

PERSONALITY RESILIENCE INDICATORS OF DISPOSITIONAL MINDFULNESS
AND SELF-REGULATION IN COLLEGE ATHLETES

A Dissertation

by

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ABSTRACT

Sport psychology research relies on advancements in the measurement of psychological resilience to explore healthy and adaptive responses to conditions that present adversity among student athletes. This study examined relationships between personality, attention and self-regulation as a means to contribute a prototypical perspective of athlete resiliency that correlates with health and wellbeing under stress. A sample of 75 college student athletes completed the Big Five personality dimensions using the Big Five Inventory (BFI), the Mindful Attention Awareness Scale (MAAS) and The Self-Regulation Scale (SRQ). A cluster-analysis of the BFI data yielded a three-cluster solution of the resilient, overcontrolled and undercontrolled personality prototypes generally found in previous research with an important exception: the highest Neuroticism score did not occur in the overcontrolled cluster, but in the undercontrolled cluster. Data analyses indicated that resilient athletes reported significantly higher overall present moment attention ($M = 4.09$, $SD = .77$) compared to both the undercontrolled [$M = 3.45$, $SD = .49$, $t(45) = 3.39$, $p = .01$] and overcontrolled groups, $M = 4.09$, $SD = .77$, $t(48) = 3.49$, $p = .01$. Resilient athletes were reported significantly higher self-regulation ($M = 234.64$, $SD = 18.01$) compared only to the undercontrolled group, $M = 219.88$, $SD = 16.24$, $t(45) = 2.95$, $p = .01$. No significant differences were detected between men and women on present moment attention or self-regulation. Personality prototype had a significant main effect on present moment attention [$F(2,69) = 4.77$, $p < .01$] and gender had a significant main effect on self-regulation,

$F(1,69) = 4.42, p < .01$. However, no interaction between gender and personality prototype was detected on present moment awareness or self-regulation. Distinctive aspects of athlete resilience pertaining to present moment awareness and self-regulation, along with implications for future study of resilience and other personality prototypes in sports psychology are discussed.

DEDICATION

To Betty, for always embracing the moment.

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1. INTRODUCTION

According to the NCAA 2009 Membership Report, nearly one half million (430,301) college students are members of a sports team. Nearly 50,000 (45,545) of those athletes compete at championship levels. Collegiate athletic programs rely on sport sciences to effectively integrate the psychological and physiological elements of training and competition. The purpose of this chapter is to explore how personality research design in sport psychology has evolved and promoted contemporary advancements in athletic training and performance. The conceptual blueprint of this study is built upon the developmental theory of personality as it pertains to dispositional mindfulness and self-regulation in sports. Following a review of personality in sport, recent trends in dispositional mindfulness and self-regulation are considered from a sports perspective. The element of attention during the present moment is a concept currently studied across the clinical fields of psychology as “dispositional mindfulness” (Brown & Ryan, 2003).

William James (1890) famously pronounced that experience is what one agrees to attend to. Athletes who develop their capacity to control attention in the moment may hold an advantage by eliciting the primary element of mindfulness during athletic training and performance. This mode of awareness may improve an athlete’s ability to guide the focus of attention, while reducing unwanted reactions to internal or external distractions. Dispositional mindfulness provides a unique platform on which to consider how athletes may harness levels of attentional control.

To better understand the role of attention in athletic performance, the present

study will investigate differences in dispositional mindfulness and self-regulation that may occur as a function of personality. The five-factor model of personality (Costa and McCrae, 1992) provides a strong theoretical basis for examining specific personality prototypes. The five dimensions of personality offer an empirically stable forecast of traits over time (Digman, 1990) and a useful tool to examine life outcomes (Piedmont, Hill, & Blanco, 1999). Trait theorists conceive personality to be comprised of specific traits, which in turn inspire behavioral temperament. The Big Five (Neuroticism, Extraversion, Agreeableness, Conscientiousness, Openness) were the domains identified to consolidate the variety of personality traits. Originally anticipated as an effective predictor of athletic performance, sports psychologists quickly discovered considerable individual variability in the relationship between the personality traits and performance (Vealey, 2002). Even so, the Big Five model has continued to illustrate meaningful patterns in athletic personality traits (Vealey, 2002).

Self-regulation theory (Schwarzer, 1999) provides information regarding how well athletes employ techniques to manage stress, including their cognitive and emotional reactions. Sports psychologists have taken particular interest in the self-regulatory processes of athletes. Many talented and trained athletes occasionally have difficulty managing attentional and behavioral responses to stress during sports performance (Behncke, 2002). Competitors committed to extensive training programs commonly employ techniques to improve psycho-somatic monitoring and response. Self-regulation research has been influential in helping athletes learn effective stress management techniques (Behncke, 2002). One fundamental mechanism of the self-

regulatory process is self-monitoring. Self-monitoring is described as the span of attention that searches to alert an individual to a stimulus that requires a response. Among elite athletes, the advantage of controlling short spans of attention often makes the difference between victory and defeat.

This dissertation is designed to address how the relationship between personality and attention components enable psychological resilience in the college athlete. Dispositional mindfulness and self-regulation research are integrated with personality clustering methods to formulate a study design that builds on the existing body of sports psychology literature. Personality investigators using a person-centered approach found three reliable prototypes built from the Big Five domains including overcontrolled, undercontrolled and resilient. The major advantage in classifying athletes by prototype is a more complete profile that reflects personality as a variation across multiple dimensions. These prototypes have been previously found to correlate with behavioral health outcomes (Berry & Schewebel, 2009), wellbeing and life satisfaction under time of extreme stress and transition (Berry, Elliott & Rivera, 2007). Research has yet to examine how approaching athlete personality from the prototypical perspective may advance the applied understanding of sports performance. This study will demonstrate how overcontrolled, undercontrolled and resilient athletes vary in levels of dispositional mindfulness and self-regulation. The findings will be used to discuss implications of the self-regulatory process during athlete training and performance.

The broader goal of this research is to guide college athletes towards a balanced approach for physical and psychological health and performance. Personality assessment

among college athletes is common when attempting to understand or accommodate a particular reaction to the sport or academic environment. Particularly under demanding training conditions, athletes benefit from personality research by becoming more familiar with the tides of their “natural” behavioral patterns. To their further advantage, an athlete familiarized with the five core personality factors can begin to more accurately interpret and constructively respond to their teammates, coaches and instructors. Educational and psychological professionals working with athletes are also to benefit from personality assessment that helps reveal how their athletes will react behaviorally to one another.

Dispositional mindfulness offers an access point to assess how athletes process awareness in the present moment. Traditional mindfulness theory combines attention with attitude. With a selected interest in the shifting of cognitive focus, this study will measure only the attentional component of mindfulness with the assumption that dispositional mindfulness may help regulate the perception of stressful stimuli, emotional appraisal and the subsequent behavioral response (Brown & Ryan, 2003).

Self-regulation is presented as the third theory of applied interest. The process of self-regulation is a formula with changing variables dependent on internal and external experience. Examining how athletes practicing techniques to improve the recognition and facilitation of this process is rooted at the core of this research project.

The purpose of this study is to investigate differences in dispositional mindfulness and self-regulation processes among collegiate athletes as a function of personality prototypes. This study will advance our understanding of these dispositional mindfulness

variables as they relate to stable personality prototypes. Linking dispositional mindfulness with different personality prototypes may help inform specific mindfulness interventions and training programs for athletes. The Big Five constructs personality framework is a critical step towards understanding dispositional mindfulness as a psychologically adaptive skill that may inform athletes, coaches, instructors and sports health professionals. To date, no studies have explored dispositional mindfulness and self-regulation from a person-centered approach within the context of the resilient, overcontrolled, and undercontrolled personality types.

2. LITERATURE REVIEW

This section begins with an exploration of personality research from a sports perspective. Dispositional mindfulness and self-regulation are defined and described as adaptive constructs with relevance to personality and performance issues. Studies are reviewed that apply concept of dispositional mindfulness and self-regulation to athletic performance. Support for using a person-centered approach to explore personality resiliency is discussed along with the prototype model to measure how athletes may differ in dispositional mindfulness and self-regulation. This section concludes with three research questions.

2.1 Personality in Sports Psychology

Personality research is used among college athletes in building, modifying and improving supportive relationships while dealing with challenges on and off the field. Some advantages include identifying areas of strengths and weakness to better inform decision-making, goal setting, self-monitoring and self-regulation behaviors. A great variety exists in research attempts to define personality (Vealey, 2002). To help athletes explore the relationship between their personality and performance contemporary sport psychologists are encouraged to move beyond the narrow confines of trait research and descriptive profiling. The empirical classification of the four common features that permeate sports personality literature include; identity, individual differences, internal determination and the integrated self. Referring to these areas of interest when interpreting personality measurement broadens the potential for application and value of

outcome data. Shifting from a theoretical view of sport personality to personality in sport allows researchers to adopt a more inclusive inquiry to the influence of character on performance (Vealey, 2002). For example, personality can be understood to be predominately internally determined (Freudian), externally determined (Skinnerian), or somewhere in between. At one end of this continuum, a dispositional approach explains how stable and consistent internal qualities may influence behavior. At the other end, a situational approach explains how environmental conditions relate to individual response. The interactional approach falls in between and encompasses components of both the dispositional and situational perspective. A review of 20 years of sport personality research illustrated the increasing implementation of the interactional paradigm (Vealey, 1989).

Vealey (2002) highlights the implications of research inquiries regarding within-athlete variation of personality (idiographic approach) and inquiries regarding central tendencies of athlete behavior (nomothetic approach). An integrative approach that measures personality trait configuration is argued more beneficial than the relative standing of athletes across variable traits. The proposed paper will employ an integrative approach to capture athlete resiliency among personality prototype configurations. It also employs a correlation method of data collection, which has been found to be the most widely selected method sport personality research (Vealey, 1989).

Personality research has long held theory based in the FFM of personality (Digman, 1990), providing a reliable set of personality dimensions that capture individual differences. The dimensions include openness consciousness, extraversion

agreeableness and neuroticism. They have high reliability and validity and present a sound structure of personality. Most FFM research measures the five dimensions, their descriptions in questionnaires, and their relationship to behavior. FFM reviewers suggest that the hierarchical organization of personality traits is consistent and applicable across observers and cultures (McCrae & John, 1992). The five dimensions are also connected to predicting important life outcomes (John & Srivastava, 1999).

Sport psychology has revealed interesting associations between the FFM and sports performance. Regression analysis of the FFM has been used to predict athletic performance based on self-report, coach evaluation and performance statistic data (Piedmont, et al., 1999). Athletic performance was found associated with the personality dimensions of conscientiousness and neuroticism. Neuroticism in the sports context was interpreted as the capacity to tolerate stress, control impulsivity and maintain a sense of self under performance pressure. Neuroticism was also significantly associated with coping ability. The authors argued some personality traits increase motivation to participate, train and compete athletically. Their results forecast a trait combination of high conscientiousness and low neuroticism might help build a behavioral and attitudinal foundation that indirectly lends itself to the performance goals of college athletes.

The FFM has been shown to determine different levels of involvement in sports as well as indicate the likely coping strategies adopted by athletes (Allen, Greenlees & Jones, 2011). One study examining the main and interactive effects of the FFM on coping in sports revealed that extraverted athletes showed greater emotional stability

and openness to new experiences. Extraverted athletes also employed problem-focused strategies, conscientious athletes used more emotion-focused strategies and athletes with low levels of openness used the most avoidant strategies.

Criticism for the assessment of personality correlates among athletes has been well documented (Eysenck, Nias & Cox, 1982; Vealey, 1992). Testing procedure traditionally follows the administration of an empirically validated personality measure to athletes and non-athletes with a subsequent analysis of any observed differences in subscales. Reviewers of this literature warn that personality research in sports often falls short in sample sizes too small to yield sufficient statistical power and too heterogeneous to derive corresponding analyses of results. Research designs that use poorly structured theoretical model of personality may also fail to address important distinctions within homogenous groups of athletes. For example, increasing time allowed during athletic performance was found to impose an advantageous influence on extroverted athletes over their introverted counterparts (Eysenck et al., 1982). Vealey (2002) also cautioned researchers to monitor for misrepresented test items, social desirability bias, tautological reasoning and explanatory analysis without a priori hypotheses.

Many questions are still unanswered in sports personality research. Studies have yet to demonstrate consistent observations in the dimensions of personality among athletes as compared to non-athletes. Consistent differences between sports are not found and generating meaningful application of results can be limited due to methodological restrictions. Physical activity itself seems to have no influence on global

personality traits, though is still connected to less emotional negativity and an improved self-concept (Vealey, 2002).

Though participating in sports may not be powerfully linked to personality, it is empirically associated with many important cognitive, behavioral and emotional functions. Being successful in sports promotes self-confidence, productive coping strategies and coping mechanisms. It is also unsurprisingly linked to extreme commitment and determination. Elite athletes and non-elite athletes are found to differ in thinking and the ability to self-regulate, though not in their enduring personality traits and dispositions (Allen et al, 2011; Vealey, 2002). For example, elite and non-elite athletes show little to no difference in dispositional anxiety, but elite athletes demonstrate a more protective level of cognitive skill when controlling anxiety during the stress of sport competition. These findings emphasize the relevance of cognitive control and attention in an athlete despite the expected emergence of some anxiety during sport performance.

