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Evaluation of the Mindfulness-Acceptance-Commitment (MAC) Approach for Enhancing Athletic Performance

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EVALUATION OF THE MINDFULNESS-ACCEPTANCE-COMMITMENT (MAC) APPROACH FOR ENHANCING ATHLETIC PERFORMANCE

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Title: Evaluation of the Mindfulness-Acceptance-Commitment (MAC) Approach for Enhancing Athletic Performance

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In the quest for peak performance, athletes have traditionally engaged in performance skills training as the primary intervention strategy for enhancing athletic performance. However, mindfulness and acceptance-based strategies have been gaining momentum, particularly becoming the subject of further investigation in sport psychology. The Mindfulness-Acceptance-Commitment (MAC) approach for performance enhancement is a seven-week protocol that works to enhance athletes' nonjudgmental awareness, cultivates experiential acceptance, and improves task-focused attention so that athletes learn they can reach peak performance despite negative internal states (Gardner & Moore, 2004, 2007). This open trial study examined the efficacy of the MAC program in comparison to a matched seven-week psychological skills training program for enhancing athletic performance among 19 collegiate athletes of various sport domains. Based on analysis of variance, results indicated that the groups did not significantly differ, however athletes in the MAC group demonstrated increased mindfulness skills in their ability to describe and to be non-reactive towards their inner experience from pretest to posttest. Moreover, the MAC group demonstrated increased experiential acceptance, particularly describing an increased ability to take action towards their goals. This study provides limited support for the applicability and utility of the MAC program with collegiate athletes. Further research is necessary to better understand the performance-related attributes that may be the underlying cause to athletic performance enhancement, as well as determining the sport specific impact of the MAC program.

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CHAPTER ONE

INTRODUCTION

Performance Enhancement

Applied sport psychology has predominately utilized cognitive behavioral methods to help athletes achieve ideal performance states primarily through self-regulation strategies (Whelan, Mahoney, & Meyers, 1991). Methods such as goal setting, imagery, mental rehearsal, arousal control, self-talk, and pre-competitive routines are all strategies that have been the focus of research in performance enhancement. Specifically, Meichenbaum's (1977) integrative approach to cognitive behavioral modification and Bandura's (1977) social cognitive theory have influenced the development of psychological skills training in order to enhance athletic performance. Psychological skills training (PST) is based on improving performance states through self-regulatory processes and can be accomplished through the methods listed above (Hardy, Jones, & Gould, 1996). Research has continued in the area of PST because of the belief that low levels of anxiety, fewer experiences of negative thinking, and high levels of self-confidence in athletes are associated with better performance (Gould, Eklund, & Jackson, 1992; Gould et al., 1981; Orlick & Parington, 1988).

The PST approach is based on the assumption that negative internal states such as negative thoughts, emotions, and bodily sensations impede performance and that they must be controlled or reduced thereby promoting an increase in positive thinking and self-confidence. Accordingly, the increases in a positive internal state will result in an ideal performance state allowing the athlete to perform at his or her best (Hardy, Jones, & Gould, 1996). Based on this assumption, research has primarily focused on enhancing performance through the reduction, control, or elimination of negative internal states such as anxiety or worry. Studies often explore

the mechanisms of change as the need to control, yet research has not sufficiently revealed its effectiveness in improving performance (Moore, 2009).

In 2003, Moore performed a qualitative review by examining studies utilizing PST strategies to determine the degree of empirical support for PST in enhancing athletic performance. Studies were reviewed according to the established criteria of empirically supported treatments developed by the Committee on Science and Practice (under Division 12 of the American Psychological Association; Chambless & Hollon, 1998; Gardner & Moore, 2006). Out of the studies that met criteria, Moore (2003) found that none of them demonstrated empirical support for the utilization of goal setting, imagery, arousal control, or self-talk modification for performance enhancement. Although multicomponent interventions demonstrated slightly better efficacy than single intervention strategies, the findings were inconsistent. The review concluded that traditional methods of performance enhancement had not demonstrated sufficient efficacy and alternative strategies should be considered (for a comprehensive discussion of the review, see Gardner & Moore, 2006).

One alternative strategy to PST that is gaining preliminary empirical support is the Mindfulness-Acceptance-Commitment Approach (MAC: Gardner & Moore, 2007) to athletic performance enhancement. This approach differs from traditional methods of performance enhancement strategies because it does not operate on the previously held assumption that negative internal states will impede performance. The theory suggests that you do not need to control, change, or eliminate negative internal states in order to perform optimally. Rather, the MAC approach suggests that through mindfulness and acceptance based strategies, athletes increase task-focused attention thereby improving their performance. The MAC approach is based on Mindfulness-Based Cognitive Therapy (Segal, 2002) and Acceptance-Commitment

Therapy (Hayes et al. 1999) and has been adapted to be utilized with athletes. Preliminary research using the model has shown some limited support for its effectiveness (Wolanin, 2005; Lutkenhouse et al., 2007; Schwanhausser, 2009). The approach teaches athletes to increase their awareness of internal states in the present-moment and to be accepting of whatever internal processes they may be experiencing. Moreover, the approach encourages athletes to recognize that their thoughts are not reality, but are simply just passing thoughts. In this way, the athletes learn that they do not need take to action in response to their thoughts. Athletes move from experiential avoidance (escape from uncomfortable negative internal states) to a process of experiential acceptance that works in service of their identified values. The emphasis is on present-moment awareness and acceptance, thereby increasing the athletes' task-focused attention allowing them to respond to performance situations more effectively. Although the MAC approach has some studies that offer preliminary support for its efficacy in performance enhancement, further evaluation is needed.

The remainder of the literature review will evaluate research findings in the area of performance skills training and traditional methods of performance enhancement. In addition, the Mindfulness-Acceptance-Commitment approach will be explained beginning with an examination of its theoretical underpinnings and research in mindfulness and acceptance-based approaches. A more detailed description of the MAC approach as applied to athletic performance enhancement will follow. The review concludes with a summary and discussion of the specific research questions and hypotheses suggested by the review and to be examined in this dissertation.

Traditional Methods of Performance Enhancement

Methods of performance enhancement have primarily been based on the assumption that reduction in negative internal states will result in increases in positive emotions and levels of confidence, subsequently enhancing athletic performance (e.g., Hardy et al., 1996). This assumption has promoted the use of performance skills training with athletes to train them in control-strategies that will decrease or eliminate negative internal states in the hopes of achieving ideal performance states. Skills are taught to athletes such as goal setting, mental imagery, arousal control, self-talk modification, and pre-competitive routines to improve self-regulatory processes that will assist in achieving an ideal performance state. The use of mental skills with athletes was first inspired by Bandura's social cognitive theory (1977) and Meichenbaum's development of cognitive behavioral modification (1977). Performance skills training (PST) has dominated in applied sport psychology as the primary method of helping athletes improve performance, despite several models and theories of performance supporting the notion that negative internal states *can* lead to ideal performance states. Models such as the CUSP catastrophe model, the individual zones of optimal functioning (IZOF) model, and processing efficiency theory all support that ideal performance states can occur while experiencing negative thoughts or emotions (as discussed by Mellalieu et al., 2006). For example, the processing efficiency theory (PET; Eysenck and Calvo, 1992) holds that when cognitive components of anxiety are manifest, processing efficiency may be impaired along with reduced working memory capacity due to task-irrelevant focus. However, what they referred to as "cognitive anxiety" may also serve as a signal of the importance of the task therefore maintaining task performance or enhancing task performance even under high anxiety.

In recent years, the CUSP catastrophe model has been further investigated to better understand the model's predictions. The model proposes that high levels of anxiety and physiological arousal, up to a certain point, will lead to positive effects on performance. However, experiences of anxiety and physiological arousal beyond a particular level will result in a 'catastrophic' drop in performance (Hardy et al., 1996). But, in a study examining the CUSP catastrophe model, Cohen and colleagues (Cohen, Pargman, & Tenenbaum, 2003) found that even under increasing levels of anxiety and physiological arousal, there were no catastrophic declines in performance further indicating that performance can be maintained or improved even while experiencing high levels of anxiety. This suggests, then, that the fundamental assumption of a need to reduce negative internal states is faulty.

Despite research on these models that support that ideal performance can occur while experiencing negative internal states, the use of PST persists. Gardner and Moore (2004) suggested that studies examining the mechanisms of change mediating traditional PST procedures have not been supportive of the underlying assumptions of PST procedures. Craft and colleagues (Craft, Magyar, Becker, & Feltz, 2003) conducted a meta-analytic review exploring the potential impact of self-confidence and competitive anxiety on athletic performance. Results were consistent with the notion of the dubious value of PST procedures, indicating that self-confidence, competitive anxiety, and athletic performance are only weakly related. In addition, other empirical research on PST fails to reveal sufficient efficacy to continue its promotion and use as the primary method for performance enhancement (Moore, 2003). Research on the strategies of PST and its ability to promote ideal performance states and improve athletic performance, along with research examining alternative perspectives related to performance enhancement will be reviewed below.

In 2003, Moore conducted a qualitative review of studies that examined PST strategies and their effectiveness in enhancing athletic performance. Moore (2003) examined studies based on the criteria that had been previously established for empirical support in this area (as promulgated by Chambless, & Hollen, 1998). The investigators reviewed interventions aimed at athletic performance enhancement through the use of goal setting, imagery, self-talk modification, arousal regulation, and multicomponent interventions. Only 6 empirical studies were found evaluating the impact of goal setting on athletic performance. Of the 2 studies that met criteria, neither revealed significant performance enhancing effects. In a review of studies examining goal-setting in sport, Kaufman (2008) further described the inconsistencies that can be found in the literature regarding the impact of goal-setting on performance. Contrary to popular belief, goal-setting is not considered a "gold standard" for enhancing athletic performance.

