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PSYCHOMETRIC PROPERTIES OF THE COLLEGE ATHLETE PSYCHOLOGICAL
SCREENING TOOL: VALIDATION OF THE DEPRESSION AND ANXIETY
SUBSCALES

A Dissertation Proposal
Presented to
The Faculty in the Department of Psychology
Western Kentucky University
Bowling Green, KY

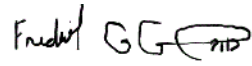
In Partial Fulfillment
Of the Requirements for the Degree of
Doctor of Psychology

By
Joseph Charles Case

August 2020

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SCREENING TOOL: VALIDATION OF THE DEPRESSION AND ANXIETY
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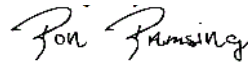
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8/26/20

Associate Provost for Research and Graduate Education

I dedicate this dissertation to all of the former professors, teachers, family, and friends who have helped me reach this milestone. I would like to individually thank my mother, Rachel Case-Williamson for instilling a sense of work-ethic and teaching me to value higher education. To my wife, Hilary Case for your encouragement and support to finish my doctoral degree. And finally, to my children, Braxton and Eleanor Case. You will always be the “why” behind my goals.

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Directed by Frederick Grieve, Daniel Wann, Ron Ramsing, and Paula Upright

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The aim of the present study was to gain a better understanding of the descriptive psychometric properties of the College Athlete Psychological Screening (CAPS) measure. The CAPS is a newly developed assessment screening measure designed to assess 14 common problem areas for college athletes. For the present investigation, 395 participants completed the 108-item CAPS measure. To establish criterion validity, participants also completed the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI). The present study had three research questions. Question one discussed the descriptive psychodynamic properties (Cronbach's alpha, means, and standard deviations) of the 14 CAPS subscales. Question two addressed concurrent validity of the CAPS Depression subscale compared to the Beck Depression Inventory. Question three addressed the concurrent validity of the CAPS Anxiety subscale. Additionally, a Multitrait Multimethod Matrix (MTMM) was utilized to assess the concurrent and divergent validity between the CAPS Depression, CAPS Anxiety, BDI, and BAI. In a post-hoc analyses, items from the CAPS Depression and CAPS Anxiety subscales were combined into a single measure. The new measure had good internal consistency and great concurrent and divergent validity with the BDI and BAI suggesting the CAPS Depression and Anxiety subscales combined are a more valid and reliable measure of depressive symptomology compared to the BDI than either scale alone. The

results of the present study provide a framework for future investigation with the CAPS measure.

Chapter One: Introduction

College sports continue to grow in popularity in the United States. In 2011-2012, college sports generated \$874.6 million dollars in revenue (NCAA, n.d.). College sports have become a lucrative venture for athletes and those associated with college athletics (e.g., coaches and staff). This trend has fundamentally altered youth sports in America. An estimated 8 million high school students participate in organized sports; many with aspirations to play college sports. Of those 8 million athletes, approximately 500,000 student-athletes earn academic scholarship in exchange for participation in competitive sports at National Collegiate Athletic Association (NCAA) member schools; even more participate in other forms of college sports (i.e., intermural, club, and recreational teams); (NCAA, 2017). Many aspects of the student-athlete experience have been studied in academia (e.g., paying student-athletes, classroom preparedness, and graduation rates). Clinically, research has focused on prevention and rehabilitation of medical issues (e.g., physical injury, concussions, chronic traumatic encephalopathy). However, there are other factors that could impact both performance and the overall wellness of student athletes.

Research indicated athletes are susceptible to illness despite an abundance of protective factors (Bar & Markser, 2013). However, there is a paucity of research related to the psychological assessment and treatment of student-athletes. In fact, only 39% of NCAA College Athletic Trainers have a formal plan to assess and treat psychological issues (Kroshus, 2016). Furthermore, Carr and Davidson (n.d.) underscored the lack of clinical and sport psychologists related to the psychological needs of student athletes. The current study explores factors associated with the student-athlete experience,

potential stressors, and existing practices related to the assessment and treatment of psychological issues in student athletes. Then, informed from existing literature, the present study will introduce a comprehensive screening assessment for use with collegiate athletes. Finally, the present study will explore the psychometric properties of the new measure along with concurrent and predictive validity with existing assessment measures. However, before exploring the assessment of intercollegiate athletes, the introduction will discuss common stressors and mental health concerns of college students.

Stressors and Mental Health Concerns of College Students

The role of stress has been explored as a causal factor for psychological distress and associated disorders. For example, the Diathesis Stress Model purported that psychological disorders such as depression and schizophrenia are a product of genetic predisposition and the perception and experience of stressful life events (Caspi et al., 2003; Neuchterlein & Dawson, 1986). Individual differences exist for possible genetic causal factors for students. Yet, most students experience physiological and psychological symptoms of stress usually self-attributed to their experiences in college. Pierceall & Keim (2007) reported that 75% of undergraduate students endorsed “moderate stress” while another 12% endorsed “high stress;” only 13% of students endorsed low levels of stress. Generally, college stressors have been classified in terms of academic stress and financial stress associated with being a student (Pederson & Jodin, 2016). Examples of academic stressors include grades, time management and assignments, familial and personal expectations for performance, pressure related to career development, and others (Pederson & Jodin, 2016). Examples of financial

stressors relate to managing personal finances, cost of tuition and fees, lack of money, carrying personal debt and others (Pederson & Jodin, 2016). In addition to classroom performance, college associated stressors also affect student's psychological wellbeing. A significant number of undergraduate students meet diagnostic criteria for various psychological disorders (Eisenberg et al., 2011).

According to the National Center of Educational Statistics (2017) in 2016 over 20.5 million students enrolled in college coursework. College students disproportionately experience psychological disorders compared to other demographic groups and even non-student same-age peers. Appropriately 32% of college students experienced a mental health problem (e.g., depression, anxiety) in the past year. To extrapolate the estimates regarding the number of college students, it would equate to a one-year incidence rate of over 6 million students. And, despite an abundance of mental health resources, many fail to seek treatment. Of the 32% of students affected by psychological distress, only 36% of those individuals received treatment (Eisenberg, et al., 2011).

The stress associated with being a college student should not be overlooked in athletes. As the literature suggested, college students experience a plethora of unique stressors. And these stressors have been linked to a variety of psychological disorders in college students. However, athletes also face additional sources of stress that are unique from those of a non-athlete student.

Stress Associated with the Student-Athlete Experience

The Student Athlete

Before discussing the stress associated with participation in athletes a distinction should be made to define student-athlete. There are several criteria that could distinguish

college students from college student athletes. Distinguishing characteristics and classifications of athletes include those who receive academic scholarship in exchange for sport participation, time commitment requirements, and level of competition. NCAA Division I (NCAA D-I) is the highest classification for student-athletes. NCAA D-I Universities offer the most academic scholarships, attract the best athletes, receive the most media attention, and provide the best opportunities for future professional sports opportunities (NCAA, 2017).

Stress and Stressors of Athletes

Regarding college stress, the present investigation assumes college-athletes face the same stressors as nonathletic students (e.g., adjusting to college, social issues, and academic pressure). Previous research has also indicated that athletes have unique support and protective factors. However, student athletes also experience unique challenges associated with their participation in sports-related activities. Additional stressors include stress from coaches and parents, pressure to perform, and potential of ending of their athletic career from either injury or eligibility (Rao & Hong, 2016). Additionally, most sports require a student-athlete to spend more than 40 hours per week engaged in team-related activities (e.g., meetings, practice, travel, games, physical therapy, and workouts). To facilitate these scheduling concerns, student-athletes are segregated from other non-athlete students (Comeaux & Harrison, 2011; Rao & Hong, 2016). Examples of this segregation include athletes being assigned similar majors, taking coursework online, and attending classes with other athletes. This, paired with the time constraints, isolates many student-athletes from non-athlete students (Comeaux & Harrison, 2011). Based on these factors Lu et al., (2011) identified eight common

categories of stress associated with college athletics. Those categories included sport injury, performance demand, coach relationship, training adaptation, interpersonal relationships, romantic relationships, family relationships, and academic requirements.