Research efforts struggle to reach consensus regarding how athlete personality differ between athletes and non-athletes (Allen et al, 2011). The substantial amount of studies conducted is difficult to generalize due to inadequate operational definitions of the independent variables measured (Morgan, 1972). One study comparing non-athletes, competitive athletes and noncompetitive athletes according to their respective personality types found athlete groups to be more dominant and self-sufficient than non-athletes (McKelvie, Lemieux & Stout, 2003). Dominance was considered a selective personality strength among athletes facing fierce competition while self-sufficiency

described the internal capacity athletes utilize to maintain their drive during the course of training. This research offers a perspective of personality that symbiotically positions itself with the other ingredients for performance success.

In measuring athlete competitiveness, Kirkcaldy (1982) found that men and women athletes scored higher in extroversion, emotional stability and tough-mindedness. One explanation for high extraversion in women athletes was to manage pressures of group-cohesion and dependency, with emotional stability understood as a protective factor from competition stress. The high levels of tough-mindedness and persistence in men athletes were interpreted as predictors of success, lessening their reliance on emotional stability. These findings were woven into the context of developmental gender differences as evidence that athletic career success for women is contingent upon them exhibiting higher levels of assertiveness, sociability and enthusiasm (Kirkcaldy, 1982). The level of competition at the collegiate level marks relevance for these findings, particularly as many men and women student athletes set career goals that extend beyond athletic performance.

A study of sports participation motivation in a sample of 415 college students found athletic participation positively associated with intrinsic enjoyment of physical exercise (Reiss, Wiltz & Sherman, 2001) when interpreting the link between the athletic personality and enjoyment of physical exercise, it was concluded that further assessment should emphasize the extent to which one enjoys exercise rather than the self-report of athletic competence. The theory underlying this argument aligns well with the purpose

of this paper in carefully considering which factors moderate the association between personality and sports training and performance.

Sport psychology research argues that the most transparent determinants of personality and physique are genetic factors, which explain between 70% and 90% of observable variation (Eysenck et al., 1982). Still, several consistent patterns of personality features among athletes are found. Not only does the athlete archetype consist of higher extraversion, but also lower levels of cortical arousal. The latter finding attributes higher levels of competitiveness, assertiveness and pain thresholds among athletes as means to achieve desired brain stimulation. Furthermore, athletic performance correlates with low neuroticism and state-related anxiety, suggesting athletes may be better equipped to effectively manage distressing arousal (Eysenck et al., 1982).

Well-designed research may eventually demonstrate to what degree behavior is internally or externally defined or which factors influence how athletes develop their attitude towards sport performance. It would also be helpful to identify which factors during competition seem to supersede even the strongest personality factors and how cognitive, emotional and behavioral functioning interact during sport performance. Research can also improve its applicability by diversifying assessment procedures and to creating a dynamic approach when evaluating consistencies and variability in athlete personality.

Sport psychology researchers are thus encouraged to narrow their approach to specific personality content areas. This allows the observations collected to be

interpreted in the most meaningful way for the athletes. This study will interpret personality measurement through a resiliency lens by clustering the athletes by ego-control/resiliency prototypes. Grouped athletes will then be compared by capacity for dispositional mindfulness, a complex cognitive process that directly influences affective and behavioral response. Psychology research is invested in exploring which personality traits help make a successful college athlete. This emphasis can better inform college athletes to the role their sport plays in determining which personality traits are accentuated or suppressed. College athletes can then strategically begin to apply this information when interpreting how to maximize their personal potential to achieve goals within and outside their sport.

2.2 Dispositional Mindfulness and Self-Regulation: Adaptive Constructs in Sports

Prior to sports psychology adopting an applied interest in mindfulness, researchers established two basic elements of the construct: dispositional mindfulness and acceptance. Various analyses indicated that present moment attention and acceptance are not correlated, encouraging an open exploration of how each element may independently affect mental health. Over years of defining the mindfulness, a clear pattern of attending to the present-moment emerged. Bishop et al. (2004) described mindfulness as “a state in which one is highly aware and focused on the reality of the present moment, accepting and acknowledging it, without getting caught up in thoughts that are about the situation or in emotional reactions to the situation.” Similar definitions include ‘...moment-by-moment awareness’ (Germer, 2005) and ‘attentional control’ (Teasdale, Segal & Williams, 1995).

Mindfulness research has studied clinical intervention to assess the efficacy of meditative practices among patient populations (Kabat-Zinn, 1990). Hospital and clinics and clinics nationwide subsequently adopted meditative techniques into the treatment of various medical problems including depression, anxiety, OCD. However, origins of mindfulness extend beyond meditative techniques to reflect a receptive state of consciousness in which attention simply observes what is occurring. (Brown & Ryan, 2003). Another similar and commonly cited definition of mindfulness is described as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994).

Researchers have intentionally and explicitly emphasized the element of attention in the depiction of mindfulness for clinical (Epstein, 1999; Kabat-Zinn, 2003; Marlatt & Kristeller, 1999; Miller, Fletcher & Kabat-Zinn, 1995) as well as for non-clinical purposes (Brown & Ryan, 2003; Horowitz, 2002). For example, a meta-mechanism model of mindfulness was derived from behaviorist theory (Shapiro, Carlson, Astin & Freedman, 2006). The first axiom is intention or the evolving dynamic of purpose that outlines a schema of awareness. The second axiom is attention, the cognitive process of moment-to-moment attention which helps order the contents of consciousness itself. The third axiom is the attitude of acceptance. This model is presented as a cyclical process, with all three mechanisms simultaneously guiding the conscious experience of re-perceiving. Re-perceiving is thus argued to allow for particular self-regulatory processes to occur. To illustrate this, consider an athlete becoming frustrated as they are slightly outperformed by their competitor due to error in their technique. In mere instant

of cognition, the athlete may attempt to self-regulate by purposely (intentionally) bringing their focus (attention) to shifting their orientation (attitude) from self-criticizing to non-judgmental. This tri-axiomatic model of mindfulness compliments the cognitive theory of sports psychology by explaining how attention orientation is inherently associated with activating components of the self-regulatory process.

Fortunately, the distinction between mindfulness constructs has led researchers to develop an assortment of measures that target the different components of dispositional mindfulness (Brown & Ryan, 2003). The present study is interested in exploring the function of attention within the bi-dimensionality of mindfulness by measuring it in isolation among a sample of college athletes. To be consistent with the literature, this paper will here forward refer to the construct of measurement as *dispositional mindfulness* (Brown & Ryan, 2003).

Cognitive research is valued in sports psychology in part for its potential to advance athletic training procedures. In many cases the training may consist of teaching athletes how to self-regulate. A recent study demonstrated reliable improvement in self-regulation ability with brief introduction to basic integrative mental training (Tang et. al., 2007). Athlete stress has been described as the internal and external factors that interfere with a state of equilibrium and make adaptation to change more challenging (Humphrey, Yow & Bowden, 2000).

Managing stress is central to athletes seeking to perform at their highest potential. Lazarus (1999) discusses how the General Adaptation Syndrome (GAS) encompasses stress as the “nonspecific response of the body to any demand on it.” The

GAS model consists of three stages; alarm reaction, resistance stage, and exhaustion.

Alarm reaction involves the biochemical transmission of adrenaline and other corticoids required to prepare the body to act in response to the stress. If the level and length of exposure is tolerable, the body adapts via retaliation and repair (resistance stage).

However, prolonged exposure can result in a failure to adapt (exhaustion) and may reactivate the alarm reaction. College athletes commonly experience versions of the fight or flight phenomenon depicted in the GAS including a pounding heart, perspiration, increased blood pressure, dilated pupils, knotted stomach, difficulty swallowing and tightness in the chest. These physiological responses are a means of self-preservation activated by any perceived stressor. For this reason, it is entirely possible for players watching from the bench to experience a stress response commensurate to players on the field.

Several stress-related medical conditions include migraine headaches, mental health problems, high blood pressure, diabetes, cirrhosis of the liver, multiple sclerosis, lung disease, accidental injury, coronary heart disease and cancer (Lazarus, 1999). The potential for health risks due to unregulated stress is a topic of discussion essential for optimal achievement of any individual athlete or team. Humphrey et al. (2000) found college athletes perceive stress as stress as pressure, commonly depicted as a mental strain related to time, workload, performance and winning. They also reported stress being perceived as anxiety related to goal accomplishment and generally feeling overwhelmed. Frustration with the loss of control, conflict, worry and tension were also common perceptions of athlete stress. The athletes contextualized their perceptions by

identifying various sources of their stress. Academic problems ranked highest, followed by athletic demands, time, relationships and finances. Fully satisfying academic requirements clearly emerges as the major sources of stress for 95% of the men and 86% of the women athletes sampled. Interestingly, the consequences of stress were reported to have the highest negative impact on mental/emotional health, followed by physical health, athletic performance and finally academic performance. This may suggest that although academic demand may activate athlete stress, the stress itself may result in a greater detriment to the student health than to sport and academic performance.

Humphrey et al. (2000) encouraged athletes to value behaviors that help maintain a healthy lifestyle. They propose these to include nutrition, diet, body restoration and physical exercise. Adapting sport programs to meet the needs of each athlete can provide a systematic approach to the issue of managing harmful stress. That being said, identifying beneficial stress is also of relevance as several athletes reported a positive influence of stress as a motivational drive to succeed.

Stress reduction is achieved via relaxation strategies including progressive relaxation, mental imagery, meditation and biofeedback. Success with these methods are expected to individually vary, so athletes are recommended to try several different methods when personalizing an action plan to manage stress. One goal for athletes is to develop an internal culture of coping that provides feasible, reliable and effective self-regulation techniques. Similar to other sports training, athletes become better positioned and more efficient in self-regulating during stress reactions as anticipated outcomes become more predictable.

For college athletes under demanding conditions, understanding the relationship between personality and performance indicators can be crucial. By examining interactions between personality, dispositional mindfulness and self-regulation, athletes will be better prepared to select effective techniques to better manage the perception and response to stress.

Mindfulness is one mechanism by which researchers explore our ability to control behaviors, thoughts and emotions. For example, evidence found linking mindfulness to persistence built confidence in researchers that mindfulness is distinctively characterized as a mode of attentional self-regulation that draws a particular aspect of focus to present moment experience (Evans, Baer & Sergerstrom, 2009). As compared to self-awareness, the mindfulness construct circumvents evaluative interpretations of experience through intentionally accepting all observations without effort to respond (Evans et. al, 2009). This important difference illustrates how sustained attention in the present moment serves to naturally authenticate perception rather than to automatically identify and reduce experiential discrepancies.

Investigating dispositional mindfulness and persistence led Brown and colleagues (2007) to propose an association between present moment attention and adaptive functioning. Their research emphasized how dispositional mindfulness generally facilitates persevering behaviors. Sport psychology provides a helpful reminder that persistence is only one element of the self-regulation process that controls an athlete's thoughts, behaviors and emotions. The current study explores dispositional mindfulness as a self-regulatory practice in athletics.

Self-regulation requires resources of attention (Shapiro & Schwartz, 2000) that guide feedback loops to process relevant information (Carver & Scheier 2001). It is considered a dispositional variable accountable for regulating actions in multiple dimensions. Investigations of the self-regulation scale selected for the current study found attention control a fundamental element of self-regulation in the face of difficult hurdles and setbacks (Luszczynska, Dieh, Gutiérrez-Doña, Kuusinen & Schwarzer, 2004). Tang et al. (2007) hypothesized that brief training and practice in integrative body-mind training (IBMT) with principles of mindfulness may generate a beneficial influence to the network of executive attention related to self-regulation (Posner & Rothbart, 2007).

Mindfulness intervention outcomes have revealed improvements in attention systems, lowered anxiety, depression, anger, and fatigue. Furthermore, participants showed improved mood, stress-related cortisol reduction and increased immunoreactivity. This research targeted international college students and demonstrated well how even brief intervention methods can efficiently enhance self-regulating thoughts, emotions and behavior. The cognitive emphasis closely corresponds to studies in sport psychology that explore the malleable nature of dispositional mindfulness (Fontani, Lodi, Felici, Migliorini & Corradeschi, 2006; Williams, Donovan & Dodge, 2000).

A meta-analysis calculated precise estimates of the connection between mindfulness and the personality traits found in the FFM by synthesizing findings from 32 samples in 29 studies (Giluk, 2009). Though some inconsistencies were found, the

strongest FFM personality traits related to mindfulness included neuroticism, negative affect and conscientiousness. Neuroticism has an expected relationship with anxiety, self-consciousness, insecurity and poor coping with stress (Costa & McCrae, 1992). Therefore, it has a negative association with mindfulness that reflects a greater ability to tolerate thoughts, emotions and experiences. Mindfulness has shown both a positive (Baer, Smith & Allen, 2004) and negative association (Thompson & Waltz, 2007) with extraversion. Extraverts are characterized by excitement and stimulation, hinting towards a negative relationship with mindfulness. Openness to experience is positively associated with mindfulness as it requires curiosity and receptivity to internal and external experiences. Agreeableness is positively associated with mindfulness as it appears consistent with Kabat-Zinn's (1990) depiction of the 'beginners mind' by approaching interactions with a new sense of trust. Conscientiousness is linked to dependability and responsibility (Barrick, Mount & Judge, 2001). In a similar way, the benefits of mindfulness are explained by a greater ability to self-regulate (Masicampo & Baumeister, 2007; Shapiro et al., 2006).

McCrae and Löckenhoff (2010) reviewed the self-regulation and FFM research, emphasizing the individual differences found among the central processes of self-regulation. They argued that aspects of conscientiousness may facilitate the selection of techniques for attaining self-control. Discussed implications of the FFM include better understanding self-regulation and efforts to enhance self-control.