Similarly, research on mental imagery yielded no significant results based on the 6 studies that met criteria in Moore's qualitative review. In addition, a comprehensive review of mental imagery interventions completed by Jones and Stuth (1997) found mixed results for mental imagery enhancing athletic performance. In examining studies of the impact of self-talk modification on performance enhancement, Moore found that of the 4 studies that met criteria, none demonstrated significant performance enhancing effects. Moreover, self-talk research has yielded conflicting results both in experimental and field-based research (Kaufman, 2008). For example, in several studies examining the verbalization of self-talk during various sport tasks that included an assigned and selected positive phrase, as well as control conditions, results were equivocal (Van Raatle et al., 1994; Van Raatle et al., 1995; Harvey et al., 2006).

In considering arousal regulation procedures (e.g., relaxation strategies, "psyching up"), Moore (2003) once again found that of the four empirical studies of arousal regulation procedures, no significant performance-enhancing effects were found. The lack of consistent empirical support for the effects of goal setting, imagery, self-talk modification, and arousal regulation on performance enhancement is disappointing, especially because these strategies are often promoted as effective and are still frequently utilized.

However, multicomponent interventions (a combination of performance skills enhancement techniques) have shown slightly better efficacy than single intervention strategies, but results remain inconsistent. Out of the 12 empirical studies that met criteria, Moore found that only 6 out of 12 studies revealed significant performance enhancing effects (for comprehensive reviews see Moore, 2003; Gardner & Moore, 2006). Overall, results were unequivocal for single intervention strategies and were inconsistent for multicomponent intervention strategies of the studies that met criteria for the review. Moreover, Moore (2003) concluded that these single and multicomponent intervention strategies should only be considered to be "experimental" interventions. Janelle (2000) supported Moore's contention that there is limited empirical support in understanding the mechanisms of change in performance enhancement. In a more recent article examining the progress of the MAC approach, Moore (2009) contends that although many studies examining PST strategies reveal results of the intended decreases in "negative" internal states, no significant improvements in athletic performance were obtained. This suggests that the mechanisms that are currently hypothesized to underlie change need to be reconsidered.

Since investigations of PST and control strategies have shown these methods to be insufficient as change mechanisms in performance enhancement, research has considered

alternative perspectives on the possible mechanisms of change. This work has included the examination of the role of self-regulation and attention. More specifically, self-regulatory and attentional processes are thought to be better understood through the Integrated Model of Athletic Performance (IMAP: Gardner & Moore, 2006). According to the IMAP model, there are three phases of athletic performance including the preparatory phase, performance phase, and postperformance phase. The performance phase is most critical in understanding self-regulatory processes of athletic performance. During this phase, there is an interaction between an athlete's cognitions, affect, and behavioral responses as a result of developed schemas and external events that occur (Gardner & Moore, 2006). During athletic performance, athletes engage in self-monitoring and attempt to adjust according to their preset standards (i.e. history of performance and expectations of performance), thus promoting functional or dysfunctional performance (Carver & Scheier, 1988; Sbrocco & Barlow, 1996).

Disruptions in the performance phase of the IMAP are suggested to occur when athletes experience task-irrelevant attention (Gardner & Moore, 2006). As described above, the PET suggests that task-irrelevant attention can occur when there are increases in anxiety and reduced working memory capacity (Eysenck & Calvo, 1992). When cognitive anxiety and task-irrelevant attention are present, there is often a disruption in the performance phase that will typically result in dysfunctional performance. Gardner and Moore (2007) suggested that task-focused attention (attention to external stimuli, options, and contingencies) is required to achieve an ideal performance state over self-focused attention (attention toward internal stimuli such as thoughts and emotions).

Furthermore, Gardner and Moore (2007) suggested that an ideal performance state requires "minimal self-judgment, minimal attention to external or internal threat, and minimal

future-oriented focus on possible performance consequences and ramifications." This requires "meta-cognitive" attention that is task-focused rather than self-focused. "Meta cognition" is an individual's awareness, evaluation, and response to his or her own cognitions and is considered synonymous with the skill of mindfulness according to Gardner and Moore (2006). Meta cognitions can be adaptive or maladaptive depending on the individual's interpretation and developed schema. For example, individuals with Generalized Anxiety Disorder (GAD) may interpret their worry as a coping mechanism, therefore initiating the cycle of anxiety (Wells, 2002). However, in performance situations, if athletes experience their meta-cognitions as adaptive, it will allow present-moment, task-focused attention that is key for ideal performance states.

There has been some research that has focused on these components of the model. A study conducted by Crocker, Alderman, and Smith (1988) examined this perspective by including mediation-like skills and coping skills procedures to help elite volleyball players increase present-moment awareness and develop task-focused attention. The results revealed no significant reductions in anxiety; however, there were significant improvements in performance and improvements remaining at a 6-month follow-up. In an examination of qualitative studies, Gould and colleagues (Gould et al., 1992) found that task-irrelevant attention is highly associated with poor athletic performance. These studies support the IMAP model and are consistent with acceptance-based approaches that task-relevant attention may lead to improvements in performance.

In addition, Gardner and Moore (2007) suggested that attempts to control cognitive activity lead to increases in self-focused attention rather than task-focused attention and may result in performance dysfunction or an inability to perform learned skills. Research has shown

that attempts at thought suppression can have a paradoxical effect and may actually increase the occurrence and frequency of unwanted thoughts and emotions (Purdon, 1999; Wegner & Zanakos, 1994; Wenzlaff & Wegner, 2000). Clinical research has already shown parallels to this finding. Studies have reported support for the exacerbation of symptoms through the suppression of unwanted thoughts. Specifically, this perspective has been found in the treatment for obsessive-compulsive disorder (Salkovskis, Richards & Forrester, 1995), depression (Beevers, Wenzlaff, Hayes, & Scott, 1999), and post-traumatic stress disorder (Beck et al., 2006) such that the severity and intensity of symptoms may increase resulting from trying to suppress unwanted thoughts. Gardner and Moore (2006) hypothesized that the process of thought suppression promotes task-irrelevant and self-focused attention thereby disrupting the IMAP model and impeding performance. Furthermore, attempts to suppress unwanted thoughts have shown to increase cognitive activity and negative internal states through what is known as "ironic processes of mental control" (Wegner, 1994). The research related to thought control illustrates the reluctance in promoting PST strategies for performance enhancement that are aimed at controlling internal states.

As a result of over three decades of PST research and a lack of demonstration of adequate efficacy, along with futile interventions focused on control strategies, Gardner and Moore (2006) developed an alternative method of performance enhancement that is a known as the Mindfulness-Acceptance-Commitment (MAC) approach. The approach is empirically grounded in the IMAP and is based on mindfulness and acceptance-based approaches to therapy, specifically Mindfulness Based Cognitive therapy (Segal, Williams, & Teasdale, 2002) and Acceptance Commitment Therapy ((Hayes, Strosahl, & Wilson, 1999). Instead of focusing on control strategies, the athlete is trained in self-regulatory behaviors that focus on improving the

athlete's task-focused attention and present-moment awareness (Gardner & Moore, 2007). Hardy (1997) suggests that athletes need to become more aware of their cognitive anxiety and better understand that it is a natural response to performance circumstances, an idea that is consistent with the MAC approach. The following sections will examine the theoretical foundations of the MAC approach beginning with mindfulness and followed by acceptance-based approaches.

Mindfulness

Mindfulness, a form of present-moment attention, is a tradition that is based on Eastern meditation principles and is becoming increasingly utilized in Western culture. Kabat-Zinn defines mindfulness as "the awareness that emerges through paying attention in a particular way: on purpose, in the present, and nonjudgmentally" (1994, p. 4). The use of mindfulness as a technique has become increasingly popular as a component of therapeutic interventions and has gained empirical support for the treatment of a variety of clinical conditions. Following an empirical review of mindfulness interventions, Bear (2003) found that mindfulness can be effective in treating pain, stress, anxiety, depressive relapse, and disordered eating. In addition, interventions that focus on developing mindfulness skills through meditation-like exercises including mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2003) are frequently being utilized. Further, dialectical behavior therapy (DBT; Linehan, 1993) and acceptance commitment therapy (Hayes, Strosahl, & Wilson, 1999) are treatments that incorporate mindfulness procedures into therapy interventions primarily through learning behavioral skills.

Lau and colleaugues (Lau, et al., 2006) reviewed areas of treatment in which mindfulness has been utilized with great benefit; these included generalized anxiety disorder (Roemer &

Orsillo, 2002), posttraumatic stress disorder (Wolfsdorf & Zlotnick, 2001), and substance abuse (Breslin, Zack, & McMain, 2002). Moreover, Brown and Ryan (2003) found that mindfulness is related to increases in self-knowledge and psychological well-being. Further research has revealed the effectiveness of mindfulness for interventions with clinical and non-clinical populations (for more comprehensive reviews, see Baer, 2003 and Grossman, Niemann, Schmidt, & Walach, 2004).

In recent years, there has been as shift in focus on the operational definition of mindfulness and its underlying mechanisms. Bishop et al. (2004) proposed that mindfulness involves two components: (1) the *self-regulation of attention* in the present-moment and (2) the openness, willingness, and *awareness* of experiences in the present-moment. There is some evidence to suggest the role that attention plays in mindfulness. Wenk-Sormaz (2005) found that even brief exposure to mindfulness techniques improves self-regulation of attention as revealed by less Stroop interference and increased flexibility in word production in comparison to the control group. In a study examining sustained attention, individuals that engaged in meditation were found to have mindfulness skills that were useful in distributing attention and increasing present-moment awareness in response to unexpected events in comparison to a control group (Valentine & Sweet, 1999). However, research has revealed greater support for the second component of Bishop et al. (2004) operational definition of mindfulness.