The first category of sport-stress is the potential for sports injury. There are multiple domains for stress associated with sports injury. First, student athletes face stress associated with the potential of injury related to their participation in sport. Each year over 12,500 student-athletes sustain a sports related injury (Hootman et al., 2007). According to the NCAA (2016) the prevalence of injury is 15.8 per every 1000 athletes for all college athletes. A sport-by-sport analysis revealed certain athletes (e.g., men's football players, women's cheerleading participants, and ice-hockey players) face increased risk of injury (NCAA, 2016). Secondly, post-injury and recovery can prove to be a stressful experience. Some athletes face catastrophic injury (e.g., paralysis, severe joint damage, concussions) which prematurely terminates their athletic career. However, even athletes who avoid catastrophic injury can still face stress associated with recovery from an injury (e.g., loss of strength, time away from their sport, potential of demotion, and the rehabilitation process); (Brewer, 2003; Mitchell et al., 2014).

Another domain of athletic stress is the demand to perform on the field. Performance stress can include both individual and team related stress. Individually, athletes may feel stress related to performance. Collectively, athletes feel pressure to win and avoid losses. Related to pressure to win and avoid losses is the relationship between coach and athlete. Tumultuous relationships between player and coach can prove stressful for athletes (Lu, et al., 2011). And, excessive exercise may lead to training adaptation or Overtraining Syndrome. Training Adaptation/Overtraining Syndrome can be

another stressor for athletes. Training adaptation is also known as burnout or Overtraining Syndrome. Training adaptation or Overtraining Syndrome is a neuroendocrine disorder which adversely affects athletes following excessive exercise and inadequate rest (MacKinnon, 2000).

The pressure to perform academically can be stressful for athletes. Many sports require 40-plus hours per week of sports-related activities. Parenthetically, this pressure can lead to interpersonal and familial problems for many athletes. The time related to training adaptation can limit the time athletes spend with family, friends, and may limit time for studies. Compounding the academic stress is that the NCAA requires various benchmarks for athletes to remain academically eligible to participate in their sport and to receive scholarship funding. Additionally, the NCAA requires member schools to maintain team-related academic benchmarks (e.g., graduation, grade point average). And, failure to maintain academic benchmarks could cost member-schools the ability to compete in NCAA-sanctioned events (NCAA, n.d.). This, in turn, has caused academic programs to put additional stress on student-athletes to perform in-the-classroom. This compounded with the stress associated with being a college student can prove to be an overwhelming experience for some student-athletes. Faced with multiple sources of stress many athletes struggle to manage stress ultimately affecting athletic performance.

Various researchers discussed the mutual relationship between sports performance and stress. According to Graham-Jones and Hardy (1990) stress can affect sport performance and sport-performance can affect an athlete's ability to modulate the perception of stress. Essentially, underperformance can have a negative effect on an athlete's ability to modulate stress. Additionally, the athlete's ability to modulate stress

has been identified as a causal factor of sport-underperformance. The athlete-stress model, proposed by Graham-Jones and Hardy, illustrated that athlete's response to stress follows a systemic pattern. Reilly and Williams (2003) defined a possible five-step system to describe the stress response in athletes. Stage 1, Environmental Demand, addresses both the physical and psychological aspects related to performance. Stage 2, Individual's Perception of the Environmental Demand, relates to an athlete's perceived threat (e.g., threat of injury, pressure to perform, prospect of failure) related to sport-performance. In Stage 3, Stress Response, athletes experience psychological arousal, physiological symptoms (e.g., muscle tension), and temporary (state) anxiety related to their sport-performance. Stage 4, Behavioral Consequence, measures the outcome of an athlete's performance (i.e., were they successful or unsuccessful). In other words, athletes will make a value judgment related to their sport-related behavior success (e.g., a winning performance) or failure (e.g., injury, underperforming). Then, in Stage 5, Homeostasis, athletes return to their baseline level of trait anxiety and stress. These five stages each represent vulnerable moments in which an athlete could become susceptible to the negative symptoms associated with stress. And, the negative outcomes of stress on the student-athlete are associated with a variety of psychological disorders. In some cases, athletes are more susceptible to distress compared to their non-athlete peers. And, ultimately, traditional forms of assessment fail to address these sensitive areas.

Overall, research has indicated that college-athletes face unique stressors compared to their same-age non-athlete peers (i.e., college students). And, research indicated an athlete's stress-response can have a negative impact on sport performance. However, the manifestation of stress on an athlete can also affect the athlete's

psychological wellbeing. Noren (2014) reported the unique stress associated with sport participation has the potential to induce psychological distress and/or exasperate preexisting psychological issues. The body of research adds validity to the concern over stress in athletes. Specifically, student athletes are not immune from depression and anxiety symptomology.

Depression in Athletes

The Diagnostic and Statistical Manual 5th Edition (DSM 5) of the American Psychiatric Association (2013) defines depressive disorders as the experience of low mood and or a loss of interest in daily activities for at least two weeks. Other depressive symptoms include sleep and appetite disturbances, feelings of worthlessness or excessive guilt, psychomotor retardation, thoughts of death or suicide, difficulty concentrating, and fatigue (APA, 2013). According to the American Psychiatric Association (2013), Major Depressive Disorder has a 12-month prevalence rate of 7% with incidence rates significantly higher for individuals in their early 20s. Research indicated college athletes are not immune from depressive symptomology (Wolanin et al., 2016). However, literature provided inconstant findings regarding the incidence and prevalence rates of depression in athletes.

Prevalence in Athletes

Wolanin et al. (2016) reported a prevalence rate of depressive symptoms at 23.7% among NCAA Division I athletes. Wolanin et al. (2016) also reported a gender difference in clinical levels of depressive symptomology (men = 17.5%, women = 28.1%). The Wolanin et al. (2016) study also analyzed athlete's depressive symptoms on a sport-by-sport basis. This analysis revealed that female track and field athletes

experienced the highest level of depressive symptoms (37.7%) followed by female softball players (30.4%), female soccer players (31%), and male track and field athletes (25%). Wolanin et al (2016) concluded that gender and specific sport participation may be risk-factors for the development of depressive symptoms.

On the other end of the continuum, research suggested that athletes have several protective factors compared to non-athlete peers (Armstrong et al., 2015). Armstrong et al. (2015) identified athletic protective factors such as social connectedness and increased self-esteem associated with sport participation. However, Armstrong et al. (2015) failed to account for discrepancies in prevalence of depression between sports; they only surveyed male baseball players. And, when extrapolated for a single-sport, the Armstrong et al. (2015) results correlated with the findings of Wolanin et al. (2016) in prevalence rates for male baseball players.

Depression and Vegetative Functioning

Many vegetative symptoms (e.g., sleep, appetite, fatigue) may affect the presentation of mood-related symptoms in athletes. For example, physical activity has been shown to be an effective treatment recommendation for clients with depressive symptoms (Stathopoulou et al., 2006). However, in athletes, physical activity may have a negative impact on mood related symptoms. For example, endurance athletes may subjectively endorse a decrease in both quantity and quality of sleep (Hauswirth, et al., 2014). According to Taylor et al. (2016) adolescent athletes experience increased incidence of sleep disorders. To self-medicate sleep disorder symptomology many athletes may abuse sleep medications. In one study, 18.2% of NCAA collegiate

competitive swimmers endorsed abuse of sleep medications (Rexroat, 2015). However, sleep may not be the only vegetative function affected by athletics.

