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An Investigation of Athletic Buoyancy in Adult Recreational and Sport Club Athletes

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AN INVESTIGATION OF ATHLETIC BUOYANCY IN ADULT RECREATIONAL AND SPORT CLUB ATHLETES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Kinesiology

by
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ABSTRACT

Athletic buoyancy is the ability of an athlete to effectively handle the daily setbacks and challenges they face during training and competition. Although buoyancy has received ample research in the academic domain, a dearth of information exists regarding buoyancy in the athletic domain. Therefore, the overall purpose of this dissertation was to investigate athletic buoyancy's independent contribution to sport psychology while also exploring antecedents and outcomes in adult athletes.

Study 1 compared athletic buoyancy to other cognate constructs, or similar constructs, to determine their conceptual boundaries. A one-time, online questionnaire was distributed to 294 recreational athletes (M age = 42.49 years, SD = 14.94, 81.3% male) from six sports. The questionnaire assessed responses on athletic buoyancy, mental toughness, grit, and coping. Exploratory factor analysis investigated conceptual overlap and uniqueness for each term. Results suggested that athletic buoyancy, grit, and coping are related but distinct factors. Mental toughness was ill defined, suggesting inadequate measurement and/or potential conceptual overlap.

Study 2 examined interpersonal and intrapersonal factors for their relationships with athletic buoyancy, as well as a potential outcome variable, intentions to continue sport participation. An online questionnaire was distributed to 239 collegiate club sport athletes (M age = 19.91 years, SD = 1.94, 58% male) from 24 sports. The questionnaire assessed fear of failure, sport anxiety, sport enjoyment, and enthusiastic commitment as predictors, athletic buoyancy as a mediator, intentions as the primary outcome variable, and social support as a moderator between the predictor variables and both athletic buoyancy and intentions. Results indicated that anxiety and fear of failure significantly predicted athletic buoyancy. Athletic buoyancy did not

mediate any relationships with intentions. Social support moderated the relationships between fear of failure and athletic buoyancy, and enthusiastic commitment and intentions.

Overall, findings indicate that athletic buoyancy contributes unique information to sport psychology literature, and that fear of failure and social support are both important factors to consider in future research on athletic buoyancy. The findings of this dissertation open opportunities for meaningful research exploring athletes' abilities to effectively navigate setbacks and challenges, as well as factors affecting psychological wellbeing and athletic performance.

CHAPTER 1. GENERAL INTRODUCTION

Positive psychology focuses on providing researchers with evidence-based concepts and methods used “to understand and build those factors that allow individuals, communities, and societies to flourish” (Seligman & Csikszentmihalyi, 2000, p. 13). Particularly relevant to the performance-focused athletic domain, positive psychology concepts are popular with sport psychology researchers, especially those concepts related or similar to athletic resilience, the psychological and behavioral characteristics that aid in “protecting an individual from the potential negative effect of stressors” (Fletcher & Sarkar, 2013, p. 16). Positive psychology research has also produced several similar concepts to explain how individuals may effectively handle adversity, including mental toughness (Jones, Hanton, & Connaughton, 2007), coping (Smith, Schutz, Smoll, & Ptacek, 1995), and grit (Duckworth, Peterson, Matthews, & Kelly, 2007). Each of these terms is proposed to uniquely explain psychological characteristics of an athlete that aid in their ability to overcome challenges and setbacks of various levels of severity. Having these concepts available for psychological research has the potential to greatly expand our knowledge of factors that allow athletes to flourish; however, the coexistence of each of these terms does not necessarily guarantee their conceptual independence, and previous research has done little to provide empirical evidence of their unique contributions to the literature.

To further complicate matters, another similar concept, athletic buoyancy, has recently been added to the pool of resilience-related constructs (Calhoun, Webster, & Garn, 2019), and seeks to explain similar positive psychological outcomes for athletes. However, unlike the other constructs, athletic buoyancy has very little research to help explain its conceptual boundaries and practical utility, as well as its independent contribution to sport psychology. This lack of understanding prompts the need for further research to clarify and deepen our understanding of

athletic buoyancy, its predictors and outcomes, and its usefulness for sport psychology researchers.

Foundations of Athletic Buoyancy

The majority of the literature surrounding buoyancy comes from the academic domain. Coined by Martin and Marsh (2008), academic buoyancy refers to “students’ ability to successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life” (p. 54). Such challenges may include forgetting to complete a homework assignment, performing poorly on an individual test, or navigating complex relationship dynamics with peers and teachers. Research on buoyancy has established its predictors, also called the “5Cs”: “confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence)” (Martin & Marsh, 2006, p. 277). Support has been found for each of these predictors on academic buoyancy (Martin, Colmar, Davey, & Marsh, 2010); additionally, preliminary support has demonstrated that about 25% of buoyancy in athletics was accounted for by the 5C model, though composure (low anxiety) was the only significant contributor to the model (Calhoun et al., 2019). In fact, findings have consistently demonstrated that anxiety exerts a strong, negative influence on buoyancy (Calhoun et al., 2019; Martin et al., 2010; Martin, Ginns, Brackett, Malmberg, & Hall, 2013; Putwain & Daly, 2013). Since anxiety was the only significant factor in the first examination of athletic buoyancy’s predictors, further exploration is warranted to better understand the relationship between athletic buoyancy.

Gaps in the Literature

To deepen and clarify our understanding of athletic buoyancy, more research is needed. Of primary concern is whether athletic buoyancy actually contributes unique knowledge to the

extant sport psychology literature. While athletic buoyancy is proposed to provide explanations of how athletes may effectively overcome stressors, similar terms, such as mental toughness, grit, and coping skills, among others, have already been proposed as factors important for positive outcomes in athletics; however, neither these terms nor athletic buoyancy have been examined for their conceptual boundaries, prompting the need for empirical investigation. Further research on athletic buoyancy should be founded on evidence supporting its unique contribution to the sport psychology literature, as well as its relationships with these other similar terms. Findings from such research will provide a firm foundation on which to structure clearly defined future research objectives for all of the similar terms, and help determine the scope of athletic buoyancy's influence and focus.

In addition to determining whether or not athletic buoyancy stands alone in sport psychology, it is important to investigate its framework, particularly its various predictors and outcomes. Beyond exploring the established 5C predictor model, it is important to investigate other potential psychosocial influences on athletic buoyancy. For example, because of the strong influence of anxiety on buoyancy (Calhoun et al., 2019, Martin et al., 2010), investigating other negative psychological factors, such as fear of failure, may provide more insight on the ways in which athletic buoyancy functions. Positive psychological factors, such as the more positively focused 5Cs (i.e., confidence, control, coordination, commitment) were not significant predictors of athletic buoyancy in prior research (Calhoun et al., 2019). Therefore, it is important to further investigate positive influences on athletic buoyancy, including the proposed 5Cs, and also why the negative influence of anxiety may be so prominent. Sociological factors may also be influential on athletic buoyancy, such as social support. Though previous research has not investigated the impact of social influences on athletic buoyancy, it has been suggested that

buoyancy in both academics and athletics may aid students in navigating relationships with others (Calhoun et al., 2019; Martin & Marsh, 2008). Additionally, there is some research connecting feelings of social support, motivation, and academic buoyancy, where having higher levels of support and buoyancy led to more positive outcomes for the student (Collie et al., 2017). This suggests that further investigation of social support and buoyancy is warranted in athletic buoyancy, as well, to determine how they may impact, or be impacted by, each other.

Aside from the various psychosocial influences on athletic buoyancy, evidence is also lacking regarding potential outcomes for athletic buoyancy. While several academic outcomes have been investigated in academic buoyancy research, including math and reading test performance (Colmar, Liem, Connor, & Martin, 2019) and psychological risk factors such as low feelings of control and school anxiety (Martin, Ginns et al., 2013), work has yet to investigate the outcomes of athletic buoyancy. Because athletic buoyancy focuses on overcoming obstacles, it is plausible that athletic buoyancy may impact an athlete's decision to remain active in their sport, where having higher buoyancy may contribute to increased intentions to participate in sports and physical activity. Research should focus on the various potential outcomes of athletic buoyancy, as well as its predictors and uniqueness, to determine its usefulness in both sport psychology research and practice.

Purpose

Currently, there are gaps in our understanding of athletic buoyancy's predictors, outcomes, practical implications, and unique function within extant sport psychology literature. Therefore, the current project seeks to close these gaps to provide a stable platform on which to build future athletic buoyancy research, as well as expand upon what is already known about athletic buoyancy to better understand its usefulness in sport psychology research. Study 1

focused on an investigating athletic buoyancy's uniqueness compared to commonly utilized positive psychology terms, including mental toughness, grit, and coping skills. Study 2 explored potential predictors of athletic buoyancy, including anxiety, fear of failure, enthusiastic commitment, and sport enjoyment, and also intentions to continue sport participation, a potential outcome for athletic buoyancy.

CHAPTER 2. LITERATURE REVIEW

Positive psychology researchers explore why some individuals flourish while others fail in comparable situations by identifying the factors that allow for effective and positive thoughts, emotions, and behaviors (Seligman & Csiksentmihalyi, 2000). Using the positive psychology framework, it is possible to examine mechanisms that support or undermine stressful situations for individuals participating in performance contexts such as the workplace (Green, Evans, & Williams, 2017; Martin, 2004), academics (Collie et al., 2017; Martin & Marsh, 2009), music (Ascenso, Williamon, & Perkins, 2017; Steyn, Steyn, Maree, & Panebianco-Warrens, 2015), and sports (Calhoun et al., 2019; Mesagno & Hill, 2013; Miller, 2015). The recent expansion of literature utilizing positive psychology approaches demonstrates its influence and utility for exploring factors that help individuals overcome obstacles and find success in diverse achievement domains.

In the academic domain, educational researchers have utilized positive psychology by introducing academic buoyancy, a concept derived from academic resilience, which represents a students' ability to navigate the challenges that they may face in school (Martin & Marsh, 2008, 2009). Students with high academic buoyancy are likely to effectively handle these setbacks and challenges, such as occasional poor test performance or navigating peer relationships (Martin & Marsh, 2008, 2009). Academic buoyancy has since been generalized to the athletic domain as athletic buoyancy and represents "an athlete's ability to respond effectively to the daily challenges and setbacks encountered in athletic contexts," such as a poor practice performance or navigating teammate relationships (Calhoun et al., 2019, p. 324).

Other positive psychology research in athletics has investigated a variety of topics, including pedagogical techniques to improve athlete learning (Light & Harvey, 2017),

motivational climate and athlete emotions (Ruiz, Haapanen, Tolvanen, Robazza, & Duda, 2017), the role of the coach (Amorose & Nolan-Sellers, 2016; Felton & Jowett, 2013), and especially resilience and resilience-related constructs as they relate to athletic performance and athlete well-being (Arnold & Sarkar, 2015; Sarkar, Fletcher, & Brown, 2015). While athletic buoyancy has the potential to add to this discussion (Calhoun et al., 2019), research in the athletic domain has previously established and utilized a variety of conceptually similar terms, including resilience (Fletcher & Sarkar, 2013), grit (Duckworth et al., 2007), hardiness (Kobasa, 1979; Windle, 2011), mental toughness (Jones, Hanton, & Connaughton, 2002), and coping (Giacobbi et al., 2004), each of which has its own established conceptual components and outcomes. Like athletic buoyancy, these constructs have a general focus on explaining an athlete's ability to handle and overcome adversity, though it is possible that athletic buoyancy could provide a unique contribution to the existing positive psychology-based sport literature.

Because academic buoyancy is originally derived from educational psychology literature and academic resilience, it is important to examine athletic buoyancy through the lens of existing sport psychology literature and athletic resilience, as well as other sports resilience-related constructs. By doing so, it may be possible to gain a deeper understanding of athletic buoyancy's role in sport psychology and detect conceptual overlap that may exist with extant concepts. Therefore, the purposes of this review are to examine the: (1) relationship between and theoretical framework underpinning of athletic buoyancy and resilience; (2) relationships and conceptual boundaries that exist between athletic buoyancy and other established resilience-related constructs, including grit, mental toughness, hardiness, and coping; and (3) implications that this knowledge may have for stakeholders, including coaches and athletes.

Theoretical Concerns: Resilience and Buoyancy in Academics and Athletics

Before beginning a discussion of the sport psychology literature on resilience, it is important to first discuss the origins of buoyancy and resilience in academic and athletic contexts. Through this discussion, a detailed explanation of the theoretical background of athletic buoyancy can provide a firm foundation to discuss conceptual issues with existing sport psychology literature and other resilience-related constructs.

From Academic Resilience to Athletic Buoyancy

While academic success and general psychological resilience are both popular topics of study, only relatively recently did researchers begin to study the specific factors that allow students to effectively handle adversity in academic contexts (Martin, 2002; Martin & Marsh, 2008, 2009). Psychological “resilience refers to a class of phenomena characterized by *good outcomes in spite of serious threats to adaptation or development*” (Masten, 2001, p. 228), and specifically, academic resilience has been defined as “students’ ability to deal effectively with academic setbacks, stress, and study pressure” (Masten, 2002, p. 35). Academic setbacks and pressures addressed by academic resilience are “acute or chronic adversities that are seen as major assaults on educational processes” (Martin & Marsh, 2009, p. 353). Such assaults might include a single incidence of violence, clinically diagnosed mental disorders, or chronic estrangement from classmates or teachers (Martin & Marsh, 2009). Many students never experience adversities that require resilient responses (Martin & Marsh, 2008, 2009). Otherwise, such severe adversities would be considered typical life events that do not necessarily require a unique set of psychological skills.

Therefore, while academic resilience is a useful term for describing students’ effective responses to chronic or severe adversity in school, it may not be applicable to everyday situations and struggles, such as heavy homework loads, bouts of test anxiety, or maintaining relationships

with classmates (Martin & Marsh, 2008, 2009). Consequently, academic buoyancy was developed as a separate, but related, construct (Martin, 2013). While resilience provides a pathway to understand how an individual overcome major obstacles, academic buoyancy allows for the investigation of everyday challenges that most individuals experience, and therefore, is more applicable to a larger number of individuals and circumstances than resilience (Martin & Marsh, 2008, 2009).

Building upon Martin and Marsh's (2008, 2009) work in academics, recent research has demonstrated that buoyancy in academics and athletics are connected, though separate, constructs in a sample of student-athletes (Calhoun et al., 2019). Like academic buoyancy, athletic buoyancy concerns the day-to-day setbacks and challenges that athletes experience, and therefore more applicable to a larger number of athletes (Calhoun et al., 2019). According to Sarkar and Fletcher (2014), athletes are likely to experience a variety of challenges, including competitive stressors, such as "preparation, injuries, pressure, underperforming, expectations, self-presentation and rivalry" (p. 1422), as well as organizational stressors, such as coach and teammate behavior and access to facilities, among others. Athletic buoyancy aids athletes in contending with this wide variety of daily challenges as they first present themselves, ideally helping the athlete to handle the challenges before they become severe problems that require a resilient response.

Theoretical Basis: Resilience & Buoyancy in Academics and Athletics

Resilience-based research has utilized concepts from different motivational theories to explain how individuals effectively handle the challenges they face. Therefore, untangling the theoretical foundations of resilience in both academics and athletics could provide clarity to the discussion of buoyancy, as well as the similarities of the resilience-buoyancy structure in both domains.

Theoretical basis of resilience & buoyancy: Academics. According to Martin (2002), the concept of academic resilience can be better understood by referencing several components of other motivational theories. Martin (2002) suggests that an academically resilient student is most likely to demonstrate a mastery-approach goal orientation (i.e., Achievement Goal Theory, Nicholls, 1989); possess high self-efficacy and motivation to overcome challenges (i.e., Self-Efficacy Theory, Bandura, 1977); expect to succeed and value their academic efforts and performance (i.e., Expectancy-Value Theory, Eccles, 1983); and feel control over their performance (i.e., Attribution Theory, Weiner, 1994). This combination of characteristics is likely to lead to academic resilience, persistence and adaptive behaviors in the face of adversity in school (Martin, 2002), and has informed Martin and Marsh's (2006) "5C" model of academic resilience; that is, five predictors that influence a student's level of academic resilience: "confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence)" (Martin & Marsh, 2006, p. 267). These predictors have since been carried over as significant predictors of buoyancy in both academics (Martin et al., 2010) and athletics (Calhoun et al., 2019). Since academic buoyancy derives from academic resilience, it shares theoretical foundations, including predictors (the 5Cs) (Martin & Marsh, 2009; Martin et al., 2010).

Furthering the framework, Martin and Marsh (2009) also suggest that a hierarchical relationship exists between academic buoyancy and resilience, in which buoyancy serves as "the ongoing proactive frontline response to academic adversity," while "academic resilience is the defensive backline that is invoked as necessary, if at all" (Martin & Marsh, 2009, p. 357). This implies that when an individual is faced with typical stressors (i.e., receiving an individual poor grade), buoyancy is all that may be needed to effectively handle the situation. However, in more

severe circumstances (i.e., failing a course at the end of the school year), resilience may be required for adaptive behaviors. This hierarchical structure is not only useful for explaining the necessary abilities to effectively handle adversity, but also suggests what research has clearly demonstrated in both school and sports: that buoyancy and resilience represent separate, but related, abilities in the same individual (Calhoun et al., 2019; Martin, 2013).

Contextual differences: Academics versus athletics. While resilience and buoyancy have demonstrated consistent individuality in both academic and athletic research (Calhoun et al., 2019; Martin, 2013), it is important to discuss a potential fundamental difference between these specific domains: the nature of participation. While students are most often required to participate in their education and attend school regularly, athletes generally make autonomous decisions to participate in competitive sports (Fletcher & Sarkar, 2012; Sarkar & Fletcher, 2014). This difference has yet to be investigated regarding its impact on athletic buoyancy; for example, to what extent does voluntary participation influence perceptions of stressors and challenges, and how does that in turn influence feelings of athletic buoyancy and resilience? These yet unanswered questions should inform future research and discussion of buoyancy in both student and athlete populations.

Theoretical basis of resilience and buoyancy: Athletics. Like academic resilience, athletic resilience has also been investigated to determine what aids an individual in dealing with challenges and setbacks (Fletcher & Sarkar, 2013), and has a relatively short research history (Sarkar & Fletcher, 2014). Generally, researchers describe athletic resilience as a multidimensional, dynamic process, that “often encapsulate[s] other related psychosocial constructs and overlap[s] with other areas of scientific inquiry” (Fletcher & Sarkar, 2013, p. 17). Because of this, a major challenge to studying resilience in athletics is the lack of consistency in

its definition (Windle, 2011). For example, Fletcher and Sarkar (2013) define resilience as “the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors” (p. 16). In other words, some researchers have represented psychological resilience as “both [a] trait and [a] process” that provides a buffer against stress-inducing circumstances (Sarkar & Fletcher, 2014, p. 1419). Other researchers have described resilience as a positive characteristic (Gucciardi, Gordon, & Dimmock, 2008; Lovering et al., 2015), or the capacity for effectively overcoming challenges (Maddi, Matthews, Kelly, Villarreal, & White, 2012), although describing resilience as a dynamic process that leads to adaptive responses to stressors appears to be the most common description (Fletcher & Sarkar, 2013; Windle, 2011).

Because of these varied definitions, researchers utilize different predictors and outcomes when investigating this phenomenon. This has led to inconsistency in research focusing on resilience (Windle, 2011). Therefore, it is important to gain a more complete understanding of what resilience is and is not in sport, and in what circumstances resilience is the most accurate and descriptive term to explain positive and effective behavior in response to a particular adversity or stressful scenario. Given that individuals do not typically experience extenuating circumstances on a regular basis, buoyancy and other resilience-related terms (i.e., grit, hardiness, mental toughness, and coping) might aid in efforts to understand the conceptual boundaries of these terms.

Conceptual Concerns: Athletic Buoyancy and Cognate Constructs

“The study of psychological resilience is important in sport because athletes must constantly withstand a wide range of pressures to attain and sustain high performance” (Sarkar & Fletcher, 2013, p. 265). As a result, sport psychology research has investigated an array of other personality traits and constructs related to resilience in an effort understand what helps athletes

operate optimally under pressure, both physically and psychologically. These constructs include grit, mental toughness, hardiness, and coping. With the recent addition of athletic buoyancy to resilience-based research, it is important to closely examine these constructs, to critically compare them to one another to determine their conceptual boundaries and influences, and to potentially uncover some conceptual redundancies in the current psychological resilience-based literature. This may provide evidence for or against the unique contributions of athletic buoyancy in sport psychology.

Grit

Definition. Referring to the “perseverance and passion for long-term goals” (Duckworth et al., 2007, p. 1087), grit is often discussed in terms of pursuing goals one year or more away, and “forgo[ing] immediate rewards for the sake of pay-offs in the future” (Gilchrist, Fong, Herbison, & Sabiston, 2018, p. 1). Grit is proposed to be a personality trait that allows one to push through “failure, adversity, and plateaus in progress” as they work toward their goals (Duckworth et al., 2007, p. 1088). This focus on long-term perseverance differentiates grit from athletic buoyancy, since athletic buoyancy’s focus lies in typical or short-term stressors, rather than chronic stressors or challenges (Calhoun et al., 2019). Additionally, athletic buoyancy does not focus on goal achievement in the way that grit does, but rather focuses on overcoming challenges that may or may not be associated with attaining goals. Definitions of grit and athletic buoyancy may also differ in relation to grit’s “passion” for goal achievement. While buoyancy is relevant to achievement settings (i.e., academics, athletics), its definition and predictors (5Cs) do not necessarily have an emphasis on passion or inherent enjoyment in the activity, though current research has not established this. Future athletic buoyancy research should incorporate aspects of enjoyment, as well as other discrete emotions, to determine if passion contributes to athletic buoyancy.

Because of this focus on goal achievement (Martin, Byrd, Lewis Watts, & Dent, 2015), grit has also been compared to and assessed alongside of Big Five Conscientiousness (Duckworth et al., 2007), a personality trait involving productivity, self-control, organizational skills, responsible behaviors, and delaying gratification during the pursuit of goals (Duckworth et al., 2007; McCrae & John, 1992; Tedeschi & Young, 2018). Additionally, grit, in its focus on long-term goal attainment, may share more similarities with athletic resilience than athletic buoyancy. For example, resilience is not always necessary, but is needed to effectively handle more chronic or severe situations (Martin & Marsh, 2009); similarly, "...while not all contexts require a gritty disposition to experience success, grit may be particularly relevant in contexts where perseverance and passion help to facilitate achievement, retention, and maintenance of effortful behaviors" (Gilchrist et al., 2018, p. 1) Therefore, grit may have a place next to athletic resilience, and above buoyancy, in a hierarchical model like the one proposed by Martin and Marsh (2009).

Measurement. Two factors are proposed to compose grit, "consistency of interests" and "perseverance of effort" (Duckworth et al., 2007, p. 1090), and subsequent measures of grit have utilized both long (Grit Scale; Duckworth et al., 2007) and shortened (Grit-S; Duckworth & Quinn, 2009) forms of the scale. Consistency of interests is described as the tendency to remain focused on one particular topic, activity, or goal (Duckworth et al., 2007; Gilchrist et al., 2018), such as maintaining interest in performing well in a sport. Perseverance of effort addresses the tendency to continuously expend effort toward the relevant interest (Duckworth et al., 2007; Gilchrist et al., 2018). Interestingly, the Grit-S (Duckworth & Quinn, 2009) includes items from its "Perseverance of Effort" subscale that are reminiscent of athletic and academic buoyancy scale items (Calhoun et al., 2019; Martin & Marsh, 2009). For example, an original Grit Scale –

Perseverance of Effort item, “I have overcome setbacks to conquer an important challenge” (Duckworth et al., 2007, p. 1090), is similar to an athletic buoyancy scale item, “I’m good at dealing with setbacks at sport (e.g. negative feedback, poor result)” (Calhoun et al., 2019, p. 325). Additionally, both the Grit Scale and Grit-S contain the item “Setbacks don’t discourage me” (Duckworth et al., 2007; Duckworth & Quinn, 2009), which is quite similar to the athletic buoyancy scale item, “I don’t let a bad performance at sport affect my confidence” (Calhoun et al., 2019, p. 325). Additionally, grit’s “perseverance of effort” is quite similar to the concept of commitment, one of the 5C predictors of athletic buoyancy. These conceptual and measurement consistencies may suggest that grit and athletic buoyancy scale items assess the same construct; however, this may also lend support to the notion of grit’s place next to athletic resilience in a hierarchical model, where athletic buoyancy may prove to be a predictor of perseverance of effort within grit. Construct validation should be examined among these terms to avoid the jingle-jangle fallacy (Marsh, Craven, Hinkley, & Debus, 2003). That is, researchers should not assume “that scales with the same name measure the same construct” (i.e., the jingle fallacy), or that “scales with different names measure different constructs” (i.e., the jangle fallacy; Marsh, 1994, p. 377).

