B., **Gavrilova, E.**, Danlag, A., Perry, J., Kuhn, C., Allen, D., & Benning, S. A. (2021). Comprehensive examination of collegiate athletes' utilization of goal oriented psychological assessment and intervention services. *Psychology in the Schools*, 58(3), 458-474. <https://doi.org/10.1002/pits.22458>

Donohue, B., **Gavrilova, E.**, Strong, M. A. (2020). Sport-specific optimization approach to mental wellness for youth in low-income neighborhoods. *European Physical Education Review*, 1-17. <https://doi:10.1177/1356336X20905324>

Donohue, B., Gavrilova, Y., Galante, M., **Gavrilova, E.**, Loughran, T., Scott, J, ... & Allen, D. (2018). Controlled evaluation of an optimization approach to mental health and sport performance. *Journal of Clinical Sport Psychology*, 12(2), 234-267. <https://doi.org/10.1123/jcsp.2017-0054>

Gavrilova, Y., Donohue, B., Galante, M., & **Gavrilova, E.** (2018). A controlled examination of motivational strategies: Is it better to motivate by reviewing positive consequences for goal achievement or negative consequences of not accomplishing goals? *Motivation Science*, 5(3), 235. <https://doi.org/10.1037/mot0000118>

Donohue, B., Gavrilova, Y., Galante, M., Burnstein, B., Aubertin, P., **Gavrilova, E.**, ... Benning, S. D. (2018). Empirical development of a screening method for mental, social, and physical wellness in amateur and professional circus artists. *Psychology of Aesthetics, Creativity, and The Arts*. <https://doi.org/10.1037/aca0000199>

### *Manuscripts in Preparation*

**Gavrilova, E.**, & Donohue, B. (in preparation). Evaluating the SCL-90-R for use in collegiate athletes.

## **PRESENTATIONS**

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### *Conference Presentations*

- Gavrilova, E., & Light, A.** (2019, November). A screening method for mental, social, and physical wellness in amateur and professional circus artists. In B. Donohue (Chair), *Outcome data and implications of a novel, optimization focused cognitive-behavioral intervention focused on de-stigmatizing mental health*. Symposium conducted at the annual convention for the Association of Behavioral and Cognitive Therapies, Atlanta, GA.
- Gavrilova, E., Kalita, J., & Donohue, B.** (2019, April). Influence of significant others in sport and mental health optimization programming. Poster presented at the annual convention of the Western Psychological Association, Pasadena, CA.
- Donohue, B., **Gavrilova, E., & Kowal, I.** (2019, January). A reliable and valid method of assessing, conceptualizing, and addressing problems that interfere with sport performance. Workshop conducted at the annual conference of the Center for Performance Psychology, National University's Sanford Education Center, Carlsbad, CA.
- Gavrilova, Y., Stucki, K., Galante, M., **Gavrilova, E., Danlag, A., Bricker, M., & Donohue, B.** (2018, April). A controlled examination of motivational strategies: Reviewing positive consequences for goal accomplishment, negative consequences for undesired behavior, and a relaxation exercise. Poster presented at the annual convention of the Western Psychological Association, Portland, OR.
- Galante, M., Gavrilova, Y., **Gavrilova, E., Danlag, A., Stucki, K., Bricker, M., & Donohue, B.** (2017, November). The effects of a culturally adapted intervention for student-athletes on engagement in mental health services, treatment adherence, and client satisfaction with services. Poster presented at the annual convention for Association of Behavioral and Cognitive Therapies, San Diego, CA.
- Gavrilova, Y., Galante, M., Phillips, C., **Gavrilova, E., & Donohue, B.** (2017, January). The Semi-Structured Interviews for Sport and Ethnic Culture in mental health and sport performance programming: A rapid method of enhancing athletes' engagement. Workshop conducted at the annual conference of the Center for Performance Psychology, National University's Sanford Education Center, Carlsbad, CA.
- Plant, C. P., Gavrilova, Y., Pitts, M., Galante, M., Andrewjeski, K., **Gavrilova, E., & Donohue, B.** (2016, October). *Controlled evaluation of a method of recruiting participants into treatment outcome research*. Poster presented at the 50th Annual Meeting of the Association of Behavioral and Cognitive Therapies, New York, NY.

### ***Other Presentations***

- Strong, M., Johnson, K., Hill, J., **Gavrilova, E., & Donohue, B.** (2020, February). The importance of various cultural domains in athletes. Poster presented at the annual UNLV Graduate & Professional Student Research Forum. Las Vegas, NV.
- Donohue, B., **Gavrilova, E., & Aladjova, M.** (2018, November). Establishing and committing to team guidelines. Workshop conducted with the Volleyball Team of Basic Academy of International Studies.
- Gavrilova, Y., & **Gavrilova, E.** (2016, November). Pre-performance and post-performance mindset training. Workshop conducted with the Tennis Team at UNLV.