Many athletes experience appetite disturbance associated with their participation in athletics. Various studies estimate between 40% and 60% of elite female athletes meet diagnostic criteria for eating disorders (Bar & Markser, 2013; Vardar, Vardar, & Kurt, 2007). Non-athletes can face ascetic pressure to maintain weight. In addition to these social pressures, athletes face pressure to maintain weight to perform in their sport. And, maladaptive eating behaviors have been linked to common depressive symptoms, including difficulty concentrating, social withdrawal and isolation, irritability, sadness, and negative cognitive self-appraisal (e.g., cognitions of hopelessness, helplessness); (Armstrong, et al., 2015). These symptoms could serve to exacerbate preexisting mood symptoms in athletes. Often, excessive training is a coping skill utilized to lose or maintain weight. However, excessive training can lead to fatigue and possibly Overtraining Syndrome.

Overtraining Syndrome (e.g., fatigue, training adaptation, and burnout) is a physiological disorder resulting from excessive and prolonged high-performance exercise. Overtraining Syndrome (OTS) has previously been identified as a potential stressor for athletes (Lu et al., 2011). Over time, an athlete's body may lose the ability to adapt and recover from the physical demands of excessive exercise. As stress, on a psychological level, limits an athlete's ability to cope with emotional issues OTS affects an athlete's ability to perform physically. While classified as a neuroendocrine disorder, OTS can have physical and emotional symptoms in athletes (MacKinnon, 2000). Armstrong and VanHeest (2002) reported symptoms of OTS and depression share a

similar presentation of symptomology and etiology. OTS is common in endurance athletes; lifetime estimates indicate that 60% of elite athletes could be negatively affected by OTS (Cardoos, 2015). In addition to vegetative functions, athletes also face stress from the increased incidence and prevalence of sport-related injury.

Injury

Athletes face an enhanced probability of physical injury compared to their peers. As reported earlier, each year over 12,500 college athletes sustain an injury related to their sport-performance (Hootman, et al, 2007). And, sport injury can have a negative effect on psychological functioning while mitigating sport protective factors. The American College of Sports Medicine (2006) reported nine common emotional responses to injury: sadness, isolation, irritation, lack of motivation, anger, frustration, appetite disturbance, sleep disturbance, and disengagement. Additionally, they reported other problematic emotional responses linked to injury including: depression, pain behaviors, excessive anger, crying, and substance abuse. Many of these symptoms correlate with depressive diagnostic standards established by the APA (APA, 2013).

Sport-injury can be conceptualized in several ways. One category is catastrophic injury including the risk for concussion and chronic traumatic encephalopathy (CTE). Kerr et al. (2014) reported that 38.8% of former NCAA Division I athletes reported a sports-related concussion. Several studies reported a positive correlation in depressive symptoms following a concussion. Vargas, Rabinowitz, Meyer, and Arnett (2015) compared pre-and post-concussive levels of depressive symptoms in NCAA D-1 athletes. In their study 84, college athletes were screened for depression prior to sport participation. Then, the athletes were assessed following a concussion. Vargas et al.

(2015) concluded that athletes whom had a history of depressive symptoms prior to a concussion were more likely to experience depressive symptoms following a concussion compared to non-depressed peers. Additionally, Vargas et al. (2015) concluded only 5% of non-depressed (at baseline) student-athletes experienced an increase in depressive symptoms following a concussion. These studies indicate the importance of pre-sport participation screening. And, the Vargas et al. (2015) study relied on an athletes' self-report of depressive symptoms prior to a concussion.

Student athlete stress can also lead to maladaptive coping strategies that could impact mood. Substance use is problematic behavior that may impact mood symptomology. Many studies have indicated elevated incidence of alcohol use among college athletes. Both male and female athletes endorse higher rates of substance abuse (binge drinking) than non-athlete same-gender peers (Brenner & Swanik, 2007). In another study of college-athletes ($n = 232$), 21% endorsed significant alcohol abuse behaviors. Also, depressive symptoms and psychotic symptoms had a positive correlation with alcohol abuse (Miller et al., 2002). Additionally, Putukian (2016) reported athletes may engage in substance abuse to self-medicate mood symptoms.

Overall, athletic stressors and the perception of stress potentially cause atypical presentation and risk-factors associated with depressive disorders in student athletes. Research has indicated athletes have elevated incidence of eating disordered behavior, increased risk of injury, increased maladaptive modalities of coping (e.g., substance abuse), and increased risk of neuroendocrine symptoms (e.g., Overtraining Syndrome). And, these stressors each affect the presentation and manifestation of depressive

symptoms in athletes. Additionally, athletic stressors can also impact the presentation of anxiety related symptoms in athletes.

0Anxiety in Athletes

Anxiety is often considered a comorbid condition with Depressive disorders (APA, 2013). The present investigation utilized The American Psychiatric Association's DSM 5 (2013) definition of anxiety. Anxiety is defined as is an emotional state (both present and future orientated) characterized by feelings of tension, worried thoughts, physical changes, recurring intrusive thoughts or concerns (APA, 2013). According to the National Institute of Mental Health (2017) Anxiety Disorders affect 18% (12-month incidence rate) of the general population. Many of the stressors listed in the previous section can impact an athlete's subjective experience of anxiety. In some instances these stressors may cause anxiety to present in an atypical manor in athletes. Specifically, athletes may experience an elevated risk of both clinical anxiety and performance anxiety.

However, a lack of information existed on anxiety disorders in college athletes. Several authors postulate anxiety disorders affect student athletes in similar rates as same age non-athlete peers. According to Kessler (2012) adolescents have an overall prevalence rate of over 32%; over 33% (lifetime) for adults. Furthermore, according to the Goldman (2014) 85% of athletic trainers endorsed anxiety as a common psychological issue among student-athletes.

Performance Anxiety

Athletes may also experience increased susceptibility to performance anxiety. Douglas (2004) reported a prevalence rate of 2% of performance anxiety in competitive

athletes. Patel, Omar, and Terry (2010) reported 11 common manifestations of anxiety in athletes. First, in Competitive State Anxiety, an athlete experiences anxiety isolated to a specific sport-performance (e.g., anxiety about an upcoming match). Next, Competitive Trait Anxiety, an athlete feels more generalized anxiety to their sport, not isolated to a specific activity. Somatic Anxiety is where an athlete feels anxious over somatic physical symptoms. The next form of performance anxiety is Cognitive Anxiety. Cognitive Anxiety is when athletes experience anxiety provoking cognitions related to sport performance outcomes and injury. The next subtype of performance anxiety is Behavioral Anxiety. Behavioral Anxiety addresses the physical manifestation (i.e., physical symptoms) of anxiety in athletes. According to the APA (2013) behavioral symptoms of anxiety can include headaches, muscle fatigue and tension, sleep disturbances, and feelings of restlessness. The next subtype of anxiety is known as Performance Anxiety. Performance Anxiety focuses on anxiety associated with a given sport task (e.g., hitting a baseball, winning a race, catching a football). Also, athletes may experience both productive (facilitative anxiety) and disabling (debilitative anxiety) levels of anxiety associated with their performance. Anxiety can also impact performance associated with an athletic event (e.g., pre-competition anxiety, competition anxiety, and post competition anxiety). These factors may contribute to performance anxiety resulting in underperformance in athletes (Douglas, 2004).

Additionally, other psychological concerns can have a different presentation in athletes. Specifically, athletes may simultaneously experience co-morbid disorders at a higher rate than non-athlete same-age peers. For example, 40% of female athletes screened met criteria for eating disorders. And, those who met criteria for eating

disorders also endorsed elevated levels of trait and state anxiety compared to other athletes (Vardar, Vardar, & Kurt, 2007).