In a study examining mindfulness influences on attentional processes, Anderson et al. (2007) found that participants that engaged in an 8-week Mindfulness-Based Stress Reduction (MBSR) course had significantly greater improvements in emotional well-being and mindfulness, but no improvements in attentional control in comparison to a control group. The study further indicated that mindfulness is "associated with non-directed attention, enhancing

awareness of present experience, unfiltered by assumptions or expectations," providing further support for Bishop et al. (2004) second component of mindfulness. It is clear that operational definitions of mindfulness are necessary for understanding scales that measure mindfulness.

The optimal assessment of mindfulness has also been at issue as the discussion of the components of mindfulness evolves. There are several mindfulness self-report measures that examine the constructs of awareness and acceptance at the present moment. Specifically, The Toronto Mindfulness Scale (Lau et al., 2006) identifies two factors, Curiosity and Decentering that are consistent with Bishop et al. (2004) second component of mindfulness and Segal et al. (2002) understanding of decentering. In addition, the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) and the Freiburg Mindfulness Inventory (Buchheld, Grossman, Walach, 2001) measure the single factor of awareness and acceptance of the present moment. The Kentucky Inventory of Mindfulness Skills (Baer, Smith, & Allen, 2004) has factors of awareness and acceptance, but only one factor (Observing) is related to basic attentional skills. However, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is the only measure that focuses primarily on measuring basic attentional skills. Perhaps most comprehensive and empirical, the Five-Facet Mindfulness Questionnaire (FFMQ; Baer, et al., 2006) measures five factors of mindfulness that were derived from a factor analysis of existing mindfulness measures.

The ability to direct one's attention and increase awareness of the present moment can be learned through various mindfulness exercises. The exercises are intended to help the individual attend to both external stimuli and internal experiences such as bodily sensations, thoughts, and emotions in a nonjudging, nonevaluative way. Internal and external stimuli that enter awareness are carefully observed, but are not perceived as positive or negative. The individual can

experience emotions and thoughts as naturally occurring events of human experience, rather than trying to control or reduce them (Teasdale, Moore, Hayhurst, Williams, & Segal, 2002). According to Gardner & Moore (2004), mindfulness in this way can be considered to be an attentional skill and can be applied to working with athletes.

As has been discussed, mindfulness presents an alternative strategy to control-based strategies that have been shown to have a paradoxical effect. Specifically, attempts to control negative thoughts or worries result in increased time and decreased efficiency thinking about the issue or event causing self-focused attention rather than task-focused attention (Wegner, 1994; Wenzlaff & Wegner, 2000). In addition, mindfulness has been shown to reduce the verbal linguistic component of worry and anxiety (Roemer & Orsillo, 2002). Studies have also revealed that worry often involves a predominance of negative cognitive activity (Borkovec, & Intz, 1990). There is also some evidence to suggest that the use of mindfulness is associated with beneficial neuroanatomical changes in the brain based on fMRI and EEG images (for a review, see Marks, 2008). Mindfulness can achieve the goal of reducing cognitive activity without the paradoxical effect and promote task-focused attention, thus encouraging its use in performance enhancement (Gardner & Moore, 2007).

In a study of attentional focus during athletic competition performance, results indicated self-focused attention was highly associated with performance dysfunction (Edwards et al., 2002). Increases in cognitive activity and self-focused attention can inhibit the ideal performance state in athletes. Moreover, in a study examining the impact of mindfulness training, results indicated enhancements in sustained attention, attention switching (being able to shift attention towards relevant stimuli), and decreases in rumination (Chambers, Chuen Yee Lo, & Allen, 2008). These findings support the application of mindfulness to athletic performance as

utilized in the MAC program, particular because of the ability to switch attentional focus towards task-relevant stimuli (Gardner & Moore, 2007). In study conducted by Bernier et al. (2009) in which mindfulness and acceptance based techniques were integrated into a performance enhancement program for elite golfers, results indicated improvements in non-judgmental awareness, task-relevant attentional focus, and behavioral flexibility. Similarly, mindfulness has also been associated with enhancing behavioral flexibility in response to performance demands (Gardner & Moore, 2004). Attention in the form of mindfulness has been consistently associated with ideal performance states in competitive athletes (Martin & Hall, 1997).

Mindfulness is also considered an integral part and may mediate the experience of "flow state." Kee and Wang's (2008) study using a cluster analytic approach indicated that athletes who displayed greater mindfulness were also more likely to experience flow or peak performance states. In a qualitative study examining flow state in elite swimmers, athletes described flow state experiences in mindfulness terms such as experiencing "an awareness and acceptance of bodily sensations" (Bernier et al., 2009). In a recent study examining the relationship between mindfulness, preshot routine, and free throw percentage among collegiate basketball players, results indicated that levels of mindfulness significantly predicted game free throw percentage (Gooding & Gardner, 2009).

From a cognitive perspective, mindfulness can be utilized to promote metacognitive awareness, which is learning to observe your thoughts or emotions simple as a thought or emotion without perceiving it as an absolute reality that needs to be acted upon. The individual is encouraged to develop a decentered perspective, recognizing that thoughts are not realities and no action needs to be taken to alleviate the thought. Instead of attempting to change the thoughts, the "emphasis is on changing awareness of and relationship to thoughts" (Teasdale et al., 2000).

Through increased awareness, the individual can learn to regulate attentional processes and direct attention in the desired direction particular in a performance situation. By recognizing your thoughts and emotions as simply passing events, the individual can attend more effectively to the demands of the athletic performance situation, thereby engaging in task-focused attention (Gardner & Moore, 2007).

Acceptance and Commitment Therapy

Acceptance Commitment Therapy (ACT) is essential to understanding the MAC approach to enhancing athletic performance. Similar to mindfulness, ACT expands upon the traditional cognitive behavioral model. ACT is primarily based on functional contextualism and incorporates Relational Frame Theory (RFT) to better understand the role of language and cognition (Hayes, Strosahl, & Wilson, 1999). Functional contextualism "operates on four main components (1) a focus on the whole event, (2) sensitivity to the role of context in understanding the nature and function of an event, (3) emphasis on a pragmatic truth criterion, and (4) specific scientific goals against which to apply a truth criterion" (Hayes, Strosahl, & Wilson, 1999). In what is considered the "third wave" of behavior therapy, ACT promotes a contextual understanding of behavior that includes the role of language and cognition (Hayes, 2004).

RFT suggests that language and cognition is based on relational frames and subsequently affects our behavior within a particular context. Humans tend to derive relations among events and language and over time, these relational frames are continually strengthened. As a result, RFT helps explain the likelihood that cognitive fusion and experiential avoidance will occur. Cognitive fusion occurs when relational frames are dominating over other sources of behavior regulation. In other words, evaluations and verbal constructions of the self and from the outside

become fused with direct experiences, so that our mind's construction essentially overshadows our direct experience (Zettle, 2007). The goal is to break up the relational frames through a process of cognitive defusion so individuals will no longer recognize their internal experiences (e.g., thoughts, emotions, bodily sensations) as literal or a reality that must be acted against. ACT is similar to mindfulness because it focuses on present-moment awareness and promotes the acceptance of thoughts as passing events rather than literal interpretations.

When cognitive fusion occurs, it detracts the individual from focusing on the here-and-now experience and direct contingencies; rather, the individual is more likely to adhere to rule-governed behaviors. Rule-governed behaviors are based on verbal formulations of events and their relations to them. When behavior is guided by internal processes or rule-governed, it often leads to avoidant behavior. Rule-governed behavior often works towards immediate gratification in comparison to values-directed behavior that works towards attaining one's values (Hayes, Strosahl, & Wilson, 1999). Value-directed behavior is essential in achieving ideal performance states because it encourages the athlete to engage in behaviors in service of their performance values rather than immediate goals and rewards (Gardner & Moore, 2007).

ACT promotes the detection of cognitive fusion and experiential avoidance. There is a development of "letting go" and cognitive defusion that assists in promoting the individual's identified performance values. As the individual moves from a process of cognitive fusion to cognitive defusion, the goal is also to identify experiential avoidance and move towards experiential acceptance. Experiential avoidance occurs when an individual attempts to escape from uncomfortable internal experiences (e.g., thoughts, emotions, bodily sensations) and may try to "modify the form, frequency, and context of the unwanted internal experience" (Hayes, Strosahl, & Wilson, 1999). For example, an athlete may avoid practicing as a way trying to

relieve his or her anxiety. Because experiential avoidance offers temporary relief, it negatively reinforces the individual to continue to utilize avoidance in the future without benefiting in the long term.

One form of experiential avoidance is the cognitive process of worry. Worry has a unique avoidant function in the role of experiential avoidance (Borkovec, Alcaine, & Behar, 2004). In a study examining the relationship between maladaptive perfectionism and worry, Santanello and Gardner (2007) found a significant positive correlation between experiential avoidance and worry. In addition, experiential avoidance was identified as a partial mediator between maladaptive perfectionism and worry. According to Gardner and Moore (2006), perfectionism is considered a coping strategy that athletes use to reduce or escape from unwanted, negative internal states. Excessive worry or cognitive activity has been shown as a factor in the self-regulatory model that will most likely lead to dysfunctional performance. Several studies examining EEG during athletic performance have supported this concept (Deeny, Hillman, Janelle, & Hatfield, 2003; Janelle, Hillman, & Hatfield, 2000; Hillman, Apparies, Janelle, & Hatfield, 2000).