Predictors. While grit has mostly been applied to the examination of achievement behaviors and contexts, fewer studies have investigated the predictors of grit (Gilchrist et al., 2018; Hill, Burrow, & Cotton Bronk, 2016), and those that have seem to focus on the emotional predictors. For example, Gilchrist and colleagues (2018) found that feelings of “authentic pride” (p.2), derived from personal effort and persistence and connected to feelings of internal locus of control, were significant predictors of grit in adult athletes. Other researchers have found that “changes in either positive affect or purpose commitment are likely to coincide with changes in

grit” (Hill et al., 2016 p. 266), where purpose commitment refers to feelings of value and “commitment to an ultimate life goal” (p. 258).

Although more research is needed on grit’s predictors to compare them to those of athletic buoyancy, it seems that there are already some similarities to be gleaned from the available research. Pride is associated with feelings of control, which is one of the main predictors of athletic buoyancy (5C Control) (Calhoun et al., 2019; Martin & Marsh, 2009). Additionally, purpose commitment likely shares some similarities with athletic buoyancy’s predictor 5C Commitment, which refers to commitment to one’s sport (Calhoun et al., 2019). One important difference in emphasis seems to be that while anxiety has consistently demonstrated strong predictive utility for both athletic and academic buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008, 2009; Putwain & Daly, 2013), research on the anxiety-grit link is less robust, though some studies have found evidence of a moderately negative relationship between grit and anxiety in college students (Sheridan, Boman, Mergler, & Furlong, 2015).

Outcomes. Previous research has demonstrated that grit can predict a variety of achievement and performance outcomes, such as reaching the final round of the National Spelling Bee (Duckworth et al., 2007), higher levels of engagement in exercise (Reed, 2014), and completion of the “first summer of training at West Point” (Duckworth et al., 2007, p. 1097). Specific to the sport domain, grit has also predicted higher levels of sport engagement (Martin et al., 2015), as well as a relationship to elite-level status in sports (Tadesqui & Young, 2018). In their research of a grit-sport expertise relationship, Tadesqui and Young (2018) demonstrated that persistence of effort was strongly related to engagement in deliberate practice, which is believed to be a key behavior in the development of expert skills in a variety of activities (Ericsson, Krampe, & Tesch-Romer, 1993). Additionally, consistency of interest was a

significant negative predictor of thoughts about quitting or changing sport (Tadesqui & Young, 2018). Taken together, these findings suggest that grittier athletes are engaged with the activity for longer periods of time and intend to continue working toward the goal of personal improvement in their sport. This could have important implications for athletes seeking to attain elite status in their sport, and may draw some parallels to hardiness, another proposed personality trait related to resilience.

Hardiness

Definition. First described by Kobasa (1979), hardiness is proposed as another personality construct related to, but separate from, resilience that provides protection against perceived stress (Fletcher & Sarkar, 2013) and remains stable over time (Windle, 2011). Kobasa's (1979) original interests in hardiness revolved around the investigation of why some individuals become ill after experiencing stress, while others do not. The answer, Kobasa (1979) proposed, was that hardier individuals were less likely to fall ill. Hardy individuals find purposeful meaning in their lives and actions (Kobasa, 1979; Kobasa, Maddi, & Puccetti, 1982; Martin et al., 2015), and, like mentally tough individuals (Jones et al., 2002), hardy individuals view adversities as challenges that can lead to personal growth (Ledesma, 2014; Martin et al., 2015; Salim, Wadey, & Diss, 2015). According to Maddi (2002), hardiness is derived from existential psychology, which suggests that "meaning is not given but rather is created through the decisions people make and implement" (p. 175). Therefore, hardiness is a personality characteristic that involves creating a reality that aids in achieving goals and fosters feelings of meaning through purposeful actions that can lead to both "survival in the face of stress" and "the enrichment of life" (Kobasa, Maddi, & Puccetti, 1982, p. 392). While athletic buoyancy does seek to promote athlete wellbeing (Calhoun et al., 2019), which is certainly related to aspects of hardiness' focus, an explicit focus on fostering a meaningful life is not necessarily included in its

definition. Interestingly, Martin and Marsh (2009) make reference to “academic hardiness” as a construct related to both academic buoyancy and academic resilience that was worth investigation. This supports the notion that hardiness and athletic buoyancy might also be considered separate constructs, as Martin and Marsh (2009) describe academic hardiness and academic buoyancy as separate constructs.

Hardiness is proposed to represent commitment, control, and challenge, three personality characteristics that together form a more resilient personality (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Kobasa, Maddi, & Puccetti, 1982; Ledesma, 2014; Martin et al., 2015). Commitment refers to an individual feeling deeply involved with an activity, versus feeling estranged from the activity (Kobasa, Maddi, & Kahn, 1982). Control refers to feelings of autonomy and influence on the situation and environment, while challenge refers to viewing adversity as an obstacle to overcome, not as a threat (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Kobasa, Maddi, & Puccetti, 1982). According to Maddi (2002), when all three components of hardiness are present, an individual is more likely to approach a challenging situation because they have the understanding that engaging with it will only help them develop as a person and lead to meaning in life.

As with grit and mental toughness, athletic buoyancy appears to share characteristics with hardiness. Specifically, two of hardiness’ major components, commitment and control, are also two of the 5Cs of athletic buoyancy (Calhoun et al., 2019). Additionally, unlike mental toughness, which can assist an individual with both positive and negative forms of stress, hardiness appears to primarily deal with negative stressors (Kobasa, 1979; Madrigal, Gill, & Willse, 2017), suggesting a potential role as an antecedent of athletic buoyancy in its focus. This

conceptual overlap suggests that a strong relationship between athletic buoyancy and hardiness likely exists.

Measurement. Kobasa's (1979) early research measured hardiness with five different subscales that assessed control, commitment, and challenge, the three major components of hardiness. These subscales were then combined to represent one hardiness score (e.g., Kobasa, Maddi, Kahn, 1982; Kobasa, Maddi, & Puccetti, 1982). Other measures of hardiness have also been developed to assess the three components of hardiness, including the Personal Views Survey (PVS-III; Maddi, Brow, Khoshaba, & Vaitkus, 2006). More recent hardiness studies (e.g., Madrigal et al., 2017; Martin et al., 2015; Salim et al., 2015) have utilized the Dispositional Resilience Scale (DRS; Bartone, Ursano, Wright, & Ingraham, 1989), which contains items relevant to commitment, control, and challenge. The DRS control and commitment items could easily be utilized in a measure of athletic buoyancy's 5Cs (i.e., control, commitment, coordination; Calhoun et al., 2019), suggesting some significant overlap in concepts. For example, the item "Planning ahead can help avoid most future problems," (DRS; Bartone et al., 1989) represents the control component of hardiness, and could also easily represent athletic buoyancy's component of coordination (i.e., planning ahead) (Calhoun et al., 2019). Future research should compare measures of hardiness and athletic buoyancy to determine their degree of similarity.

Predictors and outcomes. Galli and Vealey (2008) refer to hardiness as an outcome of resilience; that is, resilience may serve as a predictor of an individual's hardiness. Considering that resilience has been referred to as a personality trait (Sarkar & Fletcher, 2013), an ability (Martin & Marsh, 2006), and a dynamic process (Sarkar & Fletcher, 2013; Windle, 2011), this suggests that hardiness is a personality trait that is both part of a resilient personality and the

product of behaving in a resilient manner. Research has also focused on examining the relationships between hardiness and a variety of other psychological and performance factors, including life satisfaction (Martin et al., 2015), military academy retention (Maddi et al., 2012), Marine recruit training success (Lovering et al., 2015), athletic competition level (Sheard & Golby, 2010), and stress-related illness (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982). Overall, studies relating hardiness to such factors suggests that having a hardy personality is related to higher feelings of life satisfaction (Martin et al., 2015), persistence and success through adversity to higher levels of achievement (Lovering et al., 2015; Sheard & Golby, 2010), and lowered instances of stress-related illness (Kobasa, 1979). Considering the overlap in the components of hardiness and athletic buoyancy (commitment and control), it is possible that athletic buoyancy may also impact similar psychological and performance factors.

Mental Toughness

Definition. Although mental toughness has been defined in different ways over time (Cowden, Fuller, & Anshel, 2014; Jones et al., 2002; Weinberg, Freysinger, Mellano, & Brookhouse, 2016), most research on mental toughness in sports seems to share a common focus on how this construct relates to high-level athletic performance (Galli & Vealey, 2008). To this end, a commonly utilized definition of mental toughness is “having the natural or developed psychological edge that enables you to, generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer” (Jones et al., 2007, p. 247). Importantly, this suggests that mental toughness is not only an innate quality, but it can also be developed over time through experience (Jones et al., 2002, 2007). Additionally, mental toughness involves “be[ing] more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure” (Jones et al., 2007, p. 247).

Both parts of Jones et al.'s (2007) definition share similarities with athletic buoyancy's overarching focus on an athlete's ability to effectively handle challenges (Calhoun et al., 2019); however, while mental toughness has an emphasis on superior normative athletic performance (Jones et al., 2002, 2007), athletic buoyancy has yet to be utilized to investigate athletic performance, and in addition, does not emphasize performance within its definition. Researchers often associate mental toughness with the pursuit of maximizing athletic performance (Anthony, Gordon, Gucciardi, & Dawson, 2018; Connaughton, Wadey, Hanton, & Jones, 2008) and the behaviors and beliefs of high-level athletes (Galli & Vealey, 2008), while athletic buoyancy focuses on athletes maintaining their ability to handle challenges and flourishing despite everyday adversity (Calhoun et al., 2019). This difference is also relevant to the populations that are typically studied with each construct; while buoyancy research focuses on the typical individual (Calhoun et al., 2019; Martin & Marsh, 2008, 2009), mental toughness research over the past two decades has generally focused on elite athletes, including collegiate athletes, world champions, and Olympians (e.g., Connaughton, Hanton, & Jones, 2010; Connaughton et al., 2008; Galli & Vealey, 2008; Jones et al., 2002, 2007).

Athletic buoyancy may also differ from mental toughness in its direction of focus. Specifically, while athletic buoyancy and mental toughness are both proposed to aid in navigating negative circumstances (Calhoun et al., 2019; Jones et al., 2002, 2007; Connaughton et al., 2008), some researchers also suggest that mental toughness can aid with positive stressors (Cowden et al., 2014; Gucciardi et al., 2008). For example, Gucciardi et al. (2008) demonstrated that having high mental toughness is beneficial for handling positive situations that can cause an athlete stress, such as the attention received following exceptional performances, maintaining high-level performance throughout the season, or defending a championship title. Similarly,

during interviews with elite athletes, Jones et al. (2002) found that one of the major characteristics of mental toughness is the ability to remain focused despite positive or negative distractions during competition. Currently, no research has examined the relationship between athletic buoyancy and positive stressors.

Measurement. Mental toughness research has received criticism regarding a lack of consistency in its definition, methods, and clarity of findings (Jones et al., 2007). To address these critiques and further develop and explain mental toughness, Jones and colleagues (2002, 2007) conducted early qualitative studies to establish their working definition of the construct, as well as the various attributes that it is comprised of. Other researchers have also tended to utilize qualitative methods (i.e., semi-structured interviews) to examine mental toughness (e.g., Connaughton et al., 2010; Galli & Vealey, 2008; Gucciardi et al., 2008). Following these qualitative studies and the call for the development of valid measures of mental toughness (Jones et al., 2007), several measures of sport mental toughness emerged, including the Mental Toughness Questionnaire-48 (MTQ48; Clough, Earle, & Sewell, 2002), the Sports Mental Toughness Questionnaire (SMTQ; Sheard, Golby, & Van Wersch, 2009), and the Mental Toughness Scale (MTS; Madrigal, Hamill, & Gill, 2013). The MTQ48, in particular, seems to share several similarities with athletic buoyancy. Clough and colleagues (2002) based the MTQ48 on their suggestion that mental toughness is composed of four subcomponents, “control, commitment, challenge and confidence” (p. 38), three of which are also found within the 5Cs of athletic buoyancy: commitment, control, and confidence (Calhoun et al., 2019). Additional conceptual overlap is seen in Clough et al.’s (2002) further division of the subcomponent of control into *life control*, referring to feelings of influence and autonomy of actions, and *emotional control*, which refers to the ability to manage feelings of anxiety. Having low levels of

anxiety plays a key role as one of the 5Cs in both academic and athletic buoyancy: composure (Calhoun et al., 2019; Martin & Marsh, 2008, 2009). Therefore, considering these similarities, studies that have utilized the MTQ48 could be investigating constructs that are strikingly similar to four of the 5Cs of athletic buoyancy, a possibility that should certainly be investigated in future research in order to avoid conceptual redundancies in the sport psychology literature.

Attributes and timing of mental toughness. Another commonly cited model of mental toughness comes from Jones et al.'s series of studies (2002, 2007) on elite and "superelite" (i.e., Olympic gold medalists, world champions, etc.) athletes, where the athletes identified 12 and 30 key attributes of mental toughness, respectively. Through a series of interviews and input from the athletes regarding the appropriate ranking and placement of these attributes, the researchers were able to develop the mental-toughness framework (Jones et al., 2002, 2007), which consists of four dimensions, "attitude/mindset, training, competition, [and] postcompetition" (Jones et al., 2007, p. 247) that contain 13 different subcomponents. The first dimension, attitude/mindset, refers to "a general attitude that the ideal mentally tough performer possesses," and encompasses factors including beliefs and focus (Jones et al., 2007, p. 248). Interestingly, individual attributes within the subcategories of belief and focus are reminiscent of grit. For example, one characteristic of focus, "refusing to be swayed by short-term gains (financial, performance) that will jeopardize the achievement of long-term goals" (Jones et al., 2007, p. 250), is quite similar to the primary emphasis of grit on long-term goal attainment and also perseverance of effort (Duckworth et al., 2007). In contrast, however, focus can also be characterized by "recognizing the importance of knowing when to switch on and off from your sport," (Jones et al., 2007, p. 250), which may be interpreted differently than grit's consistency of interest, which involves remaining steadfast in the pursuit of a goal (Duckworth et al., 2007).

The remaining three dimensions of the mental-toughness framework, “training,” “competition,” and “postcompetition,” refer to “characteristics of mental toughness at specified time phases” (Jones et al., 2007, p. 248). Put simply, each of these time phases suggests that different attributes of mental toughness are relevant at different points in time in the training and competition cycle of an athlete during a season (Jones et al., 2002, 2007). For example, during the training phase, athletes in Jones et al.’s study (2007) reported the importance of long-term goal setting and maintaining control over the situation. During the competition phase, athletes discussed the importance of rethinking negative thoughts, feelings, and perceived pressures, as well as maintaining feelings of commitment and focus (Jones et al., 2007). Finally, during the postcompetition phase, athletes characterize mentally tough athletes as those who are able to effectively navigate the outcome of the competition (failure or success) (Jones et al., 2007).

This emphasis on time-specific dimensions of mental toughness demonstrates the variability of experiences that may be encountered throughout an athlete’s career, as well as its utility in comparison to athletic buoyancy and grit. While grit emphasizes long-term goal striving (Martin et al., 2015), and athletic buoyancy most likely refers to the daily struggles that an athlete may face, the mental-toughness framework (Jones et al., 2002, 2007) provides a way to look at many times points, from short-term goals and challenges to career-long achievement striving, depending on the specific point of the season an athlete is in. Another instance where the mental-toughness framework may specifically differ from athletic buoyancy is in its emphasis on the intensity of the circumstances that mental toughness may apply to. During the development of the mental-toughness framework, several studies asked athletes to consider the most challenging situations that they had encountered as an athlete, and to discuss what was required to be mentally tough enough to effectively handle these situations (Jones et al., 2002,

2007). This stands in contrast to athletic buoyancy, which focuses not on extenuatingly difficult situations, but more common, everyday hassles (Calhoun et al., 2019; Martin & Marsh, 2008, 2009).

It is possible that mental toughness is more like athletic resilience than either grit or athletic buoyancy, in that it appears to apply to a variety of situations, including both positive and negative, and short- and long-term goals (Jones et al., 2007; Gucciardi et al., 2008). In fact, researchers have even questioned the hierarchical relationship between mental toughness and resilience (Cowden et al., 2014). For example, Gucciardi and colleagues (2008) labeled resilience as a characteristic of mental toughness, rather than including mental toughness as a predictor of overall resilience. The broad nature of mental toughness seems to allow for the idea that resilience might be included within the construct of mental toughness; that is, perhaps athletic resilience and buoyancy affect an individual's interactions with perceived *negative* stressors, while other factors within mental toughness aid in handling perceived *positive* stressors.

Predictors and outcomes. Research has attempted to identify predictors and characteristics of mental toughness outside of resilience. For example, a recent study by Cowden et al. (2014) investigated whether learned resourcefulness, a set of skills that relate to managing responses to challenges, and trait anxiety are predictors of mental toughness in NCAA Division I tennis players. The researchers found that while learned resourcefulness was a significant predictor, trait anxiety was not (Cowden et al., 2014). This is an interesting finding, considering that the majority of variance found in buoyancy has been explained by anxiety (Calhoun et al., 2019; Martin et al., 2010; Martin & Marsh, 2008). Jones et al. (2002) reported that a high-level athlete expects and accepts that “competition anxiety is inevitable,” but has confidence in their

ability to effectively handle it (p. 215). So, perhaps mental toughness is more applicable to the effective handling of state-level anxiety, such as that which appears prior to or during athletic competition. Therefore, future research should examine the relationships between mental toughness and both trait- and state-level anxiety to better understand the mental toughness-resilience relationship, as well as how these terms relate to abilities like athletic buoyancy, personality characteristics like grit and hardiness, and also coping skills.

Coping

Definition. Unlike grit, mental toughness, and hardiness, coping is not a component of personality. The transactional model of stress and coping (Lazarus, 1999; Lazarus & Folkman, 1984) details that coping is a dynamic process that involves the appraisal of a situation, evaluation of available resources to cope with the situation, and subsequent actions taken to alleviate the stress. Therefore, in contrast to personality traits such as grit and hardiness, coping is a skill and a multiphasic process that an individual utilizes in an attempt to reduce the severity of and overcome the stressors that they encounter (Lazarus, 1999; Lazarus & Folkman, 1984). Researchers exploring the relationship between resilience and coping have supported the idea that high-resilience individuals tend to utilize more adaptive coping strategies than those with low-resilience (Martin et al., 2015; Smith, Saklofske, Keefer, & Tremblay, 2016). Additionally, according to Fletcher and Sarkar (2013), resilience impacts an individual's appraisals of a situation and their subsequent emotional responses, while coping specifically refers to the strategies employed to deal with those situations.

Measurement. Coping in sports has been measured both qualitatively (i.e., interviews; Cosh & Tully, 2015; Giacobbi et al., 2004) and quantitatively (i.e., self-report surveys; Smith et al., 2016). For example, Cosh and Tully (2015) conducted interviews with a variety of elite-level athletes, and asked questions including “how do you try and deal with setbacks/stress/

difficulties?” and “what do you do to get through stressful or difficult times?” (p. 122). These questions address similar topics as the athletic buoyancy scale items “I’m good at dealing with setbacks in sport (e.g. negative feedback, poor result)” and “I don’t let the stress of sports performance get on top of me” (Calhoun et al., 2019). To obtain quantitative data on coping strategies, Smith and colleagues (2016) utilized the Coping Inventory for Stressful Situations (CISS-SF; Endler & Parker, 1999), which asks participants to rank how often they engage in task-, emotion-, and avoidance-oriented coping behaviors in the face of challenges, and is not situation specific. Other measures of coping skills are situation-specific, such as the Athletic Coping Skills Inventory (ACSI-28; Smith, Schutz et al., 1995), which contains Likert scale-rated items from 7 different subscales: (1) “Coping With Adversity,” (2) “Peaking Under Pressure,” (3) “Goal Setting/Mental Preparation,” (4) “Concentration,” (5) “Freedom From Worry,” (6) “Confidence and Achievement Motivation,” and (7) “Coachability” (Smith, Schutz et al., 1995, p. 384-385). These measures of coping skills, both qualitative and quantitative, as well as domain general or specific, provide consistent evidence of an individual’s ability to evaluate their situation and determine what they can do to effectively handle it, a process termed as “appraisals” (Lazarus & Folkman, 1984).

Primary and secondary appraisals. According to the transactional process model (Lazarus & Folkman, 1984), once an individual perceives a stressor, they engage in a primary appraisal to establish whether this stressor is a potential threat or a challenge to overcome. Since resilience may impact the appraisal process (Fletcher & Sarkar, 2013), it is possible that athletic buoyancy might also influence the appraisal of a stressful situation in a sports setting. If the individual perceives the stressor as a potentially harmful threat, a secondary appraisal takes place to examine what coping resources are available to deal with the threat (Giacobbi et al., 2004;

Lazarus, 1999). If perceived coping resources are high, an individual is more likely to utilize adaptive types of coping strategies; conversely, if perceived coping resources are low, an individual is likely to utilize less adaptive strategies (Smith et al., 2016). Particularly important for secondary appraisals is perceived control; if an individual perceives that they can control their coping response to the stressor, they will also be more likely to utilize adaptive coping strategies (Giacobbi et al., 2004; Smith et al., 2016). Because control is an important factor in athletic buoyancy (Calhoun et al., 2019), and athletic buoyancy is considered to be an ability, it may be worth investigating the similarities and differences between athletic buoyancy and coping as they are utilized in the process of appraising and responding to stressors.

Types of coping strategies. After the secondary appraisal evaluates available coping resources, individuals will then engage in different types of coping strategies to deal with their stressful situation (Lazarus & Folkman, 1984). According to Smith et al. (2016), common coping strategy categories include “task-oriented” (focused on proactive problem solving), “emotion-oriented” (focused on affect regulation), and “avoidance-oriented” (focused on disengagement from stressor) coping strategies. Individuals who perceive that they have adequate amounts of coping resources available will be more likely to utilize task-oriented coping strategies, such as creating a plan to overcome the stressor (Smith et al., 2016). Those who perceive lower coping resources are more likely to utilize emotion- or avoidance-oriented coping strategies, which are “directed at managing the secondary experiences of distress” and tend to be less adaptive forms of coping in the long-term (Smith et al., 2016, p. 319).

Similarities can be found between task-oriented coping strategies and buoyancy’s 5C coordination, which focuses on planning behaviors (Calhoun et al., 2019; Martin & Marsh, 2008, 2009). Considering that athletic buoyancy is described as an ability, and coping as a set of skills,

examining the relationships between them, as well as the various personality traits (i.e., grit, hardiness, mental toughness) that might influence and be influenced by them, could be quite telling in the development of a model of effectively handling stressors.

Conclusions

Researchers have investigated a variety of resilience-related constructs to understand the factors that help athletes to be successful and mentally well, including resilience, grit, mental toughness, hardiness, and coping. With the inclusion of athletic buoyancy (Calhoun et al., 2019), it is important to explore conceptual overlap in these related constructs and determine if and how athletic buoyancy can contribute to the existing sport resilience literature.

While grit (Duckworth et al., 2007) and hardiness (Kobasa, 1979) are proposed to be personality characteristics, athletic buoyancy is defined as an ability (Calhoun et al., 2019), coping as a skill (Lazarus & Folkman, 1984), and resilience and mental toughness as a combination of a process and an innate quality that can be developed (Jones et al., 2007). Despite these definitional differences, the concepts share a similar focus on overcoming adversity, and explain why some individuals can flourish in the face of adversity while others are not. Individuals with resilient, gritty, hardy, or mentally tough personalities likely possess abilities such as athletic buoyancy, and skills such as coping that enable them to deal with stressors of varying degrees of severity.

Based on definitions, measurement practices, and correlates, it seems probable that there is overlap between athletic buoyancy and its resilience-related cognate constructs. Specifically, several of the predictors of buoyancy (5Cs) appear as predictors or factors of grit, mental toughness, hardiness, and coping. Several measures utilized to measure these concepts contain qualitatively similar items, suggesting that there may be some significant conceptual and measurement overlap. While athletic buoyancy and its 5Cs warrant further research and

discussion, there appears to be evidence that athletic buoyancy provides a unique contribution to the sport psychology literature. For example, anxiety, consistently the strongest predictor of buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008), does not appear as a focal point for the other terms discussed in the literature review. Considering that confidence, coordination, commitment, and control are specifically involved with grit, hardiness, mental toughness, and coping, athletic buoyancy's strong relationship with anxiety (i.e., 5C composure) provides evidence of its unique contribution to the existing literature. Additionally, athletic buoyancy's focus on overcoming short-term or immediate challenges and setbacks conceptually differentiates it from the other terms, though similarities with similar constructs should be investigated further.