Another contemporary research effort explored how personality and information-processing perspectives are integrated (Hoyle, 2010). Several conceptual advancements

to self-regulation included observations in variability in early expression of self-regulation, normal expectation of self-regulation present in adult personality and individual differences in the components, styles, and effectiveness of self-regulation.

Behavioral and cognitive theories have coalesced in exploring how mindfulness moderates personality outcomes from a self-regulatory perspective (Feltman, Robinson & Ode, 2009). Researchers found dispositional mindfulness (defined by being attentive and aware of present moment reality) to mitigate tendencies of negative reactivity linked to neuroticism among college students. The implications of these findings better inform the dual perspective of personality-processing presented by McCrae and Costa (1999). In a sporting context, the instrumental view would explain this association by suggesting negative life events might occur more often among athletes high in neuroticism. The temperamental view would instead argue that high neuroticism would promote corresponding levels of reactivity to negative events. The manner by which athletes react to the negativity would be considered as a more significant variable in explaining outcomes of neuroticism in sports. Approaching neuroticism as a predictor of reactivity to stress and dispositional mindfulness as a protective factor helps display the interactions between present centered attention, self-regulation and personality features.

Sports psychology research recognizes a wide spectrum of stress stimuli athletes than may impact an athlete's well being (Ray & Weise-Bjornstal, 1999). These stressors may possess cognitive, behavioral, affective, physiological, imaginal, interpersonal, and sensory cues. Without careful monitoring and coping techniques, high demands and time constraints can make it difficult for athletes to manage complex adjustment and

developmental issues during college.

Athletes that can accurately identify the source of stressful symptoms are better informed in selecting an appropriate management technique. For example, cognitive symptoms of stress may require the management of unrealistic performance expectations, self-handicapping, worry and frustration while behavioral symptoms are exhibited as restlessness, aggression and sleep disturbance. Affective symptoms of stress might be displayed as anger, guilt, and depression. Elevated heart rate, muscle tension, and headaches reflect more physiological symptoms of athlete stress. Imaginal stress symptoms can appear in the form of flashbacks, helplessness, failure and embarrassment. Manipulation, withdrawal and argumentation are common interpersonal symptoms of activation. Sensory symptoms of activation include nausea, tension, clammy hand and stomach pain. Athletes are responsible for managing the range and severity of concurrent symptoms that differ depending on expectation, perception and tolerance.

Experiencing an injury in any sport can produce a major source of stress and anxiety that affects athlete performance. Sports psychologists consult with athletes regarding a pattern of psychological issues related to injury. Fears about re-injury and surgery are common topics of discussion. Many athletes struggle to find the patience required for recovery and rehabilitation, some even avoiding rehabilitation altogether. Sometimes athletes believe they will disappoint teammates, coaches, family and friends with consequences and restrictions related to their injury. In such an instance, the stereotypical well-intentioned mentality of “push through the pain” could essentially

generate an increased level risk for the athlete (Brewer, 2001).

A group of researchers sampled 398 college athletes to measure gender differences in emotional and adjustment issues in sports (Storch, Storch, Killiany & Roberti, 2005). Women athletes reported higher levels of depressive symptoms, social anxiety, and non-support than their men athletes non-athletes of both genders. Most athletes who do not learn to control symptoms of anxiety face issues that disrupt optimal performance. Sport psychologists caution that dealing with severe anxiety in sports can be dangerous and may lead to impaired performance and dropout (Hanin, 2000).

Athletes facing unique pressures and expectations may experience a heightened vulnerability to stress (Murray, 1997). Athletes are often encouraged to adopt a tough mentality to manage the intimidation and the fear of competition. The athletic world and media demonstrate a tendency to place higher standards on student athletes as compared to non-athletes. Athletes are often expected to maintain academic and extracurricular success while also training and performing at the highest level. The corresponding messages transmitted may pressure athletes to be stronger, healthier and more dedicated. The collective impact of this pressure may adversely impact student athletes with training regimes that require specific developmental support (Murray, 1997).

Unfortunately, athletes typically underutilize school counseling and mental health services (Storch et al, 2005). Athletes that received counseling reported difficulty with time management, stress, anxiety, depression and feelings of burnout. The fear of failure and other performance related issues were also reported (Storch, et al, 2005). Ample evidence exists that illustrates the negative impact of stress and anxiety on sports

performance. Regrettably, many athletes fail to recognize and undertake viable methods to increase self-regulatory abilities that could potentially enhance their performance.

For athletes committed to overcoming these challenges, sports psychology offers numerous strategies to constructively manage anxiety and stress including progressive relaxation, visualization, biofeedback and autogenic training (Hanin, 2000). The applied process of these methods closely parallels that of mindfulness meditation, as the primary goal is to restore a balance between sympathetic and parasympathetic activation in the autonomic nervous system. Immediate benefits include decreased blood pressure and heart rate, which calms the body and mind. Long-term benefits include a strengthened immune system and capacity for awareness.

Athletes have been found to differ in the range of tolerance they exhibit regarding the intensity of anxiety before experiencing a decline in performance (Hanin, 2000). The Zones of Optimal Functions (ZOF) were developed to identify the optimal range of anxiety activation an athlete can be exposed to without interfering with performance. The evidence that athletes can learn to effectively maintain activation of anxiety within their respective ZOF corresponds well with intentions of working from a cognitive framework (Hanin, 2000).

Research on athlete coping suggests the greatest athlete demands are broadcasted through physical, psychological, environmental sources. Other primary sources of stress include expectations, relationships, life direction and uncategorized stress (Reilly 1996). To manage harmful effects of stress originating from physical demands, some athletes train with various rational thinking skills that promote healthy attitudes and behavior

(Reilly 1996). Palpable similarities appear between the mental training suggested above and that described in a model of mindfulness (Shapiro et. al., 2006). Reilly (1996) emphasized training “hard and smart”, lending the suggestion that proper intention and attitude while generating awareness are also fundamental aspects of practice. From this vantage point, the mindfulness model connection with athlete coping will be extended to include aspects of athlete attention.

2.3 Dispositional Mindfulness, Self-Regulation and Athletic Performance

Boutcher (2002) provides a comprehensive review of the attention processes related to sports performance. Attention is one of the core multidisciplinary fields of psychological study. Research efforts from cognitive psychology, developmental psychology, psychophysiology and neuropsychology join together in examining attention in sports. Though several researchers include attention as a crucial aspect of athletic performance, it currently remains in an early stage of development. In this section, special emphasis is brought to the initial sparks of awareness; dispositional mindfulness, concentration and focus. The theoretical approaches to attention in sports research are synthesized, followed by an applied consideration of issues related to attention training. Attention in sport is generally studied from an information processing, social or psycho-physiological perspectives. The integrated model developed by Boutcher (2002) accounts for greater coverage of attention’s impact on performance.

The information processing perspective consists of either control processing (slow and cumbersome) or automatic processing (effortless, quick and efficient) (Badgaiyan, 2000). The major difference between the two is that automatic processing

requires minimal effort, attention or awareness whereas control processing requires high awareness, much attention and intensive effort. Most sports performance demand a combination of the two systems as athletes perform reflexively while interpreting new information. For example, a skilled golfer or archer may rely more on automatic processing during their shot, executing carefully rehearsed motor movements. On the other hand, a basketball player may rely more on controlled processing, as each pass between players continuously demands an entirely new set of subsequent reactions.

Within the informational processing perspective, attentional selectivity describes the process by which athletes screen their focus of attention during performance (Cohn, 1991). Attentional selectivity refers to an athlete's ability to switch focus from one source of information to another. The need to develop this as a skill clearly depends on the nature of the sport. The amount of information that can be attended to at any one time is referred to as attentional capacity. Attentional capacity reflects an athlete's cognitive limitations regarding control processing. This concept appears particularly relevant when considering how a basketball player focuses when three teammates call for the ball.

The social psychological perspective explores the influences on individual differences and environmental influences on attention processes. A common finding within this view speculates that increases in emotional arousal narrows the attentional field, due to a smaller range of cue utilization. Athletes processing high emotion during performance will temporarily have less access to resources dedicated to processing information related to performance. Theoretical and explanatory research of restrictions

in control processing stem from studies exploring test anxiety, pain and self-awareness. These studies were primarily based in theories of distraction, automatic functioning and attentional style. Distraction theories address factors that attract attention away from a task such as worry and self-defeating thoughts. For example only takes one spectator to essentially distract an athlete and directly influence the course of competition.

Automatic functioning refers to an athlete placing the execution of a skill under the command of controlled processing. This form of focus does not allow automatic processing to operate efficiently. Attentional style research focused in early on the range and direction of attention (broad, narrow, internal, external). Attentional style research proves insufficient at explaining the complexity of attention, though demonstrated great relevance to the how athletes match demands of sporting environment with an appropriate style of attending. Nideffer (1976) created a measure to identify individual differences in particular attentional styles that were found relatively stable across situations and over time. The measure originally suffered from limited validity and although a host of sport-specific versions were developed which increased internal consistency, their predictive properties remained insufficient.

The psycho-physiological perspective highlights underlying mechanisms of attention by measuring cortical and cardiac activity. In neuropsychology research, measure attention's component parts electroencephalography (EEG) and event-related potential (ERP) are common methods of data collection. For example, golfers and shooters have shown a decrease in electric activity during performance (Glad & Beck, 1999; Haywood, 2006).

Neuroscience research emphasizes the important role of attention and awareness during self-regulation (van Veen & Carter, 2006). A neuropsychological approach to mindfulness identified the anterior cingulate cortex (ACC) as a primary identification and processing center for conditions linked to problematic stress (Botvinick, Braver, Barch, Carter, & Cohen, 2001). ACC activation is closely associated with subsequent information processing of nearby regions of the prefrontal cortex that further facilitate self-regulation. This observed path of processing suggests that at the neuronal level of perceiving stimuli, attention-based properties of mindfulness may help facilitate more an effective and adaptive capacity for self-regulation. This construct is also linked to increased levels of awareness (Kerns et. al., 2004, Miller & Cohen, 2001).

Cognitive psychology, education and neuroscience have been long troubled by theoretical limitations in describing attention. At its core, the fleeting moment-to-moment focus one ultimately sustains long enough to process perception of phenomenon indeed remains a mystery unsolved. One clear problem with attention is harnessing control over it when necessary. With ample evidence that attentional styles vary their influence on thoughts, emotions and behavior it, many questions arise regarding how attentional styles help of hinder personal goals. Psychological investigation can empower individual athletes to explore these questions within the context of their athletic performance. Many wonder who, what or when is controlling an athlete's attention during sports performance? It seems nearly impossible to pinpoint a definitive source directing the choir of mental activity at any given moment. Dispositional

mindfulness research proposes that the particular moment itself is the best place and time to investigate this question.

Dispositional mindfulness is a form of concentration or focus. Athletes account for a considerable population inherently aware that placing attention in the present moment cannot to be taken for granted. In an attempt to manage elements outside their control, concentration enables athletes to temporarily place the focus of attention where they desire. Following a season of dedicated training, concentration skills often determine an athletes' ultimate ability to command their body to perform flawlessly. When sharing his secrets of success, Setve Yzerman (three-time Stanley cup champion) stated, "figured out how to control thoughts, focus, and stay in the moment." Exploring how athlete's focus moment-to-moment during performance ignites a strong curiosity of a 'winners mentality. Sports clearly hold universal interest with deeply imbedded psychological impact. Athletes themselves place a great deal of emphasis on the power of concentration during performance. Arnold Schwarzenegger out performed Mike Mentzer in the 1980 Mr. Olympia competition in part, because he made comments about Mentzer's physique that made Mentzer angry and lose his concentration, costing him the title Hardcore Bodybuilding (Kennedy, 1983).

Despite descriptive limitations, conscious attention has secured an importance place in sports psychology research. Nideffer's (1976) early development of attentional styles helped to generate a wave of subsequent sports research that continues to validate the influence of various psychological states (e.g. anxiety, frustration and worry) on athlete attention (Lavalley, 2004). Cognitive sport psychologists define attention as a

‘concentration of mental activity’ (Matlin, 2002). A tripartite model developed by offered three sources of evidence suggesting that attention adheres to various dimensions of cognitive processing. The first dimension consists of a basic perceptual ability called selective attention, which identifies relevant stimuli. The second dimension is divided attention, which allows for a partitioning of focus to perform multiple skills simultaneously. The third dimension refers to concentration, the conscious effort to sustain desired attention. A tennis swing provides a simple example of the integrated nature of each dimension described. The tennis player first selectively attends to the ball traveling towards them, measuring the ball’s speed, height, and direction. As it travels over the net, the tennis player divides their attention between the positioning of the ball and their opponent, determining which side of the court to return the ball to. As they prepare to swing, the tennis player shifts to the last dimension of attention to concentrate on the power, angle and follow-through through of their racket.

Although concentration is commonly viewed as only one element of the multi-dimensional construct of attention, it is argued a major determinant for the ability to which an athlete can deliberately control their awareness. For this reason, interventions commonly target the enhancement of concentrating attention. A collection of athlete interviews, ‘peak performance’ studies and cognitive strategies research provide anecdotal, descriptive and experimental evidence of the significance of attention. Lavalley (2004) reviewed empirical investigations that combine the three sources of evidence, inferring that attention is essential for performance success (Matlin, 2002). Nideffer (1985) described how focus, as described concentrated attention or mental

energy is generally agreed to be the most important key to performance. For example, Maynard (2006) adapted Nideffer's theory (1976) to help sailors evade distracting sights and sounds not related to their performance.