College Athletes Access to Psychological Services

As research indicated athletes are at risk to develop psychological distress. However, the mental health of student-athletes is often ignored. According to Sudano and Miles (2017) 72% of Athletic Trainers (ATC's) report mental health concerns are addressed by the university counseling centers. Only 20% of NCAA Division I Athletic Departments have dedicated or in-house psychological services (Sudano & Miles, 2017). Many College Sports Medicine Departments fail to preemptively screen athletes for psychological disorders. In a recent study of NCAA Division I Universities, only 39% of NCAA team physicians and head trainers (n=365) reported having a written plan/protocol to screen and identify student athletes with mental health concerns. Fewer than half (43%) of NCAA D-1 Athletic Trainers (ATC's) report using any screening process for mental health concerns (Sudano & Miles, 2017). Of the minority who screen for mental health concerns, only 32.3% screen for depression, 30.7% for anxiety (Kroshus, 2016). Reasons are unclear; however, most trainers focus on physical health. Overall there is a lack of research and instrumentation designed to be utilized to screen a wide-range of psychological symptoms in athletes. The existing body of research suggested there is a lack of standardized screening tools for psychological and mental health concerns within college athletics (Sudano & Miles, 2017).

As discussed earlier student-athletes experience depressive and anxiety related symptoms. However, the presentation and manifestation for these symptoms can vary compared non-athlete peers. Additionally, questions exist if current measures for depressive symptoms should be used with athletes. Schuch (2015) reported current

measures of depression, used on athletes, may lack construct validity. One confounding condition, in the assessment of depressive disorders in athletes, is Overtraining Syndrome (OTS). And, the question becomes, does current assessment tools for depression account for OTS.

College Athlete Psychological Screening (CAPS)

Research has indicated that college athletes experience unique stressors. Additionally, psychological distress may manifest itself in unique ways in athletes. Some disorders have an increased prevalence and incidence of co-morbid conditions (e.g., substance abuse, eating disorders). Additionally, some conditions (e.g., Overtraining Syndrome) could be misdiagnosed as Depression utilizing current methods. Researchers have developed a specialized screening instrument designed to proactively screen athletes for psychological distress. The following section introduces the College Athlete Psychological Screening (CAPS).

CAPS Scales

The CAPS is designed to be a brief assessment of 14 common problem-areas for college athletes. The 14 constructs are: Depression, Anxiety, Stress, Substance Use, Posttraumatic Stress, Sleep Disorders, Eating Disorders, Muscle Dysmorphia, Perfectionism, Mania, Hostility, Attention Deficit Hyperactivity Disorder (ADHD), and Social Desirability (See Appendix B). These constructs were selected based on empirical research, prior assessment practices, and discussion with Athletic Trainers and Athletic Directors at a Midwestern Public University. Below is a brief description of each scale. However, the present investigation focuses on two scales: Depression and Anxiety.

The Depression Scale measures depressive mood-related symptoms. The Depression Scale was inspired by using recognized diagnostic criteria established by the

Diagnostic and Statistical Manual 5th Edition of the American Psychiatric Association (APA, 2013).

The Anxiety Scale measures negative emotional state as well as the self-appraisal of present and future orientated anxiety. The Anxiety Scale was developed by utilizing existing criteria from the DSM-5 and from empirical research. The scale assesses both physical symptoms and psychological symptoms of anxiety. Additionally, the Anxiety Scale assesses both longstanding patterns of (trait) anxiety and momentary (state) anxiety. This was important due to the presentation of state-anxiety related to athletic performance (e.g., pre-performance anxiety)(APA, 2013).

The Stress Scale measures subjective appraisal of stressors and related coping-behaviors to self-regulate stress. The literature suggested athletes experience unique stressors. Based on the research, the Stress Scale was informed by research on the unique stressors associated with participation in athletics. Additional items designed to assess stress associated with being a college-student were utilized (Lu et al., 2012).

The Substance Use Scale measures problematic substance use behaviors related to academic and sport-related performance. The Substance Use Scale was developed utilizing DSM-5 criteria for substance use disorders. Specifically, items were designed to assess an athlete's self-perception of substance use behaviors (i.e., does substance use affect athletic performance). Items assess both substance use behaviors, subjective appraisal related to substance use, and problematic and risk-taking behaviors (e.g., has the athlete participated in sport related activities while intoxicated, and has the athlete experienced a decline in performance and or missed athletic events due to the effects of substance use (APA, 2013).

The Sexual Issues Scale measures sexual issues (i.e., perceived guilt/shame related to sexual behaviors, dysfunctional behaviors, and perceived guilt/shame of self-identified sexual orientation) that could impact sport-performance. For example, does an athlete experience perceived rejection or perceived stigmatization and victimization related to their sexual practices? This scale was informed by discussions with Athletic Trainers and the current literature.

The Posttraumatic Stress Scale measures symptomology associated with PTSD (i.e., re-experiencing, emotional numbing, behavioral and emotional symptoms) and traumatic experiences. The PTS Scale was informed by utilizing current diagnostic criteria established by the DSM-5 (APA, 2013).

The Sleep Disorder Scale measures related sleep-disorders (i.e., sleep apnea, insomnia, etc.) associated with psychological and physical wellbeing. Research indicated increased incidence of sleep disorders in some subgroup of athletes (Taylor et al., 2016). Items for the Sleep Disorder Scale were informed from the DSM-5 description on sleep disorders (APA, 2013)

The Eating Disorder Scale measures problematic eating habits (i.e., caloric restriction, binge eating, and compensatory behaviors) in relation to sports-performance. As reported earlier, some competitive athletes may experience elevated incidence of eating disordered symptomology. The Eating Disorder Scale was developed from the DSM-5 and literature on Eating Disorders. The ED Scale is based on criteria for recognized common disorders including Anorexia, Bulimia, and Binge Eating Disorders (APA, 2013).

The Muscle Dysmorphia Scale measures body-image issues and compulsive exercise-behaviors associated with the desire to increase muscle mass. The MD Scale was developed by existing literature; recommendations from the Association of Applied Sport Psychology and information from the DSM-5 (APA, 2013; AASP, 2017).

The Perfectionism Scale measures cognitive and behavioral traits of perfectionism (e.g., unrealistic expectations for perfection in sport-performance, critical self-evaluations, emotional reactivity to criticism and perceived failure). The Perfectionism Scale was developed by utilizing research on the personality trait of perfectionism and accepted construct definition from the Big 5 model of personality (Caciopoo & Freberg, 2016).

The Hostility scale measures trait and state anger and aggressive-related behaviors. Research indicated athletes may have elevated levels of aggressive behaviors. Items for the Hostility scale were influenced by the literature and the DSM-5 (APA, 2013).

The Mania Scale measures elevated mood-related symptoms (e.g., decreased sleep, increased goal activity, increased impulsive behaviors) that could interfere with athletic performance. Diagnostic criteria from the DSM-5 were utilized in the creation of the Mania Scale. Of increased importance, the mania scale provides a sub-screening for differential diagnosis of mood disorders. Prior research questioned the validity of current measures for use on athletes. For example, Schuch (2015) reported mania as a distinguishing symptom in differentiating between Depression and Overtraining Syndrome; athletes with OTS will not endorse symptoms of mania. However, some

athletes with mood disorders may report history or current presentation of mania (APA, 2013).

Finally, the Social Desirability (SD) Scale measures an athletes' desire to represent themselves in a positive-light. SD assesses an individual's self-perception of pro-social traits (i.e., teamwork, helpfulness). It also assesses an individual's ability to understand relative deficits of pro-social personality traits. The SD scale also provides another measure of validity for athletes taking the assessment. In theory, if an athlete has an elevated score on the SD scale they could be minimizing or underreporting negative symptoms. The SD scale was designed utilizing current research on SD (Crowne & Marlowe, 1960; Stöber, 2001).