Practical Implications

Sport psychology research is often translated to athletes, coaches, parents, and other relevant stakeholders for the purposes of improving performance and enhancing athletic experiences. Because of this, it is critical that researchers utilize clear and consistent terms when describing the personality traits, abilities, and skills that give athletes tools to successfully deal with adversity. For example, mental toughness is commonly used and understood among coaches and athletes; in fact, much of the research surrounding mental toughness focuses on coach and athlete opinions of the definitions and components of mental toughness (Jones et al., 2007). Additionally, research tends to focus on elite-level athletes and the pursuit of high-level athletic performance (Galli & Vealey, 2008). Therefore, it is important that researchers consider the impact that focusing on these populations can have on relevant stakeholders, as well as how the research can impact the development and conceptualization of these terms. For example, when coaches and athletes consume sport psychology literature, they may not be aware of the generalizability of the findings to various competition levels, such as youth or subelite-level

athletes. Research methods and findings should be clear to all relevant stakeholders so that findings are applied and considered appropriately to a variety of populations. Additionally, coaches might consider the similarities and differences between these terms to structure their training and interactions with their athletes. Coaches who understand the antecedents and outcomes of each construct can utilize relevant measures to determine how their athletes might be bolstered to handle adversity. For example, a coach could teach coping skills to athletes who lack them, provide appropriate types of feedback to athletes relative to their personality characteristics (i.e., grit and hardiness), and anxiety interventions for athletes displaying low levels of athletic buoyancy (Calhoun et al., 2019). Utilizing this information, coaches can aid athletes in their ability to overcome obstacles and improve their performance.

Limitations and Need for Future Research

There are several limitations of this literature review. First, while six constructs (i.e., athletic buoyancy, resilience, grit, mental toughness, hardiness, and coping) were discussed and compared to one another, no direct empirical analysis was conducted to compare the terms. Future research should statistically compare each of the constructs and measures discussed in this review. Second, because of the qualitative and quantitative methodological differences in the development and assessment of the constructs, it is at times difficult to meaningfully compare them. For example, clearly distinguishing between a skill (i.e., coping), ability (i.e., athletic buoyancy), and a personality trait (i.e., grit and hardiness) can be difficult when consistent defining characteristics are not utilized in research, and their conceptual similarities might lead one to question their independence. Finally, since athletic buoyancy is a relatively new term, there is little research examining it. Until the antecedents, consequences, and uniqueness of athletic buoyancy are better understood, it will be challenging to truly establish its place in the existing sport psychology literature.

Clearly, there is a need for further research and clarification of the cognate constructs. The findings of this literature review suggest that future researchers should carefully consider which measures and concepts they will utilize in their research to investigate athletes' abilities to overcome adversity. It is quite possible that researchers have unknowingly been investigating highly similar constructs, creating redundancies and confusion in the literature, and potentially taking part in jingle-jangle fallacy (Marsh, 1994). Systematic comparison of these constructs may help further standardize the definitions and establish the conceptual uniqueness of each term to guide more consistent and precise future research. While buoyancy has received ample research in the academic domain (Martin et al., 2010; Martin & Marsh, 2008, 2009; Putwain & Daly, 2013), athletic buoyancy is a relatively new term that has limited research and understanding (Calhoun et al., 2019). Therefore, to fully understand athletic buoyancy's place in sport psychology, it is imperative that it be examined in relation to grit, hardiness, mental toughness, and coping skills. Armed with this information, coaches and athletes can gain a greater understanding of what will help them navigate the fluctuating successes and failures of training and competition while maintaining mental wellness and improving athletic performance.

CHAPTER 3. EXAMINING THE INDEPENDENCE OF RESILIENCE-RELATED CONSTRUCTS: ATHLETIC BUOYANCY, MENTAL TOUGHNESS, GRIT, AND COPING

Sport psychology researchers investigate a variety of resilience-based constructs to uncover factors that allow athletes to be successful in and out of sport, including mental toughness (Jones et al., 2007), grit (Duckworth et al., 2007), coping (Smith, Schutz et al., 1995), and recently, athletic buoyancy (Calhoun et al., 2019). Each of these constructs are proposed to represent a personal characteristic or skill that explains favorable psychological or performance outcomes; however, these terms have yet to be empirically examined for their conceptual boundaries, despite their prolific use in current sport psychology literature. As a result, some sport psychology researchers have expressed concern about potential redundancies in the resilience-based literature (Fletcher & Sarkar, 2013; Windle, 2011) where multiple terms represent similar constructs, oftentimes unknowingly (i.e., the jangle fallacy; Marsh, 1994). Therefore, it is important to establish the uniqueness of each resilience-based construct to better understand the factors that allow athletes to flourish in the face of adversity. This may aid in efforts to create positive sport experiences and continued sport participation that can promote a lifetime of physical activity and enhanced quality of life.

Theoretical Background: Cognate Constructs and the Jingle-Jangle Fallacy

Resilience Cognate Constructs

The following cognate constructs, or conceptually similar terms (Martin & Marsh, 2009), will be further investigated in this study for their uniqueness in order to establish their independent contributions to resilience-based research in sport psychology.

Athletic buoyancy. Initially proposed in the academic domain as academic buoyancy (Martin & Marsh, 2008), athletic buoyancy refers to the ability of an athlete “to respond

effectively to the daily challenges and setbacks encountered in athletic contexts” (Calhoun et al., 2019, p. 324). Challenges may include poor performances during practice sessions, navigating difficult relationships with teammates, or receiving negative feedback from coaches. Buoyancy is the subject of ample academic research and is associated with a variety of adaptive psychological outcomes such as reduced emotional instability and higher self-esteem (Martin, Nejad, Colmar, & Liem, 2013), as well as lower test-related anxiety (Putwain & Daly, 2013). Academic buoyancy also relates to school outcomes including higher grade point average and foreign language achievement (Yun, Hiver, & Al-Hoorie, 2018). Research with athletes is less established, but initial findings support the generalizability of buoyancy to the athletic domain (Calhoun et al., 2019) and highlights an inverse relationship with athletes’ anxiety, similar to findings in the academic domain (Martin, Ginns et al., 2013).

Martin and Marsh (2006, 2008) identified five predictors of buoyancy, which they termed the “5Cs”: confidence (commonly measured as self-efficacy), coordination (related to planning ahead), commitment, composure (the quality of having low levels of anxiety), and control. The existence of these five predictors has been supported in subsequent buoyancy research in both the academic (Martin et al., 2010) and athletic (Calhoun et al., 2019) domains. Importantly, of the 5Cs, composure (having low anxiety) has consistently demonstrated robust predictive utility on buoyancy (Calhoun et al., 2019; Martin et al., 2010; Martin, Ginns et al., 2013). When adapted to an athletic context, the 5Cs model significantly predicted athletic buoyancy, though about 75% of the variance was not explained (Calhoun et al., 2019), suggesting that there is much work left to unveiling the mechanisms underpinning athletic buoyancy, and especially to further understanding of its individual contribution to sport psychology. Because of the dearth of

literature on athletic buoyancy, it is imperative to determine its uniqueness in relation to other resilience constructs in order to avoid engaging in the jingle-jangle fallacy (Marsh, 1994).

Mental toughness. Like athletic buoyancy, mental toughness is also proposed to aid a person in overcoming challenges; unlike athletic buoyancy, however, sport psychology researchers commonly utilize mental toughness when investigating psychological factors that pertain to high-level athletic achievement. Mental toughness has many definitions (Cowden et al., 2014; Weinberg et al., 2016), though one of the most frequently cited definitions is: “having the natural or developed psychological edge that enables you to, generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer” (Jones et al., 2007, p. 247). Mental toughness shares some clear conceptual similarities with athletic buoyancy; namely, the emphasis on effectively handling sport-related stressors. The general nature of the definition of mental toughness also suggests that athletic buoyancy may, in fact, be one of the factors that gives athletes the proposed psychological edge compared to their opponents (Jones et al., 2007).

Despite their similarities, one primary difference between the two constructs is in their focus. While mental toughness focuses on athletic performance, athletic buoyancy has yet to be investigated for its relationship with performance. In fact, little work has been conducted on outcome variables for athletic buoyancy, though work in the academic domain, as previously discussed, suggests a variety of positive psychological and performance-based outcomes for buoyancy (Martin, Ginns et al., 2013; Putwain & Daly, 2013; Yun et al., 2018). Another divergence between the two constructs comes from the characteristics of the individuals studied; mental toughness is often investigated with elite-level athletes (e.g., Connaughton et al., 2010; Jones et al., 2007), while buoyancy research has focused on the average individual in both the

academic (Martin & Marsh, 2008) and athletic (Calhoun et al., 2019) domains. The combination of conceptual similarities and differences between mental toughness and athletic buoyancy underscores the need for preliminary investigation concerning their potential overlap.

Grit. Like mental toughness, grit also focuses on achievement, and is defined as “perseverance and passion for long-term goals” (Duckworth et al., 2007, p. 1087). Grit is comprised of two factors: “consistency of interests,” referring to the maintenance of focus on a specific goal; and “perseverance of effort,” which refers to the tendency to put forth continuous effort to achieving that specific goal (Duckworth et al., 2007, p. 1090). Interestingly, grit’s inclusion of “passion” in its definition differentiates it conceptually from athletic buoyancy. Buoyancy does not take passion into account as part of its definition (Calhoun et al., 2019; Martin & Marsh, 2009), and like mental toughness, grit’s emphasis on achievement-related outcomes differentiates it from athletic buoyancy. Even with these differences, conceptual overlap is quite possible between grit and buoyancy. For example, measurement similarities between the two are apparent; the Grit Scale (Duckworth et al., 2007) includes the item, “I have overcome setbacks to conquer an important challenge” (p. 1090), which is quite similar to the athletic buoyancy scale item, “I’m good at dealing with setbacks at sport (e.g. negative feedback, poor result)” (Calhoun et al., 2019, p. 325). The measurement and conceptual similarities between grit and buoyancy suggest that further investigation of their relationship is warranted.

Coping. While mental toughness and grit can be thought of as personality-related characteristics, coping, in contrast, is the dynamic process of appraising and reacting to stressors (Lazarus, 1999; Lazarus & Folkman, 1984). According to the transactional process model (Lazarus & Folkman, 1984), two sets of appraisals occur in response to perceived stressors: (1) the primary appraisal, to determine if the stressor is a threat, and (2) the secondary appraisal, to

evaluate our available resources to effectively handle the stressor (Giacobbi et al., 2004; Lazarus, 1999). Following this appraisal process, an individual will then utilize their available coping strategies to deal with that stressor, including task-oriented strategies involving proactive problem solving for those who perceive high available coping resources (Smith et al., 2016). For those perceiving low amounts of coping resources, engaging in emotion-oriented strategies, which involve affect regulation, or avoidance-oriented strategies, where individuals will attempt to disconnect from the stressor, may be used to “manage the secondary experiences of distress” (Smith et al., 2016, p. 319).

Because buoyancy is an ability (Calhoun et al., 2019; Martin & Marsh, 2008), while coping is a dynamic process and set of skills (Lazarus & Folkman, 1984), some conceptual overlap may be present between the terms. For example, buoyancy’s 5C coordination, which focuses on planning ahead (Martin & Marsh, 2008), is similar to task-oriented coping strategies, which involve proactive problem solving (Smith et al., 2016). Therefore, investigating the differences between athletic buoyancy and coping, as well as mental toughness and grit, can underscore redundancies that may exist in resilience-based sport psychology research.

Reducing Redundancies: The Jingle-Jangle Fallacy

According to Marsh (1994), psychology researchers sometimes unintentionally measure the same constructs while utilizing different names and measures to describe them. Conversely, researchers may utilize measures that claim to assess the same construct, but actually measure two or more different constructs (Marsh, 1994). Marsh (1994) called this tendency the jingle-jangle fallacy, where jingle refers to the assumption “that scales with the same name measure the same construct,” and jangle refers to the assumption that “scales with different names measure different constructs” (p. 377). These assumptions can lead researchers to creating inconsistencies

and redundancies in the literature, stalling advancements in the understanding of a variety of psychological constructs. To overcome this issue, it is critical to empirically investigate using construct validation techniques such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and measurement invariance testing (Marsh et al., 2003). Considering the theoretical similarities between athletic buoyancy, mental toughness, grit, and coping, using a construct validation approach will be valuable in differentiating the terms and reducing the chance of engaging in the jingle-jangle fallacy. Furthermore, establishing clearer boundaries among resilience-based constructs creates a better foundation for investigating unique antecedents and outcomes that can extend current theory and help establish effective interventions for athletes.

Purpose Statement

Upon review of these cognate constructs, it is apparent that the jingle-jangle fallacy is a possibility with resilience-based constructs and, therefore, further examination is warranted. Specifically, in order to investigate the uniqueness of athletic buoyancy, a comparison to mental toughness, grit, and coping can help establish its usefulness in sport psychology. Therefore, the purpose of Study 1 was to examine the conceptual boundaries and overlap that may exist between athletic buoyancy, mental toughness, grit, and coping to establish the uniqueness of each term. The following research question guided the development of Study 1:

1. To what extent do athletic buoyancy, mental toughness, grit, and coping overlap from a construct validity perspective?

Method

Pilot Testing

Prior to beginning Study 1, pilot testing was conducted to obtain preliminary findings and examine the validity of the questionnaire. In September of 2018, 73 college students enrolled in beginning tennis (M age = 20.70, SD = 1.04, 72.9% female) volunteered to participate in a pilot study to examine the validity of the questionnaire for this study. Three participants' responses were removed for missing data (these students only answered the demographics portion of the survey), leaving 70 total participants' responses for data analysis. The majority of the participants were upperclassmen, including 12.9% sophomores, 27.1% juniors, and 60% seniors. Approximately 48% of the volunteers reported having participated in organized sports during their time in college at the recreational, club, or varsity level. Potential participants received a link to the web-based questionnaire via email, and the researcher then met with the students in person to give further instruction and answer any pertinent questions. All students who participated did so voluntarily and without reward. Almost all participants utilized a smartphone to access the link to the survey, and the questionnaire took approximately five minutes to complete.

Pilot Testing Questionnaire Structure

The questionnaire for the pilot study consisted of a short demographics section including age, gender identity, year in college, and college sport participation, the Athletic Buoyancy Scale (Calhoun et al., 2019), the Short Grit Scale (Grit-S; Duckworth & Quinn, 2009), the Sports Mental Toughness Questionnaire (SMTQ; Sheard et al., 2009), and the Coping with Adversity subscale of the Athlete Coping Skills Inventory (ACSI-28; Smith, Schutz et al., 1995). Full

details of these scales can be found in the Methods section for Study 1, and the full questionnaire can also be found in Appendix D.

Pilot Testing Data Analysis & Results

These data were analyzed for simple correlations between athletic buoyancy, grit, mental toughness, and coping, and to examine the internal consistency of each subscale. Correlational results showed significant, moderate positive relationships between all constructs, with the exception of coping and grit ($r = .237, p = .052$). The internal consistency for subscales ranged from .68 to .82, suggesting adequate reliability and that the questionnaire was suitable to utilize for Study 1. These results support the structure of the questionnaire, and all items will be retained for the Study 1 questionnaire. Complete results of the pilot testing can be found in Table 1 below.

Table 1. Pilot test correlation estimates, descriptive statistics, and Cronbach's alpha estimates

	AB	Grit	MT	Cope	<i>M</i>	<i>SD</i>	α
AB	-				4.71	1.13	.68
GRIT	.283*	-			3.35	.60	.75
MT	.474**	.574**	-		2.83	.36	.75
COPE	.499**	.237	.541**	-	2.72	.62	.82

Note: AB = athletic buoyancy (Likert scale 1-7), grit (Likert scale 1-5), MT = mental toughness (Likert scale 1-4), Cope = coping (Likert scale 1-4), ** = $p < .01$, * = $p < .05$

Method

Participants & Recruiting

Adult athletes ($N = 294$) were recruited from a variety of recreational sports leagues in Louisiana and Texas. The sample contained athletes aged 19 to 83 (M age = 42.49, $SD = 14.94$ years), and sports included baseball ($n = 228$), basketball ($n = 25$), beach volleyball ($n = 20$), softball ($n = 13$), indoor soccer ($n = 5$), and swimming ($n = 1$). Eligible participants included adults (aged 18 years or older), who were currently participating in recreational sports at the time of data collection. Participants were not excluded based on gender identity, religion, or other

demographic factors. Athletes predominately identified as male (81.3%) and White/Caucasian (84.4%), and the majority of athletes (83%) indicated that they had participated in their sport for 10 or more years in any league or level (e.g., recreational, club, varsity, etc.). Additionally, approximately 72.1% of athletes reported having participated in sports during high school or college (varsity sport) levels, while just about 4% of athletes reported having played their sport at the professional level. Complete demographic information can be found in Table 2 below.

Table 2. Participant Demographic Information & Athletic History

	Frequency <i>N</i> = 294	Percent
Gender		
Male	239	81.3
Female	50	17.0
Ethnicity		
White/Caucasian	248	84.4
American Indian/Alaska Native	18	6.1
Multi-Racial	11	3.7
Asian/Asian American	6	2.0
Black/African American	5	1.7
Hispanic/Latino/Mexican American	3	1.0
Other	1	0.3
Did not disclose	2	0.6
Sport Played		
Baseball	228	77.6
Basketball	25	8.5
Beach Volleyball	20	6.8
Softball	13	4.4
Indoor Soccer	5	1.7
Swimming	1	0.3
Total years in sport		
<1-4 years	20	6.8
5-10 years	28	9.6
10+ years	244	83.0
Total years in current league		
<1-4 years	167	56.8
5-10 years	52	17.7
10+ years	75	25.5
Highest level of competition		
Interscholastic	108	36.7
Intercollegiate	104	35.4
Recreational	37	12.6
Club	32	10.9
Professional	12	4.1

Measures

All data were collected electronically. Participants were able to access the survey on any device capable of supporting the Qualtrics® survey format (i.e., smartphone, computer, tablet, etc.). The questionnaire was 47 total questions in length and included 7 major sections: demographics and athletic history, athletic buoyancy, grit, mental toughness, coping, sport enjoyment and commitment, and intentions to continue sport participation. Two of the variables, (1) sport enjoyment and commitment and (2) intentions to continue sport participation, were not included in the main analysis of the current study. However, information obtained from these variables was used to inform the method and model utilized in Study 2 of this project.

Demographics & athletic history. Participants were asked to provide their age, gender identity, and ethnicity, as well as information about their athletic history in their respective sport (i.e., length of time participating in sport and in current sport league, highest level of competition played in this sport). To reduce confusion in multi-sport athletes, participants were prompted to respond to the open-ended item “The sport that I am currently playing and basing my responses on is...”. Responses to this section were used to determine significant differences among the athletes based on demographics and athletic experience.

Athletic buoyancy. The Athletic Buoyancy Scale (Calhoun et al., 2019), derived from Martin and Marsh’s (2008) Academic Buoyancy Scale, contains 4 items ranked on a 7-point Likert scale, ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). Items include (1) “I don’t let the stress of sports performance get on top of me;” (2) “I think I’m good at dealing with sports performance pressures;” (3) “I don’t let a bad performance affect my confidence;” and (4) “I’m good at dealing with setbacks in sport (e.g. negative feedback, poor result).” Prior research

utilizing the Athletic Buoyancy Scale has demonstrated good internal consistency ($\alpha = .78$) in a sample of collegiate club sport athletes.

Grit. Grit was evaluated using the Short Grit Scale (Grit-S; Duckworth & Quinn, 2009). The scale contains 8 total items ranked on a 5-point Likert scale ranging from 1 (“Not at all like me”) to 5 (“Very much like me”). The Grit-S evaluates 2 subscales, consistency of interest and perseverance of effort, which make up the two-factor structure of grit proposed by Duckworth and colleagues (Duckworth et al., 2007; Duckworth & Quinn, 2009). Example items from the Grit-S include: (3) “I often set a goal but later choose to pursue a different one” (consistency of interest); and (6) “I finish whatever I begin” (perseverance of effort). The Grit-S scale has shown acceptable levels of internal consistency (i.e., .73-.83; Duckworth & Quinn, 2009).

Mental toughness. The Sports Mental Toughness Questionnaire (SMTQ; Sheard et al., 2009) was used to measure mental toughness. The SMTQ contains 14 items over three subscales: confidence, constancy, and control. Items are ranked on a Likert scale from 1 (“not at all true”) to 4 (“very true”). Example items include: (6) “I have what it takes to perform well while under pressure” (confidence); (3) “I am committed to completing the tasks I have to do” (constancy); and (2) “I worry about performing poorly” (control). The SMTQ’s three-factor mental toughness structure has demonstrated both content validity and internal consistency in prior research (Sheard et al., 2009), though in the current study, this structure was not as clearly defined.

Coping. Coping was measured with the Coping with Adversity subscale of the Athletic Coping Skills Inventory (ACSI-28; Smith, Schutz et al., 1995). This subscale is a combination of items from two originally separate subscales: Positive Orientation and Stress Management (Smith, Schutz et al., 1995). Participants are prompted to consider statements other athletes may have made and then “recall as accurately as possible how often you experience the same thing.”

Participants then rank each of the 4 items on a 4-point Likert scale from 1 (“almost never”) to 4 (“almost always”). Items include: (1) “I maintain emotional control no matter how things are going for me;” (2) “When things are going badly, I tell myself to keep calm, and this works for me;” (3) “When I feel myself getting too tense, I can quickly relax my body and calm myself;” and (4) “I remain positive and enthusiastic during competition, no matter how badly things are going” (Smith, Schutz et al., 1995). According to Smith, Schutz et al. (1995), the Coping with Adversity subscale has demonstrated convergent validity with measures of self-efficacy ($r = .41$) and self-control ($r = .42$).

Data Collection

Following approval from the Institutional Review Board, adult recreational sport league administrators were contacted through email to assess their interest in the project and obtain permission to recruit participants from their athletes. Administrators were provided with a summary of the study’s procedure and goals, as well as the link to the Qualtrics® survey. Further discussion of study procedures, expectations, and any concerns were conducted either through email or over the telephone, depending on the preference of the league administrator. Once permission was granted, the survey link and a short summary of the project were sent out to individual athletes by the league administrator, primarily through email. One exception to this procedure affected approximately 63 beach volleyball and baseball athletes, as the researcher was able to conduct the majority of the data collection from these leagues in-person. Data for these athletes were still collected using the same electronic method as all other participants, but the initial presentation of information regarding the study was conducted in-person, and the survey was accessed through QR code rather than through email link. All participants provided informed consent prior to starting the questionnaire and were permitted to stop at any point.

Data Analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 23), R Software, and Mplus (version 7.4). Data were assessed for input errors, missing data, and signs of non-normal distribution. Descriptive statistics and frequencies were obtained for all variables. Internal consistency was determined using coefficient alpha (Cronbach, 1951) for each variable in the current study, including athletic buoyancy, grit, mental toughness, and coping. Several independent samples t-tests were also conducted with each variable to investigate potential group differences between in-person data collection participants and electronic-only data collection participants.

Exploratory factor analysis (EFA) with robust maximum likelihood procedures was conducted to examine the underlying factor structure of the indicators, which divided the common variance from the unique variance associated with each latent factor. EFA enables the investigation of simple structure, a factor model containing the fewest number of factors, high primary factor loadings, and low cross-loadings between factors (Thurstone, 1947). Six models were tested ranging from one factor to six factors. The model with the fewest factors and strong model fit indices was retained to achieve the goal of maximizing verisimilitude, or the most “approximately correct” number of factors for the dataset, and parsimony (Preacher, Zhang, Kim, & Mels, 2013). Correlations among the factors were calculated, and acceptable model fit was determined using chi-square estimates (χ^2), degrees of freedom and p-value, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis Index (TLI). An RMSEA of .08 was considered “adequate,” while scores below .06 were considered “good” fit (Hu & Bentler, 1999). CFI and TLI values of .90 represent “adequate” model fit, and values of .95 or higher represent “good” model fit (Hu & Bentler, 1999). Evidence for

convergent and divergent validity of each construct was examined using primary and cross-factor loadings, exposing the amount of measurement overlap between constructs. Geomin rotation, which allows for complex factor structures with correlated factors, was used to clarify the factor structure without changing the model fit (Yates, 1987).

Results

Descriptive Statistics & Internal Consistency

Each variable demonstrated acceptable internal consistency ($\alpha = .78-.83$; Nunnally & Bernstein, 1994). Means for each variable were moderate to high relative to their scoring system, indicating that participants reported having higher adaptive traits and skills in the face of stressors and challenges. Details of the descriptive statistics for each variable and respective subscales can be found below in Table 3.