The past 30 years of sports psychology research exposes a unique association between the mechanisms of thought and feeling related to top performance. Many athletes report most proficient and rewarding performance once "in the zone." An athlete "in the zone" usually refers to the synchronization of these cognitive and emotional systems, cultivating an experience of peak performance. Capturing the essence of 'sport-flow' is an unmistakable experience often difficult to recreate on command. Following an exceptional match, a tennis player described the experience of flow as "... it just seemed to happen naturally. My shots did not feel rushed, in fact the ball seemed to slow down and I felt as if I could do almost anything. I was totally into the match, but yet I was not consciously trying to concentrate. I was aware of everything but distracted by nothing... I felt confident and in total control (Weinberg, 2002, p. 14)."

Sport professionals have long employed various strategies to improve athletic performance including autogenic training, cognitive strategies, meditation, biofeedback and stress reduction (Suinn, 1980). Athletic performance was conceptualized as the result of aptitude and skill strength, with cognitive response identified as a critical factor. Though more comprehensive models of the athletic cognitive processes were outlined in later studies, the unique function of focused attention was already well documented (Suinn, 1980). Focused attention in the sports context concerns athletes ability to narrow and sustain their attention to the task at hand.

This skill has been found to have advantageous effects in allowing athletes to shield their attention from being diverted by the extensive distractions during an event. Rather than focusing on the intellectual details of technique, athletes engage in broader awareness of their experience. This type of specialized training aims to cultivate a form of awareness with an intense focus on the present moment, making it difficult for past or future thoughts to intrude. Some athletes describe this experience as when the “the mind can be active without interfering with the body’s current movements.”

The value of this research came in the recognition of the varied psychological conditioning needs among athletes whom prefer an integrated approach to performance. Athletes are reminded that psychological conditioning requires as demanding training as does physical conditioning, with comparably high payoffs (Suinn, 1980).

With consistent practice, most athletes can potentially increase control of attention and concentration. Golfers have strengthened control of attention by assigning a small group to distract a player during their swing (Owens & Bunker, 1995). Unskilled athletes must focus intentionally on perceptual cues and consciously control their movements. Skilled athletes learn to execute their moves automatically. Contemporary research efforts are placed on automaticity at the advanced level (Vealey, 2002). For skilled shooters who master automaticity, conscious thought and analysis during the execution of a shot might be a detriment to top performance.

EEG measurements monitor electrical voltage in the brain. EEG studies monitor power in the left temporal lobe region, associated with superior practice and improve performance (Hatfield et. al, 1984). EEG coherence is an interesting development in

attention research adapted to a sports context. High EEG coherence indicates communication between different regions of the cortex while low EEG coherence indicates autonomous activity the same regions. Researchers hypothesize that concentration practice may decrease coherence between regions in the cortex (Hatfield et. al, 1984). Shooters would show a decrease in EEG coherence when aiming, allowing motor areas of the brain to execute tasks with little verbal or analytical processing to interfere. Gymnastics is considered by some to require the most skillful psychological functioning of all sports (Cogan, 2006). Gymnasts have been known to believe in order to physically perform a skill one must first imagine doing it. The high risk of injury requires them to maintain absolute focus during a routine. One method to focus on what is relevant to performance is to reduce the distraction 'noise'.

'Noise' may constitute sounds and movements coming from any six gymnastics events occurring simultaneously during competition. Gymnasts must learn to shift their focus as they rotate among them (Cogan, 2006). In addition to imagery and cognitive planning, abilities to focus and refocus are important skills. Gill (2000) discusses how athletes use kinesthetic cues to focus and regain concentration. Focusing is the ability to direct and maintain attention to important tasks, to stay in the moment. Dwelling on mistakes, analyzing performance and other distractions generate a need for athletes to acquire mental skills of refocusing attention. This refocusing marks close similarity to the relieving mindfulness loop of present moment awareness. Cognitive training plans of attention are developed to be sport specific. For example, ice hockey players are

trained to refocus on each shift of the puck (Halliwell, Zaichkowsky & Botterill, 2006; Ravizza & Osborne, 1991).

Researchers discuss how cyclists are systematically taught to improve performance by developing awareness (Taylor & Kress, 2006). Cyclists unable to effectively modulate their attention to the changing conditions of the race run the risk of improper energy exertion and conservation. They suggest a cyclist must monitor any indicators of physical and psychological intensity to help sharpen self-awareness during the race. Turning their attention to physiological signals (e.g., heart rate, breath rate, muscle tightness) and psychological signals (frustration, anxiety, aggression) of intensity first guides the cyclist's awareness to the present moment. The real-time data collected can then be cross-referenced to determine how the present moment experience relates to the full race performance (Taylor & Kress, 2006).

Athletes also manage demands to concentrate during lengthy periods of competition. Selecting an effective concentration strategy is contingent upon the features of required performance. Concentration control is central to soccer training as players learn to direct their attention. For example, the focus of a goalkeeper on the ball continuously adjusts to the ball and player positioning on the field. This allows the goalkeeper to conserve mental effort for moments that require full attention (e.g., a free kick towards home goal) (Dasil, 2006). Moran (2003) presents the particular techniques uniquely designed for soccer training. Baseball players also regard improving focus as fundamental to mental skills training (Hanson, 2006).

Golf is another sport that places concentration control as a major key to player success (Glad & Beck, 1999). However, the moments involved in actually swinging a golf club represents a small percentage of a four-hour round. Comparatively, basketball starters are often engaged in-play for up to 40 minutes during a two-hour game. Fundamental golf principles include directing attention to the swing, focusing on important elements and intensifying concentration to avoid distraction. To improve attention control, golfers practice monitoring their “stream of consciousness”.

Monitoring the stream of consciousness serves as another reminder to the consequences athletes face when they lose their focus. Just as impressive as the potential for maximum performance when attention is controlled is the potential for the collapse of conscious flow when attention is disrupted. Distracting noises, intruding thoughts and the mind going blank are common threats to sustained attention. To minimize the impact of these hazards, golfers practice staying in the present and decreasing response to distractions (Glad & Beck, 1999). Advantages to controlling conscious attention during performance include more efficient storage and retrieval of information as well as easier access to higher cognitive processes. Golfers trained in attention control can experience improved executive functioning skills such as interpretation, decision-making, and predicting outcomes (Glad & Beck, 1999).

Elite golfers are known to employ a cognitive strategy called “focus in and let go.” The aim is to concentrate particularly hard during the preparation and execution of a swing, and “let go” between swings. Focusing in and letting go provides the golfer with an attentional guideline for positioning their focus on the most important features from

one hole to the next. The unique scoring format of golf results in each hole resembling its own “mini –game”, which further emphasizes the value of golfers guiding their attention to the present moment to avoid dwelling on thoughts associated with a previous hole (Bunker, 2006).

Marital arts competitors make up another group of athletes know to “let it go” to constantly reset the focus of attention (Anshel & Payne, 2006). Marital artists often perform at a speed that does not allow for allocation of attentional resources, further emphasizing the importance present moment awareness. During the match, the most skilled competitors successfully reduce cognitive processing and heighten autonomous processing. The purpose for avoiding over-processing allows the competitor to maintain full focus on executing their performance strategy plan. Heightening the autonomous processing of that performance strategy plans automizes each movement, allowing for the execution of technique with minimal mental effort.

Cohn (1991) measured attention and concentration among expert golfers at peak performance and found effortless and automatic swings requiring no conscious control. The narrowing of focus during play was reported to also eliminate fear and worry of consequences for bad shots. Additional studies investigating attentional control and golf performance found significant associations between attention and interpersonal style (Kirschenbaum & Bale, 1980) as well as higher levels of mental preparation and concentration in more advanced proficient golfers (Thomas & Over, 1994).

Weinberg (2006) examined focused concentration as one of various psychological strategies tennis players implement to acquire the experience of ‘flow’. He

described it as a state in which the athlete fully immerses their conscious experience in the present moment. In addition to focused concentration, the merging of action and awareness depicts a mental state where an athlete feels at one with their movements. This particular fusion of action and awareness is inherently automatic and characterized by a perception of minimal effort by the athlete. In a slightly counter-intuitive manner, the athlete consciously directs their focus to the present moment for the purpose of allowing a broader sense of awareness to engage and guide performance.

Differences between able and disabled athletes may influence performance psychologically. Although the two groups are exposed to similar psychological distractions, additional distractions for disabled athletes such as leg spasms may occur more frequently outside the athlete's control. Practical differences also play a role, such as having a ball boy or girl in Paralympics table tennis, which decreases the amount of time between serves that athletes with disabilities can gather themselves.

Athletes can effectively use cognitive strategies and coping mechanisms to retain optimal competitive focus in the face of obstacles and distractions (William & Krane, 1998). The culmination of these processes allows athletes to activate self-regulation efficiently. The literature emphasizes the importance of developing individualized mental skills training programs be tailored to meet the particular needs of the student athlete (Weinberg, 2006). Sport psychologist working with teams need to be prepared to address physical, technical, tactical, mental and emotional demands of each player position. This will help to more accurately convey interpreted data to coaching staff when customize each training regime to adjust to the rate of psychological skill growth.

2.4 Integrating Mindfulness & Self Regulation with Personality Prototypes

When analyzing ‘configurations’ of multiple personality traits from a person-centered approach, the person becomes the unit of analysis rather than the variable (Steca, Alessandri, & Caprara, 2010). Configurations help illustrate how individual differences can influence health outcomes beyond what is possible from studying variables independent from one another. For example, Berry and Schwebel (2009) did not find that neuroticism predicted risk for injury in children, though by viewing the configured data model, neuroticism was found to moderate the effects of extraversion in determining injury risk. The person-centered approach allows individuals to be categorized into “types” on several dimensions of personality. This method of analysis simplifies personality description and considers multiple aspects of one’s personality that may be relevant to a particular intervention.

Variable-centered research provides the building blocks for interpreting multiple dimensions of personality. While types indeed aim to simplify, variation should be expected within groups (Asendorpf, Borkenau, Ostendorf & van Aken, 2001). Both approaches are considered valuable, and supplement our understanding of how unique components configure to produce a comprehensive picture of personality.

The developmental changes that occur during adolescence in terms of internalizing and externalizing behavioral tendencies are thought to be guided by elements of ego control (undercontrolling vs. overcontrolling) (Asendorpf et al., 2001). Other empirical evidence suggests that ego-control holds stable over time for both men

and women regardless of life circumstances that otherwise activate change in personality (Block & Block, 1980).

The literature illustrates the practicality of employing a person-centered approach using theory of ego-control and ego-resiliency (Block & Block, 1980). Ego-control measures the response to internal impulses and expression while ego-resiliency measures the ability to negotiate the expression of internal impulses with the demands of external circumstances. The theory is described along a U-shaped quadratic, representing the relationship of behavioral control. Resilient types fall towards the middle. Block and Block (2006) emphasize how too much behavioral control can be maladaptive. Conceptualizing self-control on this the U-shaped quadratic continuum allows researchers to account for overcontrolled in addition to undercontrolled tendencies.

Undercontrolled are characterized by exhibiting difficulty controlling impulses and expressiveness. They can also be spontaneous, self-dramatizing, rebellious, moody and unconcerned with ambiguity. On the other hand, overcontrolled individuals unnecessarily inhibit self-expression and behavior. They exhibit constricted demeanor, narrow interests, dependability and delayed gratification. Resilient individuals show adaptive response to changing situations with appropriate control of behavioral impulses. They handle new circumstances and conditions with greater flexibility.

The three personality typologies were derived from FMM including neuroticism, extraversion, openness, agreeableness, and conscientiousness. Prototypical configurations offer a means for researchers to arrange and decode the complexity of personality dimensions. Prototype differences are measured quantitatively for differences. An athlete

labeled as undercontrolled signifies their corresponding data resemble this type more than the other two. It should be possible to identify subtypes within the broad typologies to reveal interesting features oriented to particular distinctions of personality (Pulkkinen, 1996). Prototype clusters can also provide a useful method to exploring the potential relationships between personality, present centered attention self-regulation.

Clinically based studies validate mindfulness measures and discuss applications to other forms of practice (e.g. sports training). This study will explore whether resilient, undercontrolled, and overcontrolled typologies differ on levels of dispositional mindfulness and self-regulation. Gender differences will also be examined. Results from this study will inform those invested in the psychological health and training of college athletes.

2.5 Research Questions

Do overcontrolled, undercontrolled and resilient athlete personality prototypes differ in dispositional mindfulness and/or self-regulation?

Do men and women athletes differ in dispositional mindfulness and/or self-regulation?

Does gender moderate the relationship of personality prototype to either dispositional mindfulness or self-regulation?

3. METHODS

This section discusses methodology related to recruiting eligible study participants and procedures for collecting data. Participant demographics and the self-reports measures administered are discussed. An outline for statistically analyzing the three research questions is provided.

3.1 Participants

Participants in this study consisted of 75 student athletes between the ages of 18 and 22 that were active members of a NCAA affiliated sports team at Texas A&M University. Through email distribution, athletes were recruited to complete an online survey related to personality constructs, self-regulation and dispositional mindfulness. The sample generally reflected an even representation in gender and age by consisting of 41% men and 59% women with a mean age of 20.6. The most represented year in college was senior year (37%) and the most represented majors included Health and Kinesiology (11%) and Undecided (11%). Information about the self-reported sports affiliation of participants is provided in Table 1.