The present investigation accepted that it would be impractical to test construct validity for each of the 14 scales to other, existing measures. Instead, the present investigation selected the depression and anxiety scales to test for validation due to the widespread prevalence of these conditions among college student athletes. Future studies will explore the remaining 12 scales.

CAPS Depression Scale

Student athletes experience depressive related symptoms in similar, if not elevated, rates compared to non-athlete same-age peers. However, the presentation and manifestation for these symptoms can vary from non-athlete peers (as discussed earlier). Questions remain if current measures for depressive symptoms are appropriate for use with college athletes. Based on these factors, informed from research and current diagnostic standards the following traits were selected for use to measure depressive symptoms in athletes: cognitive symptoms (e.g., concentration deficits, feeling sad,

thoughts of self-harm) and physical complaints (e.g., appetite disturbances, decreased energy and fatigue).

CAPS Anxiety Scale

Student athletes have a similar lifetime prevalence of anxiety disorders compared to non-athlete peers. As mentioned above, the presentation and manifestation for these symptoms can vary from non-athlete peers (e.g., performance anxiety, clinical anxiety). Additionally, questions exist if current measures for anxiety symptoms should be used with athletes. Based on these factors and informed from research and current diagnostic standards the following traits were selected for use to measure anxiety symptoms in athletes: cognitive symptoms (e.g., excessive worry) and physical complaints (e.g., feeling fatigued, excessive muscle tension).

Research indicated athletes have unique presentation and manifestation of stress and psychological distress. Research also raised questions as to possible confounding variables in athletes compared to non-athlete same-age peers. Research also exposed deficit in current practices related to the assessment of psychological distress in athletes. If the present investigation can illustrate content validity and internal consistency, it could lead to the development of a comprehensive screening measure of psychological distress in athletes. First, the CAPS may be one of the only measures to assess multiple domains of psychological distress associated with the student athlete experience. In terms of flexibility, the CAPS was designed to be used as both a proactive (i.e., before sport performance) measure to establish baseline functioning and as a reactive (i.e., after a catastrophic injury) measure. Secondly, the CAPS, if proven reliable and valid, could provide a cost-effective measure for use with athletes. Existing single-trait assessments (e.g., the Beck Depression Inventory) can be a financial barrier for athletic departments.

And, as the research indicated, single-trait scales may be inappropriate for use with athletes. Third, the CAPS, if shown to have content validity and internal consistency, could provide a time-efficient measure of psychological distress.

Research Questions

Based on the paucity of information related to valid and reliable measures of psychological measures for athletes, the present investigation raises the following exploratory categories of questions: Internal Consistency of the CAPS Depression and Anxiety subscales and validity of the Depression and Anxiety subscales compared to established measures.

1. What is the Cronbach's alpha, means, and standard deviations of the 14 CAPS subscales, including the Depression and Anxiety subscales?
2. What is the concurrent validity of the CAPS Depression subscale compared to the Beck Depression Inventory?
3. What is the concurrent validity of the CAPS Anxiety subscale compared to the Beck Anxiety Inventory?

Overall, informed by the literature, the present investigation raised three research questions. The following section addresses how these questions were addressed in the present investigation.

Chapter 2: Methods

The present exploratory investigation sought to understand the descriptive psychometric properties of the CAPS assessment with a focus on the CAPS Depression and Anxiety Scales. The present investigation provided an understanding of the internal consistency of the CAPS and validated the CAPS Depression and Anxiety Scales.

Criterion validity was established by comparing raw scores on established measures of Depression and Anxiety, the Beck Depression Inventory and the Beck Anxiety Inventory.

The methods section will provide an overview of the design, participants, measures, procedures, and statistical analyses.

Participants

The current investigation recruited 425 male and female undergraduate college students between the ages of 18-23 at a midwestern regional public university. The CAPS was designed to be used as a screening measure for mental health concerns in college student athletes. However, a convenience sample of undergraduate students at a midwestern university was utilized in this study. This sample was chosen to expedite the current exploratory investigation as access to a statistically significant sample of NCAA D-1 athletes could represent a potential barrier. This sample was also obtained to later provide comparative data points between the scores of college athletes and non-athlete college students. While the sample from the present investigation partially aligned with the target demographic, the current sample of participants was not a fully representative of the target population (e.g., NCAA D1 college athletes). The study received approval from the WKU Institutional Review Board (see Appendix A). Following approval, participants were recruited from psychology courses at a midwestern university. For participation, students received “Study Board Credits” to be used to partially fulfil the

requirements of their psychology courses. 395 undergraduate students completed all of the required measures of the study and met inclusion criteria (e.g., age, enrollment status). The average age of participant was 19.01 years ($SD = 1.39$ years). Most of the participants (72%) identified as female.

Measurement

Demographic information, scores on the Depression and Anxiety CAPS and the Beck Depression Inventory-II and Beck Anxiety Inventory were collected on all participants over the age of 18. Parenthetically, participants under the age of 18 were restricted from participation in the present investigation. Demographic information included age, race, gender, current athlete status (e.g., active, inactive), sport, and grade-level (e.g., Freshmen, Sophomore). Next, a participants raw and percentile score, Cronbach's alpha, and standard deviation on the CAPS Depression and Anxiety scales were collected. Additionally, participants score (Cronbach's alpha, mean, standard deviation) on the BDI-II and BAI were obtained. The data was collected by utilizing an online survey hosted by Qualtrics. Data collection occurred for the duration of one-semester. For validation, the current investigation utilized the Beck Depression Inventory-II and the Beck Anxiety Inventory. Individual scales (e.g., Beck Depression Inventory-II, Beck Anxiety Inventory, CAPS) were presented in random-order to each participant. Randomization of scales was completed to minimize potential sources of error with participants.

College Athlete Psychological Screening

The College Athlete Psychological Screening (CAPS) was developed in 2016. The CAPS is a 108-item measure utilizing a 14-factor approach to screen college athletes

for common problem behaviors and symptoms. Factors include Depression (9 items), Anxiety (6 items), Hostility (7 items), Substance Abuse (10 items), Attention Deficit/Hyperactivity (10 items), Risk Taking (9 items), Posttraumatic Stress (9 items), Perfectionism (8 items), Sleep Problems (9 items), Stress (6 items), Muscle Dysmorphia (6 items), Eating Disorders (8 items), Sexual Issues (3 items), and Social Desirability (8 items). Each item on the CAPS is rated on a 5-point Likert scale (1-5). As the current study is an exploratory analysis, the psychometric properties of the CAPS are unknown in regards to reliability and validity.

Beck Depression Inventory-II

The Beck Depression Inventory -II (BDI-II), revised in 1996, is one of the most popular screening assessments used for clinical and research purposes (Beck et al., 1996). The BDI-II utilizes a two-factor approach to measuring depressive symptoms: mood and somatic symptoms (Vanheule et al., 2008). The affective/mood factor contains eight items while the somatic factor contains 13, for a total of 21 items. Each item, on the BDI-II, is rated on a 4-point Likert scale (0-3). The BDI produces raw number scores ranging from 0-63, with higher scores indicating depressive symptomology (Beck et al., 1996). In one study of undergraduate students ($n = 120$) the BDI had a mean score of 12.5 ($SD=9.93$); (Beck et al., 1996) In terms of reliability, the BDI has high internal consistency ($\alpha = .91$); (Beck et al., 1996). The BDI also proved to have high one-week test-retest reliability ($r = .93$). Beck reported this was important as to illustrate the scale was not sensitive to daily changes in mood (Beck, Steer, & Brown, 1996). To validate the measure, Beck compared the BDI-II to the Hamilton Depression Rating Scale. Beck discovered decent convergent validity ($r = .71$) with the Hamilton Depression Rating

Scale (Beck, Steer, & Brown, 1996). Given the strong psychometric properties and the popularity of the measure, the BDI-II was selected to validate the CAPS assessment.