Table 3. Means & Standard Deviations for Scales and Subscales

Variable	Mean	Standard Deviation	Cronbach's Alpha
Athletic Buoyancy	5.31	1.21	.83
Grit	3.71	.64	.78
Consistency of Interest	3.45	.85	.79
Perseverance of Effort	3.96	.73	.76
Mental Toughness	3.15	.43	.83
Confidence	3.24	.49	.80
Constancy	3.42	.47	.57
Control	2.76	.66	.67
Coping	3.05	.67	.81

Note: Likert scale ranges: athletic buoyancy (1-7), grit (1-5), mental toughness (1-4), coping (1-4).

Independent Samples T-Tests

Four independent samples t-tests were conducted to examine potential group differences between participants who completed surveys in the presence of the researcher and participants who completed the surveys through electronic means only. The Bonferroni adjustment was implemented, which adjusted the p -value required for significance to .0125 and reduced the risk of Type I error following multiple simultaneous analyses (Kirk, 2013). Results indicated a small,

but significant mean difference for one variable, coping, where in-person respondents reported slightly lower coping ($2.86 \pm .68$) than electronic-only respondents ($3.10 \pm .65$), $t(279) = -2.621$, $p = .009$. Though the difference is small, this finding should be investigated in future research to determine the possible impact of the distribution method on psychological measures.

Exploratory Factor Analysis

A set of EFAs were conducted to examine the underlying factor structure of the indicators by separating the common variance from the unique variance. Initial results suggested that a 6-factor model may be the best fit for the data ($\chi^2(270) = 383.651$, $p < .001$, CFI = .960, TLI = .936, RMSEA = .038). However, further inspection of the factor loadings revealed clear primary factor loadings for athletic buoyancy, grit, and coping, but problematic cross-loadings among the mental toughness indicators (see Table 4 below). Although mental toughness is comprised of three subscales (i.e., “confidence, constancy, and control,” Sheard et al., 2009, p. 187), they were not clearly represented by the primary factor loadings in the EFA results. Therefore, mental toughness was removed from the analysis, and another EFA was produced with athletic buoyancy, grit, and coping.

Table 4. EFA with Mental Toughness: Factor Loadings & Correlations in 6-Factor Model

Indicator	AB	GI	GE	C	MT1	MT2	h^2	ϵ
AB1	.760	-.062	.030	-.001	-.020	.027	.569	.431
AB2	.557	-.062	-.067	.034	.407	-.120	.564	.436
AB3	.830	.131	.028	-.129	.025	.026	.663	.337
AB4	.688	.030	.002	.050	.101	-.057	.554	.446
G1	-.026	.706	-.134	.050	.054	.051	.552	.448
G3	-.023	.569	-.018	.033	.080	.059	.391	.609
G5	-.025	.731	.094	.043	-.021	-.001	.584	.416
G8	.112	.638	-.010	.011	-.074	.043	.455	.545
G2	.409	-.165	.293	.070	.012	.033	.300	.700
G4	.008	-.051	.680	-.049	-.005	.265	.584	.416
G6	.082	.456	.656	.004	-.015	-.036	.745	.255
G7	-.027	.203	.812	.061	.025	.015	.806	.194

(table cont'd)

Indicator	AB	GI	GE	C	MT1	MT2	h^2	ϵ
C1	-.018	.045	.034	.706	.178	-.089	.620	.380
C2	-.112	-.044	.154	.728	.074	-.062	.511	.489
C3	.035	.089	-.026	.643	.082	.042	.565	.435
C4	.059	-.226	-.009	.591	.015	.283	.457	.543
MT1	.020	-.007	.096	.285	.382	.058	.387	.613
MT5	.190	.097	.117	.095	.348	.050	.353	.647
MT6	.045	.086	-.025	-.008	.628	.230	.582	.418
MT11	.036	-.033	-.064	.037	.624	.128	.460	.540
MT13	-.024	.036	.030	.244	.031	.485	.400	.600
MT14	.016	.037	.042	.200	.459	.339	.624	.376
MT3	-.013	.407	.293	-.129	.250	.028	.383	.617
MT8	-.077	.017	.126	.333	-.115	.171	.158	.842
MT10	.045	.545	.012	.299	-.009	-.023	.534	.466
MT12	-.027	.017	.023	-.011	.113	.736	.608	.392
MT2	.383	.060	.035	.130	-.064	.066	.240	.760
MT4	.170	.098	.018	.308	.111	-.003	.276	.724
MT7	.272	.008	-.036	.542	-.299	.012	.438	.562
MT9	.103	.049	-.093	.557	-.259	.214	.429	.571

Factor Correlations

AB	-						
GI	.166	-					
GE	.068	.183	-				
C	.507*	.426*	.139	-			
MT1	.274*	.194	.249*	.405*	-		
MT2	.215	.407*	.238*	.279	.291*	-	

Note: AB = athletic buoyancy, GI = grit-consistency of interest, GE = grit-perseverance of effort, C = coping, MT1 = mental toughness-confidence, MT2 = undetermined mental toughness factor, F = factor, h^2 = common variance, ϵ = uniqueness. Bold = factor loading $\geq .200$. Grey shading = primary factor loading. Dark box = large cross-loading ($\geq .300$). Italic font = moderate cross-loadings ($\geq .200$). Subscales separated to demonstrate high primary and cross-loadings. * = significant correlation, $p < .05$.

Several EFA models were tested, ranging from 1 to 6 factors. Results of the 48 geomin-rotated analyses suggested that the 4-factor model was the best fit for the data ($\chi^2(62) = 70.135$, $p = 0.22$, CFI = .994, TLI = .989, RMSEA = .021). Details of the fit indices for the models tested can be found in Table 5.

Table 5. EFA Without Mental Toughness: Model Fit Indices for Multiple Factor Models

Model	χ^2	df	<i>p</i> -value	CFI	TLI	RMSEA
1-Factor	903.528	104	<.001	.453	.369	.162
2-Factor	584.776	89	<.001	.661	.543	.138
3-Factor	243.809	75	<.001	.885	.815	.087
4-Factor	70.135	62	.22	.994	.989	.021
5-Factor	56.827	50	.24	.995	.989	.022
6-Factor	41.967	39	.34	.998	.994	.016

Note: χ^2 = chi square, df = degrees of freedom, CFI = comparative fit index, TLI = Tucker Lewis Index, RMSEA = root mean square error of approximation, best fitting model indicated with dotted outline.

Examination of factor loadings aligned with theorized constructs in the model (i.e., athletic buoyancy, coping, and the two components of grit: consistency of interest and perseverance of effort). Cross-loadings were relatively low, though the Grit 2 indicator, worded in the survey as “Setbacks don’t discourage me,” appears to primarily load onto Factor 1, which is most likely athletic buoyancy. Interestingly, results from a 5-Factor EFA suggest that the fifth factor would almost completely be comprised of the second item on the Short-Grit Scale (i.e., Grit 2, factor loading = .761). Further investigation on this finding may provide insight as to why this item stands apart from other similarly worded indicators, such as AB4 (“I’m good at dealing with setbacks in sport”). Factor loadings, common variance, unique variance, and factor correlations for this analysis can be found in Table 6 below.

Table 6. EFA Without Mental Toughness: Factor Loadings & Correlations in 4-Factor Model

Indicator	AB	GI	GE	C	h^2	ϵ
AB1	.754	-.012	.007	.015	.578	.422
AB2	.573	-.063	-.050	.236	.480	.520
AB3	.817	.172	.027	-.094	.667	.333
AB4	.677	.060	-.010	.096	.540	.460
G1	-.019	.711	-.074	.091	.526	.474
G3	-.007	.596	.039	.046	.391	.609
G5	.028	.705	.141	.013	.576	.424
G8	.089	.681	.014	-.024	.479	.521

(table cont’d)

Indicator	AB	GI	GE	C	h^2	ϵ
G2	.401	-.152	.288	.070	.293	.707
G4	.014	-.081	.753	-.050	.526	.474
G6	.034	.336	.696	.000	.742	.258
G7	-.042	.075	.869	.040	.809	.191
C1	.017	.093	.006	.747	.630	.370
C2	-.095	-.001	.119	.727	.531	.469
C3	.073	.175	-.018	.631	.547	.453
C4	.104	-.057	.007	.605	.413	.587
Factor Correlations						
AB	-					
GI	.118	-				
GE	.140*	.288*	-			
C	.445*	.348*	.258*	-		

Note: AB = athletic buoyancy, GI = grit-consistency of interest, GE = grit-perseverance of effort, C = coping, F = factor, h^2 = common variance, ϵ = uniqueness. Primary factor loadings are indicated with grey shading. Large cross-loadings ($\geq .300$) indicated with dark boxes. Moderate cross-loadings ($\geq .200$) are indicated with italic font. Grit subscales: GI (items G1, G3, G5, G8) and GE (items G2, G4, G6, G7), ordered to demonstrate factor structure. * = significant correlation, $p < .05$.

Discussion

Sport psychology researchers have expressed concern about potential redundancies in the literature regarding such constructs (Fletcher & Sarkar, 2013; Windle, 2011). Because of the risk of engaging in the jingle-jangle fallacy (Marsh, 1994), it is critical to provide empirical evidence that these constructs have been utilized appropriately in prior research and that each provides a unique contribution to furthering our understanding of factors that promote adaptive behaviors in the face of challenges and setbacks. Therefore, purpose of Study 1 was to examine resilience-related cognate constructs including athletic buoyancy, mental toughness, grit, and coping for their conceptual boundaries to provide empirical evidence of their distinctiveness. Specifically, a construct validity approach was used to test reliable quantitative measures of each construct (i.e., Athletic Buoyancy Scale, Calhoun et al., 2019; Sports Mental Toughness Questionnaire, SMTQ, Sheard et al., 2009; Short Grit Scale, Grit-S, Duckworth & Quinn, 2009); Coping with Adversity Subscale of the Athletic Coping Skills Inventory, ACSI-28, Smith, Schutz et al., 1995). After

examining each subscale's internal consistency, the subscales were examined for their distinctiveness by utilizing EFA.

6-Factor Model

Although initial EFA results suggested that a 6-factor model would best fit the data ($\chi^2(270) = 383.651, p < .001, CFI = .960, TLI = .936, RMSEA = .038$), following the review of primary and cross-factor loadings for this model, it became apparent that the 3 components of mental toughness (i.e., confidence, constancy, and control) were not reflected by their indicators (see Table 4). Results suggested that one of the six factors from the model may have been comprised of the mental toughness component "confidence," and primary factor loadings for this subscale ranged from .348 to .624. However, most indicators from the SMTQ, including four of the confidence subscale items, contained relatively high cross-loadings (i.e., $>.200$) on multiple factors. As a result, no clear factor structure could be interpreted for all three components of mental toughness, and mental toughness was removed from the remainder of the analyses for Study 1.

There may be several explanations for why this occurred, and each may have important implications for the methodological and conceptual concerns regarding the cognate constructs. First, a theoretical explanation: there may be significant conceptual overlap with the other constructs examined in the study. For example, the mental toughness factor "control" primarily loaded onto factors representing athletic buoyancy and coping, both of which place great emphasis on feelings of control. Control is one of buoyancy's 5Cs, or main predictors (Calhoun et al., 2019; Martin & Marsh, 2008, 2009), and coping as measured in Study 1 is largely comprised of personal characteristics and skills that enable a person to control their response to a stressor and decide what to do next (Smith, Schutz et al., 1995). Supporting this, the relationship

between mental toughness-confidence and coping was also represented by a moderate positive significant correlation ($r = .405$). Further, mental toughness-confidence demonstrated low-moderate correlations with grit-perseverance of effort ($r = .249$) and athletic buoyancy ($r = .274$), which may represent mental toughness' conceptual similarities with grit's focus on pushing through challenges, as well as athletic buoyancy's 5C Confidence. The magnitude of these correlations, however, suggests that these resilience-based factors were generally distinct from one another.

Constancy, another component of mental toughness, also loaded heavily onto coping (factor loadings = .299 and .333), and in addition, there were high cross-loadings with the factor representing grit-consistency of interest (factor loadings = .407 and .545). Conceptually, this makes sense; in general, both constancy and consistency of interest represent an individual's focus on achieving one specific goal (Duckworth & Quinn, 2009; Sheard et al., 2009). These conceptual similarities between the cognate constructs and mental toughness in Study 1 may have significantly impacted the mental toughness structure represented in the results. This suggests possible redundancy when measuring mental toughness alongside the other constructs.

Second, a methodological explanation for the mental toughness factor structure: the sample population consisted of recreational athletes, while the SMTQ was created and validated with athletes from higher levels of competition (i.e., "performers competing at international, national, county and provincial, or club and regional standards"; Sheard et al., 2009, p. 187). Although participants in Study 1 did report having competed at a variety of competition levels at some point in their athletic history, including professional ($n = 12$) and collegiate ($n = 104$)

levels, at the time of data collection, all participants were participating in recreational leagues¹. These leagues tend to be less competitive and require less time commitment from the athletes, which differs greatly from higher levels of competition and training. As a result, athletes from Study 1 may not have responded to the SMTQ items in the same manner as the higher-level competition athletes from Sheard et al.'s (2009) research. For example, Study 1 participants were prompted to consider experiences in their current sport when responding to the SMTQ. Items such as (4) "I am overcome by self-doubt," and (14) "Under pressure, I am able to make decisions with confidence and commitment," may not have been as relevant for the recreational athletes, who may not feel strong competition- and pressure-related emotions like those that may be felt by athletes who are currently training for and playing in higher-level competitions. Sheard and colleagues (2009) also found differences on SMTQ responses between competition levels within their own validation study. Athletes from the lower competition levels (i.e., club/regional) scored lower in confidence than athletes competing at higher levels (i.e., county/provincial); additionally, the highest-level athletes (i.e., international/national) scored higher on both confidence and constancy than any of the other competition levels (Sheard et al., 2009). It is possible that competition level is a major factor in examining and understanding mental toughness, and it is reasonable to consider that the SMTQ may have functioned differently in a group of recreational athletes, as well, if they had been a part of Sheard et al.'s (2009) initial research. This may also explain why mental toughness as measured by the SMTQ did not produce a meaningful factor structure in Study 1. Because of the possible conceptual overlap and potential measurement concerns with mental toughness, the construct was removed from the

¹ Participants were playing in recreational leagues at the time of data collection, but data was not collected regarding simultaneous sports participation at other levels of competition (i.e., club, intercollegiate, professional, etc.). Future research should address the impact of playing sports simultaneously at multiple levels.

remaining analyses, and another set of EFAs were conducted containing the three remaining constructs: athletic buoyancy, grit, and coping.

4-Factor Model, One Less Construct

In general, following the removal of mental toughness from the analysis, results suggested that the three remaining constructs, athletic buoyancy, grit, and coping, were, in fact, distinct factors as measured in this study. Results from the EFA indicated clear primary factor loadings for athletic buoyancy (factor loadings = .573-.817), coping (factor loadings = .605-.747), and grit (factor loadings = .288-.869). Further, the two components of grit, consistency of interest (factor loadings = .596-.711) and perseverance of effort (factor loadings = .288-.869), were also apparent following the EFA, suggesting that a 4-factor model worked best for the data ($\chi^2(62) = 70.135, p = 0.22, CFI = .994, TLI = .989, RMSEA = .021$). This clear factor structure can be seen in Table 6 above.

Examination of factor correlations further supported these findings and indicated that all factors displayed significant low-to-moderate, positive correlations ($r = .140-.445$), with the exception of the non-significant correlation between athletic buoyancy and grit-consistency of interest ($r = .118, p > .05$). Athletic buoyancy focuses on the ability to handle typical challenges (Calhoun et al., 2019) whereas grit-consistency of interests focuses more on remaining steadfast in pursuit of one specific goal (Duckworth & Quinn, 2009). Therefore, athletic buoyancy appears to be more conceptually different from grit-consistency of interest compared to grit-perseverance of effort. The Grit-S items for grit-perseverance of effort include strongly worded statements regarding the ability to handle challenges and feelings of confidence, including (2) “Setbacks don’t discourage me,” and (4) “I am a hard worker” (Duckworth & Quinn, 2009), each of which is reminiscent of the Athletic Buoyancy Scale Items (e.g., (1) “I don’t let the stress of sports

performance get on top of me”). Taken together, these correlations suggest that athletic buoyancy, coping, and grit are related, but clearly distinct, and also that certain components of each construct may be more closely tied than others.

There were also three instances of moderate cross-loadings among the four factors, which can be seen in Table 6. The second athletic buoyancy scale item, “I think I’m good at dealing with sports performance pressures,” displayed a low-moderate cross-loading onto the factor representing coping skills. Considering that coping reflects an individual’s set of skills to assess and effectively handle a situation, it is logical that this particular Athletic Buoyancy Scale item demonstrated the cross-loading, as the item asks an athlete to consider their ability to handle stressors, which may be interpreted as their personal set of skills to effectively handle challenges. Additionally, coping and athletic buoyancy share the strongest correlation of all the components ($r = .445, p < .05$), suggesting a meaningful relationship. The other moderate cross-loadings occurred within the second and sixth Grit-S items. The second Grit-S item, “Setbacks don’t discourage me,” loaded onto the factor representing athletic buoyancy (factor loading = .401) more so than onto its relevant grit component, consistency of interest (factor loading = .288). The wording of this particular item is reminiscent of athletic buoyancy’s item (4) “I’m good at dealing with setbacks in sport (e.g. negative feedback, poor result).” This moderate cross-loading may represent grit’s relationship to athletic buoyancy by addressing one of buoyancy’s 5C predictors: commitment. According to Martin and Marsh (2006), 5C Commitment represents persistence in the face of challenges, a similar description to grit’s consistency of interest, which may demonstrate a small amount of conceptual overlap between athletic buoyancy and grit.

The sixth Grit-S item, “I finish whatever I begin,” displayed a moderate cross-loading (factor loading = .336) onto the factor representing grit-consistency of interest. It is possible this

relationship was seen because of the item's wording; "I finish whatever I begin," could be interpreted as commitment to a goal or activity (i.e., consistency of interest), or as the drive to exert energy toward the pursuit of that goal or activity (i.e., perseverance of effort). The non-specific phrasing of this particular item may account for the moderate cross-loading seen between the two grit factors in the 4-factor model. Despite these cross-loadings, overall, the factor structure for athletic buoyancy, grit-consistency of interest, grit-perseverance of effort, and coping was clear, and demonstrates the constructs' relative uniqueness.

Limitations

There are several limitations of Study 1. A first limitation of this study relates to the recruiting process for the athletes. Despite attempts to collect face-to-face data at a variety of locations, the majority of the data was collected through electronic means only, without actual researcher-participant interaction. All relevant study information was provided to participants, but it is important to note the challenges that may arise from online data collection, such as misinterpretation of questionnaire prompts, inability to ask immediate questions, and inconsistent data collection contexts (i.e., researcher was unable to control the specific context in which each participant completed the survey). However, results suggest that the questionnaire, with the exception of the SMTQ, performed adequately and consistently. The second limitation of note, the necessary removal of mental toughness from the analysis, eliminated the ability to investigate how mental toughness functions in comparison to the other constructs. This is unfortunate, given its prolific use in sport psychology research and also as a colloquial term. However, the information gleaned from removing mental toughness from the questionnaire proved to be quite important, and provided direction for future research methods, questions, and hypotheses moving forward.

Future Research & Practical Implications

It is important to acknowledge that the sole use of quantitative, questionnaire-based data collection introduces an uncertain amount of subjectivity into the data and does not allow for the kind of meaningful depth that qualitative methods, or mixed-methods, can provide. Previous research has utilized various qualitative data collection techniques to measure these constructs, like Jones and colleagues' (2002) use of focus groups and individual interviews about mental toughness. Therefore, subsequent research to Study 1 will certainly benefit from additional research methods; however, the present study sought to develop preliminary empirical evidence for the distinctiveness of each of the constructs, and succeeded in providing a foundation to build future projects that may utilize more complex research methods to obtain that rich, meaningful detail needed to fully understand these topics.

Additionally, findings from Study 1 suggest that athletic buoyancy, grit, and coping skills can be considered and utilized as separate constructs in sport psychology research, which opens promising opportunities in the study of the positive psychological factors that promote adaptive behaviors in the face of challenges and setbacks. Because athletic buoyancy was a recently introduced term into the sport psychology literature, it was important to empirically examine whether it does, in fact, add meaningful information into the research pool. Promisingly, findings from Study 1 not only demonstrate that athletic buoyancy is separate from grit and coping, but also that grit and coping are distinct, as well; these results address, at least in part, the concerns of researchers who feared redundant methodologies and constructs (Fletcher & Sarkar, 2013; Windle, 2011), though further research is needed to further verify and clarify these results and how they may be implemented. For example, further analyses should be conducted with other commonly used questionnaires and methodologies for each construct. Additionally, because

mental toughness did not provide useful information for Study 1, future research should investigate whether mental toughness is important for recreational athletes, if perhaps a different measure of mental toughness would be more appropriate for this population, and also if mental toughness may actually already be accounted for with the measurement of athletic buoyancy, grit, and coping. If so, accounting for this will aid in reducing the potential redundancies in the literature and help sport psychology researchers avoid the jingle-jangle fallacy. Finally, future investigations should consider the strong positive relationship found between athletic buoyancy and coping and the practical implications this may have for athletes and coaches. For example, it is possible that improving coping skills may help enhance athletic buoyancy, or vice versa. Understanding this relationship, as well as those among all variables in Study 1, may provide athletes, coaches, and sport psychology practitioners with tools to promote positive affect, improved sport experiences, and extended sport participation.

CHAPTER 4. AN INVESTIGATION OF THE INTRAPERSONAL AND INTERPERSONAL INFLUENCES ON ATHLETIC BUOYANCY AND SPORT PARTICIPATION INTENTIONS

Participation in sports comes with a variety of psychological, physical, and social benefits for individuals across the lifespan (Eime, Young, Harvey, Charity, & Payne, 2013; Shores, Becker, Moynahan, Williams, & Cooper, 2015). For example, positive sport experiences can lead to increases in self-efficacy in young athletes (Reverdito et al., 2017), reduced sedentary behavior in older adults (McCracken & Dogra, 2018), and improved feelings of social connectedness (Hoye, Nicholson, & Brown, 2015). Despite the known benefits, the troubling reality is that the majority of adults do not participate in adequate amounts of physical activity to reap health benefits or prevent disease (Centers for Disease Control and Prevention, 2018). Additionally, as with time spent in exercise, sport participation tends to decline with age (Eime et al., 2016; Jenkin, Eime, Westerbeek, & van Uffelen, 2018). Therefore, determining important antecedents related to one's intentions to participate in sports could provide valuable information on how to keep adults physically active, psychologically well, and socially engaged.

Theoretical Background: Barriers to Participation and Psychosocial Factors

Barriers to Sports Participation

To understand the factors that motivate adults to remain in sports, it is important to first examine various barriers that ultimately lead to dissatisfaction, and possibly dropout, in this age group. Research examining sport participation rates throughout the lifespan has repeatedly demonstrated that participation in sports tends to decline with age (Eime et al., 2016; Gucciardi & Jackson, 2015; van Houten, Kraaykamp, & Breedveld, 2017). Specifically, in a study of Australian athletes, Eime et al. (2016) found that about one-third of athletes in the sample were under the age of 20, and their level of sport participation dropped dramatically during

adolescence. Because of the rapid decline in sport participation seen during and after adolescence (Eime et al., 2016), and the low rates of sport participation in adulthood (Gucciardi & Jackson, 2015), various barriers to participation have been identified and acknowledged, which may provide guidance on methods to ultimately reduce their prevalence and improve participation.

Witt and Dangi (2018) have identified three categories of barriers to youth sport participation that are reflective of barriers also identified by other researchers in adult populations (Jenkin et al., 2018; van Houten et al., 2017). The first category, *intrapersonal constraints*, includes barriers such as “lack of enjoyment (not having fun, being bored); low perceptions of physical competence; intrinsic pressures (e.g., stress); and perceptions of negative team dynamics (negative feelings toward team or coach” (Witt & Dangi, 2018, p. 191). For young adults, major life changes, such as the start of a new career, can pose a significant intrapersonal challenge to continued sport participation (van Houten et al., 2017). For older adults (50+ years), intrapersonal constraints may include limited athletic or physical skills, or declining physical health (Jenkin et al., 2018). *Interpersonal constraints*, the second category of barriers identified by Witt and Dangi (2018), may include perceived pressure from parents for young athletes (Witt & Dangi, 2018), marriage or birth of a child for young adults (van Houten et al., 2017), or perceived time constraints in older adults (Jenkin et al., 2018). Finally, *structural constraints* refer to practical barriers to sport participation, including overuse injuries from excessive practice time for young athletes (Witt & Dangi, 2018), lack of facilities and childcare opportunities for young adults and adults with small children (van Houten et al., 2017), and lack of age- and ability-appropriate sport opportunities for older adults (Jenkin et al., 2018).