One of the goals of ACT is to be willing to experience uncomfortable internal states such as worry and anxiety. ACT is also similar to mindfulness because it promotes an open, nonevaluative, nonjudging, accepting approach to experiencing psychological events even if the events are perceived as negative. Similarly, there is a willingness to experience these events without trying to control, change or suppress them (Hayes, 2004). As mentioned above, research suggests that attempting to control or suppress unwanted internal experiences may have a counterproductive effect and will result in increases in negative internal states (Wegner, 1994; Wenzlaff & Wegner, 2000). In addition, in a study on emotion regulation, Lynch, Robins,

Morse, and MorKrause (2001) found that avoidance or inhibition of emotion was predictive of psychological distress in both clinical and non-clinical populations. These studies provide further support that control strategies are ineffective for enhancing performance.

Another goal of ACT is psychological flexibility. There are six core processes that contribute to psychological flexibility including self as context, defusion, acceptance, focus on the present moment, values, and committed action. According to Hayes, Strosahl, Luoma, et al. (2004) psychological flexibility,

> … involves the ability to defuse from provocative or evocative private content, accept private experience for what it is, stay in touch with the present moment, differentiate a transcendent self from the contents of consciousness, make contact with valued life ends and build patterns of committed action in pursuit of those ends. (p. 60)

Through psychological flexibility individuals can work towards living a values-driven life so that their actions are in service of their identified values. Individuals commit to moving forward toward their identified values and will overcome psychological barriers through defusion and acceptance and will handle situational barriers with direct action (Hayes, Strosahl, & Wilson, 1999). Similarly, athletes can engage in behaviors for in the moment competition and behaviors that are working towards their identified performance values (Gardner & Moore, 2007).

Acceptance-based interventions have rapidly been gaining empirical support for their efficacy in increasing psychological flexibility and alleviating a variety of clinical and nonclinical concerns. In an empirical review of ACT interventions, Hayes and colleagues (Hayes et al., 2004) found ACT to be effective in treating depression, psychosis, substance use disorders, chronic pain, eating disorders, and work-related stress . There is some evidence to support that ACT decreases the believability of thoughts without decreasing the frequency of thoughts as indicated in a study examining thought processes of participants with psychotic symptoms (Bach & Hayes, 2002). This concept is consistent with Gardner and Moore (2004) idea that ideal

performance states can occur in the presence of negative internal states. In a study comparing hypnosis and ACT with elite canoeists, results indicated increases in athletic performance as measured by the number of repetitions on a rowing machine (Garcia et. al., 2004). Research has also shown that ACT increases psychological flexibility and encourages individuals to be accepting of negative internal states (Bond & Bunce, 2000).

There is also research that examined the combination of mindfulness and acceptance. For example, Roemer and Orsillo (2002) developed a treatment for Generalized Anxiety Disorder (GAD) incorporating mindfulness and acceptance-based interventions to address excessive cognitive activity and rumination that accompany the disorder. Mindfulness and acceptance-based approaches have also been effective with non-clinical populations by helping to reduce work-related stress and improving interpersonal relationships (Bond & Bunce, 2000; Carson, Carson, Gil, & Baucom, 2004). These studies suggest the possible applicability and potential benefits of this type of intervention with other non-clinical populations such as with athletes.

There is clearly an overlap between mindfulness and acceptance at the process level (Orsillo & Roemer, 2005). Moreover, the effectiveness of mindfulness and ACT in treating clinical and non-clinical populations has encouraged the development of an integrative approach for enhancing human performance. In addition, research on control strategies reveals that they are ineffective in performance enhancement, whereas recent models of human performance suggest that ideal performance states can be attained by helping the athlete attend to performance demands rather than focusing on cognitive activity that leads to self-focused attention. Recently, Gardner and Moore (2007) developed a mindfulness and acceptance-based approach to performance enhancement for athletes by training them in self-regulatory processes to achieve ideal performance states.

Mindfulness-Acceptance Commitment Approach

The Mindfulness-Acceptance Commitment Approach (MAC) is a combination of mindfulness and ACT techniques that was designed to be utilized with performance populations and can be used with athletes. The semi-structured approach is organized into five components that include: psychoeducation, mindfulness, values identification and commitment, acceptance, and integration and practice. The approach is based heavily on the acceptance-based behavioral interventions that have been found effective in treating clinical and nonclinical populations (Hayes, Follette, & Linehan, 2004). According to Gardner and Moore (2007) the MAC approach

> …promotes acceptance of one's internal experience, no matter what that might be, while at the same time focusing the performer on the contextually appropriate behavioral responses required to effectively navigate through life's ever-changing situations in order to fully engage in one's valued activities and achieve goals that really matter. (p. 31)

The MAC approach shares some similarities to the concept of flow (Csikzentmihalyi, 1990) that describes ideal performance states in athletes as heightened present-moment awareness and concentration on the task at hand that occurs without feeling self-conscious. Flow is also described as the "merging of action and awareness" (Csikzentmihalyi, 1990). The MAC approach seeks to promote the optimal performance state in athletes and experience of flow.

The first component of the MAC approach involves providing a theoretical rationale for using the MAC approach, establishing the purpose and goals of MAC and helping the athletes understand their performance experiences from the MAC perspective. Many athletes have experience with other performance enhancement methods, so it is essential that the athletes understand the uniqueness of the MAC approach for performance enhancement. The MAC approach teaches the athletes to maintain attention and poise without having to control their internal experiences. The educational process of the MAC approach should involve a discussion of self-regulatory processes and the athletes' previous attempts at regulating their internal

experiences while performing. One of the goals of the MAC program is to help athletes develop the ability to allow naturally occurring experiences such as emotions and thoughts to be recognized as transitory aspects of the human experience. Mindfulness can be extremely useful in reaching this goal (Gardner & Moore, 2007).

The next component of the MAC program involves teaching the athletes mindfulness techniques to assist them in becoming more aware of both internal and external experiences. More importantly, the athlete will engage in present-moment attention acknowledging their experience in a nonjudging, nonevaluative way. Athletes will learn to simply observe and "let go" of any negative or unpleasant thoughts or emotions without treating them as a realities that need to be acted against. This begins the process of cognitive defusion that will assist the athletes in their abilities to become task-focused. Cognitive defusion is the process of untangling learned associations between thoughts, feelings, and behaviors, so that the athletes will no longer respond to their internal states as realities.

Once athletes have a general understanding of the MAC approach and are engaging in mindfulness exercises, they are ready to identify what important performance-related values they hold. The performance values are essential in guiding day-to-day actions and encouraging the athlete to live a values-directed life rather than an emotion-directed life that is focused solely on achievement outcomes. Athletes should consider living a values-directed life as a journey to achieving their performance values. By living a values-directed life, the athletes are more likely to achieve their performance goals.

The next component of the program focuses on what may be inhibiting the athletes from living a values-directed life and includes a discussion of the costs associated with efforts to control or eliminate internal states. Athletes are encouraged to shift from experiential avoidance

to experiential acceptance in which they allow themselves to experience negative internal states without judgment (Hayes, et al., 1999). Through acceptance of all internal states, athletes will be able to "let go" of any negative emotions, thoughts or bodily sensations and have the ability to focus on the performance task.

As the athletes progress in the MAC program, they will commit to the model of experiential acceptance and will engage in actions that are working towards their performance values. The remainder of the program is focused on the integration and enhancement of mindfulness, acceptance, and commitment. In addition, potential obstacles for the successful maintenance of the skills acquired will be explored (Gardner & Moore, 2007).

Although the MAC approach is based on mindfulness and acceptance-based interventions that have garnered research support for their efficacy with a variety of populations, the MAC approach is in need of further studies to assess its efficacy. Research on the MAC approach is very limited; however, there are a few studies including case studies, an open trial and one randomized controlled trial that have revealed some preliminary support for its effectiveness. In 2005, Wolanin's dissertation investigated the preliminary version of the MAC protocol with eleven Division I collegiate athletes. Based on self- and coach-ratings, the athletes revealed significant improvements in their athletic performance in comparison to the control subjects. A case study by Lutkenhouse was also published in 2007 examining the impact of the MAC program with a 19-year-old, female lacrosse player who was classified as Performance Dysfunction and who was experiencing significant interpersonal and emotion regulation difficulty (Lutkenhouse, 2007). Since the program was not intended to be a formal case study, results were based only on Wolanin's Sport Performance Questionnaire and coach and player behavioral observations (Gardner & Moore, 2006; Wolanin, 2005). Anecdotal evidence was

gained in support of the program and individual intervention success was obtained, but larger trials were still needed.

In 2007, in a larger randomized controlled trial with a 118 Division I collegiate athletes, Lutkenhouse and colleagues investigated the MAC approach in comparison to a traditional performance skills training (PST) intervention protocol. Similarly to Wolanin's study, coach-ratings of performance revealed significant improvements in athletic performance at posttest compared to the PST group. In addition, the MAC group demonstrated significant increases in aggressiveness, reductions in experiential avoidance, and increases in flow experiences (Gardner & Moore, 2007; Lutkenhouse, Gardner, & Morrow, 2007). Most recently, another case study was conducted examining the impact of the MAC program with an adolescent competitive springboard diver. Results indicated significant changes in athletic performance as measured by objective measures of diving performance, as well as significant increases in mindfulness, experiential acceptance, and flow state experience (Schwanhausser, 2009). These studies provide limited preliminary support for the effectiveness of the MAC program, particularly because the dissertation and unpublished manuscript described above have not yet received critical external review, replication, or other empirical response. Moreover, the case studies cannot be generalized. Thus, additional studies are required to examine the effectiveness of the MAC approach in enhancing athletic performance and helping athletes achieve optimal performance states.