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI), published in 1988, is a leading measure of symptoms associated with anxiety (Beck, et al., 1988). The BAI is a 21-item, self-report, measure of several factors of anxiety (e.g., physiological symptoms, affective, and somatic symptoms). Items on the BAI are presented in a four-point Likert scale (0-3). Item responses are summed and reported as raw scores ranging from 0-63. Beck clustered raw scores to add descriptive labels to include Low Anxiety (raw scores 0-21), Moderate Anxiety (raw scores 22-35), and Potentially Concerning Levels of Anxiety (raw scores 36-63). The BAI was proven to have sound psychometric properties. The BAI has outstanding reliability (Cronbach's $\alpha = .92$), and one-week test-retest reliability ($r = .75$). Of note, Beck reported the one-week test-retest reliability was significant as it accounted for daily fluctuations in anxiety symptoms. In terms of validation, the BAI had a moderate correlation with the Hamilton Anxiety Rating Scale ($r = .51$) and the Hamilton Depression Scale ($r = .25$). The correlation with the Hamilton Depression Scale was conducted as Beck wanted to isolate anxiety symptoms from depressive symptoms (Beck et al., 1988). Given the psychometric properties and the popularity of the scale, the BAI was selected to validate the CAPS Anxiety Scale.

Procedures

The present study was resubmitted to the Institutional Review Board (IRB) at the research institution (The IRB at the research institution had previously approved the CAPS assessment; approval was needed for the Beck Depression Inventory and the Beck

Anxiety Inventory). After approval was granted, an online survey containing the informed consent, demographic questions, CAPS, Beck Depression Inventory and Beck Anxiety Inventory was posted to the psychology department online study board. Participants were required to review the informed consent before receiving access to the questions. The informed consent contains the following information: A brief description of the study, confidentiality and privacy statement, detailed procedural instructions to complete the study, notification of potential sources of harm or distress, information for self-referral counseling services, permission to discontinue administration at any time, and contact information for the researcher. Once a participant reviews the informed consent, they will have a check-box to indicate they have had access to the informed consent. Additionally, the statement “continued participation implies consent” is stated on the informed consent. This step was added as a recommendation of the IRB Chairperson at the research institution. After completing the informed consent, participants received the CAPS, BDI, and BAI measures. After completion, participants were redirected to a closing page and given the option to sign-up to receive a physical copy of the final draft of the project. Once the participants complete the survey, their data was securely stored in a password protected online database. Additionally, a physical copy of all data will be stored in a secure research laboratory on campus

The present investigation should have posed a minimal risk for participants. However, it is impossible to identify all potential sources of discomfort or subjective distress. The informed consent document contained information for the Universities Counseling Center. This information contains contact information should a participant feel they could benefit from receiving psychological services. Additionally, the present

investigation followed the American Psychological Association (APA) Code of Ethics in regards to privacy and confidentiality of data. No individual result or data set was shared for publication; only group data was reported. Researchers reserved the right to breach participants' confidentiality in the event of reported or endorsed suicidal ideations, homicidal ideations, or child and elder maltreatment.

Data Analysis

The following variables were measured as part of the present investigation: Raw scores (sums of subscale items), Cronbach's alpha, means, and standard deviations of all 14 CAPS subscales including the CAPS Depression Scale score, CAPS Anxiety Scale score. Raw scores (sums of scale items), Cronbach's alpha, means, and standard deviations were also collected for the BDI-II, and BAI. Data analysis for the present study was completed by using JASP 0.9.2.0 for statistical analysis.

The first research question assessed the descriptive psychometrics for each CAPS subscale including the Depression subscale and Anxiety subscale of the CAPS. To address these questions researchers calculated Cronbach's alpha to assess inter-item reliability of each scale. Cronbach's alpha is a measure of the relationship of each item compared to the group of items as whole. The Cronbach's alpha score will be reported. The present investigation will employ a cut-off point at $\alpha = .70$. However, according to Nunnally (1978) in an exploratory investigation a value as low as $\alpha = .50$ may be adequate.

Research questions two and three sought to understanding the criterion validity between the CAPS Depression subscale and the Beck Depression Inventory (question two) and the CAPS Anxiety subscale and the Beck Anxiety Inventory (question three). The following data was collected: raw scores for the CAPS Depression and Anxiety,

Beck Depression Inventory-II, and the Beck Anxiety Inventory. The present investigation will then utilize a Pearson's Correlation to establish an estimate of the relationship between each raw score. Pearson Correlation scores can range from -1.0 to 1.0 to determine an effect, the present investigation will establish a cut-off of $r = .50$ to determine effect. After the preliminary investigation is completed, the present investigation utilized a Multitrait-Multidimensional Matrix (MTMM). The MTMM allowed a formal investigation into the convergent and divergent validity between the CAPS measure and the Beck Scales.

Overall, the present investigation will report the results of the Cronbach's alpha, means, standard deviations of the CAPS, BDI, and BAI. Pearson's correlation, and results of the MTMM analysis were provided for comparative analysis of convergent and divergent validity. These statistical tests allowed for an exploratory analysis into the internal consistency of the CAPS and criterion validity compared to established measures of Depression and Anxiety symptomology.

Chapter Three: Results

Preliminary Analysis

The Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) were used to establish criterion validity with College Athlete Psychological Screening (CAPS) Depression and Anxiety subscale. The BDI and BAI were shown to have strong internal consistency (See Table 1).

Table 1

Internal Consistencies, Means, and Standard Deviation Statistics for the BDI and BAI

Measure	Cronbach's α	<i>M</i>	<i>SD</i>
Beck Depression Inventory (21 items)	.93	13.46	11.43
Beck Anxiety Inventory (21 items)	.92	18.11	14.16

Research Question One:

Question One sought to understand the underlying descriptive psychometric properties (Cronbach's α , means, and standard deviations) of the 14 CAPS subscales. Results of the present investigation suggest the CAPS subscales have moderate to fair internal consistency reliability (See Table 2). For the individual subscales, the Hostility scale had the highest Cronbach's alpha ($\alpha = .85$, $\mu = 19.04$, $SD = 6.69$). The Social Desirability scale had the lowest Cronbach's alpha ($\alpha = .55$, $\mu = 25.97$, $SD = 3.23$).

Research Question Two

Research Question Two sought to explore the concurrent validity between the CAPS Depression subscale and the Beck Depression Inventory. Research question two was answered by completing a Multitrait Multimethod Matrix (MTMM) to assess the concurrent and divergent validity between the two measures. The results of the MTMM

Table 2: Internal Consistencies, Means, and Standard Deviation Statistics for the College Athlete Psychological Screening (CAPS)

Subscale	Cronbach's α	<i>M</i>	<i>SD</i>
Hostility (7 items)	.85	19.04	6.69
Substance Abuse (10 items)	.81	16.08	5.94
Depression (9 items)	.81	21.08	6.41
Attention Deficit/Hyperactivity (10 items)	.80	31.12	7.50
Risk Taking (9 items)	.78	30.85	6.33
Posttraumatic Stress (9 items)	.77	28.77	6.28
Anxiety (6 items)	.76	14.96	3.89
Perfectionism (8 items)	.73	24.96	5.43
Sleep Problems (9 items)	.73	25.21	5.22
Stress (6 items)	.70	15.21	4.60
Muscle Dysmorphia (6 items)	.70	12.23	4.06
Eating Disorders (8 items)	.58	18.63	4.55
Sexual Issues (3 items)	.58	5.44	2.31
Social Desirability (8 items)	.55	25.97	3.23

are displayed in Table 3. The CAPS Depression Subscale was found to have fair concurrent validity with the Beck Depression Inventory ($r = .77$).