Knowing the various barriers to sport participation across the lifespan affords the opportunity to focus on the specific factors that can hinder participation, specifically those that

fall within the categories of barriers identified above: intrapersonal, interpersonal, and structural (Witt & Dangi, 2018). To identify these barriers and potentially reduce them in the future, Study 2 addresses “intrapersonal” factors, including fear of failure, athletic buoyancy, sport enjoyment, sport commitment, and anxiety; as well as the “interpersonal” factor of social support, to examine their impact on adults’ intentions to continue playing their sports in future seasons.

Fear of Failure, Sport Enjoyment, Sport Commitment, Athletic Buoyancy, & Anxiety

Fear of failure has been described as “the motive to avoid failure in evaluative achievement situations” (Sagar & Jowett, 2012, p. 62), as well as the tendency to view potential performance failures as threats to one’s wellbeing (Conroy, Willow, & Metzler, 2002).

According to Lazarus (1991), when an individual perceives that they could fail at a personally meaningful activity, they may then prospectively interpret the consequences of that failure as a threat to their wellbeing, resulting in a fear response to that potential threat. Individual appraisals of failure can vary; however, one model of fear of failure (Conroy, 2001; Conroy et al., 2002) identifies 5 underlying dimensions: (1) fear of “experiencing shame and embarrassment”; (2) fear of “devaluing one’s self-estimate”; (3) fear of “having an uncertain future”; (4) fear of “important others losing interest”; and (5) fear of “upsetting important others” (Conroy et al., 2002, p. 77). If athletes interpret a potential failure in a meaningful activity as a threat to one or more of these categories, it is likely they will experience fear of failure (Conroy et al., 2002).

Although athletes have reported that feelings of fear of failure can be motivational for high performance (Conroy et al., 2002), research on fear of failure has identified a breadth of negative outcomes associated with avoidance behaviors and negative affect in achievement settings (Conroy, 2001). For example, Conroy and colleagues (2002) found that fear of failure was “associated with (a) high levels of worry, somatic anxiety, cognitive disruption, and sport

anxiety, and (b) low levels of optimism” (p. 76). These negative interpretations of the consequences of failing could impact our physical and psychological wellbeing (Conroy et al., 2002), and perhaps influence athletes’ decisions to continue engaging with the activity.

According to the most recent iteration of the Sport Commitment Model (SCM), an athlete’s commitment to their sport is comprised of two components: “enthusiastic commitment,” which refers to the “positive or ‘want to’ side of commitment,” and “constrained commitment,” which refers to the “have to” side, or feelings of obligation toward a sport (Scanlan, Chow, Sousa, Scanlan, & Knifsend, 2016, p. 234; Scanlan, Russell, Scanlan, Klunchoo, & Chow, 2013). The present research focuses on enthusiastic commitment. The SCM details that enthusiastic commitment is representative of “the desire and resolve to persist in a sport over time,” and a “willingness to overcome obstacles to continue sport participation” (Scanlan et al., 2016, p. 235), concepts that are similar to those promoted by athletic buoyancy and the other resilience-related cognate constructs discussed in Study 1. Additionally, the SCM presents sport enjoyment as a major predictor of sport commitment, defined as “the positive affective response to a sport experience that reflects generalized feelings of joy” (Scanlan et al., 2016, p. 235). Athletes who experience feelings of sport enjoyment should feel higher enthusiastic commitment to that sport and, therefore, may be less likely to leave the sport at the end of a season. Further, commitment is one of the 5C predictors of buoyancy proposed by Martin and Marsh (2008). This suggests that since sport enjoyment promotes feelings of enthusiastic commitment, and commitment is a predictor of buoyancy, then higher feelings of sport enjoyment may lead to improved athletic buoyancy and ultimately longer sport participation. Linking these concepts may help us understand the relationship between athletic buoyancy and intentions to continue sport

participation; that is, how an athletes' buoyancy may impact their decision to either remain in their sport long-term or drop out prematurely.

Although previous research on the predictors of buoyancy (i.e., 5Cs: confidence, coordination, commitment, composure, and control) has established their predictive utility, findings suggest only limited variance explained in athletic buoyancy in a population of collegiate club sport athletes (Calhoun et al., 2019). Additionally, athletic buoyancy has yet to be examined for its predictive utility on sport-related outcomes, such as intentions to continue engaging in a sport, though buoyancy in the academic domain has demonstrated a positive correlation with both academic achievement and engagement (Martin, 2014). Therefore, further research on this construct is necessary to establish its antecedents and consequences, as well as to determine if it has a meaningful role in determining intentions to continue participating in sports.

Anxiety (i.e., composure) has demonstrated the strongest predictive influence on buoyancy in academics and athletics thus far, and has exhibited a consistent negative relationship with buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008, 2009). Anxiety is associated with many negative psychological and behavioral outcomes, including dropout from sport due to fear of “excessive criticism” (Witt & Dangi, 2018, p. 192), and a student adopting “counterproductive strategies,” such as self-handicapping, in the face of adversity (Martin et al., 2010, p. 488). Importantly, anxiety has demonstrated strong correlations with other achievement setting-relevant factors, including fear of failure (Amjad, Irshad, & Gul, 2018; Conroy, 2001; Correia & Rosado, 2018).

Martin and Marsh (2008) suggest that one way that students might reduce feelings of anxiety is to make positive changes that can help with their feelings of fear of failure, such as viewing mistakes as opportunities for learning and improvement. This relationship between

anxiety and fear of failure may have implications for buoyancy. For example, in the academic domain, there is evidence that academic buoyancy may influence the way in which students interpret fear appeals, specifically, consequence reminders (e.g., a reminder that the final exam is worth 50% of final grade, or that a student cannot pass a course with less than a C grade). Research has shown that when teachers remind students of the potential consequences of failure, academic buoyancy serves as a moderator between fear appeals and fear appraisals, where having higher academic buoyancy helps a student deal with the stress of this reminder (Symes, Putwain, & Remedios, 2015). Considering the strong influence of anxiety on buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008, 2009) and Symes et al.'s (2015) findings, a more complex relationship between anxiety, athletic buoyancy, and fear of failure may exist. Combatting fear of failure, anxiety, or low buoyancy may lead to positive psychological outcomes that ultimately increase a person's desire to remain an active participant in sports. Additionally, considering the important role of the teacher on fear appraisals in Symes et al.'s (2015) research, it may be pertinent to explore the potential role of social support as an additional factor of understanding academic and athletic buoyancy.

Social Support

The 5Cs of athletic buoyancy are all intrapersonal in nature, focusing on five personal factors and feelings toward sports. This intrapersonal focus may exclude the potentially important interpersonal role of social support. Research has investigated the relationship between social support and academic buoyancy as they relate to academic motivation, where higher levels of social support and academic buoyancy were related to positive motivation outcomes such as higher self-efficacy and persistence in school (Collie et al., 2017). It is likely that athletic buoyancy also shares a similar relationship with social support and positive achievement

motivation-related outcomes. Further investigation of these concepts is warranted to expand upon the current understanding of buoyancy and the interpersonal factors that may influence it.

Psychosocial investigations of sport have uncovered a range of social benefits of sport participation, including increased feelings of social connectedness (Hoye et al., 2015; Jenkin et al., 2018). Youth who have social support from friends are significantly more physically active (Duncan, Duncan, & Strycker, 2005), which likely extends to sport participation. Additionally, athletes who play team sports experience more positive social and psychological outcomes than those who play individual sports, which is likely due to the “social nature” of team sports (Eime et al., 2013, p. 13). Social support has also shown links to sport-related anxiety. For example, young athletes who receive social support from their coaches have demonstrated lowered sport performance anxiety (Bum & Shin, 2015; Smith, Smoll, & Barnett, 1995).

Taken together, these findings provide support for the existence of relationships among social support and the intrapersonal variables in Study 2. Buoyancy is largely informed by anxiety (Calhoun et al., 2019; Martin & Marsh, 2008, 2009), and anxiety has demonstrated a negative relationship with social support (Smith, Smoll et al., 1995). This suggests that as social support increases, feelings of anxiety should decrease and, therefore, athletic buoyancy should be positively impacted. Additionally, higher perceived social support may lessen feelings of fear of failure, reducing its potential impact on athletic buoyancy. It is also possible that social support may be associated with higher feelings of sport enjoyment which may, in turn, positively impact sport commitment and athletic buoyancy. However, it should be noted that prior research has not yet supported a direct relationship between social support or social acceptance and sport commitment (Garn, 2016; Scanlan et al., 2016), though the reasons for this non-relationship have not been fully explored. This provides a unique opportunity to examine if and how athletic

buoyancy, anxiety, and fear of failure may be related to the link between social support and sport commitment. Understanding the existence and strength of these relationships may ultimately help explain whether an individual can overcome the various barriers they encounter, or if they intend to pursue activities that promote health and wellbeing.

Purpose Statement, Research Questions, & Hypothesized Model

The purposes of Study 2 were (1) to explore both interpersonal and intrapersonal factors that related to athletic buoyancy, including fear of failure, anxiety, sport enjoyment, sport commitment, and social support; and (2) to examine athletic buoyancy's predictive utility on intentions to continue sport participation in adult athletes. The following research questions guided the development in Study 2:

1. Does athletic buoyancy mediate the relationships between the predictors (anxiety, fear of failure, sport enjoyment, sport commitment) and the outcome, intentions?
2. Does social support moderate the relationships between the predictors (anxiety, fear of failure, sport enjoyment, and sport commitment), athletic buoyancy and intentions?

The hypothesized model examined in Study 2 can be found in Figure 1.

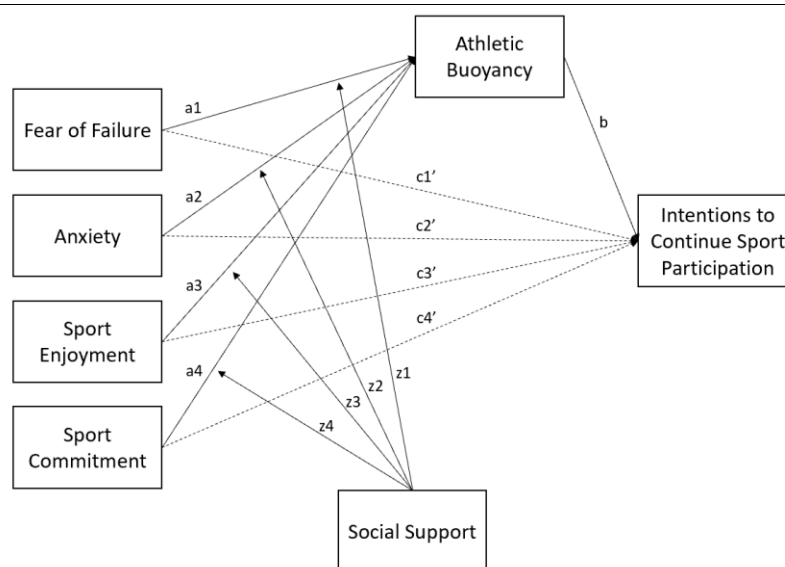


Figure 1. Study 2 Hypothesized Model

Method

Pilot Testing

During Study 1, data were collected on three extra variables to inform the method and model utilized in Study 2: (1) sport commitment, (2) sport enjoyment, and (3) intentions to continue playing sports in the future. This pilot testing had several purposes. First, at the time Study 1 was conducted, athletic buoyancy had yet to be examined for its predictive utility on any outcome, so preliminary examination of its effect on intentions to continue sport participation was warranted prior to setting the model to be tested in Study 2. Second, because little research addresses affective influences on athletic buoyancy aside from anxiety, a negative affective experience, an investigation of positive affective experiences was also warranted to determine its place in the model for Study 2. Third, previous research on athletic buoyancy in a population of sport club athletes has demonstrated a positive correlation between athletic buoyancy and sport commitment, one of the 5C predictors ($r = .23, p < .05$; Calhoun et al., 2019). However, results did not support sport commitment's predictive utility on athletic buoyancy ($\beta = .11, p = .06$), despite the fact that commitment is one of the 5C predictors of buoyancy proposed by Martin and Marsh (2008, 2009). Therefore, further exploration of the relationship between athletic buoyancy and sport commitment was needed.

Pilot Testing Questionnaire Structure

In addition to the primary sections of the questionnaire utilized in Study 1, athletes completed the 5-item Sport Enjoyment and 6-item Enthusiastic Commitment subscales of the Sport Commitment Questionnaire-2 (Scanlan et al., 2016), as well as a 3-item scale modified from its original focus on exercise (Chatzisarantis, Biddle, & Meek, 1997) to measure intentions

to continue sport participation. Details of these measures can be found in the Method section for Study 2, and the full questionnaire can be found in Appendix G.

Pilot Testing Data Analysis & Results

Data were analyzed to obtain descriptive statistics (i.e., mean and standard deviation), Cronbach's alpha estimates, and simple correlations between athletic buoyancy, sport enjoyment, enthusiastic commitment, and intentions to continue sport participation. Most variables' means were high relative to their scoring system, and all variables were significantly, positively correlated. Full results of these analyses can be found in Table 7 below.

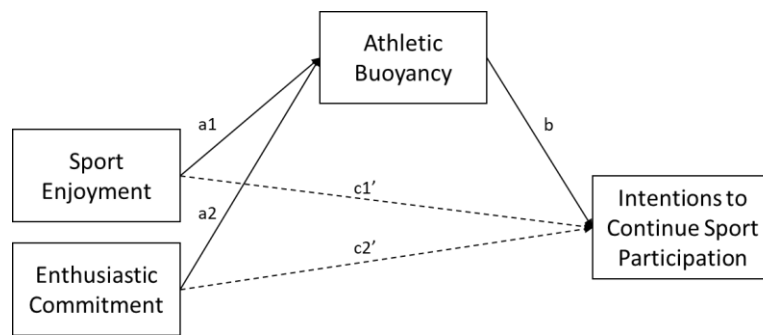
Table 7. Pilot testing correlation estimates, descriptive statistics, and Cronbach's alpha

	AB	SE	EC	INT	<i>M</i>	<i>SD</i>	α
AB	-				5.29	1.22	.83
SE	.309**	-			4.82	.49	.91
EC	.126*	.678**	-		4.47	.70	.91
INT	.216**	.673**	.720**	-	6.60	.94	.93

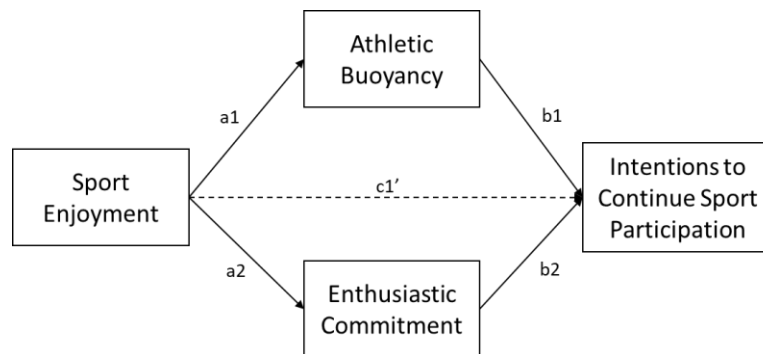
Note: AB = athletic buoyancy (Likert scale 1-7), SE = sport enjoyment (Likert scale 1-5), EC = enthusiastic commitment (Likert scale 1-5), INT = intentions to continue sport participation (Likert scale 1-5), ** = $p < .01$, * = $p < .05$

Several multiple linear regressions were conducted to aid in determining the most appropriate model to use in Study 2, with intentions to continue sport participation as the dependent variable in each analysis. The three models tested in the pilot study can be found in Figure 2 below. Pilot Model 1 examined sport enjoyment and enthusiastic commitment as predictors of intentions, with athletic buoyancy serving as a mediator between the predictors and outcome variable. Results indicated that Pilot Model 1 explained about 60% of the variance found in intentions ($R^2 = .58$), though athletic buoyancy served neither as a significant predictor of intentions ($\beta = .03, p = .41$), nor mediator between enthusiastic commitment and intentions ($\beta = -.001, p = .46$) or sport enjoyment and intentions ($\beta = .03, p = .42$). Results also indicated that

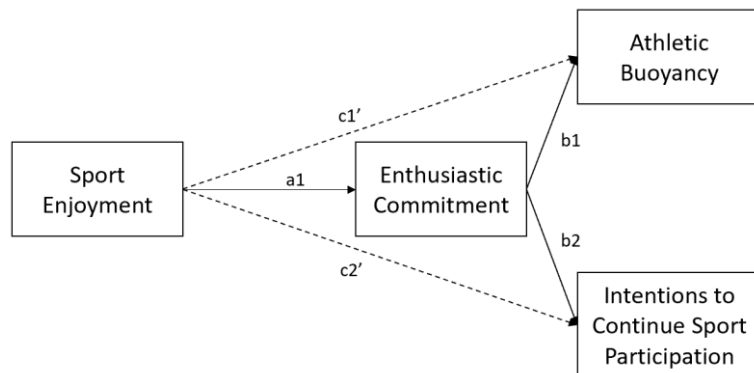
enthusiastic commitment negatively predicted athletic buoyancy ($\beta = -.15, p < .05$). Prior research demonstrated a positive relationship between commitment and athletic buoyancy (Calhoun et al., 2019), so the current results may simply indicate measurement error, or possibly inherent and unexplored differences between the population of recreational athletes used in Study 1 and the sport club athletes used in Calhoun et al.'s (2019) research.



Pilot Model 1



Pilot Model 2



Pilot Model 3

Figure 2. Pilot models tested

Building on results from Pilot Model 1, Pilot Model 2 placed athletic buoyancy and enthusiastic commitment as predictors of intentions, and sport enjoyment as a predictor of athletic buoyancy and enthusiastic commitment. Research has demonstrated sport enjoyment's predictive utility on enthusiastic commitment (SCM; Scanlan et al., 2016), and the current analysis serves as an exploration of its influence on athletic buoyancy. Results again demonstrated that sport enjoyment was a significant positive predictor of both athletic buoyancy ($\beta = .30, p < .001$) and enthusiastic commitment ($\beta = .68, p < .001$). Additionally, sport enjoyment's direct influence on intentions was significant ($\beta = .28, p < .05$), as well as its indirect path through enthusiastic commitment ($\beta = .33, p < .001$). As in Pilot Model 1, the indirect pathway between sport enjoyment, athletic buoyancy, and intentions was non-significant ($\beta = .01, p = .42$).

Results of Pilot Model 1 and Pilot Model 2 suggested that athletic buoyancy did not serve as a significant predictor of intentions, nor as a mediator between sport enjoyment, sport commitment, and intentions. However, because sport enjoyment and enthusiastic commitment both significantly predicted both athletic buoyancy and intentions, and because of the significant positive correlation between athletic buoyancy and intentions, athletic buoyancy was utilized as a second outcome variable correlated with intentions in Pilot Model 3, with enthusiastic commitment serving as the mediator between sport enjoyment and the outcome variables. Results of Pilot Model 3 indicated that all direct and indirect relationships were significant. Interestingly, Pilot Models 1 and 3 both indicated a negative relationship between enthusiastic commitment and athletic buoyancy, despite commitment being a 5C predictor of buoyancy (Martin & Marsh, 2008). The results of the pilot studies determined that athletic buoyancy may be best utilized as an outcome variable alongside intentions, that sport enjoyment is a strong

predictor of both outcome variables, and that sport commitment needs to be further examined as a predictor of athletic buoyancy in Study 2.

Main Analyses: Participants & Recruiting

Participants ($n = 239$, M age = 19.91 years, $SD = 1.94$) were recruited from 24 sport clubs at a university recreation center in the Southeastern United States. Eligible participants were 18 years of age or older, currently actively participating in a university-sponsored sport club, and were not excluded based on gender identity, religion, or other demographic factors. The majority of participants identified as male (58%), and White/Caucasian (77%). Approximately 44% of athletes reported having participated in their sport at any level (i.e., recreational, club, varsity, etc.) for 4 years or less, about 30% had competed for 5-10 years, and another 27% had competed for more than 10 years. All participants provided informed consent electronically prior to the start of data collection. The consent form for Study 2 can be found in Appendix F.

Measures

Demographics. Participants were asked to provide their age, gender identity, and ethnicity. To gain insight on their athletic history, participants were asked what sport they participated in at the time of the study (if athletes participated in more than one club at a time, they were asked to select just one), how long they had participated in those sports at any level (i.e., recreational, club, varsity, etc.), and how long they were participating in their current sport club. Complete demographic information can be found in Table 8 below.

Athletic buoyancy. As in Study 1, the Athletic Buoyancy Scale (Calhoun et al., 2019) was utilized in Study 2. The Athletic Buoyancy Scale, modified from Martin & Marsh's (2008) Academic Buoyancy Scale, contains four items rated on a 7-point Likert scale from "Strongly

disagree” to “Strongly agree.” All scale items for the Athletic Buoyancy Scale, as well as the other measures utilized in Study 2, can be found in Appendix G.

Table 8. Participant Demographic Information & Athletic History

		Frequency (<i>N</i> = 239)	Percent
Gender			
	Male	139	58.2
	Female	98	41.0
	Non-Binary	1	.42
	Other	1	.42
Ethnicity			
	White/Caucasian	184	77.0
	Multi-Racial	19	7.9
	Black/African American	15	6.3
	Hispanic/Latino/Mexican American	14	5.9
	Asian/Asian American	6	2.5
	Lebanese	1	.4
Sport Played			
Male Only	Lacrosse	24	10.0
	Soccer	22	9.2
	Ultimate Frisbee	21	8.8
	Volleyball	12	5.0
	Baseball	8	3.3
	Basketball	7	2.9
	Rugby	4	1.7
	Ice Hockey	1	.4
Female Only	Ultimate Frisbee	16	6.7
	Rugby	14	5.9
	Volleyball	12	5.0
	Soccer	10	4.2
	Lacrosse	3	1.3
Combined	Equestrian	15	6.3
	Running	13	5.4
	Water Polo	13	5.4
	Quidditch	11	4.6
	Powerlifting	8	3.3
	Bowling	7	2.9
	Tennis	6	2.5
	Rowing	5	2.1
	Triathlon	4	1.7
	Climbing	2	.8
	Competitive Esports	1	.4
Total years in sport			
	<1-4 years	104	43.5
	5-10 years	71	29.7
	10+ years	64	26.8

Anxiety. Sport-related anxiety was measured utilizing the 15-item Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006). The SAS-2 measures feelings of anxiety experienced both prior to and during athletic competition (Grossbard, Smith, Smoll, & Cumming, 2009), and assesses anxiety in three different categories: “somatic anxiety, worry, and concentration disruption” (Smith et al., 2006, p. 482). Participants were prompted to consider how they tend to feel before or during sports competition, and then to indicate their response on a 4-point Likert scale from 1 (Not at all) to 4 (Very much). Example items include (14) “My muscles feel tight because I am nervous” (somatic anxiety); (9) “I worry that I will play badly” (worry); and (1) “It is hard to concentrate on the game” (concentration disruption). The SAS-2 has shown reliability and validity across a variety of sports, languages, and genders (Ramis, Viladrich, Sousa, & Jannes, 2015).

Fear of failure. The short form of The Performance Failure Appraisal Inventory, which was developed to measure general feelings of fear of failure (PFAI; Conroy et al., 2002), was used to measure fear of failure. The PFAI contains 5 items, each of which assesses one of the five categories identified by Conroy (2001) that represent why an individual might fear failure: the fears of “experiencing shame and embarrassment,” “devaluing one’s self-estimate,” “having an uncertain future,” “important others losing interest,” and “upsetting important others” (Conroy et al., 2002, p. 77). Example items include (4) “When I am failing, important others are disappointed” (fear of important others losing interest); and (2) “When I am failing, it upsets my ‘plan’ for the future” (fear of having an uncertain future). Respondents were prompted to indicate how much they believed each statement is true of them, and each item was ranked on a 5-point Likert scale from 1 (Do Not Believe At All) to 5 (Believe 100% of the Time). The short

form PFAI has displayed evidence of acceptable validity and reliability (Conroy & Metzler, 2003), as well as longitudinal factorial invariance (Conroy, Metzler, & Hofer, 2003).

Sport enjoyment & commitment. Two subscales from the Sport Commitment Questionnaire-2 (Scanlan et al., 2016) were utilized: Sport Enjoyment and Enthusiastic Commitment. The 5-item Sport Enjoyment subscale measures feelings of joy associated with athletic experiences, and the 6-item Enthusiastic Commitment subscale focused on athletes' drive to persist in their sport over long periods of time (Scanlan et al., 2016). Participants were asked to rank all 11 items on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Participants were prompted to consider the sport they were playing at the time of the study and to provide their "honest opinion" about the statements. Example items include (1) "Playing this sport is fun" (Sport Enjoyment) and (11) "I am willing to do almost anything to keep playing this sport" (Enthusiastic Commitment) (Scanlan et al., 2016, p. 244-245). Both subscales separately demonstrated high internal consistency during developmental testing ($\alpha = .92$), as well as a high significant correlation with each other ($r = .86$). Additionally, Scanlan et al. (2016) found sport enjoyment to be one of the strongest positive predictors of enthusiastic commitment.