Table 1 Participant Self-Reported NCAA Sport Affiliation

<u>NCAA Sport Affiliation</u>	<u>Percent</u>
Basketball	1
Softball	3
Volleyball	5
Golf	5
Tennis	7
Equestrian	8
Football	8
Track & Field/Cross Country	25
Swimming/Diving	33

3.2 Procedure

After providing consent, participants were able to access a self-report survey online that took approximately 15 minutes to complete. The survey collected general demographic information (i.e. gender, age, sport, college year) to screen and interpret any evidence of variance within the collected sample. Each participant also completed the Big Five Inventory (BFI), the Mindfulness Attention Awareness Scale (MAAS) and the Self-Regulation Scale (SRS). Participants received a compensatory gift card for successful completion of the survey in the amount of five dollars.

3.3 Measures

Big Five Inventory (BFI)

A total of 44 self-reported items make up the BFI (John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) and are weighed on a 5-point Likert scale that ranges from 1 (Disagree Strongly) to 5 (Agree Strongly). The BFI was developed to explore the five-dimensional structure of the most prominent personality traits; the five factors of Openness (O), Conscientiousness (C), Extraversion (E), Agreeableness (A) and Neuroticism (N). Advantages to using the BFI include brief administration and strong psychometric properties. As compared the strongest validated Big Five measure, the NEO-FFI (Costa & McCrae, 1992) the BFI correlated well with respect to content convergence and internal validity. The BFI produced a mean internal consistency score of .83 and a mean corrected convergent validity correlation with the NEO-FFI of .95. Preliminary research on the BFI scales reported alpha reliabilities ranging from .75 to .90 and test-retest reliabilities reaching a mean of .85 (John et al., 2008). The BFI was

selected as a reliable, valid and descriptive tool to disclose specific personality traits of the athlete sample independent from the psychopathological factors commonly found in other personality inventories. The BFI has been found to be an effective tool to measure personality distributions in the athlete populations (Kaiseler, Polman, & Nicholls, 2012).

Mindful Attention Awareness Inventory (MAAS)

The MASS (Brown & Ryan, 2003) consists of a 15 items that rate dispositional mindfulness on a 6-point Likert scale (1 = almost always; 6 = almost never). The scale captures an implicit approach to mindfulness assessment and was selected for its ability to quantify dispositional mindfulness independent from acceptance-based features of mindfulness. Several aspects which make the MAAS an appropriate and effective tool for measuring dispositional mindfulness in college athletes include it's short self-reporting administration, its empirical support of convergent, discriminant and incremental validity, it's positive correlation to self-regulation outcomes and its initial validation of psychometric properties in a college sample (Brown & Ryan, 2003; Van Dam et al., 2010). The construct of dispositional mindfulness captured by the MAAS is argued to play a significant role in several aspects of mental health and well-being (Brown & Ryan 2003).

Self-Regulation Questionnaire (SRQ)

The SRQ (Brown, Miller, & Lawendowski, 1999) was created to evaluate the self-regulatory processes modeled by Miller and Brown (1991) that address the general principles of behavioral self-control. The SRQ has been found as an effective measure of self-regulation in community and college-aged populations (Aubrey, Brown & Miller,

1994). Strong psychometric properties were found with respect to test-retest reliability ($r = .94, p < .0001$) and internal consistency of the scale ($\alpha = .91$). When compared with associated measures, the SRQ has generated strong convergent validity. Total SRQ total are classified accordingly; >239 = High (intact) self-regulation capacity, $214-238$ = Intermediate (moderate) self-regulation capacity and < 213 =Low (impaired) self-regulation capacity.

3.4 Research Questions

As presented in the literature review, the three research questions in this study were selected to explore the function of resilience as a unique feature within the personality structure. A plan for statistical analysis was generated to guide a methodologically sound investigation of the research questions.

Research Question 1. Do overcontrolled, undercontrolled and resilient athlete personality prototypes differ in dispositional mindfulness and/or self-regulation?

Research Question 2. Do men and women athletes differ in dispositional mindfulness and/or self-regulation?

Research Question 3. Does gender moderate the relationship of personality prototype to either dispositional mindfulness or self-regulation?

3.5 Statistical Analysis

All analyses of the outcome data were performed with SPSS. Two independent variables were used in the analyses: Personality cluster and gender. We examined differences that occurred on two dependent variables: dispositional mindfulness and self-regulation.

The initial analysis consisted of calculating descriptive statistics to examine means, standard deviations, and outliers across the variables. Frequency distributions inspected for normality in scoring patterns. A bivariate analysis was performed to explore the relationships between the independent and dependent variables; we expected the two dependent variables to be positively correlated. A two-part clustering procedure was conducted using Ward's method and a k-means clustering formula to verify a replication of the three personality prototypes found in the sample. This statistical technique allowed for reconfiguring the BFI item data to reveal the athlete's typologies including Resilient, Over-Controlled and Under-Controlled profile clusters. A chi-square test was conducted to examine associations in gender distribution across the three personality prototypes. To answer the first research question, a series of ANOVAs were conducted to detect for a difference in dispositional mindfulness and self-regulation scores between personality types. Independent sample T-tests were performed to further delineate where the differences were found between the three types of personality. Additional ANOVAs were conducted to answer the second research question regarding gender differences in dispositional mindfulness and self-regulation. Regarding the third research question, a 2 X 3 Multivariate Analysis of Variance (MANOVA) was conducted test for significant differences in the means of total dispositional mindfulness and self-regulation scores across the three personality prototypes by gender. The MANOVA tested for (a) main effects of each independent variable on the dependent variables and (b) interactions that would reveal if gender moderates the association of personality prototypes to dispositional mindfulness and self-regulation.

4. RESULTS

This section includes the results of the data analyses conducted in SPSS to explore the three posed research questions. An initial analysis of the athlete response data (i.e., frequencies and descriptive statistics) is presented. Results of the personality clustering methods (i.e., hierarchical and nonhierarchical clustering) are displayed. The findings of a sampling distribution of the means and univariate analysis (i.e., t-tests and ANOVA) are presented to determine if and how the independent variables (personality type and gender) differ on the dependent variables (dispositional mindfulness and self-regulation). These results address the first two research questions. A multivariate analysis of variance (i.e. MANOVA) was conducted to address the third research question and examine the interaction effects of personality prototype and gender on the dependent variables.

4.1 Initial Analyses

Descriptive statistics -- means, standard deviations and kurtosis -- were calculated for all variables. No missing data or outliers were found during the initial analysis. The sample ($N = 75$) included 31 men (41%) and 44 women (59%). The average age of the sample was 20.6 years ($SD = 1.43$). Respondents included 10 Freshmen (13% of the total sample), 18 Sophomores (24%), 14 Juniors (18%), 28 Seniors (37%) and five who were beyond their Senior year (7%). A broad spectrum of collegiate athletes participated including a basketball player (1%), three softball players (4%), four volley ball players (5%) , four golfers (5%), five tennis players (7%), six equestrians (8%), six football players (8%), 19 students participating in track and

field/cross country (25%) and 25 swimmers/divers (33%). The most common major reported was Health and Kinesiology (11%).

Scores across all scales generally reflected unimodal, symmetric distributions. Only the MAAS revealed a relative concentration of scores in the center of the distribution (Kurtosis = .802). The scoring pattern for the SRQ and BFI scales reflected normal distributions. The average score of dispositional mindfulness from this student athlete sample ($M = 3.6$) aligned closely with previously studied college student populations ($M = 3.83$; Brown & Ryan, 2003). The average score of self-regulation detected in student athlete sample ($M = 226.75$) fell within the intermediate (moderate) self-regulation capacity ($M = 214-238$) consistent with other college samples (Brown, Miller, & Lawendowski, 1999). Study participants scored highest in Agreeableness ($M = 4.05$) and lowest in Neuroticism ($M = 2.53$) on the BFI.

As expected, bivariate analysis detected a positive correlation between dispositional mindfulness and self-regulation scores ($r = .48$). Dispositional mindfulness scores were positively correlated with both Conscientiousness ($r = .31$) and Agreeableness ($r = .25$). Self-regulation scores were positively correlated with both Conscientiousness ($r = .5$) and Openness ($r = .31$). Dispositional mindfulness and Self-Regulation scores were both negatively correlated with Neuroticism ($r = -.49$; $r = -.21$, respectively). Within the Big Five, Extraversion and Agreeableness were found to negatively correlate with Neuroticism ($r = -.30$; $r = -.40$ respectively). Agreeableness and Conscientiousness were positively correlated ($r = .28$) For the purpose of this

analysis, the .05 level of significance was used to identify all correlations. Descriptive statistics and correlations are displayed in Table 2.

Table 2
Descriptive Statistics and Correlations for Dispositional Mindfulness, Self-Regulation and the Big Five Personality Variables

Variable	MAAS	SRQ	E	A	C	N	O
MAAS	—	.48**	.22	.25*	.31**	-.49**	.203
SRQ		—	.08	.06	.50**	-.21*	.31**
BFI							
E			—	.11	.07	-.30*	.150
A				—	.28*	-.40**	.01
C					—	-.19	-.01
N						—	.01
O							—
<i>M</i>	3.60	226.75	3.55	4.05	3.87	2.53	3.65
<i>SD</i>	.74	17.60	.80	.58	.66	.76	.57

Note. MAAS= Dispositional Mindfulness Scale; SRQ= Self Regulation Questionnaire; BFI = Big Five Inventory; N = Neuroticism; E = Extraversion; A = Agreeableness; C = Conscientiousness, O = Openness
* $p < .05$. ** $p < .01$.

4.2 Personality Clusters

To detect for natural groupings in student athlete personality type, a series of cluster analyses were performed. Using these multivariate procedures, personality scores were classified into the following subgroups; overcontrolled, undercontrolled and resilient. The two clustering methods presented in this study are exclusive and did not permit for the appearance of data points in more than one cluster. All data were standardized across the measured variables to ensure measurements were placed on a common scale for comparison. With consideration of the small sample size, box-plots were constructed to inspect for outliers that may affect the sensitivity of clustering; none were found. Hierarchical clustering was performed using the Wards method to translate

the BFI data and determine which clusters to retain. The Wards method produced a cross-tabulation that reflected a three-cluster solution for the three personality prototypes; overcontrolled, undercontrolled, and resilient. This approach considered each variable as a separate cluster and averaged the distances between data points in the three clusters.

During the final classification, a non-hierarchical clustering procedure using K-Means generated clusters based on ‘seed cases’ that were detected furthest from the center of all the data. Remaining cases are assigned to the nearest seed. Cases were reassigned accordingly until the lowest possible within-groups sum of squares was obtained. The K-Means procedure found successful convergence in the three-cluster solution due to no or small change in cluster centers.

The three personality prototypes acquired from the cluster analyses are displayed with the Big Five standardized z score traits in Figure 1. Cohen’s kappa coefficient (.44) was calculated to compare classification between the hierarchical and non-hierarchical clustering methods. Profile agreement considerations are further explored in the discussion due to the Cohen’s kappa coefficient falling just below the typical cut off at .60 as previously recommended (Asendorf et. al., 2001). In both the Hierarchical Clustering and K-Clustering procedures, the absolute type of distance metric was selected to use between the quantitative variables.

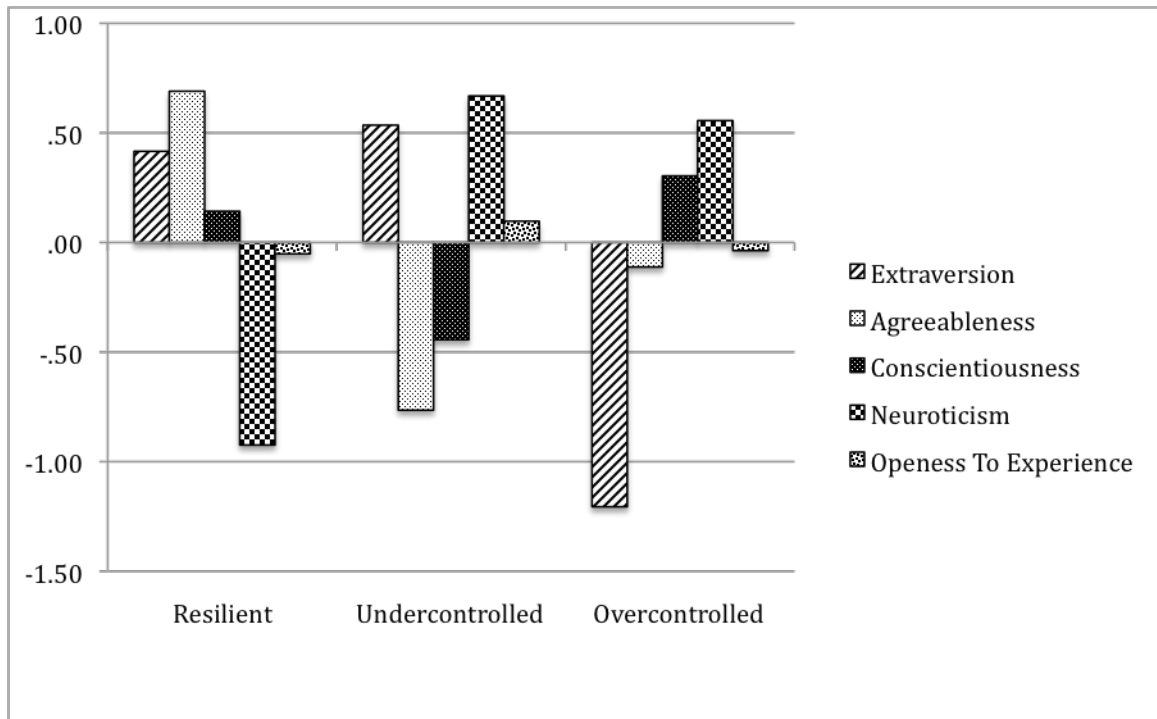


Figure 1. Three Personality Prototypes Derived from the Big Five Inventory (BFI). Big Five personality traits are displayed in standardized z scores. The sample included 75 participants.