Research Question Three

Research Question Three explored the concurrent validity between the CAPS Anxiety Subscale and the Beck Anxiety Inventory. Similar to research question two, a MTMM was utilized to assess the concurrent and divergent validity between the CAPS Anxiety Subscale and the Beck Anxiety Inventory. The results of the MTMM are

Table 3: Multitrait Multimethod Matrix (MTMM) Comparing the CAPS Depression and Anxiety Subscales to the Beck Depression and Beck Anxiety Inventories:

MTMM Table	Beck Depression Inventory (BDI)	CAPS Depression (CAPS-D)	Beck Anxiety Inventory (BAI)	CAPS Anxiety (CAPS-A)
BDI	.92			
CAPS-D	.77	.82		
BAI	.70	.57	.91	
CAPS-A	.59	.85	.51	.77

Key: Green (reliability), Yellow (Convergent Validity), Red and Black (Divergent Validity)

displayed in Table 3. The CAPS Anxiety was found to have fair concurrent validity with the Beck Anxiety Inventory ($r = .51$).

Additional Findings

The results of the present study also provided additional insights into the CAPS screening measure. The MTMM also provided additional validity metrics for the CAPS. First, the MTMM also provided discriminant validity estimates comparing the uniqueness of the CAPS Depression and Anxiety Subscales. The CAPS Anxiety Subscale was found to have fair discriminant validity from the Beck Depression Inventory ($r = .59$). The CAPS Depression Subscale illustrated fair discriminate validity with the Beck Anxiety

Inventory ($r = .57$). Additionally, the MTMM provided discriminant validity comparing the CAPS Depression and Anxiety Subscale. The CAPS Depression and CAPS Anxiety Subscales had low discriminant validity ($r = .85$). Also, the MTMM provided additional comparisons between the Beck Depression Inventory and the CAPS Anxiety Subscale ($r = .59$), and the Beck Anxiety Inventory and the CAPS Depression Subscale ($r = .57$).

Post Hoc Analyses

Given the results of the MTMM, additional analyses were completed to better understand the relationship between the CAPS Depression and Anxiety Subscales. The MTMM analyses revealed a strong relationship between the two subscales. Given the nature of each of the constructs, it would be expected for the two scales to share some of the same traits. However, the MTMM revealed that the CAPS Anxiety Subscale has a stronger relationship with the Beck Depression Inventory ($r = .59$) than the Beck Anxiety Inventory ($r = .51$).

The items for the CAPS Depression subscale and CAPS Anxiety subscale were examined to better understand the relationship among the items. Given the similarity of items, an additional analysis was completed in which the items for the CAPS Depression Subscale and the CAPS Anxiety subscale were merged into one scale. The new CAPS Depression Scale contained 14 items (nine from the CAPS Depression subscale and five from the CAPS Anxiety subscale). The new CAPS Depression/Anxiety subscale was found to have stronger internal consistency ($\alpha = .89$, $\mu = 36.04$, $SD = 9.65$) than either of the other scales individually.

A secondary analysis was completed to examine the convergent and divergent validity with the BDI and BAI instruments. The new CAPS Depression/Anxiety subscale

was found to have good convergent validity with the BDI ($r = .88$), and divergent validity ($r = .67$) with the BAI (See Table 4).

Table 4: *Convergent and Divergent Validity of the CAPS Depression/Anxiety Scale and the BAI and BDI*

	BDI	CAPS-D/A	BAI
Beck Depression Inventory (BDI)	.93	---	---
CAPS Depression/Anxiety (CAPS-D/A)	.88	.89	---
Beck Anxiety Inventory (BAI)	.70	.67	.92

Chapter Four: Discussion

The purpose of this study was to gain a better understanding of the psychometric properties of the CAPS measure specifically focusing on the Depression and Anxiety subscales. The findings of this study provided Cronbach's Alpha, means, and standard deviations for each of the 14 clinical scales of the CAPS. The findings of the current study also explored the validity of the Depression and Anxiety subscales of the CAPS by comparing these scales to the Beck Depression Inventory and the Beck Anxiety Inventory.

The results for this study were addressed through three questions regarding the CAPS measure. Hypothesis One sought to understand the underlying descriptive psychometric properties of the CAPS. The present analyses of the 14 subscales found Cronbach's alpha scores ranging from $\alpha = .85$ to $\alpha = .55$. The results of the present investigation indicated the CAPS Depression subscale had good internal consistency ($\alpha = .81$) while the CAPS Anxiety subscale had moderate internal consistency ($\alpha = .77$). Research Question Two was designed to assess the concurrent validity between the CAPS Depression subscale and the Beck Depression Inventory (BDI). Results of the investigation found that the CAPS Depression inventory had fair concurrent validity with the BDI ($r = .77$). Research Question Three was designed to assess the concurrent validity between the CAPS Anxiety Subscale and the Beck Anxiety Inventory (BAI). Results from the investigation found that the CAPS Anxiety subscale had limited concurrent validity with the BAI ($r = .51$). Additional analyses found that the CAPS Anxiety scale had poor discriminant validity with the BDI ($r = .59$). In a post-hoc analyses, items from the CAPS Depression and CAPS Anxiety subscales were combined

into a single factor. This new combined factor had great concurrent and divergent validity. Thus, it appears that the CAPS Depression and Anxiety subscales combined are a valid and reliable measure of depressive symptomology compared to the BDI than either scale alone.

Clinical Implications

Results of the present study provide preliminary support for the utility for several of the CAPS subscales. The present investigation also illustrated that the CAPS measure could provide succinct and quick insight into possible mental health concerns of participants. In the present investigation, participants completed the CAPS measures, the BDI, and the BAI in approximately 11 minutes. This illustrates further support for the goal for a brief administration time.

Our findings also illustrate the clinical utility of the CAPS measure. As previous research has indicated, many athletic departments do not have an adequate plan for addressing the mental health concerns of their student-athletes (Kroshus, 2016). Even fewer athletic departments employ at least one qualified mental healthcare professional (Kroshus, 2016). Most athletic departments rely on the services of their respective University or College Counseling Center (Kroshus, 2016). The CAPS could serve as a screening tool to provide clinical insights to non-mental healthcare providers (e.g., Athletic Trainers, Team Physicians). Specifically, the CAPS measure could be used to identify potential candidates for referral to on-campus mental healthcare providers. Given the relative brief administration time, the CAPS could also serve as a pre-sport participation mental health screening measure for incoming and new student athletes.

Thus, use of the CAPS could fulfil one of the NCAA best practice recommendations for mental healthcare of student athletes (NCAA, 2017).

The results of the present study indicate the Depression and Anxiety CAPS subscale combined is a valid and reliable screening measure of depressive symptomology in college students. This is paramount, as previous research has suggested that nearly 24% of NCAA Athletes experience depressive symptomology (Wolanin et al., 2016).

Strengths and Limitations

The present investigation had several noteworthy strengths. There is a paucity of existing research related to treatment options for the mental healthcare needs of college student athletes. The results of the present study provide an exploratory analysis of a screening measure that could improve clinical treatment options and access to care for student athletes. Based on the post hoc analyses, the CAPS measure was shown to provide a reliable and valid measure of depressive symptomology compared to the BDI. This insight further illustrates the clinical utility of the CAPS. Taken together, our findings indicate that the CAPS could be a quick, cost-effective, and valid measure of depressive symptoms in college students. Our findings also indicate the CAPS subscales have fair internal consistency. The results of the present study provide a framework for future investigations with the goal of improving access to mental healthcare services for college athletes.

There are at least three limitations with the present study. A first limitation involves the sample of participants used for the present study as previously identified in the methods section. Ideally, future normative studies for use of the CAPS would target a sample from a population of college student-athletes.

A secondary limitation involved the use of self-report measures. Previous research suggests that participants may not provide accurate information for a variety of reasons. With self-report data, participants may provide socially acceptable responses or randomly respond to items (Schwarz, 1999). While the CAPS measure contains an embedded Social Desirability Scale, the BDI and BAI do not assess for social desirability. The propensity for socially acceptable answers could be a threat to the present investigation, as the scales assess potentially sensitive mental health related constructs.