Social support. To measure social support, the Perceived Available Support in Sport Questionnaire (PASS-Q; Freeman, Coffee, & Rees, 2011) was used. The PASS-Q measures an athlete's perception of the availability of their social support in four categories: "emotional, esteem, informational, and tangible support" (Freeman et al., 2011, p. 56). Participants were asked to rank 16 items, 4 for each category of social support, on a 5-point Likert scale from 0 (Not at all) to 4 (To a very great extent). Likert scale response anchors were adjusted from the original anchors (0 = Not at all; 4 = Extremely so; Freeman et al., 2011) to improve the clarity of

the answer options. Respondents were prompted with the item stem, “If needed, to what extent would someone...,” and were then presented with items such as: (1) “...provide you with comfort and security” (emotional support); (6) “...enhance your self-esteem” (esteem support); (15) “...give you advice when you’re performing poorly” (informational support); and (12) “...do things for you at competitions/matches” (tangible support) (Freeman et al., 2011, p. 61). The PASS-Q has demonstrated acceptable internal reliability (Cronbach’s alpha between .67 and .91; Adams, Coffee, & Lavalley, 2015) as well as strong validity (Freeman et al., 2011).

Intentions to continue sport participation. Intentions were measured utilizing a three-item subscale originally designed to measure “intentions to exercise in leisure time” (Chatzisarantis et al., 1997, p. 348). Items were adjusted to measure the athletes’ intentions to participate in their sport in the future, and included (1) After this season, I intend to play this sport again; (2) I plan to play this sport again in the future; and (3) I am determined to play this sport again in the future (Chatzisarantis et al., 1997). Although the original scale asked participants to respond on a 7-point Likert scale from -3 to +3 (Chatzisarantis et al., 1997), each item for Study 2 was rated from 1 (Very unlikely) to 7 (Very likely) to maintain a consistent format among the subscales used in this study. The original scale items demonstrated high internal consistency (Cronbach’s alpha = .89-.90) and significant, positive correlations with exercise behaviors (Chatzisarantis et al., 1997).

Procedure & Data Collection

Study approval was obtained from the Institutional Review Board prior to the start of data collection. Administrators at a university recreation center were contacted through email to obtain permission to recruit participants from their sport club athletes. Administrators were provided with access to the Qualtrics® survey, informed consent, and a summary of the study’s

procedure and goals. Following further discussion and responding to questions, permission was granted, and details of the study, including the study details and survey link, were delivered to the sport club presidents (i.e., club leaders) during their mandatory beginning-of-the-semester meeting. Participation in the study was presented as a “task” for the clubs and athletes to complete; however, each team and athlete was made aware of their autonomy to either accept or decline the offer to participate in the study. All participants provided informed consent prior to starting the questionnaire and were permitted to stop the survey at any point.

Data Analysis

Statistical analyses were conducted using the PROCESS macro for SPSS (version 23) and R Software. Prior to the main analyses, data were checked for input errors, missing data, outliers, and non-normality. Descriptive statistics and frequencies, as well as internal consistency with coefficient alpha (Cronbach, 1951), were determined for each variable, including athletic buoyancy, fear of failure, anxiety, enjoyment, commitment, social support and its four subscales, and intentions to continue sport participation. Both mediation and moderation models were examined in the main analysis. Mediating variables explain or are responsible for the relationship between a predictor and its outcome, while moderating variables impact “the direction and/or strength of the relation” between a predictor and its outcome at different values of the moderator (Baron & Kenny, 1986, p. 1174). A moderated-mediation model was tested in two steps, where (1) athletic buoyancy mediated the relationship between the predictors (fear of failure, anxiety, enjoyment, and commitment) and the outcome (intentions), and (2) social support moderated the relationships between the predictors and the mediator (athletic buoyancy).

First, to test for mediation, a series of multiple linear regressions were conducted using the SPSS macro PROCESS, which examines moderation, mediation, and moderated mediation,

and allows for multiple independent variables in the model (Hayes, 2013). If the 95% bootstrap confidence interval (5000 resamples) of the indirect regression paths did not include zero (0), then significant mediation had occurred. Results from the mediation analysis suggested that further exploration of the moderating effect of social support was warranted between two different outcome variables: (1) athletic buoyancy, and (2) intentions. Therefore, two moderation models were examined, where (1) social support served as the moderator of the relationships between the predictors and athletic buoyancy, and (2) where social support served as the moderator between all predictors, including athletic buoyancy, and intentions. For both moderation analyses, appropriate interaction terms were created (i.e., fear of failure x social support, anxiety x social support, enjoyment x social support, and commitment x social support, as well as athletic buoyancy x social support for the second moderation analysis), and multiple regression analyses were conducted. Significant regression paths from the interaction terms indicated moderation of the respective relationships between the predictors and athletic buoyancy. Significant interactions were probed using simple slopes tests examining the range of values of the moderator (-1 SD to +1 SD) at which the interactions were significant. For all regression analyses, effect sizes were determined using the *F*-statistic and *R*²; the strength and direction of the relationships were examined using standardized beta coefficients (β).

Results

Descriptive Statistics & Internal Consistency

All variables displayed acceptable internal consistency ($\alpha = .78-.96$; Nunnally & Bernstein, 1994). Means for each variable relative to their scoring system suggested that participants reported having lower levels of anxiety and fear of failure, moderate levels of social support, and high levels of sport enjoyment, enthusiastic commitment, and intentions to continue

playing sports. Details of the descriptive statistics for all variable and relevant subscales, including correlations, means, standard deviations, and coefficient alpha, can be found in Table 9 below.

Table 9. Correlation estimates, descriptive statistics, and Cronbach's alpha estimates

	AB	ANX	FF	SS	SE	EC	INT
AB	-						
ANX	-.439**	-					
FF	-.534**	.589**	-				
SS	.035	.004	-.039	-			
SE	.096	-.142*	-.133*	.184*	-		
EC	.176*	-.216**	-.237**	.205*	.617**	-	
INT	.106	-.178*	-.142*	.169*	.483**	.768**	-
<i>M</i>	5.31	1.56	2.11	3.91	4.78	4.52	6.44
<i>SD</i>	1.15	.60	.96	.91	.50	.80	1.09
<i>α</i>	.78	.91	.86	.96	.92	.94	.93

Note: AB = athletic buoyancy; ANX = anxiety; FF = fear of failure; SS = social support; SE = sport enjoyment, EC = enthusiastic commitment, INT = intentions. Each variable was ranked on a Likert scale with the following ranges: AB (1-7), ANX (1-4), FF (1-5), SS (1-5), SE (1-5), EC (1-5), INT (1-7).

Mediation Analysis

The overall mediation model significantly explained approximately 59% of the variance found in intentions, and only enthusiastic commitment as a significant predictor ($\beta = .77, p < .001$). The model also explained approximately 31% of the variance in athletic buoyancy. Additionally, fear of failure ($r = -.42, p < .001$) and anxiety ($r = -.18, p = .01$) were significant, negative predictors of athletic buoyancy, while sport enjoyment ($p = .86$) and enthusiastic commitment ($p = .52$) were not found to be significant predictors. Ultimately, athletic buoyancy did not serve as a significant mediator between any of the predictor variables and the outcome variable, intentions. It is apparent that athletic buoyancy does not influence intentions to continue participating in sports, and also that anxiety, fear of failure, and commitment are all important influencers on athletic buoyancy. Therefore, following the mediation analysis, moderation

testing proceeded by investigating the influence of social support on the relationships between the predictor variables and athletic buoyancy and intentions as separate outcome variables.

Moderation Analyses

Athletic buoyancy. Since mediation was not present, the first moderation analysis utilized athletic buoyancy as an outcome variable and examined the potential moderating effect of social support on the relationships between each of the predictor variables and athletic buoyancy. Moderation results indicated that social support significantly moderated the relationship between fear of failure and athletic buoyancy ($p = .008$, CI lower = -7.84, CI upper = -.97), but none of the other predictor variables. For athletes reporting low social support (-1 SD), for every one unit increase in fear of failure, athletic buoyancy was reduced by approximately .48 ($b = -.48$, $t(230) = -5.41$, $p < .001$). For athletes reporting high levels of social support (+1 SD), every one unit increase in fear of failure resulted in a .81 decrease in athletic buoyancy ($b = -.81$, $t(230) = -8.61$, $p < .001$). A follow-up simple slopes analysis further confirmed this relationship, and those with high social support ($\beta = -.71$, $p = .03$) had a stronger negative slope than those with lower social support ($\beta = -.26$, $p < .001$). These results indicate that rather than reducing the impact of fear of failure on buoyancy, as reported social support increases, the negative impact on athletic buoyancy actually increases as fear of failure goes up. Figure 3 plots the slopes for the significant fear of failure-social support interaction. Potential explanations for this relationship are explored in the discussion below. Following the examination of the first outcome variable, athletic buoyancy, the same analysis was conducted with the second, original outcome variable, intentions to continue sport participation.

Intentions. The second moderation analysis utilized all previously used predictor variables (i.e., fear of failure, anxiety, enjoyment, and commitment) and added athletic buoyancy

as a predictor variable. The model significantly explained approximately 61% of the variance seen in intentions ($F(11,222) = 31.572, p < .001, R^2 = .61$). Only enthusiastic commitment ($\beta = .79, p < .001$) was a significant predictor of intentions and explained the majority of the variance in intentions accounted for by this model. The interaction between social support and commitment was also significant ($p = .04$), and confidence intervals (CI lower = -69.47, CI upper = -2.53) supported this finding, indicating that moderation had occurred.

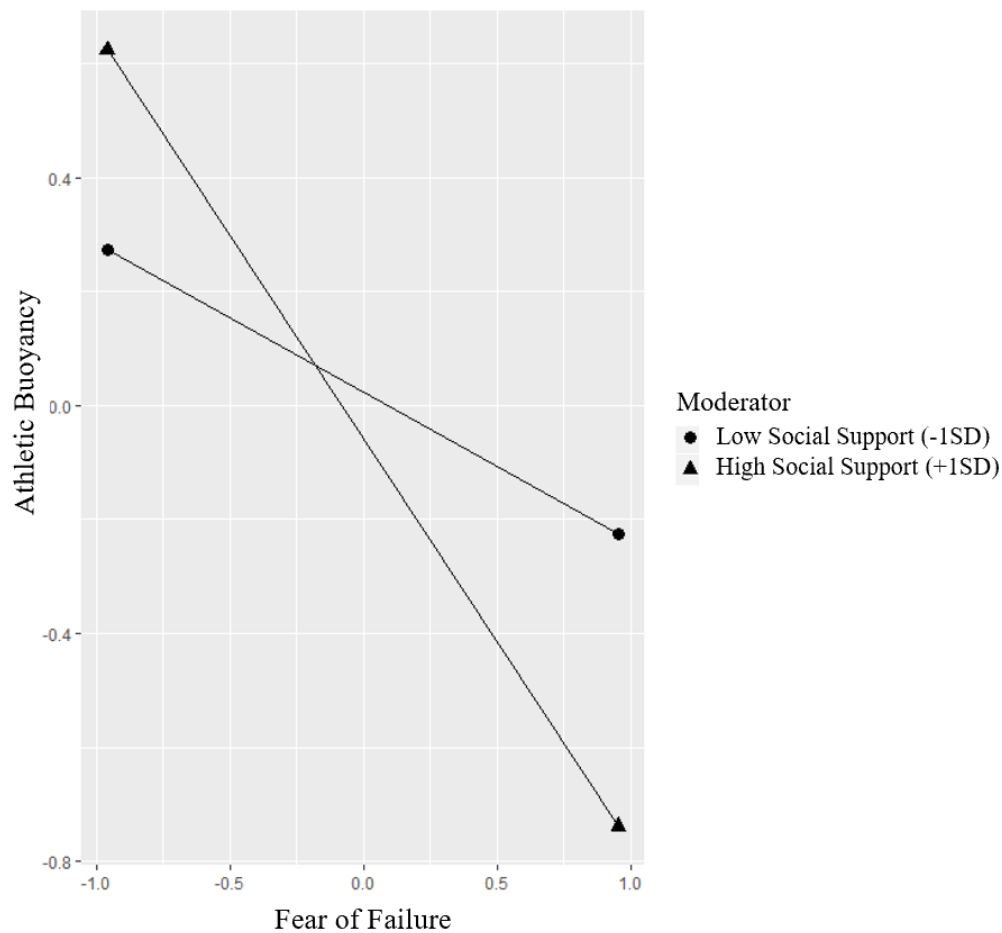


Figure 3. Simple slopes plot – Fear of failure-social support interaction on athletic buoyancy

A simple slopes analysis indicated that for all levels of social support, as enthusiastic commitment increased, intentions to continue sport participation also increased, though the slope

was steeper for the high social support group ($\beta = 1.27, p < .001$) than for the low social support group ($\beta = .87, p < .001$). Therefore, commitment positively influenced intentions more strongly for those who have higher levels of reported social support. See Figure 4 for the plot of the slopes of this interaction.

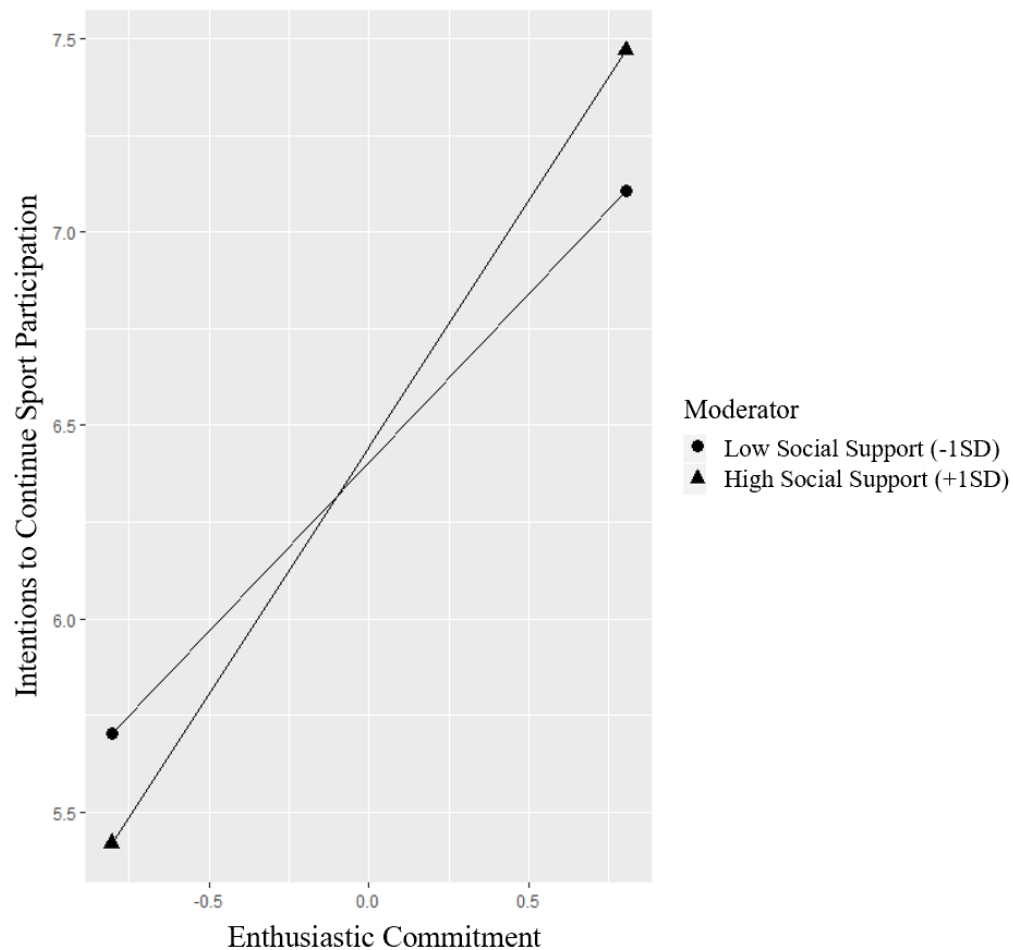


Figure 4. Simple slopes plot – Commitment-social support interaction on intentions

Discussion

The purposes of Study 2 were to (1) explore potential predictors of athletic buoyancy, including fear of failure, anxiety, sport enjoyment, and enthusiastic commitment, and (2) to examine a potential outcome variable for athletic buoyancy: intentions to continue sport

participation. Research questions included (1) to what extent does athletic buoyancy mediate the relationships between the predictors and intentions; and (2) does social support moderate the relationships between the predictors and athletic buoyancy or intention for continued participation?

To address the first research question, whether athletic buoyancy served as a mediator between the predictor variables and intentions, a mediation analysis was conducted. Results of the mediation analysis indicated that athletic buoyancy does not share a significant relationship with intentions and, therefore, mediation did not occur between the predictor variables and intentions. Since athletic buoyancy aids an athlete in overcoming everyday setbacks and challenges (Calhoun et al., 2019), it was assumed that athletic buoyancy should have some influence on intentions to continue playing sports as it may help an athlete to feel more confident or in control. However, this relationship was not supported. One potential finding of note is that the mean value of intentions reported by the athletes was 6.44 on a 7-point scale, suggesting a highly motivated sample of athletes. This high mean value may have influenced the non-relationship between athletic buoyancy and intentions, though more research will be needed to further explore this relationship. It is possible that the athletic buoyancy is more relevant for athletes whose intentions are not so strong.

These findings help to further focus research on the specific outcomes of athletic buoyancy and open opportunities for further exploration on how athletic buoyancy can be utilized in sport psychology research. For example, because athletic buoyancy is the ability to overcome everyday setbacks and challenges (Calhoun et al., 2019), it is possible that athletic buoyancy has ties to short-term athletic performance. Therefore, perhaps it is more pertinent to focus on more immediate or short-term performance-based outcomes, such as training or in-

competition performance, rather than a concept with a greater time interval to consider, such as intentions to participate in sports in the future or after a season ends. In important recent work by Colmar et al. (2019), buoyancy in the academic domain was investigated for its predictive utility on academic performance. Results from this study indicated that academic buoyancy did, in fact predict academic performance through an important mediator: academic self-concept (Colmar et al., 2019). Prior research had linked academic performance to academic self-concept (Marsh & Craven, 2006; Marsh & O'Mara, 2008), but buoyancy had yet to be considered in that relationship before Colmar et al.'s (2019) research. Knowing that academic self-concept, and in turn, academic performance, can be an outcome variable for academic buoyancy, it is likely valuable to determine if these findings generalize to the athletic domain and may aid in linking athletic buoyancy to athletic performance and athletic self-concept.

During the mediation analysis, as in prior research (Calhoun et al., 2019; Martin & Marsh, 2008; Putwain & Daly, 2013), anxiety was a significant, negative predictor and accounted for approximately 19% ($p < .001$) of the variance in athletic buoyancy. New to the athletic buoyancy literature, however, is the significant, negative impact of fear of failure on athletic buoyancy ($\beta = -.65, p < .001$), which explained approximately 31% of the variance found in athletic buoyancy. This finding indicates that as feelings of fear of failure increase, athletic buoyancy decreases significantly, suggesting important implications for the foundations of athletic buoyancy and potential links to outcomes. Fear of failure was measured using five items representing different reasons that an individual fears failing: “experiencing shame and embarrassment,” “devaluing one’s self-estimate,” “having an uncertain future,” “important others losing interest,” and “upsetting important others” (PFAI; Conroy et al., 2002, p. 77). Several links may be drawn between these five items athletic buoyancy. For example, control is

one of the 5Cs of athletic buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008), and is reminiscent of the PFAI's "having an uncertain future" item. "Devaluing one's self-estimate" may be linked to reduced feelings of confidence or self-efficacy, another of the 5Cs of athletic buoyancy. Therefore, some of the relationship between fear of failure and athletic buoyancy may be accounted for in that they may have some overlapping underlying concepts.

Additionally, and importantly for the present research, the PFAI considers social factors, "important others losing interest" and "upsetting important others" as reasons why a person may fear failing (Conroy et al., 2002). The present study sought to investigate the intrapersonal factor of social support by examining its potential role as a moderator between the predictor variables and athletic buoyancy. Results indicated that social support significantly moderated the relationship between fear of failure and athletic buoyancy. Interestingly, for those with higher social support, fear of failure had a greater negative impact on athletic buoyancy than those with lower social support. This finding at first seems contradictory, but consideration of the measure used in Study 2 may help to explain these results. The PFAI measures social factors (Conroy et al., 2002), including fearing others losing interest and upsetting important others. Perhaps when social support is abundant, some athletes may feel excessive pressure to maintain that social support, and fear its loss. As a result, athletes may fear the normative consequences of making errors in practice or games, or other everyday setbacks and challenges, reducing feelings of athletic buoyancy. These relationships should be explored in future research to determine, first, if this finding is replicable in this population (i.e., sport club athletes) and other athletic populations (i.e., recreational, varsity, youth, professional, etc.); and second, exactly how and why these relationships function in athletes at various levels of competition.

The final analysis for Study 2 was an investigation of social support as a potential moderator between the predictor variables (including athletic buoyancy) and intentions, the outcome variable. Examining intentions as the outcome variable revealed that social support significantly moderated just one relationship, between enthusiastic commitment and intentions, in a logical pattern. For athletes who reported higher (+1 SD) social support, intentions were more strongly and positively related to enthusiastic commitment than athletes who reported lower (-1 SD) social support, though the low support group also shared a significant, positive relationship with enthusiastic commitment. This suggests that having greater social support can greatly influence an athlete's feelings of commitment and whether or not they decide to continue playing their sport in future seasons. This may have important implications for parents, coaches, and athletes, who should be aware of the impact that having adequate social support, including "emotional, esteem, informational, and tangible support" (Freeman et al., 2011, p. 56), can have on the athlete, their commitment, and drive to continue training and competing.

Limitations

While Study 2 provided some interesting and important information about factors related to athletic buoyancy, there are several limitations that should be noted. First, as in Study 1, data were collected through online-based, self-report questionnaires. Because the researcher was not present at the times of data collection, the conditions under which the athletes completed their questionnaires could not be controlled. These varied conditions may have influenced the responses of the athletes, which should be considered when interpreting the results. A second limitation relates to the types of barriers investigated in Study 2. Witt and Dangi (2018) identified three types of barriers to participation, including intrapersonal, interpersonal, and structural. While Study 2 investigated intrapersonal (i.e., anxiety, fear of failure, athletic

buoyancy, sport enjoyment, enthusiastic commitment) and interpersonal (i.e., social support) factors, structural factors, such as access to facilities and athletic programming, were not investigated. Future research should incorporate structural factors to gain a more complete understanding of the factors that influence both athletic buoyancy and intentions to continue sport participation.

A third limitation of Study 2 is the absence of the relationship between athletic buoyancy and intentions to continue sport participation. Prior research was not available regarding their potential relationship, though the theoretical foundations of athletic buoyancy suggested that a relationship may be present. Results of Study 2 provided clear evidence that this relationship does not exist, prompting the need for additional statistical analyses. However, while the analysis did not succeed in identifying a significant outcome of athletic buoyancy, important information was gleaned regarding a variety of influences on athletic buoyancy, as well as a specific factor, intentions, that is not related to athletic buoyancy. These findings reduce the gaps in the existing literature and provide a foundation for future research.

Future Research & Practical Implications

Building on the results of Study 2, future research should further explore the relationship found between fear of failure and athletic buoyancy, especially the moderating effect of social support. Understanding the mechanisms behind why fear of failure impacts athletic buoyancy more strongly for athletes with high levels of social support may provide important details for the parents and coaches who are providing that support. For example, if an athlete reports having high amounts of fear of failure, it may be important to identify which cause of fear of failure is the most prominent for that athlete. If the fear of upsetting important others or the fear of losing important others' interest are the reasons behind their high fear of failure, this may also have

implications for their athletic buoyancy, since the moderating effect of social support seems to increase the negative influence of that fear of failure on athletic buoyancy. One concept that may help with understanding this relationship is contingent self-esteem, which refers to self-esteem that is dependent upon factors such as performance or others' approval (Deci & Ryan, 1995; Reinboth & Duda, 2004). Contingent self-esteem may, in part, help to explain the relationships seen in Study 2 whereby higher levels of social support appeared detrimental in relation with fear of failure. Therefore, research should consider contingent self-esteem and other similar factors, and focus on detangling these relationships to help inform parents and coaches about how social support can impact their athletes, in both positive and negative ways.