Present Study

Much research has been done on performance skills training for enhancing athletic performance; however, research has revealed insufficient support for its effectiveness. Despite the lack of consistent empirical support, PST continues to be utilized as the primary method for

athletic performance enhancement. The assumed underlying mechanisms of change, particularly the belief that controlling negative internal states will promote performance enhancement needs to be further evaluated and alternative approaches need to be considered. Furthermore, other performance-related attributes need to be explored that may be contributing to the performance enhancement process. The MAC approach recognizes that performance can improve despite the experience of negative internal states. The combination of mindfulness and acceptance-based interventions offer an alternative to performance enhancement that utilizes the same principles that have been found effective in treating clinical and non-clinical populations. The MAC program has garnered some preliminary support for as an alternative strategy for improving athletic performance; however, more studies are necessary to determine its efficacy and further understand the mechanisms involved.

The present study aims to investigate the MAC program and its efficacy in enhancing athletic performance in comparison to a performance skills training program with collegiate athletes. In addition, the study is designed to examine the performance-related attributes involved in the performance process to determine if mindfulness and acceptance-based strategies promote ideal performance states and enhance performance.

The first study hypothesis is that athletes participating in the MAC groups will reveal significantly greater improvements in athletic performance in comparison to the PST groups. Athletic performance will be measured by coach and self-ratings of athletic performance, such that improvements will be reflected in these rating scores.

Next, it is hypothesized that athletes participating in the MAC groups will experience significantly greater increases in performance-related attributes such as experiential acceptance, mindfulness, and flow experiences in comparison to the PST groups. As a result of the MAC

program, athletes will manifest higher levels of experiential acceptance and mindfulness as indicated by scores on the Acceptance and Action Questionnaire (Hayes et al., 2004) and the Five-Facet Mindfulness Questionnaire (Baer et al., 2006), respectively. In addition, athletes participating in the MAC program will reveal significant improvements in their flow state or ideal performance state as indicated by the Flow State Scale (Jackson & Marsh, 1996).

Further, it is expected that that athletes participating in the MAC groups will experience significant decreases in thought suppression because of engaging in mindfulness and acceptance-based techniques. As part of this, it is predicted that athletes in the MAC group will demonstrate lower scores on the White Bear Suppression Inventory (WBSI; Wegner, & Zanakos, 1994), consistent with reduced tendencies to suppress thoughts.

Finally, it is hypothesized that athletes who exhibit personality qualities such as openness to experience will display significantly greater improvements in athletic performance than athletes exhibiting other personality qualities. Early research has supported the conclusion that the Big-Five Factor of openness to experience is highly correlated with mindfulness (Brown & Ryan, 2003; Lau et al., 2006).

CHAPTER TWO

METHODS

Participants

Participants included 19 volunteers from a Division II NCAA athletic department of a mid-sized university in a northeastern state. Participants were recruited by contacting coaches and presenting a brief performance enhancement workshop and description of the study to athletes and coaches. Athletes were asked to volunteer to participate in a seven-week performance enhancement program. Prior to participation, interested athletes met with one of the group leaders to review the program and informed consent. During the initial meetings, 23 athletes signed up to participate, however two athletes withdrew from the study before the first group meeting. During the course of the program, two athletes also withdrew from the program due to injury and scheduling difficulties. Therefore, athletes who completed the program included 11 male athletes and eight female athletes ranging in age (18-years-old to 23-years-old; mean = 19.4) and class rank (freshmen to senior). Participants were all Caucasian athletes except one African-American male athlete. Participants included athletes from various sport domains including women's basketball, baseball, women's lacrosse, women's soccer, track and field, and golf. Volunteers received no compensation for their participation in the study. All participants signed an informed consent that had been approved by the University Institutional Review Board prior to participation in the study.

Direct Performance Measures

Coach's Rating Scale of Athlete's Performance. The head coach of each team completed a rating of their respective athletes' athletic performance using a rating scale developed for this study (See Appendix A). The rating scale consists of 10-items and uses a 5-point likert scale that

ranges from (1) *very poor* to (5) *very good*. The rating scale is a direct measure of athletic performance and includes variables of performance such as concentration, strength, competitiveness, motivation, quickness, fitness, endurance, mechanics, aggressiveness, agility, and team cohesion. A definition of each variable was also provided to assist in rating. The scale was designed based on Wolanin's (2005) development of a similar coach's rating scale used in a preliminary study of the MAC approach. Wolanin's original scale was unavailable, so a similar scale was created.

Athlete's Performance Self-Rating Scale. Each athlete completed a self-rating scale of his or her athletic performance. The scale is the self-report version of the coach's rating scale of athlete's performance (See Appendix A). The coach's and athlete's ratings scales are critical together in measuring athletic performance, particularly because an athlete's perceived self-rating of performance may not be as representative of the athlete's actual athletic performance.

Measures of Performance-Related Attributes

Acceptance and Action Questionnaire. The Acceptance and Action Questionnaire (AAQ) is a self-report measure that was developed to assess experiential avoidance (Hayes et al., 2004). The 16-item version of the AAQ was chosen for this study and has responses ranging on a 7-point likert scale from (1) *never true* to (7) *always true* (See Appendix A). Sample items include "Despite doubts, I feel as though I can set a course in my life and then stick to it" and "I try to suppress thoughts and feelings that I don't like by just not thinking about them." Responses are coded such that high scores reflect greater experiential avoidance. The 16-item AAQ is highly

correlated with the final nine-item AAQ (r = .89) (Hayes, et al., 2004). Research also supports the adequacy of the AAQ reliability and validity (Bond & Bunce, 2003; Hayes, et al., 2004).

Five Facet Mindfulness Questionnaire. The Five Facet Mindfulness Questionnaire (FFMQ; Baer, et al., 2006) is an instrument that was developed based on a factor analytic study of five mindfulness questionnaires including the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Freiburg Mindfulness Inventory (FMI: Buchheld, Grossman, & Walach, 2001), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, & Greeson, 2004), and the Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagman, 2005) (See Appendix A). The analysis found five factors that appear to represent various aspects of mindfulness. The factors include observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. The factors are measured through a 39-item self-report questionnaire. Examples of items include "I watch my feelings without getting lost in them" and "It's hard for me to find the words to describe what I am thinking." Responses are coded according to a 5-point likert scale from (1) *never or very rarely true* to (5) *very often or always true.* The internal consistency is reasonable for the five facet scales with alphas ranging from .75 to .91. Although research on the FFMQ is in its early stages, findings suggest adequate validity and internal consistency (Baer et al., 2006).

Flow State Scale. The Flow State Scale (FSS) is a 36-item self-report measure that was developed to assess intensity and frequency of the experience of flow in sport and physical activity (See Appendix A). The measure has nine scales that represent Csikszentmihalyi's (1990)

dimensions of flow, each dimension measured by four items. The dimensions measured include challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration of task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. Responses range on a 5-point likert scale from (1) *strongly disagree* to (5) *strongly agree.* Sample items include "I made the correct movements without thinking about having to do so" and "My abilities matched the high challenge of the situation." Internal consistency for the 9 subscales of the FSS are reasonable with a mean $\alpha = .83$ (Jackson & Marsh, 1996). The 9-first-order factor model will be used for this study because one higher-order global scale reveals insufficient psychometric properties.

White Bear Suppression Inventory. The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) is a 15-item measure designed to assess thought suppression (See Appendix A). It can be used to help identify individuals that may be prone toward obsessional thinking and to predict depression among individuals who wish they didn't experience negative thinking. Items are scored on a 5-point likert scale from (1) *Strongly disagree* to (5) *Strongly agree.* Responses are coded such that high scores reflect greater thought suppression. The WBSI demonstrates excellent convergent validity and has very good internal consistency, with alphas ranging from .87 to .89 (Wegner & Zanakos, 1994).

Mini-Markers. The Mini-Markers (Saucier, 1994) is a brief measure of the Big-Five personality attributes that include openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism (See Appendix A). The measure was developed as a brief version of Goldberg's (1992) Unipolar Big-Five Markers. The measure consists of 40-items or adjectives

of personality for which the athletes will rate how accurately they describe them on a 9-point likert scale ranging from (1) *Extremely Inaccurate* to (9) *Extremely Accurate.* The Mini-Markers is highly correlated with the Unipolar Big-Five Measure (r = .92 to .96). In addition, findings suggest adequate internal consistency for a brief measure with alphas ranging from .69 to .90 (Saucier, 1994).

Procedure

After recruiting volunteers, participants underwent an interview conducted by clinical doctoral students who were supervised by a licensed psychologist. The purpose of the interview was to understand each athlete's goals for participation in a performance enhancement program and to discuss barriers in reaching his or her ideal performance state. Based on the interview, athletes that were demonstrating significant psychological impairment were to be excluded from participation in the study and were to be referred to appropriate psychological services. However, no athletes met this exclusion criterion. In addition, athletes who experienced illness or injury that prevented them from actively participating in their sport for an extended period of time were excluded from the study such that one athlete was excluded for meeting this criterion.

All eligible volunteers were assigned to one of four possible groups to participate in a seven-week performance enhancement program in a group format. Athletes' schedules were obtained and athletes were assigned to a group based on their time availability. Random assignment was not possible due to the limited time availability of athletes in trying to coordinate a specific time to meet weekly. Two groups of athletes received training according to the MAC protocol and the other two groups of athletes received training according to the United States Olympic Committee's (USOC) Mental Training Manual (USOC; 1999). Two groups of each

type were used to enhance the sample size. The groups consisted of three to ten athletes in each group and included male and female athletes of various sports. The groups met once a week for seven weeks. The duration of each session was approximately one hour. The sessions were held in a university recreational building to help accommodate athletes' demanding schedules.