Gavrilova, Y., & Gavrilova, E. (2016, November). Motivational statements: Learning how to optimally motivate yourself and teammates. Workshop conducted for the Tennis Team at UNLV.

Gavrilova, E., & Reeves, J. (2016, October). Positive request: Learning to optimally settle disagreements and request things so people are more motivated to do what you want. Workshop conducted at Women's Development Center, Las Vegas, NV.

Gavrilova, E., & Andrewjeski, K. (2016, September). Reciprocity awareness: Intervention aimed at enhancing interpersonal relationships. Workshop conducted at Women's Development Center, Las Vegas, NV.

Gavrilova, E., Corral, A., & Stevenson, E. (2016, August). HEARD (Hear, Empathize, Ask, Review, Decide): Interpersonal communication skills training to resolve conflict. Workshop conducted at Women's Development Center, Las Vegas, NV.

### ***Invited Radio Interviews Relevant to Professional Expertise***

Easter, M. (Producer). (2018, November 10). *Nevada Health with Michael Easter: Assessing the mental health of student athletes*. Las Vegas, NV.

### **EDITORIAL EXPERIENCE**

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#### **Editorial Assistant**

Journal of Child & Adolescent Substance Abuse

June 2019-June 2020

Editor: Ron Acierno, Ph.D.

### **TEACHING EXPERIENCE**

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#### **Instructor**

University of Nevada, Las Vegas, NV

Aug. 2019-May 2020

Supervisor: Wayne Weiten, Ph.D.

- Taught 2 sections of live- and virtual-classroom Psychology 101 courses each semester. Concurrently enrolled in Teaching of Psychology with a supervisory component for the initial semester of teaching.
- Developed syllabi, planned courses, prepared and presented lectures, facilitated class discussions, developed online content pages, utilized MindTap learning platform, and created and graded exams.
- Adapted lectures, exams, and discussion for virtual instruction in response to COVID-19.

#### **Guest Lecturer**

University of Nevada, Las Vegas, NV

Fall 2018

Supervisor: Brad Donohue, Ph.D.

- Presented a lecture on Oppositional Defiant Disorder & Conduct Disorder to undergraduates enrolled in Child Behavior Disorders course.

#### **Teaching Assistant**

University of Nevada, Las Vegas  
Las Vegas, NV

Summer 2017, 2018

Instructor: Brad Donohue, Ph.D.

- Assisted class materials, monitored students' progress, managed online platform of the course, and assisted in grading exams in two sections of Child Behavior Disorders course.

### **PROFESSIONAL SERVICE ACTIVITIES**

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#### **Diversity, Equity, & Inclusion Intern Representative**

January 2022-July 2022

Indiana University School of Medicine

- Attending monthly committee meetings. Facilitating communication between internship cohort class and committee members.

**Diversity, Inclusion, & Equity Committee Member**

May 2020-May 2021

Nevada Psychological Association

- Attending monthly/bi-monthly committee meetings. Assisted in coordination of events and planning, voiced feedback to licensed psychologists committee members.

**Cohort Representative, Clinical Psychology Doctoral Students Committee**

May 2020-May 2021

Psychology Department, UNLV

- Providing advocacy and support of clinical psychology doctoral students.
- Organizing and attending monthly committee meetings, acting as liaison between faculty and students, organizing social justice events, coordinating pre-interview events and housing for program applicants.

**Graduate Student Mentor, Research & Mentorship Program**

Aug. 2018-May 2019

Graduate College, UNLV

Supervisor: Brad Donohue, Ph.D.

- Collaborated weekly with an undergraduate student to increase their knowledge and research skills critical for graduate education and professional development.

**President, Registered Student Organization**

Aug. 2018-May 2019

Family Research & Services (FRS), UNLV

Supervisor: Brad Donohue, Ph.D.

- FRS is a non-profit applied research laboratory that hosts several cutting-edge research projects that are supported by NIH and other federal agencies. FRS won Outstanding New Student Organization of the Year in 2014 and Outstanding New Program in 2013.
- Provided day-to-day oversight of ongoing projects & outreach efforts.

**RELEVANT TRAINING RECEIVED**

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**Foundations of Motivational Interviewing (MI)**

Summer 2020, 5 hours

Michael Goldstein, Ph.D., VA Southern Nevada Healthcare System, Las Vegas, NV

- Introduction to MI, including the main principles and strategies for implementing them with Veterans.

**Telepsychology Best Practice 101**

Spring 2020, 8 hours

Marlene M. Maheu, Ph.D., American Psychological Association

- Training series provided an introduction to telepsychology, including competencies for telepractice, critical ethical, legal, clinical, and technical issues, and reimbursement strategies.