The first group appeared consistent with the resilient profile as it featured the lowest level of Neuroticism and elevations on Extraversion, Agreeableness and Conscientiousness. The second group reflected the undercontrolled personality prototype as it was distinguished by low Conscientiousness and Agreeableness and above average elevations on the other three factors. Interestingly, the undercontrolled group had a higher Neuroticism score than the overcontrolled group. The third group appeared consistent with the overcontrolled type as characterized by lowest Extraversion score of the three clusters and high Neuroticism. The student athlete sample was classified as 29% resilient, 33% as undercontrolled and 37% as overcontrolled. This distribution

differs from that observed in other research (e.g. 49% resilient, 28% undercontrolled, and 23% overcontrolled; Adendorf et al., 2001).

Results of a chi-square test detected a statistically significant association in the distribution of gender across personality types, $\chi(2)=8.60, p = .01$. It appeared that female athletes were more likely to cluster as resilient and overcontrolled and male athletes were more likely to be undercontrolled. The number of participants by personality prototype and gender is displayed in Table 3.

Table 3
Cross-tabulation of Participants by Personality Prototype and Gender

Personality Prototype	Gender		Total
	Men	Women	
Resilient	8	14	22
Undercontrolled	16	9	25
Overcontrolled	7	21	28
Total	31	44	75

4.3 Research Questions

The first research question of this study aimed to explore if and how dispositional mindfulness and/or self-regulation differ across the three personality prototypes. The analyses of dispositional mindfulness and self-regulation variables across personality groups are displayed in Table 4. A series of one-way ANOVAs indicated a statistically significance difference between the three prototypes on dispositional mindfulness [$F(2,72)=8.34, p = .001$] and self-regulation scores; $F(2,72)=4.51, p = .01$. To explore which dependent variable scores differed across the three groups of personality, a series

of independent sample T-test were conducted. The corresponding analyses indicated significantly higher dispositional mindfulness scores in the resilient prototype group ($M = 4.09, SD = .77$) compared to both the undercontrolled [$M = 3.45, SD = .49, t(45) = 3.39, p = .001$] and overcontrolled groups ($M = 4.09, SD = .77, t(48) = 3.49, p = .01$). No difference was found between the undercontrolled and overcontrolled groups on dispositional mindfulness ($t(51) < 1, p = .51$). Further t-tests indicated significantly higher self-regulation scores in the resilient prototype group ($M = 234.64, SD = 18.01$) compared only to the undercontrolled group, $M = 219.88, SD = 16.24, t(45) = 2.95, p = .01$. No differences were found in self-regulation scores between the resilient and overcontrolled groups [$t(48) = .1.63, p = .11$] nor between the overcontrolled and undercontrolled groups $t(51) = -1.52, p = .14$. Figures 2 and 3 present the dispositional mindfulness and self-regulation means plotted for the three personality groups, respectively.

Table 4
Comparison of Personality Prototypes on Dependent Variables

Variable	Resilient			Undercontrolled			Overcontrolled			n^2	F
	M	SD	d_{12}	M	SD	d_{23}	M	SD	d_{13}		
MAAS	4.09	.77	.98	3.46	.49	1.9	3.34	.73	.99	.19	8.34**
SRQ	234.64	18.01	.86	219.88	16.24	.40	226.75	17.95	.43	.11	4.51**

Note. Degrees of freedom for all variables are (2, 72). d_{12} = Cohen's d between resilient and undercontrolled groups; d_{23} = Cohen's d between undercontrolled and overcontrolled groups; d_{13} = Cohen's d between resilient and overcontrolled groups; MAAS= Dispositional Mindfulness Scale; SRQ= Self Regulation Questionnaire
* $p < .05$ ** $p < .01$.

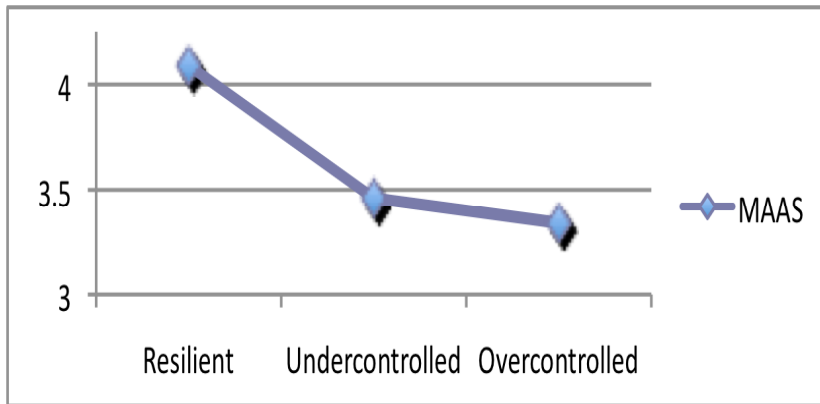


Figure 2. Means of Dispositional Mindfulness (MAAS) By Personality Prototypes

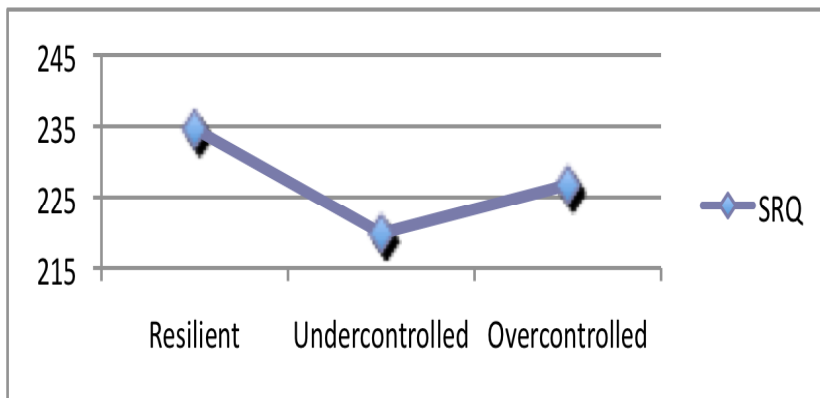


Figure 3. Means of Self-Regulation (SRQ) By Personality Prototypes

The second research question intended to explore how dispositional mindfulness and/or self-regulation differed by athlete gender. The analyses of dispositional mindfulness and self-regulation variables in men and women are displayed in Table 5. A series of one-way ANOVAs found no significance difference between male and female athletes in dispositional mindfulness, [Women, $M = 3.72$, $SD = .77$; Men, $M = 3.51$, $SD = .71$; $F(2,72) = 1.4$, $p = .228$] or self-regulation [Women, $M = 229.84$, $SD = 17.81$; Men, $M = 224.57$, $SD = 17.31$; $F(2,72) = 1.65$, $p = .204$]. Figures 4 and 5 present the dispositional mindfulness and self-regulation means for both genders.

Table 5
Comparison of Gender on Dispositional Mindfulness and Self-Regulation

Variable	Women		Men		d_{12}	n^2	F
	M	SD	M	SD			
MAAS	3.72	.77	3.51	.71	.28	.13	1.42
SRQ	229.84	17.81	224.57	17.31	.30	.15	1.65

Note. Degrees of freedom for all variables are (2, 72). d_{12} = Cohen's d between women and men groups; MAAS= Dispositional Mindfulness Scale; SRQ= Self-Regulation Questionnaire

* $p < .05$. ** $p < .01$.

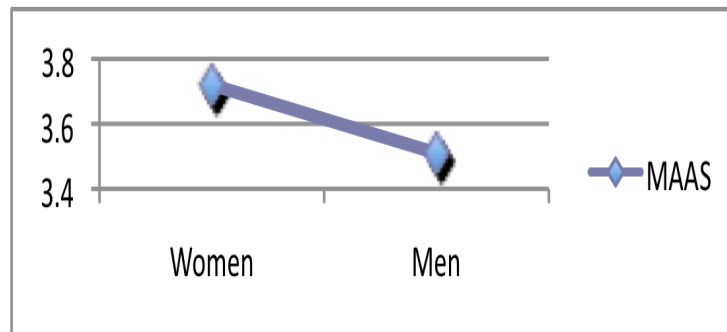


Figure 4. Means of Dispositional Mindfulness (MAAS) By Gender

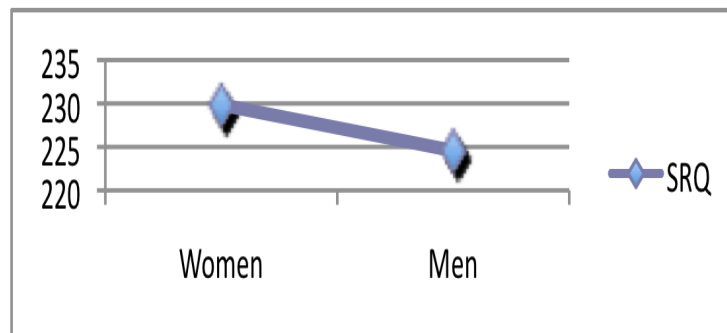


Figure 5. Means of Self-Regulation (SRQ) By Gender

The third research question examined if and how gender moderates the relationship of personality prototype to either dispositional mindfulness or self-regulation. A 2 X 3 Multivariate Analysis of Variance (MANOVA) tested for main effects and interaction effects between the two independent variables on the two dependent variables. These results are displayed in Table 6. Personality prototype had a significant main effect on dispositional mindfulness, $F(2,69) = 4.77, p < .01$, but not on self-regulation. Gender had a significant main effect on self-regulation [$F(1,69) = 4.42, p < .01$], but not on dispositional mindfulness. Gender did not moderate the association of personality prototypes to dispositional mindfulness and self-regulation. Even though personality prototype and gender independently have an effect on one dependent variable, they do not work together to produce a change in either dispositional mindfulness or self-regulation.

Table 6
Effect of Personality Prototype and Gender on Dispositional Mindfulness and Self-Regulation

Effect	Variable	<i>df</i>	<i>F</i>
Personality Prototype	MAAS	(2,69)	4.77**
	SRQ	(2,69)	1.45
Gender	MAAS	(1,69)	2.22
	SRQ	(1,69)	4.42*
Personality Prototype X Gender	MAAS	(2,69)	.46
	SRQ	(2,69)	.66

Note. Analysis use is multivariate analysis of variance (MANOVA).
MAAS= Dispositional Mindfulness, SRQ = Self Regulation Questionnaire
* $p < .05$. ** $p < .01$.

4.4. Summary

Descriptive statistics indicated that the sample in this study represented a nearly even distribution of both male and female athletes from nine different NCAA Division 1 sport teams. As expected, a bivariate analysis indicated that dispositional mindfulness scores were positively associated with SRQ scores. Neuroticism was negatively associated with dispositional mindfulness and SRQ scores. A series of hierarchical and nonhierarchical clustering methods generated consistent convergence of the three personality prototypes. However, observed proportions differed from the average distribution found in previous research. In addition, contrary to previous work, the undercontrolled group had a higher Neuroticism score than the overcontrolled group. The undercontrolled group was also defined, in part, by having the highest Extraversion score of the three clusters.

The first research question asked if the three personality prototypes differed in dispositional mindfulness and self-regulation. A series of ANOVAs detected a significance difference in dispositional mindfulness and self-regulation scores between

personality types. Subsequent t-tests revealed the resilient prototype group scored significantly higher in dispositional mindfulness than the undercontrolled and overcontrolled groups. The resilient prototype group also scored significantly higher in self-regulation scores than the undercontrolled group.

The second research question explored gender differences in dispositional mindfulness and self-regulation. A series of ANOVAs detected no differences between dispositional mindfulness and self-regulation scores obtained by the male and female athletes. The third research question examined if and how gender moderated the relationship of personality prototype to either dispositional mindfulness or self-regulation. The results of the 2×3 MANOVA performed indicated that personality prototype had a significant main effect on dispositional mindfulness and that gender had a significant main effect on self-regulation. No interactions were found to suggest that gender moderated the association of personality prototypes to dispositional mindfulness or self-regulation.

5. DISCUSSION AND CONCLUSIONS

This study was designed to better understand how psychological resilience is enabled in athletes by exploring relationships between personality, dispositional mindfulness and self-regulation. A growing body of literature in sport psychology credits the theory of resiliency with facilitating the selection of healthy and adaptive responses to conditions that present adversity among student athletes. Three measures were methodologically administered to a sample of college student athletes to explore associative and interactional relationships between the measured variables of interest. This section aims to (a) summarize the data collected (b) discuss answers to the three research questions and (c) discuss and integrate these results with existing literature concerning personality prototypes and their distinguishing features. Unique aspects of resilience among athletes that may pertain to dispositional mindfulness and self-regulation, along with implications for future study of resilience in sports psychology will also be discussed.

5.1 Research Summary

Resilient athletes in this study were higher in dispositional mindfulness as compared to their undercontrolled and overcontrolled counterparts. Undercontrolled and overcontrolled athletes did not differ in dispositional mindfulness. Resilient athletes were higher in self-regulation compared only to the undercontrolled group. No differences in self-regulation were detected between the resilient and overcontrolled athletes or between overcontrolled and undercontrolled athletes. Male and female athletes did not differ on the dependent variables. Gender had a significant main effect

on self-regulation. Despite these effects, no interactions were found to suggest that gender moderated the association of personality prototypes to dispositional mindfulness or self-regulation.