Two female clinical doctoral students administered the MAC and Mental Training programs to athletes. Each clinician lead a Mental Training group and co-led a larger combined MAC training group. The MAC training groups were combined to one group because of the limited time availability of group members and clinicians. In addition, it also created greater treatment integrity that the protocol was being implemented properly with both clinicians co-leading. The clinicians received a brief training workshop before administering the performance enhancement programs and underwent an adherence check to monitor the proper delivery of the performance enhancement programs. This was particularly important because the investigator was one of the treating clinicians. A clinical doctoral student who was neither the investigator nor one of the clinicians completed the adherence check by reviewing treatment protocols, observing each clinician during one session and completing a rating form to evaluate the clinicians' implementation of the treatment protocol. The clinical doctoral student assessed whether or not the clinicians were properly implementing each program and were not biased towards any one particular group. The observer completed an adherence check scale that was designed for this study (See Appendix B). The adherence check revealed no significant differences between the clinician's implementation of the treatment protocols.

Clinicians were supervised by a licensed psychologist during the study. The clinicians were given the book, "The Psychology of Enhancing Human Performance: The Mindfulness-Acceptance-Commitment (MAC) Approach" (Gardner & Moore, 2007) that includes a step-by-

step protocol for the performance enhancement program. In addition, clinicians were provided with the United States Olympic Committee's (USOC) Mental Training Manual (USOC; 1999) which also includes a step-by-step protocol. Clinicians adhered to the treatment protocol for each session that is described below.

Performance Enhancement Programs

The USOC Mental Training Manual is a seven-session psychological skills training protocol that utilizes goal-setting, imagery, relaxation/stress-management, positive self-talk, and arousal control procedures. The first session was used to help athletes understand the model for sport psychology. In addition, athletes learned how to engage in effective goal-setting. Athletes identified process and outcome goals for their athletic performance. During the second session, athletes learned mental imagery techniques. Athletes engaged in several mental imagery exercises and learned how and when to use mental imagery in sport. The third session focused on athletes developing self-talk modification strategies. Athletes were to become aware of common self-talk errors and learned more effective ways to control what they say to themselves.

During the fourth session, athletes learned energy management skills so they could effectively control their body's energy level during performance. Athletes were encouraged to find the right energy level for their optimal performance. The fifth session focused on helping athletes develop their concentration skills. Athletes learned what attention dimension is best for responding to the demands of their sport. The sixth session was dedicated to increasing the athletes' self-confidence. Athletes learned what they can accomplish because of high levels of self-confidence. Mental preparation strategies were also discussed. During the final session, the

skills learned were reviewed and ways to stick with the program were discussed, along with how to incorporate all of the skills to perform under pressure.

The MAC program is also a seven-session protocol that incorporates mindfulness and acceptance-based strategies to help athletes achieve optimal performance. The first session of the MAC program involved psychoeducation about the intervention. The session was intended to help the athlete prepare for the program and understand the theoretical rationale for the program. The second session introduced the topic of mindfulness and cognitive defusion. Athletes engaged in mindfulness exercises to begin the cognitive defusion process. The third session was dedicated to helping athletes identify their performance values and to start engaging in daily behaviors that are in service of those values. The fourth session introduced the concept of acceptance and helped athletes to determine interferences or processes of experiential avoidance that may have inhibited them from experiencing performance improvements. During the fifth session, athletes were encouraged to commit to their performance values. Athletes engaged in exercises to identify goals associated with their performance values. The sixth session was dedicated to consolidating the skills learned and combining mindfulness, acceptance, and commitment. In addition, athletes learned how to enhance poise in performance situations. The final session was dedicated to reviewing what was learned and maintaining the skills in the future.

Measures

Prior to beginning the performance enhancement program, athletes completed several measures that included the AAQ, FSS, FFMQ, WBSI, and Mini-Markers. The measures took approximately 25-30 minutes to complete. In addition, head coaches completed a rating scale of each athlete's current performance and athletes completed a similar self-rating scale.

During the performance enhancement program, information gathered from the group sessions was confidential. Participants were asked to not discuss their program procedures with others in order to try to control for contamination effects. Unfortunately, due to the nature of a team sport, coaches and other athletes were most likely not blind to study groups. At the conclusion of the performance enhancement programs, each athlete completed the same measures completed prior to participation. Coach-ratings and self-ratings of athletic performance were also obtained at this time. If an athlete missed a session, attempts were made to have an individual make-up session with the athlete in order to preserve the performance enhancement program. All athletes were highly compliant and attended make-up sessions if they were unable to attend the group session. No athletes were excluded from the study for failing to attend weekly scheduled meetings or make-up sessions.

During data collection, all data from participants was coded as participant numbers. A participant number was put on the data and the name of participant was cut off the top of any forms. Only the participant number is included in the data set. A master list was created that includes names and participant numbers and will remain locked in an office for a minimum of three years in accordance with federal law.

CHAPTER THREE

RESULTS

The groups did not significantly differ with regard to age, gender, race, year in college, or sport. Sports represented in the MAC group included golf (30%), track and field (30%), softball (10%), women's lacrosse (20%), and women's soccer (10%). Sports represented in the MT group included golf (22.2%), track and field (22.2%), women's basketball (22.2%), and baseball (33.3%). The statistical analyses used in this study included one-way between subjects analysis of variance (ANOVA), two-way mixed ANOVAs and paired sample t-tests. Change scores were calculated by subtracting the pretest score from the posttest score for each of the assessment measures that athletes completed prior to the start of the program and at its conclusion. Overall, the results for the change measures were inconsistent, in that significant results were found for the MAC group and the MT group on different measures. Athletes in the MT group revealed significant improvements in athletic performance as indicated by the self-ratings of athletic performance. Interestingly, athletes in the MT group displayed increased flow state experiences as measured by the FSS at the conclusion of the program. Both groups demonstrated increased experiential acceptance which included an increased ability to take action towards their goals (as measured by the AAQ) and an increase in non-reactivity to their inner experience (as measured by the FFMQ).

In addition, athletes in MAC group demonstrated an increased ability to describe their inner experience (as measured by the FFMQ) revealing enhancements in mindfulness abilities. Athletes in both groups did not reveal significant changes in their tendency to suppress thoughts (as measured by the WBSI). A one-way between subjects ANOVA was calculated to compare any potential differences based solely on differences between clinicians. Using a Bonferroni

correction to control for Type I error rate, results indicated no significant differences between groups based on clinicians of the MT groups. Data were not examined for the MAC group because it was co-led by both clinicians. The following section will further describe the statistical analyses and results that were obtained in this study.

The hypothesis that athletes participating in the MAC group would reveal greater improvements in their athletic performance as measured by coach and self-ratings of athletic performance was tested with a one-way between subjects ANOVA. There were no significant differences between the MAC group and the MT groups for both the coach's ratings, $F(1, 17) = .004$ and self-ratings, $F(1, 17) = .241$ ($p > .05$). Based on an independent sample t-test, no significant differences were obtained for coach's ratings at pretest. Paired sample t-tests were calculated for the coach and self-ratings examining change over time. Significant results were obtained for the self-rating of athletic performance in the MT group. The mean difference between the MT group participants' self-rating score was -2.78 with a 95% confidence interval between -4.652 and -.902. The effect size of $d = .49$ indicates a medium effect. A significant result was obtained ($t = -3.418$, $df = 8$, $p < .0005$). No significant results were found for the MAC group examining change over time (within group). In addition, no significant differences

A two-way mixed ANOVA was calculated to examine potential group differences as well as to examine change in participants' pretest versus posttest scores on the Action and Acceptance Questionnaire. Higher scores reflect greater experiential avoidance. The main effect for change scores was significant $F(1, 17) = 69.48$, $p = .000$, partial $n^2 = .803$. The change score by group interaction was not significant $F(1, 17) = 2.61$, $p = .124$, partial $n^2 = .133$. Paired sample t-tests were calculated for each subscale revealing significant results for the Action Subscale in both groups indicating an increase in experiential acceptance at the conclusion of the program and a

greater willingness to take action towards their goals. The mean difference between the MAC group participants' AAQ scores for the Action Subscale was 4.4 with a 95% confidence interval between 1.61 and 7.18. The effect size was large (d = .95). A significant result was obtained (t = 3.57, df = 9, p < .0005). The mean difference between the MT group participants' AAQ scores for the Action Subscale was 7.67 with a 95% confidence interval between 4.32 and 10.97. The effect size was also large (d = 1.39) and a significant result was obtained for the Action Subscale for the MT group, (t = 5.35, df = 8, p < .0005). Paired sample t-tests revealed no significant results for the MAC group or the MT group on the Willingness subscale. The mean difference between the MAC group participants' AAQ scores for the Willingness Subscale was -3.1 with a 95% confidence interval between -7.195 and .995. The mean difference between the MT group participants' Willingness subscale scores was -3.44 with a 95% confidence interval between -9.97 and 3.09.

A two-way mixed ANOVA was calculated to examine group differences and to test the hypothesis that athletes participating in the MAC group would demonstrate increased mindfulness abilities based on the five factors of mindfulness as measured by the Five-Facet Mindfulness Scale (Observe, Describe, Act with awareness, Non-judging of inner experience, and Non-reacting of inner experience). The main effect for mindfulness qualities was significant, F(4, 68) = 6.603, p = .000, partial n^2 = .280. The mindfulness qualities and group interaction was not significant, F(4, 68) = .276, p = .892, partial n^2 = .016. Paired sample t-tests were also calculated to examine change within group over time across all subscales. Significant results were obtained in the MAC group for change in the Describe Scale score (t = -2.41, df = 9, p < .0005) indicating an increase in participants' ability to describe their inner experience. The effect size of d = .61 indicates a large effect. The mean difference between the MAC group

participants' Describe Scale score was -3.5 with a 95% confidence interval between -6.79 and -.209. There were also significant results for change in Non-React scores for participants in both the MAC and MT groups indicating that athletes obtained an increased ability to not react to their inner experience. The mean difference between the MAC group participants' Non-React score was -5.8 with a 95% confidence interval between -8.34 and -3.26. A significant result was obtained (t = -5.16, df = 9, p <.0005) with a large effect size of d = 2.07. The mean difference between the MT participants' Non-React score was -3.89 with a 95% confidence interval between -6.04 and -1.73. A significant result was obtained (t = -4.16, df = 8, p < .0005) with an effect size of d = 1.25 indicating a large effect.