Another area of future research should also be to continue exploring potential outcomes of athletic buoyancy. While intention to continue sport participation was not a significant outcome of athletic buoyancy, there is reason to believe that athletic buoyancy may predict athletic self-concept and athletic performance, as is suggested by prior research in the academic domain (Colmar et al., 2019; Marsh & Craven, 2006; Marsh & O'Mara, 2008). Additionally, research should focus on incorporating multiple data collection methods, including qualitative and quantitative methods, and research methods, including longitudinal methods, in order to truly gain a thorough perspective on how athletic buoyancy functions, what influences it, and what its outcomes are. These areas of future research will enable researchers to close the gaps in the existing literature, create a firm foundation to continue building future research projects and directions, and determine the impact that athletic buoyancy may have on athletic performance and, ultimately, overall psychological wellbeing.

CHAPTER 5. GENERAL DISCUSSION

Athletic buoyancy has the potential to add meaningful detail to the existing sport psychology literature on factors that allow athletes to flourish in the face of adversity. Until Martin and Marsh's (2008) introduction of the concept of academic buoyancy, researchers had not considered a factor that aids athletes in effectively handling the challenges they face every day. Rather, research has tended to focus on how an individual handles more severe instances of adversity, such as chronic illness or serious injury, which overlooks the importance of the typical stressors that individuals are almost guaranteed to experience simply by participating in an activity (Calhoun et al., 2019; Martin & Marsh, 2008, 2009). Understanding why some are able to overcome these stressors and others are not is important has the potential to explain important outcomes, such as performance and self-concept, as was explored by Colmar et al. (2019), though prior to the present research links to concepts such as these had not been studied in the athletic domain. Therefore, the purpose of this dissertation was to close some of the gaps that exist in the present knowledge of athletic buoyancy literature and expand upon what is already known of its specific predictors and outcomes.

Study 1 sought to investigate the uniqueness of athletic buoyancy in comparison to other similar and commonly utilized constructs, mental toughness, grit, and coping skills, to determine if athletic buoyancy makes a unique contribution to the research pool. Study 2 built upon the results of Study 1, and examined several possible predictors (i.e., fear of failure, anxiety, sport enjoyment, enthusiastic commitment) and one potential outcome (i.e., intentions to continue sport participation) of athletic buoyancy to broaden our understanding of how athletic buoyancy functions, both in its foundations and also in its influences on other factors. The results of these studies have served to expand our understanding of athletic buoyancy and guide future research.

Exploring Athletic Buoyancy's Uniqueness

Several important concepts were established in Study 1. First, the primary objective was to determine if athletic buoyancy makes a meaningful, independent contribution in comparison to other similar terms, and results suggested that it does, in fact, stand apart from these other concepts. Beyond this finding, results also suggested that coping skills and grit also stand alone and contribute their own unique information to sport psychology research. Most interestingly, however, is the finding that the structure of mental toughness as measured in Study 1 was not truly identifiable; that is, mental toughness did not stand apart from the other constructs, but rather, seemed to be largely accounted for by them. Study 1's discussion explores possible explanations for this, including conceptual overlap with the other constructs and potential measurement concerns. These findings have important implications for future sport psychology research projects that utilize mental toughness and other similar terms.

The jingle-jangle fallacy (Marsh et al., 2003) suggests that researchers have a tendency to assume that psychometric scales that have different names actually measure different constructs. Clearly, although mental toughness did not share a name with the other constructs used in Study 1, conceptual overlap was present. Therefore, we cannot assume that these scales with different names provided distinct information. It is possible that mental toughness may be more like an umbrella term, under which terms such as athletic buoyancy, grit, and coping may be found, which future research would need to verify. Regardless, the present research served as an important platform on which to move forward with confidence in the knowledge that athletic buoyancy is not providing redundant information to sport psychology, and also that future research in athletic buoyancy might also consider the inclusion of grit and coping skills when

needed, with the understanding that each term should contribute something unique to the research.

Exploring Athletic Buoyancy's Structure

Once athletic buoyancy's uniqueness was established in Study 1, Study 2 sought to further explore potential predictors and outcomes to better understand its structure and factors it may influence. Prior research on athletic buoyancy established that the 5Cs (i.e., confidence, coordination, commitment, composure, and control) significantly predicted about 25% of athletic buoyancy in a group of college sport club athletes (Calhoun et al., 2019), and it was established that anxiety (i.e., having low composure) was the strongest predictor of athletic buoyancy, as had been seen in research on academic buoyancy (Martin et al., 2010; Martin, Ginns et al., 2013; Putwain & Daly, 2013). In the academic domain, buoyancy had also been investigated for its relationships with outcomes such as academic self-concept and academic performance (Colmar et al., 2019), feelings of control (Collie et al., 2015), and class participation and enjoyment for young students with attention-deficit/hyperactivity disorder (ADHD; Martin, 2014). Findings from these studies suggest that the buoyancy construct has the potential to apply to a variety of positive outcomes, but buoyancy in the athletic domain is still relatively unexplored, and no outcome variables have been identified. Therefore, Study 2 sought to expand what is currently known of athletic buoyancy by investigating several predictors, including anxiety and commitment, two previously established predictors, as well as two new predictors, fear of failure and sport enjoyment.

Results indicated that fear of failure and anxiety were both significant predictors of athletic buoyancy, and fear of failure actually had a more significant impact on athletic buoyancy than anxiety did. This finding is important, because prior to the present research, anxiety was

considered to be the strongest influencer on buoyancy, and fear of failure had yet to be examined with buoyancy in either the athletic or academic domain. Additionally, the relationship between fear of failure and athletic buoyancy was moderated by social support, another novel factor in the athletic buoyancy research. Although findings initially seemed counterintuitive (i.e., the higher social support group reported a greater negative impact of fear of failure on athletic buoyancy), the heavy influence of social factors in the fear of failure construct (Conroy et al., 2002) may explain this relationship. As explored in Study 2's discussion, perhaps some individuals with greater amounts of social support may be more fearful to lose that support after failing, negatively impacting their athletic buoyancy. Further exploration on the nature of this relationship is needed, and when understood, may provide important information about how significant others may influence an individual's athletic buoyancy.

As for the exploration of factors that athletic buoyancy may influence, no significant outcome variables were identified for athletic buoyancy in Study 2. Although it was one of the primary objectives to identify an outcome variable, finding non-significance still provides important information regarding the nature of athletic buoyancy. Athletic buoyancy was not related to intentions to continue sport participation in the future, which suggests that perhaps athletic buoyancy is less effective for understanding outcomes in the future, and more applicable to shorter-term outcomes, such as immediate athletic performance, or current psychological states such as self-concept. Therefore, findings from Study 2 have provided direction for future research that will uncover the most appropriate context for athletic buoyancy's use, hopefully aiding researchers, coaches, parents, and athletes in understanding what athletic buoyancy means, how it can influence the athlete, and the implications this may have for their performance and wellbeing.

Future Research & Practical Implications

Future research should seek to further explore athletic buoyancy's predictors and outcomes, as identified by the current research. The 5Cs (confidence, coordination, commitment, composure, and control) were the previously identified predictors of buoyancy (Calhoun et al., 2019; Martin & Marsh, 2008, 2009), and the present research added fear of failure and social support as important factors to the athletic buoyancy framework. Interestingly, in Study 2, sport enjoyment and commitment did not provide as much influence on athletic buoyancy as the more negatively focused psychological factors, anxiety and fear of failure, despite the fact that commitment is one of the proposed 5Cs of buoyancy, and other positively-focused predictors, including confidence and control, have demonstrated predictive utility on athletic buoyancy (Martin & Marsh, 2008, 2009). Future work on athletic buoyancy would benefit from a deeper investigation of the influence of positively oriented psychological factors, including enjoyment and commitment, as well as the negatively focused factors, such as fear of failure, to gain a deeper understanding of how athletic buoyancy functions.

In addition to identifying relevant factors in the athletic buoyancy framework, research should focus on the practical application of athletic buoyancy in real-world settings. For example, based on findings from the current research, addressing fear of failure should aid in improving athletic buoyancy. Therefore, research developing a fear of failure intervention may be helpful for those displaying low athletic buoyancy. By identifying an athlete's most prominent source of fear of failure (i.e., fear of disappointing important others, embarrassment, etc., Conroy et al., 2002), an intervention could be conducted to help the athlete overcome their fears and perhaps alter their fear appraisal process to interpret challenges and setbacks as challenges, rather than as threats. Doing so should bolster the athlete's athletic buoyancy, improving their abilities

to overcome everyday challenges in the future. Similar interventions for other relevant factors, including anxiety and confidence, could be conducted to address other negative influences or promote positive influences on athletic buoyancy. Sport psychology practitioners, coaches, and parents could make use of simple interventions designed to help improve their athletes' buoyancy and hopefully, their athletic performance and general psychological wellbeing, as well.

More research is also needed to explore the relationship between social support and athletic buoyancy. Social support appears to be an important factor related to the fear of failure-buoyancy relationship, though research is needed to understand why this relationship appeared as it did in Study 2. Social support displayed a generally positive effect on the commitment-intentions relationship, but in comparison, the impact of social support on the athletic buoyancy-fear of failure relationship seemed almost counterintuitive. Athletes with higher social support appeared to be more negatively impacted by fear of failure than their lower social support counterparts, suggesting that, at least for some individuals with high fear of failure, more social support may actually have a negative impact on athletic buoyancy.

Qualitative research, such as semi-structured interviews and focus groups, may be helpful for a developing a deeper understanding of exactly how social support demonstrated this relationship. For example, discussing with an athlete how significant others impact their athletic experience may provide insight on why more support could be detrimental. Another area to explore may involve the specific demographics of the athletes. Data from Study 2 were collected from college club sport athletes who identified as predominately White/Caucasian and male. It is possible that athletes from other demographic groups, such as young athletes who are still dependent upon their parents, or adult recreational athletes who may have careers and families, may display different relationships with social support and athletic buoyancy than what was seen

by the college sport club athletes. Therefore, repeating Study 2 in these other groups, as well as using qualitative research methods to gain richer details, may provide important and novel information that can guide future research and the development of interventions, tools, and practical knowledge to share with coaches, parents, athletes, and other relevant stakeholders.

APPENDIX A. STUDY 1 INSTITUTIONAL REVIEW BOARD APPROVAL FORM

ACTION ON EXEMPTION APPROVAL REQUEST



TO: Jackie Calhoun
Kinesiology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: March 11, 2019

RE: IRB# E11573

TITLE: Examining the Independence of Resilience-Related Constructs: Athletic Buoyancy, Mental Toughness, Grit, and Coping

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8892
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

New Protocol/Modification/Continuation: New Protocol

Review Date: 3/11/2019

Approved X Disapproved _____

Approval Date: 3/11/2019 Approval Expiration Date: 3/10/2022

Exemption Category/Paragraph: 2a

Signed Consent Waived?: Yes

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable):

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>

APPENDIX B. STUDY 1 INFORMED CONSENT

1. Study Title: Examining the independence of resilience-related constructs: Athletic buoyancy, mental toughness, grit, and coping
2. Performance Site: Online
3. Investigators: The following investigators are available for questions about this Study M-F, 8:00 a.m. – 4:30 p.m.

Jackie V. Calhoun (504) 715-9829
Dr. Alex Garn (225) 578-5954
4. Purpose of Study: The purpose of this research is to investigate the conceptual similarities and differences between several similar terms in sport psychology, including athletic buoyancy, grit, mental toughness, and coping.
5. Subject Inclusion: Adult recreational athletes in Louisiana
6. Number of Subjects: 300
7. Study Procedures: Adult recreational athletes will be recruited to participate in this study. Participants will be asked to complete a one-time online questionnaire, and will give consent through online participation in the study. The questionnaire will take about 8-10 minutes to complete, and will cover demographic information, athletic buoyancy, grit, sport mental toughness, and sport coping skills. All participants will be assigned an ID number so their responses will remain confidential.
8. Benefits: There are no specific benefits to participating in this study beyond having the opportunity to participate. Information received from this study could provide clarification on the differences between each term studied, as well as a greater understanding of athletic buoyancy. This could have important implications for athletic coaching and sport psychology.
9. Risks: There are no foreseeable risks related to this research project. All informed consent will be provided along with the questionnaire responses, and will therefore remain confidential. The Investigators will be the only people with access to the dataset.
10. Right to Refuse: Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. Privacy: Results of this study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

12. Signature: The study has been discussed with me and all of my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have any questions about subject's rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692.

By answering the questions and completing the survey online, I agree to participate and give consent to use my information in the study described above.

APPENDIX C. STUDY 1 MEASURES

Athlete Questionnaire

Demographics

What is your age? _____

I identify my gender as... _____

Ethnicity (select all that apply):

_____ Black/African American

_____ Hispanic/Latino/Mexican American

_____ White/Caucasian

_____ Asian/Asian American

_____ American Indian/Alaska Native

_____ Native Hawaiian/Pacific Islander

_____ Multi-Racial

Other (please specify) _____

What sport(s) do you currently participate in? _____

How long have you participated in this sport in any league or level (e.g., recreational, varsity, club, etc.)? (please select one):

_____ Less than 1 year

_____ 7-8 years

_____ 1-2 years

_____ 8-10 years

_____ 3-4 years

_____ 10+ years

_____ 5-6 years

How long have you participated in your current recreational league? (please select one):

_____ Less than 1 year

_____ 7-8 years

_____ 1-2 years

_____ 8-10 years

_____ 3-4 years

_____ 10+ years

_____ 5-6 years

General Instructions: The following sections contain statements that refer to your experiences as an athlete in your sport as opposed to any other particular situation.

Athletic Buoyancy Scale (Calhoun, Webster, & Garn, 2019)

Directions: How much do you agree with the following statements?							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
1. I don't let the stress of sports performance get on top of me.	1	2	3	4	5	6	7
2. I think I'm good at dealing with sports performance pressures.	1	2	3	4	5	6	7
3. I don't let a bad sports performance affect my confidence.	1	2	3	4	5	6	7
4. I'm good at dealing with setbacks in sport (e.g. negative feedback, poor result)	1	2	3	4	5	6	7

Short Grit Scale (Grit-S; Duckworth & Quinn, 2009)

Directions: Here are a number of statements that may or may not apply to you. There are no right or wrong answers, so just answer honestly, considering how you compare to most people.					
How much do you agree with the following statements?	Not at all like me	Not much like me	Somewhat like me	Mostly like me	Very much like me
1. <i>New ideas and projects sometimes distract me from previous ones.</i>	1	2	3	4	5
2. Setbacks don't discourage me.	1	2	3	4	5
3. <i>I often set a goal but later choose to pursue a different one.</i>	1	2	3	4	5
4. I am a hard worker.	1	2	3	4	5
5. <i>I have difficulty maintaining my focus on projects that take more than a few months to complete.</i>	1	2	3	4	5
6. I finish whatever I begin.	1	2	3	4	5
7. I am diligent.	1	2	3	4	5
8. <i>I have been obsessed with a certain idea or project for a short time but later lost interest.</i>	1	2	3	4	5

Note: *Italicized* items are reverse-coded; Consistency of Interest = items 1, 3, 5, 8; Perseverance of Effort = items 2, 4, 6, 7

Sports Mental Toughness Questionnaire (SMTQ; Sheard, Golby, & van Wersch, 2009)

Directions: How true is each statement for you?				
	Not at all true	Somewhat not true	Somewhat true	Very true
1. I can regain my composure if I have momentarily lost it.	1	2	3	4
2. <i>I worry about performing poorly.</i>	1	2	3	4
3. I am committed to completing the tasks I have to do.	1	2	3	4
4. <i>I am overcome by self-doubt.</i>	1	2	3	4
5. I have an unshakeable confidence in my ability.	1	2	3	4
6. I have what it takes to perform well while under pressure.	1	2	3	4
7. <i>I get angry and frustrated when things do not go my way.</i>	1	2	3	4
8. <i>I give up in difficult situations.</i>	1	2	3	4
9. <i>I get anxious by events I did not expect or cannot control.</i>	1	2	3	4
10. <i>I get distracted easily and lose my concentration.</i>	1	2	3	4
11. I have qualities that set me apart from other competitors.	1	2	3	4
12. I take responsibility for setting myself challenging targets.	1	2	3	4
13. I interpret potential threats as positive opportunities.	1	2	3	4
14. Under pressure, I am able to make decisions with confidence and commitment.	1	2	3	4

Note: *Italicized* items are reverse-coded; Confidence = items 1, 5, 6, 11, 13, 14; Constancy = items 3, 8, 10, 12; Control = items 2, 4, 7, 9

Coping with Adversity; Athletic Coping Skills Inventory-28 (Smith, Schutz, Smoll, & Ptacek, 1995)

Directions: A number of statements that athletes have used to describe their experiences are given below. Please read each statement carefully and then recall as accurately as possible how often you experience the same thing. There are no right or wrong answers. Do not spend too much time on any one statement.				
	Almost never	Sometimes	Often	Almost always
1. I maintain emotional control no matter how things are going for me.	1	2	3	4
2. When things are going badly, I tell myself to keep calm, and this works for me.	1	2	3	4
3. When I feel myself getting too tense, I can quickly relax my body and calm myself.	1	2	3	4
4. I remain positive and enthusiastic during competition, no matter how badly things are going.	1	2	3	4

Sport Enjoyment & Enthusiastic Commitment (Sport Commitment Questionnaire-2; Scanlan et al., 2016)

Directions: Based on the sport that you are currently playing, please rate how much you agree/disagree with each statement by using the scale below. There are no right or wrong answers. We only want your honest opinion about the following statements.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1. Playing this sport is fun	1	2	3	4	5
2. I am dedicated to keep playing this sport.	1	2	3	4	5
3. I like playing this sport.	1	2	3	4	5
4. I am willing to overcome any obstacle to keep playing this sport.	1	2	3	4	5
5. I love to play this sport.	1	2	3	4	5
6. I am determined to keep playing this sport.	1	2	3	4	5
7. Playing this sport is very pleasurable.	1	2	3	4	5
8. I am very attached to this sport.	1	2	3	4	5
9. Playing this sport makes me happy.	1	2	3	4	5
10. I will continue to play this sport for as long as I can.	1	2	3	4	5
11. I am willing to do almost anything to keep playing this sport.	1	2	3	4	5

Intentions to Continue Sport Participation (Chatzisarantis, Biddle, & Meek, 1997)

Directions: Please respond to the following statements.							
	Very unlikely	Unlikely	Somewhat unlikely	Indifferent	Somewhat likely	Likely	Very likely
1. After this season, I intend to play this sport again.	1	2	3	4	5	6	7
2. I plan to play this sport again in the future.	1	2	3	4	5	6	7
3. I am determined to play this sport again.	1	2	3	4	5	6	7

APPENDIX D. STUDY 2 INSTITUTIONAL REVIEW BOARD APPROVAL FORM



ACTION ON EXEMPTION APPROVAL REQUEST

TO: Jackie Calhoun
Kinesiology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: November 18, 2019

RE: IRB# E12006

TITLE: An Investigation of Athletic Buoyancy and Sport Participation Intentions: The Influence of Fear of Failure, Social Support, Sport Enjoyment, and Anxiety

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8892
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

New Protocol/Modification/Continuation: New Protocol

Review Date: 11/18/2019

Approved X Disapproved _____

Approval Date: 11/18/2019 Approval Expiration Date: 11/17/2022

Exemption Category/Paragraph: 2a,b

Signed Consent Waived?: Yes

Re-review frequency: Three years

LSU Proposal Number (if applicable):

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>

APPENDIX E. STUDY 2 INFORMED CONSENT

1. Study Title: An Investigation of Athletic Buoyancy and Sport Participation Intentions: The Influence of Fear of Failure, Social Support, Sport Enjoyment, and Anxiety
2. Purpose of Study: The purposes of this research are to investigate the relationships between athletic buoyancy, fear of failure, anxiety, social support, and sport enjoyment, as well as their influence on intentions to continue sport participation.
3. Study Procedures: Adult sport club athletes will be recruited to participate in this study. Participants will be asked to complete a one-time online questionnaire, and will give consent through online participation in the study. The questionnaire will take about 5-10 minutes to complete, and will cover demographic information, athletic history, athletic buoyancy, fear of failure, anxiety, social support, sport enjoyment, enthusiastic commitment, and intentions to continue playing this sport. No identifying information (i.e., names, email addresses, etc.) will be collected, and all responses will remain confidential.
4. Risks: There are no foreseeable risks related to this research project. All informed consent will be provided along with the questionnaire responses, and will therefore remain confidential. The investigators will be the only people with access to the dataset.
5. Benefits: There are no specific benefits to participating in this study beyond having the opportunity to participate. Information received from this study could provide clarification on the differences between each term studied, as well as a greater understanding of athletic buoyancy and promoting sport enjoyment. This could have important implications for athletic coaching and sport psychology research.
6. Investigators: The following investigators are available for questions about this Study M-F, 8:00 a.m. – 4:30 p.m.

Jackie V. Calhoun (504) 715-9829
Dr. Alex Garn (225) 578-5954
7. Performance Site: Southeastern United States; online data collection
8. Number of Subjects: 300
9. Subject Inclusion: Adult club sport athletes

10. Exclusion Criteria: Adults who are not actively participating in collegiate club sports
11. Right to Refuse: Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.
12. Privacy: Results of this study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.
13. Financial Information: There is no cost for participation in this study, nor is there any compensation to the subjects for participation.
12. Signature: The study has been discussed with me and all of my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have any questions about subject's rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692.

By answering the questions and completing the survey online, I agree to participate and give consent to use my information in the study described above.

APPENDIX F. STUDY 2 MEASURES

Athlete Questionnaire

Demographics

What is your age? _____

I identify my gender as... _____

Ethnicity (select all that apply):

_____ Black/African American

_____ Hispanic/Latino/Mexican American

_____ White/Caucasian

_____ Asian/Asian American

_____ American Indian/Alaska Native

_____ Native Hawaiian/Pacific Islander

_____ Multi-Racial

Other (please specify) _____

What sport club do you currently participate in? (note: if you are in more than one sport club, please select just one to reference for this survey): _____

How long have you participated in this sport in any league or level (e.g., recreational, varsity, club, etc.)? (please select one):

_____ Less than 1 year

_____ 7-8 years

_____ 1-2 years

_____ 8-10 years

_____ 3-4 years

_____ 10+ years

_____ 5-6 years

How long have you participated with your current sport club (please select one):

_____ Less than 1 year

_____ 7-8 years

_____ 1-2 years

_____ 8-10 years

_____ 3-4 years

_____ 10+ years

_____ 5-6 years

General Instructions: The following sections contain statements that refer to your experiences as an athlete in your sport as opposed to any other particular situation.

Athletic Buoyancy Scale (Calhoun, Webster, & Garn, 2019)

Directions: How much do you agree with the following statements?							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
1. I don't let the stress of sports performance get on top of me.	1	2	3	4	5	6	7
2. I think I'm good at dealing with sports performance pressures.	1	2	3	4	5	6	7
3. I don't let a bad sports performance affect my confidence.	1	2	3	4	5	6	7
4. I'm good at dealing with setbacks in sport (e.g. negative feedback, poor result)	1	2	3	4	5	6	7

Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006)

Directions: Circle the number that says how you <i>usually</i> feel before or while you compete in sports.				
	Not at all	A little bit	Pretty much	Very much
1. It is hard to concentrate on the game.	1	2	3	4
2. My body feels tense.	1	2	3	4
3. I worry that I won't play well.	1	2	3	4
4. It is hard for me to focus on what I am supposed to do.	1	2	3	4
5. I worry I will let others down.	1	2	3	4
6. I feel tense in my stomach.	1	2	3	4
7. I lose focus on the game.	1	2	3	4
8. I worry that I will not play my best.	1	2	3	4
9. I worry that I will play badly.	1	2	3	4
10. My muscles feel shaky.	1	2	3	4
11. I worry that I will mess up during the game.	1	2	3	4
12. My stomach feels upset.	1	2	3	4
13. I cannot think clearly during the game.	1	2	3	4
14. My muscles feel tight because I am nervous.	1	2	3	4
15. I have a hard time focusing on what my coach tells me to do.	1	2	3	4

The Performance Failure Appraisal Inventory (Short-Form) (PFAI; Conroy, Willow, & Metzler, 2002)

Directions: Read each statement below and think of how often you believe each is true in your performance domain (sports). Use the rating scale below to indicate how much you believe each statement applies to you.