The three research questions aimed to address the function of resilience as a unique feature within the personality structure. The findings of the study provide new evidence of the resilient prototype's relationship with dispositional mindfulness and self-regulation among athletes. A clear pattern appeared to emerge between athlete resilience and higher dispositional mindfulness (compared to undercontrolled and overcontrolled) and self-regulation (compared to undercontrolled). Although there was a significant difference in gender across personality types, there were no real differences between men and women the measures of dispositional mindfulness or self-regulation.

The trait model of resilience assumed in this study is embedded in a developmental perspective and has consistently demonstrated that value of exploring the personality prototypes (Asendorpf et al., 2001; Donnellon & Robbins, 2010). The person-centered approach was purposefully selected to depict how a constellation of personality traits (resiliency) may be associated with dispositional mindfulness and self-regulation. This study focuses targets the adaptive function of dispositional mindfulness as a self-regulatory practice that facilitates persevering behaviors (Brown et al., 2007). Although some research has detected a developmental tendency to shift toward resilience over time (Sprecht, Luhmann & Geiser, 2014), it remains generally assumed that personality features are long-standing (Block, 1993). Resilient athletes may be distinguished by a unique propensity for dispositional mindfulness and other receptive

states of mind, which likely stem from their self-regulatory processes that characterize ego-control, (Block, 1993; Donnellan & Robins, 2010). For athletes that experience difficulty modifying their level of ego-control in response to various circumstances, dispositional mindfulness and self-regulatory processes may offer an alternative route to enhancing resiliency.

5.2 Personality Prototypes Features Among College Athletes

Successful convergence was found of the same personality prototypes that occur consistently in the population and the acquired kappa value for the tripartite solution ($k = .44$) approached the recommended criterion (approximately $.60$; Asendorpf et al., 2001). As displayed in prior research (Asendorpf et al., 2001), the resilient prototype was distinguished by low Neuroticism and elevation in Extraversion, Agreeableness and Conscientiousness. The second prototype was identified as undercontrolled and featured low Conscientiousness and Agreeableness and elevations on the other factors. The undercontrolled prototype immediately stood out as highest in Neuroticism, a unexpected result that did not align with previous Big Five trait studies that consistently find the overcontrolled type with the highest level of Neuroticism of the three prototypes (Asendorpf et al., 2001; Steca et al. 2010). The third prototype, overcontrolled, was differentiated from the other two types by the lowest Extraversion score and the second highest Neuroticism score.

Although the college athlete sample in this study generated recognizable personality types, is not uncommon for cluster structuring to vary in the distinctness of the boundaries between types (Chapman & Goldberg, 2011). In the study, there were

two distinct ways in which the personality prototypes of these athletes varies from previous studies: The undercontrolled group had the highest level of Neuroticism and a relatively low percentage of the sample was resilient. In addition, there was an intriguing difference in the distribution of men and women across the three personality prototypes.

Athlete Neuroticism

As a group, the college athletes scored lower in Neuroticism ($M = 2.53$, $SD = .76$) score than comparison samples within the same age group ($M = 3.32$, $SD = .82$; John & Srivastava, 1999). This aligns with previous findings that suggest low athlete neuroticism is explained by their ability to consistently reduce levels arousal during athletic performance (Kaiseler et al., 2012; McKelvie et al., 2003). However, the uncharacteristically high neuroticism in the undercontrolled athletes in this study generated questions related to theory, method and measurement.

Previous studies (Costa & McCrae, 1992) have established the relationship between Neuroticism and various symptoms of distress (i.e., anxiety, self-consciousness, insecurity and poor coping with stress). Although the overcontrolled group is typically characterized by the highest elevation of Neuroticism of the three prototypes, this study showed different results. Instead, the undercontrolled group exhibited the highest neuroticism and lowest self-regulation. With consideration of neuroticism in the sports context (Piedmont et al., 1999), undercontrolled athletes in this study appear quite susceptible to difficulty controlling impulsivity and perhaps with thoughtful, goal-oriented coping. This finding emphasizes the potential for risk among this group and

suggests that undercontrolled athletes may be ideal candidates for intervention efforts that increase tolerance to negative emotion.

The three prototypes have been preciously associated with developmental attachment styles; resilient-secure, undercontrolled-anxious and overcontrolled-avoidant (Cooper, Shaver, & Collins, 1998). Although these styles were derived from family systems, participation in sport (particularly team sports) may reflect similar relational themes. From this view, environmental factors are emphasized as contributing to the behavioral expression of personality. It could be possible that the demands of NCAA competition manifest higher neuroticism in athletes that have adopted an anxious style rather than an avoidant style. This could partially explain the observation in this study of undercontrollers exhibiting a slightly less adaptive response to stress than overcontrollers.

Methodological and measurement issues may have influenced the undercontrolled neuroticism score. It is possible that the sample size collected in this study was did not properly represent the true college athlete population at Texas A&M University. Although the participants reflected a diverse range of sports on campus, they did not consist of many athletes from the most popular sports (i.e., football and basketball). Other common measurement concerns in typology research have included problems consistently replicating the three prototypes with Big-Five measures, the appearance of an ambiguous cluster in lieu of an undercontrolled group and problems with predictive validity of personality types versus personality traits (Donnellan & Robbins, 2010). Although numerous proposed definitions of resilience further

exacerbate these concerns (Sarkar & Fletcher, 2013), this study recognized athlete resilience as a dynamic construct that directly influences and facilitates positive adaptation to stressors. Accordingly, further study is warranted to more precisely address why the undercontrolled athletes in this study appear higher in neuroticism than those in non-athlete college students (Ramkumar, 2012) and larger datasets (Asendorpf et al., 2001).

Although Neuroticism did not account for the gender differences observed across personality types in this study, observations of the construct in previous studies have led to inferences that premature emotional response may likely impede athletic performance (McKelvie, Lemieux & Stout, 2003). The “neurotic cascade” was coined to describe mechanisms that underlie potential susceptibility to neuroticism (Suls & Martin, 2005). Accordingly, undercontrolled athletes may benefit by monitoring the factors that can affect the experience of distress including a heightened response to minor infractions, greater exposure to negative experiences, evaluation of events as more damaging, extended periods of negative mood and difficulty adjusting to persisting problems. The unique depiction of athlete neuroticism in this study also presents some incentive to embrace a ‘type-as distinctive form’ rather than a ‘type-as-label’ perspective of personality types. By offering a more accurate reflection of the distinctions between types, this approach enhances the inspection of personality clusters beyond the unequivocally described three prototypes (Donnellan & Robbins, 2010).

Prototype Distribution

Resilient athletes in this study represented the smallest prototype group. The inverse of this finding was observed in non-athlete college students on the same campus

(Ramkumar, 2012). Conversely, overcontrolled athletes in this study represented the largest prototype group while the opposite was observed in non-athletes. To compare beyond Texas A&M University, the athlete sample in this study also consisted of significantly fewer resilient prototypes and more overcontrolled prototypes than samples collected among children (Berry & Schwebel, 2009; Chapman & Goldberg, 2011; Dennissen et al., 2008), among adolescents (Robins, John, Caspi, Moffitt & Stouthamer-Loeber, 1996), among adults (Specht, Luhmann & Geiser, 2014), among the elderly (Steca et al., 2010) and even other college athletes (McSherry, 2012).

It is important to note that data collection for this study occurred toward the end of the spring semester. At this time of year, academic and athletic demands may have temporarily merged in a way that generated an increase in perceived response to environmental stressors. This could have been reflected in the overrepresentation of the overcontrolled group. The overcontrolled group is traditionally characterized most susceptible to experiences of distress (Braunstein-Bercovitz, Frish-Burstein, & Benjamin, 2012). According to the developmental perspective, the avoidant attachment style of overcontrolled group (Cooper et al., 1998) may contribute to their lower presentation of psychological well-being (Ong et al., 2009) and higher interpersonal problems (Steca et al., 2010).

It might also be possible that there is an adaptive quality to the overcontrolled personality structure within the context of the student athlete experience. Previous arguments indicated that excessive behavioral control might be maladaptive by needlessly inhibiting self-expression and behavior (Block & Block, 2006). Along the

continuum of athlete personality, it might be conceivable that this display of characteristics (i.e. constricted demeanor, narrow interests, dependability and delayed gratification) could lend itself to practical advantages in sport training and performance. Furthermore, a recent study of international athletes found conscientiousness to be the only personality factor that was positively associated with and predictive of athlete performance (Mirzaei, Nikbakhsh & Sharififar, 2013). It could be possible that athletes are overrepresented by the overcontrolled type due to a heightened development in the emotional and impulse restraint necessary during competition, though these interpretations are purely speculative.

Gender Distribution

Consistent with recent studies (Ramkumar, 2012; Specht, Luhmann & Geiser, 2014), significant gender differences across personality types were detected in this study.

Undercontrolled male athletes outnumbered undercontrolled female athletes and resilient female athletes outnumbered resilient male athletes. The opposite pattern was observed among the non-athlete sample. Women in the overcontrolled group outnumbered their overcontrolled male counterparts among both athletes and non-athletes. Accordingly, it appeared that female athletes in the study were overrepresented in the resilient and overcontrolled groups while male athletes were overrepresented in the undercontrolled group. It should be noted that small sample sizes have been held responsible for inconclusive results in previous studies that examined how and why personality types differ by gender (Specht et al., 2014).

The overrepresentation of overcontrolled female college athletes in this study

may offer insight to the most commonly observed trends in how psychological factors are displayed across prototypes (Caspi & Silva, 1995; Robins et al., 1996).

Overcontrolled individuals are found more susceptible to internalizing problems and experiencing psychological distress. Symptoms of anxiety, depression and poor coping may therefore be expected to occur more commonly in female athletes. Conversely, undercontrolled athletes (overrepresented by men in this study) are characterized by externalizing problems and impulsive behavior.

A self-regulatory application of these findings may suggest that female athletes may benefit more from social-emotional learning interventions, whereas male athletes may benefit more from behavioral-control oriented interventions. Sport intervention methods designed to increase performance often employ the development of self-monitoring and self-regulation skills. These intervention approaches are carefully differentiated between skills-sets that simply screen for behavioral changes and those that encompass social and emotional responses to internal stimuli (Karoly, 1993). The purpose for these various interventions is to provide athletes with a more comprehensive tool kit for regulating the physical, emotional and social factors that can shape performance.

5.3 Dispositional Mindfulness and Self-Regulation in Athlete Resilience

Dispositional Mindfulness

The resilient athletes in this study clearly illustrated their consistent engagement of attention to the present. The applied construct of dispositional mindfulness is well documented in sports research and has been successfully linked to peak athletic

performance (Harmison, 2006) and quality of athletic performance (Wulf, 2007). A tri-axiomatic model of attention proposes that higher dispositional mindfulness may also benefit athletes in other areas of attention ability (e.g. sustained attention, focus shifting and cognitive inhibition) (Shapiro et al., 2006). A corresponding interpretation of these findings suggests that resilient athletes may be better equipped to activate attention and other components of self-monitoring that initiate and facilitate the self-regulatory process. Although the undercontrolled group obtained a higher average score than the overcontrolled group in dispositional mindfulness, the difference was not significant. Despite considerable differences in how these two personality groups operate within the context of ego-control, there appears to be substantial similarity in the degree to which they attend to the present.

Self-Regulation

In sport psychology, self-regulation is described as a multi-faceted construct governed by interrelating factors. It is considered to operate as a stable mechanism that guides thoughts and behaviors towards a particular objective. Among athletes, activation of objective-oriented behaviors is considered a critical aspect of guiding appropriate individual responses to performance (Karoly, 1993). The self-regulatory process is presumed to assist in storing the responses in the working memory for continuous inspection. Should any psychological or physiological content that obstructs progress towards the set objective be detected, the self-regulatory process initiates a shift in behavior towards the desired outcome (Karoly, 1993).

The resilient athletes in this study were higher in self-regulation than undercontrolled athletes. It has been argued that the self-regulation in sports is based on the practice of self-monitoring and may be more associated with an external than internal focus (Behncke, 2002). Accordingly, the athletes in this study with resilient personality structures appear to demonstrate an advantage in adaptively responding to change with appropriate control of impulsivity. This interpretation proposes that resilient athletes may have the flexibility to effectively deal with changing conditions. These findings indicate that self-regulation is apparently characteristic of resilient collegiate athletes.

Gender Differences

The findings in this study correspond with other studies that found few gender differences in dispositional mindfulness (Kong, 2014) or other adaptive features of personality (Gill, 1992; Meyers, Bourgeois, LeUnes & Murray, 1999). Although clear evidence of gender differences in self-regulation has also not been firmly established (Bembenutty, 2007), researchers continue to highlight the importance of exploring how various factors (i.e., age, health and status) interact with gender to shape unique expressions of self-regulation (D'Ambrosio, Donorfio, Coughlin, Mohyde, & Meyer, 2008). Furthermore, continuing to examine gender differences may eventually inform intervention efforts (Pemberton & Petlichkoff, 1988).

This study provides a unique example of using self-regulation to effectively illustrate specific psychological and behavior functioning patterns found among elite athletes (Gill, 1992; Kirschenbaum & Wittrock, 1984). Specifically, the adaptive benefit of self-regulation is argued to improve athlete's ability to succeed in their sport by

executing their training most effectively during challenging circumstances. Therefore, equivalent demands to exercise self-regulatory skills within the sporting context might help interpret to the lack of differences observed in this study between men and women.