A third limitation involved the range of Cronbach's alpha's found for the 14 subscales of the CAPS. While most of the subscales were found to have adequate internal consistency, three scales fell below established benchmarks for brief screening measures: Sexual Issues, Social Desirability, and Eating Disorders. However, given the nature of these subscales, these findings are logical. The Sexual Issues subscale is a three-item subscale that measures sexual deviant behaviors, subjective concern over sexual identification issues, and adverse consequences of sexual activity. Each of these areas are assessed by a single question. While the scale may have limited internal consistency, these questions could still provide clinical insights into a student athletes distress. The Eating Disorder subscale is an eight-item subscale that assesses symptoms associated with Anorexia Nervosa (e.g., caloric restriction) and Bulimia Nervosa(e.g., compensatory behaviors). However, given the existing body of research regarding prevalence rates of eating disordered behaviors in college athletes, the Eating Disorder scale could still provide clinical utility. Finally, the Social Desirability subscale is a 10-item measure that assesses participants tendency to respond to items in a pro-social or

favorable manner. The Social Desirability items range in topics from interpersonal relationship behaviors, internal morals and values, to pro-social attitudes. While the scale has low internal consistency, the results from the scale provide valuable insights into the manner in which participants approached the CAPS measure. For these subscales (Sexual Issues, Eating Disorders, and Social Desirability) address different issues within the scale so internal consistency is expected to be low.

Future Research

The present investigation was the first study since the creation of the CAPS and represents another milestone in the development of the CAPS measure. In terms of future research, it would be useful to extend the current findings by exploring several areas. First, future studies should shift to growing a normative sample of NCAA college athletes. This would include recruiting participants from NCAA member institutions. This would address the limitation regarding the sample utilized for the present investigation. Second, future research could shift to factor analyses of the items from the CAPS measure. A confirmatory factor analyses (CFA) could ensure the CAPS items align with the designed scales for the CAPS and improve some of the internal consistency issues discovered in the present study. A third line of future research would be to create a new Anxiety subscale. This new Anxiety subscale would replace the previous anxiety scale from the present study. Previous research indicated athletes experience unique sources of stress and anxiety (Patel, et al., 2010; Lu, et al., 2011). Designing a new CAPS Anxiety subscale could allow the CAPS to more closely assess the unique stressors and sources of anxiety experienced by competitive athletes.

Conclusions

A growing body of research illustrates the growing need for mental healthcare services within college athletics (Kroshus, 2016). The existing body of literature provided mixed results regarding the occurrence and prevalence rates of mental health concerns of college student athletes. Early research suggested that the many protective factors within sport (e.g., social connections) provided immunity for mental health concerns (Armstrong, et al., 2015). However, research suggests that competitive athletes face similar mental health challenges compared to non-athlete peers (Wolanin, et al., 2016). In some cases, research suggested that sport participation could be a risk factor for mental health concerns (Bar & Markser, 2013; Vardar et al., 2007; Lu et al., 2011; Rexroat, 2015; Hootman, et al., 2007). Yet, most NCAA athletic departments are ill equipped to manage the psychological needs of their student-athletes (Kroshus, 2016; NCAA, 2017). The need for real-time mental health clinical data is paramount to Athletic Trainers and Sports Medicine professionals (Kroshus, 2016).

The present investigation provided exploratory insights regarding the CAPS measure. Results of the present study illustrated the reliability and validity of the Depression subscale of the CAPS measure. The results of the study provided new insights into the CAPS measure for future development. Based on the additional analyses, the revised Depression subscale provided a reliable measure compared to the Beck Depression Inventory. The present investigation also illustrated the need to create a performance anxiety subscale. Future research should further explore the validity and reliability of the CAPS. Overall, the present investigation provided preliminary support for the CAPS Depression Scale while exploring the psychometric properties of the

current CAPS scales. The results of the present study provided rich insights to further enhance the development and utility of the CAPS measure.

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Appendix A
IRB Approval

INFORMED CONSENT DOCUMENT

Project Title: Understanding Mental Health Concerns of Undergraduate Students
Investigator: Joseph C. Case, Psychology, joseph.case@wku.edu or 270-901-4344
Faculty Sponsor: Dr. Frederick Grieve, WKU Psychology 270-745-4417

You are being asked to participate in a project conducted through Western Kentucky University. The University requires that you give your agreement to participate in this project.

You must be 18 years old or older to participate in this research study.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

You should keep a copy of this form for your records.

1. **Nature and Purpose of the Project:** The present study is designed to gain further understanding of mental health concerns for undergraduate students and student-athletes. For our clinical purposes, this study is designed to enhance the clinical assessment of student-athletes by establishing normative data on undergraduate students. The results of this study will improve our collective clinical knowledge regarding common problem-areas for undergraduate students.

2. **Explanation of Procedures:** Participants will be given a link to a confidential online survey (hosted by Qualtrics). Participants may complete the survey on a computer, tablet, or smart phone. Each participant will be asked to complete the survey once. The surveys should take roughly 60 minutes to complete. After completing the survey participants will send an email to the investigator(s) to indicate completion. This step is to ensure Study Board credit is awarded while maintaining the confidentiality of the survey results.

3. **Discomfort and Risks:** There are no foreseeable risk for taking part in this investigation. However, if you are considering or seeking assistance with any issues or concerns one resource to reach out to is listed below.

Western Kentucky University Counseling Phone: 270-745-3159

The WKU counseling center is staffed with full-time clinicians, pre-doctoral students, and graduate students. They provide a range of counseling services and offer presentations for off and on-campus organizations for a variety of topics, including depression, stress management, sexual assault awareness, and psychological wellness.

4. **Benefits:** Your participation does not guarantee any benefits. However, participating in the present investigation includes exposure to clinical research in general. Your participation will also help to establish normative data that will enhance clinical efficacy in terms of the assessment of mental health concerns in student athletes.

5. **Confidentiality:** Participation will be confidential, and you are requested to not include your name on any of the data forms. Raw data will be stored securely. No identifiable data is requested or will be used in publications or presentations related to this study.

6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Your continued cooperation with the following research implies your consent.

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD
Paul Mooney, Human Protections Administrator
TELEPHONE: (270) 745-2129



WKU IRB# 17-180
Approval - 2/6/2018
End Date - 12/1/2018
Expedited
Original - 11/30/2016

Appendix B
College Athlete Psychological Screening (CAPS)
Sample Items

College Athlete Psychological Screening

Sample Items

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Somewhat Agree; 5 = Agree

Perfectionism:

I must do things perfectly 1 2 3 4 5

Stress:

I experience difficulty breathing when
no physical activity is present: 1 2 3 4 5

Substance Use:

I have missed a game or practice due to
the effects of substance use 1 2 3 4 5

Sleep Disorders:

I wake up feeling tired 1 2 3 4 5

Social Desirability:

I've never wanted to yell at a coach 1 2 3 4 5

PTSD

I feel scared or anxious when I hear
loud noises 1 2 3 4 5

Eating Disorders:

I skip meals 1 2 3 4 5

Muscle Dysmorphia:

I wish I had the body of a superhero 1 2 3 4 5

Depression:

I am worthless 1 2 3 4 5

Anxiety:

My muscles are tense much of the time *1* *2* *3* *4* *5*

Hostility:

People are scared of my temper *1* *2* *3* *4* *5*

Sexuality:

I find my sexuality gets me into trouble *1* *2* *3* *4* *5*

Attention Deficit/Hyperactivity:

I often forget things *1* *2* *3* *4* *5*

Impulsivity/Risk Taking:

I make spontaneous decisions *1* *2* *3* *4* *5*