	Do Not Believe At All		Believe 50% of the Time		Believe 100% of the Time
1. When I am failing, I am afraid that I might not have enough talent.	1	2	3	4	5
2. When I am failing, it upsets my “plan” for the future.	1	2	3	4	5
3. When I am not succeeding, people are less interested in me.	1	2	3	4	5
4. When I am failing, important others are disappointed.	1	2	3	4	5
5. When I am failing, I worry about what others think about me.	1	2	3	4	5

The Perceived Available Support in Sport Questionnaire (PASS-Q; Freeman, Coffee, & Rees, 2011)

Directions: Read each statement below and decide to what extent someone you know would help you with each thing.					
If needed, to what extent would someone...	Not at all	To a small extent	To a moderate extent	To a great extent	To a very great extent
1. provide you with comfort and security	0	1	2	3	4
2. reinforce the positives	0	1	2	3	4
3. give you constructive criticism	0	1	2	3	4
4. help with travel to training and competitions/matches	0	1	2	3	4
5. always be there for you	0	1	2	3	4
6. enhance your self-esteem	0	1	2	3	4
7. give you tactical advice	0	1	2	3	4
8. help with tasks to leave you free to concentrate	0	1	2	3	4
9. care for you	0	1	2	3	4
10. instill you with the confidence to deal with pressure	0	1	2	3	4
11. give you advice about performing in competitive situations	0	1	2	3	4
12. do things for you at competitions/matches	0	1	2	3	4
13. show concern for you	0	1	2	3	4
14. boost your sense of competence	0	1	2	3	4
15. give you advice when you're performing poorly	0	1	2	3	4
16. help you organize and plan your competitions/matches	0	1	2	3	4

Note: Emotional Support = items 1, 5, 9, 13; Esteem Support = items 2, 6, 10, 14; Informational Support = items 3, 7, 11, 15; Tangible Support = items 4, 8, 12, 16

Sport Enjoyment & Enthusiastic Commitment (Sport Commitment Questionnaire-2; Scanlan et al., 2016)

Directions: Based on the sport that you are currently playing, please rate how much you agree/disagree with each statement by circling a number from 1 to 5 using the scale given below. There are no right or wrong answers. We only want your honest opinion about the following statements.					
	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1. Playing this sport is fun.	1	2	3	4	5
2. I am dedicated to keep playing this sport.	1	2	3	4	5
3. I like playing this sport.	1	2	3	4	5
4. I am willing to overcome any obstacle to keep playing this sport.	1	2	3	4	5
5. I love to play this sport.	1	2	3	4	5
6. I am determined to keep playing this sport.	1	2	3	4	5
7. Playing this sport is very pleasurable.	1	2	3	4	5
8. I am very attached to this sport.	1	2	3	4	5
9. Playing this sport makes me happy.	1	2	3	4	5
10. I will continue to play this sport for as long as I can.	1	2	3	4	5
11. I am willing to do almost anything to keep playing this sport.	1	2	3	4	5

Intentions to Continue Sport Participation (Chatzisarantis, Biddle, & Meek, 1997)

	Very unlikely	Unlikely	Somewhat unlikely	Indifferent	Somewhat likely
1. After this season, I intend to play this sport again.	1	2	3	4	5
2. I plan to play this sport again in the future.	1	2	3	4	5
3. I am determined to play this sport again.	1	2	3	4	5

REFERENCES

- Amjad, R., Irshad, E., & Gul, R. (2018). Relationship between competition anxiety and fear of failure among sportsmen and sportswomen. *Journal of Postgraduate Medical Institute*, 32(1), 65-69.
- Amorose, A. J., & Nolan-Sellers, W. (2016). Testing the moderating effect of the perceived importance of the coach on the relationship between perceived coaching feedback and athletes' perceptions of competence. *International Journal of Sports Science & Coaching*, 11(6), 789-798.
- Anthony, D. R., Gordon, S., Gucciardi, D. F., & Dawson, B. (2018). Adapting a behavioral coaching framework for mental toughness development. *Journal of Sport Psychology in Action*, 9(1), 32-50.
- Arnold, R., & Sarkar, M. (2015). Preparing athletes and teams for the Olympic Games: Experiences and lessons learned from the world's best sport psychologists. *International Journal of Sport and Exercise Psychology*, 13(1), 4-20.
- Ascenso, S., Williamon, A., & Perkins, R. (2017). Understanding the wellbeing of professional musicians through the lens of Positive Psychology. *Psychology of Music*, 45(1), 65-81.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Bartone, P. T., Ursano, R. J., Wright, K. M., & Ingraham, L. H. (1989). The impact of a military air disaster on the health of assistance workers: A prospective study. *Journal of Nervous and Mental Disease*, 177(6), 317-328.
- Bum, C., & Shin, S. H. (2015). The relationships between coaches' leadership styles, competitive state anxiety, and golf performance in Korean junior golfers. *Sport Science Review*, 24(5/6), 371-386.
- Calhoun, J. V., Webster, E. K., & Garn, A. C. (2019). An investigation of the generalisability of buoyancy from academics to athletics. *International Journal of Sport and Exercise Psychology*, 17(4), 321-333. doi: 10.1080/1612197X.2017.1349823
- Centers for Disease Control and Prevention. (2018). Facts about Physical Activity. Retrieved from <https://www.cdc.gov/physicalactivity/data/facts.htm>

- Chatzisarantis, N. L. D., Biddle, S. J. H., & Meek, G. A. (1997). A self-determination theory approach to the study of intentions and the intention-behaviour relationship in children's physical activity. *British Journal of Health Psychology*, 2, 343-360.
- Clough, P., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. In I. Cockerill (Ed.), *Solutions in sport psychology* (pp. 32-43). London: Thomson.
- Collie, R. J., Martin, A. J., Bottrell, D., Armstrong, D., Ungar, M., & Liebenberg, L. (2017). Social support, academic adversity and academic buoyancy: A person-centered analysis and implications for academic outcomes. *Educational Psychology*, 37(5), 550-564.
- Collie, R. J., Martin, A. J., Malmberg, L., Hall, J., & Ginns, P. (2015). Academic buoyancy, student's achievement, and the linking role of control: A cross-lagged analysis of high school students. *British Journal of Educational Psychology*, 85, 113-130.
- Colmar, S., Liem, G. A. D., Connor, J., & Martin, A. J. (2019). Exploring the relationships between academic buoyancy, academic self-concept, and academic performance: A study of mathematics and reading among primary school students. *Educational Psychology*, 39(8), 1068-1089.
- Connaughton, D., Hanton, S., & Jones, G. (2010). The development and maintenance of mental toughness in the world's best performers. *The Sport Psychologist*, 24, 168-193.
- Connaughton, D., Wadey, R., Hanton, S., & Jones, G. (2008). The development and maintenance of mental toughness: Perceptions of elite performers. *Journal of Sports Sciences*, 26(1), 83-95.
- Conroy, D. E. (2001). Fear of failure: An exemplar for social development research in sport. *Quest*, 53, 165-183.
- Conroy, D. E., & Metzler, J. N. (2003). Temporal stability of Performance Failure Appraisal Inventory items. *Measurement in Physical Education and Exercise Science*, 7(4), 243-261.
- Conroy, D. E., Metzler, J. N., & Hofer, S. M. (2003). Factorial invariance and latent mean stability of performance failure appraisals. *Structural Equation Modeling*, 10(3), 401-422.
- Conroy, D. E., Willow, J. P., & Metzler, J. N. (2002). Multidimensional fear of failure measurement: The Performance Failure Appraisal Inventory. *Journal of Applied Sport Psychology*, 14, 76-90.
- Correia, M. E., & Rosado, A. (2018). Fear of failure and anxiety in sport. *Análise Psicológica*, 36(1), 75-86.

- Cosh, S., & Tully, P. J. (2015). Stressors, coping, and support mechanisms for student athletes combining elite sport and tertiary education: Implications for practice. *The Sport Psychologist*, 29, 120-133.
- Cowden, R. G., Fuller, D. K., & Anshel, M. H. (2014). Psychological predictors of mental toughness in elite tennis: An exploratory study in learned resourcefulness and competitive trait anxiety. *Perceptual & Motor Skills: Exercise & Sport*, 119(3), 661-678.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.
- Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. H. Kernis (Ed.), *Efficacy, agency and self-esteem* (pp. 31-49). New York: Plenum.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087-1101.
- Duckworth, A. L., & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment*, 91(2), 166-174.
- Duncan, S. C., Duncan, T. E., & Strycker, L. A. (2005). Sources and types of social support in youth physical activity. *Health Psychology*, 24(1), 3-10.
- Eccles, J. (1983). Expectancies, values, and academic behaviors. In J. Spence (Ed.), *Achievement and achievement motivation*. San Francisco: Freeman.
- Eime, R. M., Harvey, J. T., Charity, M. J., Casey, M. M., Westerbeek, H., & Payne, W. R. (2016). Age profiles of sport participants. *BMC Sports Science, Medicine and Rehabilitation*, 8, 1-10.
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for adults: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10, 1-14.
- Endler, N., & Parker, J. (1999). *Coping Inventory for Stressful Situations: Manual* (2nd ed.). Toronto: Multi-Health Systems.
- Ericsson, K. A., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363-406.
- Felton, L., & Jowett, S. (2013). "What do coaches do" and "how do they relate": Their effects on athletes' psychological needs and functioning. *Scandinavian Journal of Medicine & Science in Sports*, 23, e130-e139.

- Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Psychology of Sport and Exercise*, 13, 669-678.
- Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist*, 18(1), 12-23.
- Freeman, P., Coffee, P., & Rees, T. (2011). The PASS-Q: The Perceived Available Support in Sport Questionnaire. *Journal of Sport & Exercise Psychology*, 33, 54-74.
- Galli, N., & Vealey, R. S. (2008). "Bouncing back" from adversity: Athletes' experiences of resilience. *The Sport Psychologist*, 22, 316-335.
- Garn, A. (2016). Perceived teammate acceptance and sport commitment in adolescent female volleyball players. *The Sport Psychologist*, 30, 30-39.
- Giacobbi, Jr., P. R., Lynn, T. K., Wetherington, J. M., Jenkins, J., Bodendorf, M., & Langley, B. (2004). Stress and coping during the transition to university for first-year female athletes. *The Sport Psychologist*, 19, 1-20.
- Gilchrist, J. D., Fong, A. J., Herbison, J. D., & Sabiston, C. M. (2018). Feelings of pride are associated with grit in student-athletes and recreational runners. *Psychology of Sport & Exercise*, 36, 1-7.
- Green, S., Evans, O., & Williams, B. (2017). Positive psychology at work: Research and practice. In C. Proctor (Ed.), *Positive psychology interventions in practice* (pp. 185-206). Cham, Switzerland: Springer International Publishing.
- Grossbard, J. R., Smith, R. E., Smoll, F. L., & Cumming, S. P. (2009). Competitive anxiety in young athletes: Differentiating somatic anxiety, worry, and concentration disruption. *Anxiety, Stress, & Coping*, 22, 153-166.
- Gucciardi, D. F., Gordon, S., & Dimmock, J. A. (2008). Towards an understanding of mental toughness in Australian football. *Journal of Applied Sport Psychology*, 20, 261-281.
- Gucciardi, D. F., & Jackson, B. (2015). Understanding sport continuation: An integration of the theories of planned behavior and basic psychological needs. *Journal of Science and Medicine in Sport*, 18, 31-36.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guildford Press.
- Hill, P. L., Burrow, A. L., Cotton Bronk, K. C. (2016). Preserving with positivity and purpose: An examination of purpose commitment and positive affect as predictors of grit. *Journal of Happiness Studies*, 17, 257-269.

- Hoye, R., Nicholson, M., & Brown, K. (2015). Involvement in sport and social connectedness. *International Review for the Sociology of Sport*, 50(1), 3-21.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Jenkin, C. R., Eime, R. M., Westerbeek, H., & van Uffelen, J. G. Z. (2018). Sport for adults aged 50+ years: Participation benefits and barriers. *Journal of Aging and Physical Activity*, 26, 363-371.
- Jones, G., Hanton, S., & Connaughton, D. (2002). What is this thing called mental toughness? An investigation of elite sport performers. *Journal of Applied Sport Psychology*, 14, 205-218.
- Jones, G., Hanton, S., & Connaughton, D. (2007). A framework of mental toughness in the world's best performers. *The Sport Psychologist*, 21, 243-264.
- Kirk, R. E. (2013). *Experimental design: Procedures for the behavioral sciences* (4th ed.). Los Angeles: SAGE.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology*, 37, 1-11.
- Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, 42(1), 168-177.
- Kobasa, S. C., Maddi, S. R., & Puccetti, M. C. (1982). Personality and exercise as buffers in the stress-illness relationship. *Journal of Behavioral Medicine*, 5(4), 391-404.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. New York: Springer.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Ledesma, J. (2014). Conceptual frameworks and research models on resilience in leadership. *SAGE Open*, 2014, 1-8.
- Light, R. L., & Harvey, S. (2017). Positive pedagogy for sport coaching. *Sport, Education and Society*, 22(2), 271-287.
- Lovering, M. E., Heaton, K. J., Banderet, L. E., Neises, K., Andrews, J., & Cohen, B. S. (2015). Psychological and physical characteristics of U.S. Marine recruits. *Military Psychology*, 27(5), 261-275.

- Maddi, S. R. (2002). The story of hardiness: Twenty years of theorizing, research, and practice. *Consulting Psychology Journal: Practice and Research*, 54(3), 173-185.
- Maddi, S. R., Brow, M., Khoshaba, D. M., & Vaitkus, M. (2006). Personal Views Survey, Third Edition-Revised (PVS III). *Consulting Psychology Journal: Practice and Research*, 58(3).
- Maddi, S. R., Matthews, M. D., Kelly, D. R., Villarreal, B., & White, M. (2012). The role of hardiness and grit in predicting performance and retention of USMA cadets. *Military Psychology*, 24, 19-28.
- Madrigal, L., Gill, D. L., & Willse, J. T. (2017). Gender and the relationships among mental toughness, hardiness, optimism and coping in collegiate athletics: A structural equation modeling approach. *Journal of Sport Behavior*, 40, 68-86.
- Madrigal, L., Hamill, S., & Gill, D. L. (2013). Mind over matter: The development of the Mental Toughness Scale (MTS). *The Sport Psychologist*, 27, 62-77.
- Marsh, H. W. (1994). Sport motivation orientations: Beware of jingle-jangle fallacies. *Journal of Sport & Exercise Psychology*, 16, 365-380.
- Marsh, H. W., & Craven, R. G. (2006). Reciprocal effects of self-concept and performance from a multidimensional perspective: Beyond seductive pleasure and unidimensional perspectives. *Perspectives on Psychological Science*, 1(2), 133-163.
- Marsh, H. W., Craven, R. G., Hinkley, J. W., & Debus, R. L. (2003). Evaluation of the Big-Two-Factor Theory of academic motivation orientations: An evaluation of jingle-jangle fallacies. *Multivariate Behavioral Research*, 38(2), 189-224.
- Marsh, H. W., & O'Mara, A. (2008). Reciprocal effects between academic self-concept, self-esteem, achievement, and attainment over seven adolescent years: Unidimensional and multidimensional perspectives of self-concept. *Personality and Social Psychology Bulletin*, 34(4), 542-552.
- Martin, A. J. (2002). Motivation and academic resilience: Developing a model for student enhancement. *Australian Journal of Education*, 46(1), 34-49.
- Martin, A. J. (2004). The role of positive psychology in enhancing satisfaction, motivation, and productivity in the workplace. *Journal of Organizational Behavior Management*, 24, 113-133.
- Martin, A. J. (2013). Academic buoyancy and academic resilience: Exploring 'everyday' and 'classic' resilience in the face of academic adversity. *School Psychology International*, 34(5), 488-500.

- Martin, A. J. (2014). Academic buoyancy and academic outcomes: Towards a further understanding of students with attention-deficit/hyperactivity disorder (ADHD), students without ADHD, and academic buoyancy itself. *British Journal of Educational Psychology*, 84, 86-107.
- Martin, J. J., Byrd, B., Lewis Watts, M., & Dent, M. (2015). Gritty, hardy, and resilient: Predictors of sport engagement and life satisfaction in wheelchair basketball players. *Journal of Clinical Sport Psychology*, 9, 345-359.
- Martin, A. J., Colmar, S. H., Davey, L. A., & Marsh, H. W. (2010). Longitudinal modelling of academic buoyancy and motivation: Do the '5Cs' hold up over time? *British Journal of Educational Psychology*, 80, 473-496.
- Martin, A. J., Ginns, P., Brackett, M. A., Malmberg, L., & Hall, J. (2013). Academic buoyancy and psychological risk: Exploring reciprocal relationships. *Learning and Individual Differences*, 27, 128-133.
- Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, 43(3), 267-281.
- Martin, A. J., & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology*, 46, 53-83.
- Martin, A. J., & Marsh, H. W. (2009). Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs. *Oxford Review of Education*, 35(3), 353-370.
- Martin, A. J., Nejad, H. G., Colmar, S., & Liem, G. A. D. (2013). Adaptability: How students' responses to uncertainty and novelty predict their academic and non-academic outcomes. *Journal of Educational Psychology*, 105(3), 728-746.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3), 227-238.
- McCracken, H., & Dogra, S. (2018). Sedentary time in male and female masters and recreational athletes aged 55 and older. *Journal of Aging and Physical Activity*, 26, 121-127.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175-215.
- Mesagno, C., & Hill, D. M. (2013). Definition of choking in sport: Re-conceptualization and debate. *International Journal of Sport Psychology*, 44(4), 267-277.
- Miller, L. M. (2015). Positive psychology in college sport and exercise. In J. C. Wade, L. I. Marks, & R. D. Hetzel (Eds.), *Positive psychology on the college campus* (pp. 299-317). New York, NY: Oxford University Press.

- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Preacher, K. J., Zhang, G., Kim, C., & Mels, G. (2013). Choosing the optimal number of factors in exploratory factor analysis: A model selection perspective. *Multivariate Behavioral Research*, 48, 28-56.
- Putwain, D. W., & Daly, A. L. (2013). Do clusters of test anxiety and academic buoyancy differentially predict academic performance? *Learning and Individual Differences*, 27, 157-162.
- Ramis, Y., Viladrich, C., Sousa, C., & Jannes, C. (2015). Exploring the factorial structure of the sport anxiety scale-2: Invariance across language, gender, age and type of sport. *Psicothema*, 27, 174-181.
- Reed, J. (2014). A survey of grit and exercise behavior. *Journal of Sport Behavior*, 37(4), 390-406.
- Reinboth, M., & Duda, J. L. (2004). The motivational climate, perceived ability, and athletes' psychological and physical well-being. *The Sport Psychologist*, 18, 237-251.
- Reverdito, R. S., Carvalho, H. M., Galatti, L. R., Scaglia, A. J., Gonçalves, C. E., & Paes, R. R. (2017). Effects of youth participation in extra-curricular sport programs on perceived self-efficacy: A multilevel analysis. *Perceptual and Motor Skills*, 124(3), 569-583.
- Ruiz, M. C., Haapanen, S., Tolvanen, A., Robazza, C., & Duda, J. L. (2017). Predicting athletes' functional and dysfunctional emotions: The role of the motivational climate and motivation regulations. *Journal of Sport Sciences*, 35(16), 1598-1606.
- Sagar, S. S., & Jowett, S. (2012). The effects of age, gender, sport type and sport level on athletes' fear of failure: Implications and recommendations for sport coaches. *International Journal of Coaching Science*, 6(2), 61-82.
- Salim, J., Wadey, R., & Diss, C. (2015). Examining the relationship between hardiness and perceived stress-related growth in a sport injury context. *Psychology of Sport and Exercise*, 19, 10-17.
- Sarkar, M., & Fletcher, D. (2013). How should we measure psychological resilience in sport performers? *Measurement in Physical Education and Exercise Science*, 17, 264-280.
- Sarkar, M., & Fletcher, D. (2014). Psychological resilience in sport performers: A review of stressors and protective factors. *Journal of Sports Sciences*, 32(15), 1419-1434.

- Sarkar, M., Fletcher, D., & Brown, D. J. (2015). What doesn't kill me...: Adversity-related experiences are vital in the development of superior Olympic performance. *Journal of Science and Medicine in Sport*, 18, 475-479.
- Scanlan, T. K., Chow, G. M., Sousa, C., Scanlan, L. A., & Knifsend, C. A. (2016). The development of the Sport Commitment Questionnaire-2 (English version). *Psychology of Sport and Exercise*, 22(2016), 233-246.
- Scanlan, T. K., Russell, D. G., Scanlan, L. A., Klunchoo, T. J., & Chow, G. M. (2013). Project on Elite Athlete Commitment (PEAK): IV. Identification of New Candidate Commitment Sources in the Sport Commitment Model. *Journal of Sport & Exercise Psychology*, 35, 525-535.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5-14.
- Sheard, M., & Golby, J. (2010). Personality hardiness differentiates elite-level sport performers. *International Journal of Sport and Exercise Psychology*, 8, 160-169.
- Sheard, M., Golby, J., & van Wersch, A. (2009). Progress toward construct validation of the Sports Mental Toughness Questionnaire (SMTQ). *European Journal of Psychological Assessment*, 25(3), 186-193.
- Sheridan, Z., Boman, P., Mergler, A., & Furlong, M. J. (2015). Examining well-being, anxiety, and self-deception in university students. *Cogent Psychology*, 2(1), 1-17.
- Shores, K., Becker, C. M., Moynahan, R., Williams, R., & Cooper, N. (2015). The relationship of young adults' health and their sports participation. *Journal of Sport Behavior*, 38(3), 306-320.
- Smith, M. M., Saklofske, D. H., Keefer, K. V., & Tremblay, P. F. (2016). Coping strategies and psychological outcomes: The moderating effects of personal resiliency. *The Journal of Psychology*, 150(3), 318-332.
- Smith, R. E., Schutz, R. W., Smoll, F. L., & Ptacek, J. T. (1995). Development and validation of a multidimensional measure of sport-specific psychological skills: The Athletic Coping Skills Inventory-28. *Journal of Sport & Exercise Psychology*, 17, 379-398.
- Smith, R. E., Smoll, F. L., & Barnett, N. P. (1995). Reduction of children's sport performance anxiety through social support and stress-reduction training for coaches. *Journal of Applied Developmental Psychology*, 16, 125-142.
- Smith, R. E., Smoll, F. L., Cumming, S. P., & Grossbard, J. R. (2006). Measurement of multidimensional sport performance anxiety in children and adults: The Sport Anxiety Scale-2. *Journal of Sport & Exercise Psychology*, 28(4), 479-501.

- Steyn, B. J. M., Steyn, M. H., Maree, D. J. F., & Panebianco-Warrens, C. (2015). A cross-over from sport psychology to the psychology of music: An intervention study on undergraduate music students. *African Journal for Physical, Health Education, Recreation and Dance (AJPHERD)*, 21(2), 596-611.
- Symes, W., Putwain, D. W., & Remedios, R. (2015). The enabling and protective role of academic buoyancy in the appraisal of fear appeals used prior to high stakes examinations. *School Psychology International*, 36(6), 605-619.
- Tedesqui, R. A. B., & Young, B. W. (2018). Comparing the contribution of conscientiousness, self-control, and grit to key criteria of sport expertise development. *Psychology of Sport & Exercise*, 2018, 110-118.
- Thurstone, L. L. (1947). *Multiple-factor analysis*. Chicago: The University of Chicago Press.
- van Houten, J. M. A., Kraaykamp, G., & Breedveld, K. (2017). When do young adults stop practising a sport? An event history analysis on the impact of four major life events. *International Review for the Sociology of Sport*, 52(7), 858-874.
- Weinberg, R., Freysinger, V., Mellano, K., & Brookhouse, E. (2016). Building mental toughness: Perceptions of sport psychologists. *The Sport Psychologist*, 30, 231-241.
- Weiner, B. (1994). Integrating social and personal theories of achievement striving. *Review of Educational Research*, 64(4), 557-573.
- Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*, 21, 152-169.
- Witt, P. A., & Dangi, T. B. (2018). Why children/youth drop out of sports. *Journal of Park and Recreation Administration*, 36, 191-199.
- Yates, A. (1987). *Multivariate exploratory data analysis: A perspective on exploratory factor analysis*. Albany: State University of New York Press.
- Yun, S., Hiver, P., & Al-Hoorie, A. H. (2018). Academic buoyancy: Exploring learners' everyday resilience in the language classroom. *Studies in Second Language Acquisition*, 1-16.

VITA

Jackie V. Calhoun, a Louisiana native, attended Louisiana State University in Baton Rouge, LA beginning in 2009. She received a Bachelor of Arts degree in Anthropology in 2013 and continued her education at LSU to receive a Master of Science degree in Kinesiology, focusing on sport pedagogy and sport psychology. In August of 2014, Jackie held the position of Graduate Assistant of Fitness and Wellness with LSU University Recreation, and beginning in August 2015, she worked as a Graduate Teaching Assistant in the LSU School of Kinesiology until May of 2019. During this time, Jackie pursued a doctoral degree in Kinesiology at LSU, where she focused her studies and research on athletic buoyancy and other psychological factors in competitive sports settings. Jackie is a candidate to graduate in August 2020 and plans to pursue a career in both secondary and higher education.