A one-way between subjects ANOVA was conducted on the change in Flow State Scale (FSS) scores to evaluate whether there was a significant difference between the MAC and the MT groups. A bonferroni correction was calculated to control for Type I error rate and no significant results were obtained. Paired sample t-tests were calculated for all subscales to further examine the change in pretest and posttest scores. No significant results were obtained for the MAC group, however significant results were found in the MT group for all subscales except the Transformation of Time subscale (See Table 2). Interestingly, group means differed at pretest such that the MT group had significantly lower pretest scores than the MAC group. However, based on an independent samples t-test, only one significant result was obtained (t = 2.45, df = 17, p <.0005) for the Clear Goals Subscale. The mean difference between the MT and MAC groups was 1.60 with a 95% confidence interval between .221 and 2.98.

Table 1

Mean Scores, Standard Deviations, and Change Scores of the Flow State Scale Subscales by Group at Pre and Post-Test

Subscale	MAC Group			MT Group		
	Pretest Mean (SD)	Post-test Mean (SD)	Change	Pretest Mean (SD)	Post-test Mean (SD)	Change
Challenge-Skill Balance	17.5 (3.03)	18.0 (2.36)	1.5	13.78 (2.90)	17.56 (2.07)	**3.78
Action	15.2 (3.15)	16.6 (2.06)	1.4	12.89 (1.03)	17.0 (2.06)	**4.11
Clear Goals	18.6 (1.35)	18.3 (2.21)	-0.3	17.0 (1.5)	18.22 (1.30)	*1.22
Unambiguous Feedback	15.8 (2.25)	17.4 (1.58)	1.6	13.56 (3.35)	17.44 (1.74)	**3.88
Concentration	14.2 (3.25)	16.0 (3.09)	1.8	11.44 (3.24)	16.56 (1.08)	**5.12
Sense of Control	14.4 (2.27)	15.7 (2.87)	1.3	12.78 (2.86)	17.11 (2.26)	**4.33
Loss of Self-Consciousness	12.0 (3.97)	14.2 (4.32)	2.2	10.56 (2.74)	15.44 (3.28)	**4.88
Transformation of Time	13.4 (4.47)	13.4 (3.84)	0	11.0 (4.15)	14.67 (4.66)	3.67
Autotelic Experience	17.1 (3.84)	17.3 (4.32)	0.2	13.67 (4.15)	18.56 (1.94)	*4.89

Note. * Significant at $p < .05$

** Significant at $p < .01$

A one-way between subjects ANOVA was calculated for participants' change scores based on the White Bear Suppression Inventory. Higher scores reflect greater thought suppression. The results were not significant, $F(1, 17) = .933$, $p > .05$ such that neither group demonstrated significant decreases in thought suppression. Paired sample t-tests were calculated to further examine the data. The mean difference between the MAC group participants' WBSI scores was -.5 with a 95% confidence interval for the estimated population mean difference between -6.32 and 5.32. The effect size was not significant ($d = .04$). A paired sample t-test revealed that the difference between pre and posttest was also not significant. The mean difference between the Mental Training (MT) group participants' WBSI scores was 4 with a 95% confidence interval between -4.78 and 12.78. No significant results were obtained, however a small effect size was found ($d = .26$). Although a small effect size was obtained, it should not be considered a reliable measure given the lack of significant results.

Correlations between the big five personality factors including openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism as measured by the Mini-Markers questionnaire were conducted with all variables to explore the hypothesis that openness to experience is related to athletic performance improvements. In addition, the concept that openness to experience is related to mindfulness is further analyzed. Contrary to the study hypothesis, no significant correlations were found in either group on the direct performance measures (coach and self-ratings of athletic performance). Moreover, only one significant positive correlation was obtained between Openness to Experience and the Willingness subscale of the AAQ ($r_s = .707$, $N = 9$, $p < .0005$) in the MT group. No other significant correlations were found between Openness to Experience and any other scale for either group.

Discussion

The present study aimed to investigate the MAC approach for enhancing athletic performance in comparison to more traditional performance enhancement methods as utilized in the USOC Mental Training program. In addition, the study intended to further investigate the performance-related attributes that may contribute to achieving peak performance. The performance-related attributes that were examined included acceptance, mindfulness, flow state experience, and thought suppression. Finally, the study investigated the Big Five personality traits among athletes to understand if the personality trait of Openness to Experience was associated with athletic performance enhancement. Although not every prediction was supported, the results suggest that mindfulness and acceptance-based approaches to athletic performance enhancement may be a viable intervention for athletes. The ability to be mindful, present-focused and to be accepting of negative internal states may help athletes to more readily achieve high performance states.

In contrast with the initial predictions, athletes participating in the MAC group did not display statistically significant increases in their athletic performance as indicated by coach and self-ratings of athletic performance. This outcome is in contrast with other mindfulness-based interventions that found significant improvements in athletic performance based on self or coach ratings (e.g. Lutkenhouse, Gardner, & Moore, 2007; Lutkenhouse, 2007; Wolanin, 2005). In general, ratings of athletic performance were higher at the end of the program for both groups indicating perceived and observed improvements in the athletes' overall athletic performance. No significant differences between groups were found; however athletes in the MT group displayed significant improvements in their athletic performance based on their self-ratings over time. The coach's and self-ratings of athletic performance questionnaires were developed for this

study, therefore the psychometric properties of the measure need further investigation. It is possible that the rating forms did not accurately measure the construct thereby decreasing the likelihood of finding significant results.

It was hypothesized that athletes in the MAC group would experience greater experiential acceptance than athletes in the MT group; however athletes in both groups demonstrated an increased ability to engage in experiential acceptance. This was particularly displayed through a greater ability to take action toward their goals which is one of the constructs associated with experiential acceptance. Although the MT group was not predicted to have significant increases in experiential acceptance, there was a module included in the MT program that focused on goal setting. The MAC group displayed significant increases in experiential acceptance as expected because one of the modules of the MAC program teaches athletes how to engage in behaviors that are driven by their values as well as to accept negative internal states. Although the programs are different in their conceptualization, it is plausible that the impact of each of these modules was captured by the AAQ measure and reflected in the athletes increased ability to take action towards their goals. This may explain why the MT group displayed significant increases in experiential acceptance.

Athletes in both groups also displayed a greater ability to be non-reactive to their inner experience. Non-reactivity to inner experience is a reflection of experiential acceptance which is also one of the goals of the MAC program. Athletes in the MAC group were expected to improve their ability to be present-moment focused and nonjudgmental of their inner experience. These findings are consistent with other studies investigating the mindfulness and acceptance based approaches, such that athletes assigned to the MAC group demonstrated increased experiential acceptance (Lutkenhouse, Gardner, Morrow, 2007; Bernier et al., 2009). Baer and colleagues

(2004) also reported support for the notion that present-moment awareness promotes non-reactivity and prevents impulsivity because individuals are more equipped to handle challenges. It is unclear as to why the MT group would display increased non-reactivity towards their inner experience given the aims of the Mental Training Program. The Mental Training Program utilizes control and emotion regulation strategies to assist athletes in managing their anxiety and negative emotions. It does not promote or encourage a non-evaluative acceptance of the inner experience, particularly negative internal states. It is possible that emotion regulation strategies evoke experiential acceptance as a by-product of the intervention, however research does not appear to support this argument (Sloan, 2004).

In addition, individual differences among group members must be considered as alternative explanations for this finding. It is possible that athletes in the MT group displayed innate abilities or personality qualities that allowed them to be non-reactivity towards their inner experience. For example, athletes in the MT group may have displayed a positive explanatory style such that they had a greater tendency to be non-reactive to their inner experience prior to the start of the program and it was enhanced as the program continued. A positive relationship has been found between a positive attributional style and enhanced athletic performance (Gordon, 2008; Seligman et al., 1990). This may account for some of the significant results that were obtained for the MT group. In accordance with the initial prediction, athletes in the MAC group demonstrated increased mindfulness particularly in their ability to be aware of and describe their inner experience. This is consistent with other research examining mindfulness and its association with flow state or peak performance (Jackson, 2000; Jackson & Roberts, 1992; Russell, 2001). Moreover, Kee and Wang's (2008) study demonstrated the strong relationship between mindfulness and flow state. The results further indicated that individuals who

demonstrated high mindfulness could more easily adopt mental skills. Therefore, it is possible that athletes who demonstrated high mindfulness at the start the performance enhancement programs were more readily able to acquire the skills during the program and improve their performance.

One of the purposes of the study was to better understand the concept of flow and its relatedness to performance enhancement. Contrary to the study hypothesis, the MAC group did not display significant improvements in flow compared to the MT group as predicted. In fact, athletes in the MT group displayed significant increases in flow state from pre to posttest. There were no significant results found for the MAC group based on ratings from the start and at the conclusion of the program. This finding was in contrast with other studies examining mindfulness based interventions (Lutkenhouse, Gardner, & Morrow, 2007; Kaufman, 2008; Bernier, Thienot, Codron, & Fournier, 2009). Athletes in the MT group displayed significant improvements in all of the subscales measuring flow including Challenge-Skill Balance, Action-Awareness, Clear Goals, Unambiguous Feedback, Concentration, Sense of Control, Loss of Self-Consciousness, and Autoletic Experience. The Transformation of Time subscale was the only subscale that a significant result was not obtained. However, the Transformation of Time subscale is considered the least capable of measuring the flow state (Jackson & Eklund, 2002). In more closely examining the data, the MT group athletes tended to rate each subscale lower at pre-measure, thereby revealing larger differences at post-measure. However, these differences were not statistically significant, except for the Clear Goals Subscale.