**Psychological First Aid (PFA) Course**

Spring 2020, 6 hours

George Everly, Jr., Ph.D., John Hopkins University

- Specialized online training course on providing PFA to people in an emergency, using the RAPID model: Reflective listening, Assessment of needs, Prioritization, Intervention, and Disposition. PFA is applicable to a wide array of traumatic situations, including mass disasters, pandemics, and violence, and is effective in promoting personal and community resilience.

**Telehealth for Mental Health Professionals**

Spring 2020, 12 hours

Joni Gilbertson, MA, NCC, LCPC, BC-TMH, Professional Education Systems Institute

- Comprehensive 2-day distance therapy online training covering the legal, ethical, business, and in-session issues of telemental health.

**Lesbian, Gay, Bisexual, and Transgender (LGBT) Health Care Issues** Fall 2019, 4 hours  
VA Southern Nevada Healthcare System, Las Vegas, NV

- Provided by the Human Rights Campaign, CME-accredited virtual training on LGBTQ health care issues, including cultural competency and working with trans youth and adults.

**Military Culture Training for Health Care Professionals** Fall 2019, 8 hours  
VA Southern Nevada Healthcare System, Las Vegas, NV

- Online training modules included self-awareness and military ethos, organization and roles, stressors and resources, and treatment resources, prevention & treatment.

**Alpha Stim Training for Health Care Professionals** Fall 2019, 3 hours  
VA Southern Nevada Healthcare System, Las Vegas, NV

- Received certificate of proficiency in conducting medical education for Microcurrent Electrical Therapy (MET) and Cranial Electrotherapy Stimulation (CES).

**Comprehensive Training in Dialectical Behavioral Therapy (DBT)** Fall 2019, 42 hours  
Alan and Armida Fruzzetti, Ph.D., University of Nevada, Las Vegas

- Comprehensive 6-day training focused on DBT, an evidence-based treatment for complex, difficult to treat mental disorders. DBT combines standard cognitive-behavioral techniques for emotion regulation and reality-testing with concepts of distress tolerance, acceptance, and mindful awareness largely derived from Buddhist meditative practice. Workshop introduced DBT theory, structure, targets, treatment strategies, skills, skill training, and skill coaching.

**Interprofessional Education Day** Spring 2019, Spring 2020, 12 hours  
University of Nevada, Las Vegas Supervisor: Michelle Paul, Ph.D.

- Annual integrated care workshops with medical, nursing, psychology, physical therapy and social work students aimed at increasing awareness of interprofessional education, roles, responsibilities, & understanding of interprofessional team functioning to better serve patients.

**Family Behavior Therapy (FBT) for Adults** Summer 2019, 25 hours  
Bradley Donohue, Ph.D., University of Nevada, Las Vegas

- Comprehensive 3-day training focused on FBT for Adults, evidence-supported behavioral treatment for substance use and mental health disorders, developed with support of NIDA and NIMH.

**Introduction to Acceptance and Commitment Therapy (ACT)** Fall 2018, 16 hours  
Steven C. Hayes, Ph.D., University of Nevada, Las Vegas

- Two-day workshop on experiential understanding of six basic processes of ACT's Psychological Flexibility Model, their relationship with Relational Frame Theory (RFT), case conceptualization and treatment planning, and practical skills for fostering client willingness and openness to change.

**Regression Workshop** Spring 2017, 18 hours  
Andrew Freeman, Ph.D., University of Nevada, Las Vegas

- Comprehensive 6-day workshop on regression and use of R statistical programming for data analysis.

**Developing Healthy Academic Writing Habit: Writing with POWER** Spring 2016, 8 hours



Patricia Goodson, Ph.D., University of Nevada, Las Vegas

- All-day live workshop. Promoting Outstanding Writing for Excellence in Research (POWER) provides motivational and instrumental support for academic writing of graduate students and faculty.

## **PROFESSIONAL AFFILIATION**

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- American Group Psychotherapy Association (AGPA) 2020-2021
- American Psychological Association (APA) 2020-Present
  - Division 47 (Sport & Performance Psychology) 2016-Present
- Association for Contextual Behavioral Science (ACBS) 2018-2021
- Center for Performance Psychology 2017-Present
- Association for Applied Sport Psychology (AASP) 2017-2020
- Nevada Psychological Association (NPA) 2017-Present
- Association for Psychological Science (APS) 2017-2020
- Western Psychological Association (WPA) 2017-2019
- Association for Behavioral and Cognitive Therapies (ABCT) 2016-2020

## **INTERCOLLEGIATE ATHLETICS**

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### **Division I Women's Swimming Team**

Spring 2012-Spring 2016

Team Captain

Fall 2014-Spring 2015

University of Nevada, Las Vegas

- Received full athletic scholarship (2012-2016).
- Devoted 20 hours per week to athletics while carrying full course load.
- Gained valuable leadership and team-building experience.

## **LANGUAGES**

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- English
- Russian

## **REFERENCES**

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Available upon request.