For contextual purposes, it should be noted that the average self-regulation score across three personality types fell within the moderate range for self-regulation as defined in the literature (Brown et al., 1999). Although personality is understood to be inherently stable in its presentation over time, dispositional mindfulness and self-regulation are considered adaptive skill-sets. Both are suggested to benefit all personality prototypes that encounter problems with ego-regulation. The significant relationship detected between dispositional mindfulness and self-regulation scores supported previous findings that suggest dispositional mindfulness may represent a unique perceptual quality related to, and possibly predictive of, an array of self-regulatory and well-being constructs. More research is needed to support this, but it appears quite promising for athletic interventions.

5.4 Limitations

Several sources of measurement error in this study should be considered. Participant survey responses offer a limited representation of associations between athlete personality type, dispositional mindfulness and self-regulation. The cross-sectional design of this study limits all inferences that can be made regarding how personality type affected variability in dispositional mindfulness and self-regulation. Only a few interactions could be studied in this sample of student athletes.

Due to the fact that all participants in this study were students enrolled in a large

university and participating on a Division 1 NCAA sports team, there are limits in making generalizations about the results to the broader population of college athletes. The small sample size used also limits the generalizability of results. It should be noted that the athletes participating in the study lacked controlled reporting conditions that may compromise the authenticity of responses (i.e., socially desirable and fictitious responses).

The use of dispositional scales may overemphasize some personality characteristics over others instead of highlighting an integrative nature of personality characteristics that works collectively towards an athletic objective. Additional errors in measurement may occur due to items not properly measuring the constructs of interest. Due to the person-centered design of this study, dimensional comparisons of personality traits are not presented as they are in the variable-centered approach. The use of multiple assessment techniques (i.e. self-report and physiological measures) is an effort that may help mediate some of the noted methodological weaknesses (Ray & Weise-Bjornstal, 1999).

Researchers have established the importance of holding a meta-theoretical understanding of attention (Moran, 2009) and resiliency (Richardson, 2002). This study does not explore how systems of meta-attention function among the athlete population as related to reducing distractions and attending to internal/external cues during competition. Evaluating the impact of intervention programs to develop attention and self-regulatory skills will improve as psychometric tools available become more population-specific to athletes.

5.5 Implications for Future Research

Ego-resiliency has been long recognized as a stable personality trait (Block, 1993) and is credited with facilitating faster physiological and emotional recovery from stress (Ong, Bergeman & Boker, 2009). By circumventing exposure to prolonged psychological distress, resilient athletes are believed to more effectively recover from distressing conditions and experiences. Many experimental and practical advantages correspond with the typological approach used in this study. Examining athlete resilience via personality prototype offers an efficient system of classification, attending to the “whole person” rather than isolate traits specific to an athlete.

Other interesting patterns in athlete resiliency emerged from the data collected in this study. For example, other research that has found overall higher scores on Agreeableness and Conscientiousness and lowest on Neuroticism may reflect a signature pattern among national and international athletes (Allen, Greenlees & Jones, 2011; Talyabee, Moghadam & Salimi, 2013). Athletes may have learned or developed robust expression of control guided by goal-oriented behavior compare to other, non-athletic individuals. Agreeableness may reflect a tendency among athletes to promote social harmony and willingness to compromise with others. This may be facilitated by the recurring and long-term interactions with other athletes and coaching personnel in structured and informal settings.

The typological approach to exploring personality offers considerable value to athlete research, particularly in light of associations found between the three personality prototypes and a number of developmental outcomes (i.e., IQ, academic performance,

behavior and emotional condition) (Donnellan & Robbins, 2010). Longitudinal evidence of an inverse association between resiliency and problematic behavior (Huey & Weisz, 1997) further illustrates value in exploring how resilience may benefit athletes over time. The only published study of athlete personality prototypes was unsuccessful in clearly replicating the tripartite typology (McSherry, 2012). These efforts indicate consistent relevance of the personality dimensions and a need to further develop a model that enhances our understanding of athlete resilience as a function of personality structure.

The findings in this study contribute to sports research by understanding differences in dispositional mindfulness and self-regulation that might occur as a function of personality. Within the model of ego-resiliency, these dependent variables are considered adaptive features that may improve health and performance when properly developed in athletes. Studying the adaptive nature of personality resilience from a person-centered approach offers a format for examining trait configurations as compared to merely isolated traits. Exploring constructs such as dispositional mindfulness from this perspective will help identify mechanisms that may activate adaptive psychological functioning in resiliency. It should be noted that including additional factors that may interact with resiliency can complicate research designs and may call for larger sample sizes to enhance reliability (Asendorpf & van Aken, 1999). Dispositional mindfulness scales are limited in interpretative ability when not supported by well-established theory and methodology (Bergomi, Tschacher & Kupper, 2013). Consequently, researchers are encouraged to continue developing measures that more

accurately quantify and interpret attention skills relevant to athlete training and performance.

Researching personality resilience from a developmental perspective also offers unique insight to sport psychology interventions. Although a study examining longitudinal data on self-regulation generally found evidence of highly stable personality patterns (Meeus, Van de Schoot, Klimstra & Branje, 2011), it also found the presence of transitions between personality prototypes during late adolescence. Implications were that personality prototype transitions shifted towards the resilient group more often than towards the undercontrolled and overcontrolled groups. Accordingly, college-aged students may serve as an ideal population for intervention efforts to promote the self-regulatory skills associated with personality resilience. Future research designs may include predicting the likelihood of how self-regulation interventions may influence health and performance outcomes between the resilient, overcontrolled and undercontrolled personality types.

Continuing to explore complex trait interactions from a developmental perspective will help explain personality associations with predicted life outcomes, differences in response to similar environmental conditions and finer distinctions in theories of personality development. In an effort to further complement the existing literature of variable-centered research, future researchers are encouraged to design studies that embrace both person-centered and variable-centered approaches. Even the strongest critics of typological approach with regard to concerns of predictive validity and clinical applicability still recognize value across settings in examining how

personality traits tend to cluster (Costa, Herbst, McCrae, Samuels & Ozer, 2002).

Future research efforts to configure personality traits should practice increasing the use of clustering solutions to better account for the historical variability in the presentation of prototypes across samples (Chapman & Goldberg, 2011). Athletes may further benefit by advancing the depiction of personality resilience from discrete group association to inter-dimensional group association. For example, research examining team sports may benefit from the identification of distinctive patterns observed between the three personality prototypes. The person-centered approach in this study is credited with connecting previous personality research with present-moment attention and self-regulation in a new and meaningful way. The significant roles that dispositional mindfulness and self-regulation were found to play in resilient psychological functioning indicated a need for continued efforts to explore these and other adaptive constructs that enhance college athlete responses to adversities.

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APPENDIX A

DISPOSITIONAL MINDFULNESS SCALE

Mindfulness Attention Awareness Scale (MAAS)

Please indicate the degree to which you agree with each of the following items using the scale below. Simply circle your response to each item.

	1	2	3	4	5	6
	almost always	very frequently	somewhat frequently	somewhat infrequently	very infrequently	almost never
1. I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
3. I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
6. I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
7. It seems I am "running on automatic" without much awareness of what I'm doing.	1	2	3	4	5	6
8. I rush through activities without being really attentive to them.	1	2	3	4	5	6
9. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.	1	2	3	4	5	6
10. I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
11. I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
12. I drive places on "automatic pilot" and then	1	2	3	4	5	6

wonder why I went there.

- | | | | | | | | |
|-----|--|---|---|---|---|---|---|
| 13. | I find myself preoccupied with the future or the past. | 1 | 2 | 3 | 4 | 5 | 6 |
| 14. | I find myself doing things without paying attention. | 1 | 2 | 3 | 4 | 5 | 6 |
| 15. | I snack without being aware that I'm eating. | 1 | 2 | 3 | 4 | 5 | 6 |

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APPENDIX B

SELF-REGULATION QUESTIONNAIRE

Self-Regulation Questionnaire (SRQ)

Please indicate the degree to which you agree with each of the following items using the scale below. Simply indicate your response to each item.

1	2	3	4	5
Strongly disagree	Disagree	Uncertain or Unsure	Agree	Strongly Agree

1. ___ I usually keep track of my progress toward my goals.
2. ___ My behavior is not that different from other people's.
3. ___ Others tell me that I keep on with things too long.
4. ___ I doubt I could change even if I wanted to.
5. ___ I have trouble making up my mind about things.
6. ___ I get easily distracted from my plans.
7. ___ I reward myself for progress toward my goals.
8. ___ I don't notice the effects of my actions until it's too late.
9. ___ My behavior is similar to that of my friends.
10. ___ It's hard for me to see anything helpful about changing my ways.
11. ___ I am able to accomplish goals I set for myself.
12. ___ I put off making decisions.
13. ___ I have so many plans that it's hard for me to focus on any one of them.
14. ___ I change the way I do things when I see a problem with how things are going.
15. ___ It's hard for me to notice when I've "had enough" (alcohol, food, sweets).
16. ___ I think a lot about what other people think of me.
17. ___ I am willing to consider other ways of doing things.
18. ___ If I wanted to change, I am confident that I could do it.
19. ___ When it comes to deciding about a change, I feel overwhelmed by the choices.
20. ___ I have trouble following through with things once I've made up my mind to do something.
21. ___ I don't seem to learn from my mistakes.
22. ___ I'm usually careful not to overdo it when working, eating, drinking.
23. ___ I tend to compare myself with other people.
24. ___ I enjoy a routine, and like things to stay the same.
25. ___ I have sought out advice or information about changing.
26. ___ I can come up with lots of ways to change, but it's hard for me to decide which one to use.
27. ___ I can stick to a plan that's working well.
28. ___ I usually only have to make a mistake one time in order to learn from it.
29. ___ I don't learn well from punishment.
30. ___ I have personal standards, and try to live up to them.
31. ___ I am set in my ways.

32. ___ As soon as I see a problem or challenge, I start looking for possible solutions.
33. ___ I have a hard time setting goals for myself.
34. ___ I have a lot of willpower.
35. ___ When I'm trying to change something, I pay a lot of attention to how I'm doing.
36. ___ I usually judge what I'm doing by the consequences of my actions.
37. ___ I don't care if I'm different from most people.
38. ___ As soon as I see things aren't going right I want to do something about it.
39. ___ There is usually more than one way to accomplish something.
40. ___ I have trouble making plans to help me reach my goals.
41. ___ I am able to resist temptation.
42. ___ I set goals for myself and keep track of my progress.
43. ___ Most of the time I don't pay attention to what I'm doing.
44. ___ I try to be like people around me.
45. ___ I tend to keep doing the same thing, even when it doesn't work.
46. ___ I can usually find several different possibilities when I want to change something.
47. ___ Once I have a goal, I can usually plan how to reach it.
48. ___ I have rules that I stick by no matter what.
49. ___ If I make a resolution to change something, I pay a lot of attention to how I'm doing.
50. ___ Often I don't notice what I'm doing until someone calls it to my attention.
51. ___ I think a lot about how I'm doing.
52. ___ Usually I see the need to change before others do.
53. ___ I'm good at finding different ways to get what I want.
54. ___ I usually think before I act.
55. ___ Little problems or distractions throw me off course.
56. ___ I feel bad when I don't meet my goals.
57. ___ I learn from my mistakes.
58. ___ I know how I want to be.
59. ___ It bothers me when things aren't the way I want them.
60. ___ I call in others for help when I need it.
61. ___ Before making a decision, I consider what is likely to happen if I do one thing or another.
62. ___ I give up quickly.
63. ___ I usually decide to change and hope for the best.

APPENDIX C

BIG FIVE INVENTORY

How I am in general

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

1	2	3	4	5
Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly

I am someone who...

1. _____ Is talkative
2. _____ Tends to find fault with others
3. _____ Does a thorough job
4. _____ Is depressed, blue
5. _____ Is original, comes up with new ideas
6. _____ Is reserved
7. _____ Is helpful and unselfish with others
8. _____ Can be somewhat careless
9. _____ Is relaxed, handles stress well.
10. _____ Is curious about many different things
11. _____ Is full of energy
12. _____ Starts quarrels with others
13. _____ Is a reliable worker
14. _____ Can be tense
15. _____ Is ingenious, a deep thinker
16. _____ Generates a lot of enthusiasm
17. _____ Has a forgiving nature
18. _____ Tends to be disorganized
19. _____ Worries a lot
20. _____ Has an active imagination
21. _____ Tends to be quiet
22. _____ Is generally trusting
23. _____ Tends to be lazy
24. _____ Is emotionally stable, not easily upset
25. _____ Is inventive
26. _____ Has an assertive personality
27. _____ Can be cold and aloof
28. _____ Perseveres until the task is finished
29. _____ Can be moody

30. _____ Values artistic, aesthetic experiences
31. _____ Is sometimes shy, inhibited
32. _____ Is considerate and kind to almost everyone
33. _____ Does things efficiently
34. _____ Remains calm in tense situations
35. _____ Prefers work that is routine
36. _____ Is outgoing, sociable
37. _____ Is sometimes rude to others
38. _____ Makes plans and follows through with them
39. _____ Gets nervous easily
40. _____ Likes to reflect, play with ideas
41. _____ Has few artistic interests
42. _____ Likes to cooperate with others
43. _____ Is easily distracted
44. _____ Is sophisticated in art, music, or literature.