Another plausible explanation for this outcome may have to do with the specific interventions that were utilized in the MT group. Motivation, confidence, and positive self-talk have been found to help to initiate the flow experience and all of these were included in the MT

protocol (e.g. Jackson, 1995; Russell, 2001). The results may also suggest that the athletes in the MT group were inherently different than the athletes in the MT group from the start of the program in a particular way that was not detected. It is possible that the level of motivation among athletes between groups was different such that the athletes in the MT group exhibited significantly greater motivation to follow the treatment protocol. In both programs, athletes were instructed to practice skills learned on a daily basis; however it is unclear if all athletes adhered to this instruction. The variable of motivation is one that may have been overlooked in this study.

In contrast to the initial predictions, athletes displayed no significant differences between the MAC group and the MT group in their tendency to suppress their thoughts. In fact, the MAC group WBSI scores remained the same at the start and at the end of the program despite learning alternative strategies that would promote an acceptance of negative thoughts. Interestingly, the MAC group exhibited improvements in their ability to be non-reactive to their inner experience as described above, yet they continued to engage in the same amount of thought suppression at the end of the program.

The final purpose of the study was to explore the Big Five personality traits, specifically the quality of Openness to Experience and its relationship with athletic performance enhancement. Contrary to the study hypothesis, no significant relationship was found based on the direct measures of athletic performance (coach and self-ratings of athletic performance). In regards to performance-related attributes, athletes participating in the MT group were found to have a positive correlation between Openness to Experience and Willingness to experience negative internal states. It is unclear as to why the MAC group did not display significant correlations like the MT group particularly because you would expect to find a relationship between Openness to Experience and Willingness to experience negative internal events. No

other significant correlations were obtained for Openness to Experience. Based on the findings, additional research examining the Big Five personality qualities and athletic performance enhancement is necessary to better understand their relationship.

Limitations

There are several limitations of the present study that should be considered and addressed in future research on mindfulness and acceptance based performance enhancement programs. Due to scheduling constraints, athletes were assigned to groups based on their time availability. This caused some differences in the implementation of the program because the MT groups were led by two different clinicians, whereas the MAC group was co-led by both clinicians. Random assignment should be more rigorously utilized in future studies in order to reduce the possible effects of extraneous variables as well as to minimize systematic training differences based on clinician differences. One clinician should lead all group conditions or the same structure should be implemented for each group.

Another possible method is each program should be lead by different clinicians. Since both clinicians led the MAC and the MT training programs, aspects of both programs may have been filtering through by the clinicians without their awareness thereby contaminating the treatment protocols. However, adherences to protocol checks were conducted during the study and the results indicated treatment integrity was intact. Although no significant differences between clinicians were obtained, the measure used to assess treatment integrity may not have been sensitive enough to some of the specific differences in treatment delivery between the programs. Finally, the author served as one of the clinicians in this study creating the possibility

of bias towards a particular group which may impact the results; however, no differences were observed based on the clinician adherence check.

The small sample size is also a notable limitation to the study and may have contributed to the lack of support for the initial predictions. Because of the small sample size, the results that were obtained cannot be generalized to other populations. Additionally, the sample was not particularly diverse regarding ethnicity and age. Future research should continue to explore a broad range of athletes to determine if the program is more suitable for a particular kind of sport athlete. Athletes included in this study represented a variety of team and individual sports and did not allow a large enough sample to examine potential sport differences. Recent research on emotional contagion suggests that athletes participating on a team may be more susceptible to affective linkage in which athletes take on the collective mood of their teammates (Totterdell, 2000; Ilies, Wagner, & Morgeson, 2007). This may play a significant role in athletes' ability to perform well during athletic competition. It is also a variable that does not impact individual sport athletes, therefore future research on performance enhancement should examine potential differences between individual and team sport athletes.

Another limitation of the study was that no objective performance measures (i.e. batting averages, race times, free throw percentage, etc.) were examined due to the broad range of sports being represented. It is recommended that sport specific objective performance measures be included in future studies. Future studies should also more closely examine potential sport specific effects of the performance enhancement programs by including larger samples of particular sport athletes. It is possible that the MAC program would be more effective for athletes in sports where there are greater opportunities to focus on one particular task (i.e. golf, bowling, rifle shooting) in comparison to sports in which athletes must be responding more

quickly and reacting to external stimuli and situational demands (i.e. lacrosse, basketball, baseball, etc.) This notion is based on comments from athletes regarding improvements in there athletic performance such that the golf athletes noted their ability to take their time, whereas other athletes had to be more reactive. A more thorough understanding of sport specific influences needs to be researched. The variable of motivation and the extent to which athletes practiced the skills they were learning may also have played an integral role in the impact of the program among athletes; however, no measure of motivation or tracking of practice was used in this study. The skills being taught in the MAC program require daily practice to become proficient and to ultimately positively impact the participants' athletic performance. The lack of assessment of the athlete's practicing skills learned may have negatively contributed to the outcome of the study. A measure of motivation and assessment of practice among athletes may be a very useful addition to future studies.

There is also some evidence to suggest that athletes should not be treated as a homogenous population (Martin & Toogood, 1997; Gardner & Moore, 2006). Gardner and Moore (2004, 2006, 2007) recommend that athletes be classified according to the Multilevel Classification System for Sport Psychology (MCS-SP) as nonclinical, subclinical, or clinical thereby adjusting the program accordingly to meet the individual needs of the athlete. While athletes were not classified in this study, it is possible that the intervention findings were limited because the program was not individualized to the current needs of the athletes. For example, Wolanin (2005) found limited results in examining the MAC program when the athletes were considered a homogenous population, however when athletes were classified according to the MCS-SP, significant results were obtained.

Despite these limitations, the study revealed some support for mindfulness and acceptance based interventions such that these strategies for performance enhancement should continue to be explored. In particular, athletes in the MAC program demonstrated greater mindfulness abilities that have been shown to facilitate the flow experience or peak performance (Kee & Wang, 2008). Future research should continue to investigate the efficacy and effectiveness of the MAC program, as well as explore the performance-related attributes that include but are not limited to mindfulness, acceptance, and flow state that may lead to optimal performance. Moreover, future research should consider breaking down the MAC program and examining the components individually. Due to some of the conceptual overlap between the methods, this strategy may be helpful in determining the specific impact of each component of the program on performance. Ultimately, larger randomized controlled trials with various sport athletes are necessary to evaluate the program, as well as the mechanisms related to performance enhancement.

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Appendix A

Coach's Rating of Team Member's Athletic Performance

Coach's Name_____

Please circle one: Head Coach Assistant Coach

Sport _____

Team Member who is being evaluated_____

Please rate the team member's current athletic performance as it pertains to the specific sport using the scale below for all of the dimensions. Please use the descriptions of athletic dimensions form to aid in your evaluation.

1- Very Poor
2- Poor
3- Adequate
4- Good
5- Very Good

Overall Athletic Performance _____

Aggressiveness……_____

Concentration…… _____

Strength……..._____

Endurance…….. _____

Motivation……..._____

Quickness……..._____

Agility ……_____

Fitness ……....._____

Mechanics ……..._____

Team Cohesion……...._____

Self-Rating of Athletic Performance

Name_____ Date_____

Sport _____

Please rate your current athletic performance using the scale below for all of the dimensions. Please use the descriptions of athletic dimensions form to aid in your evaluation.

1- Very Poor
2- Poor
3- Adequate
4- Good
5- Very Good

Overall Athletic Performance _____

Aggressiveness……_____

Concentration…… _____

Strength……..._____

Endurance…….. _____

Motivation……..._____

Quickness……..._____

Agility ……_____

Fitness ……....._____

Mechanics ……..._____

Team Cohesion……...._____

Descriptions of Athletic Dimensions

Aggressiveness-
Degree of effort; display of energy towards a goal, will to succeed; competitiveness

Concentration-
Degree of focus or attention on the task at hand

Strength-
Demonstrates muscular abilities related to the sport

Endurance-
Degree of withstanding physical challenges; preserving or continuing while under distress

Motivation-
Ability to utilize skills and talent to achieve a particular goal; display will, drive, and actions in favor of goals

Quickness-
Acting with swiftness, responsive

Agility-
Graceful, nimble, flexible movement; ease of movement

Fitness-
Good physical condition, ability to meet physical demands of sport

Mechanics-
Execution of skills and techniques necessary to perform the sport

Team Cohesion-
Ability to work well with others; to collaborate on team goals

Name_____

The Acceptance and Action Questionnaire – I

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following scale to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

_____ 1. I am able to take action on a problem even if I am uncertain what is the right thing to do.

_____ 2. When I feel depressed or anxious, I am unable to take care of my responsibilities.

_____ 3. I try to suppress thoughts and feelings that I don't like by just not thinking about them.

_____ 4. It's OK to feel depressed or anxious.

_____ 5. I rarely worry about getting my anxieties, worries, and feelings under control.

_____ 6. In order for me to do something important, I have to have all my doubts worked out

_____ 7. I'm not afraid of my feelings.

_____ 8. I try hard to avoid feeling depressed or anxious

_____ 9. Anxiety is bad.

_____ 10. Despite doubts, I feel as though I can set a course in my life and then stick to it.

_____ 11. If I could magically remove all the painful experiences I've had in my life, I would do so.

_____ 12. I am in control of my life

_____ 13. If I get bored of a task, I can still complete it.

_____ 14. Worries can get in the way of my success.

_____ 15. I should act according to my feelings at the time.

_____ 16. If I promised to do something, I'll do it, even if I later don't feel like it.

MINI-MARKERS

How Accurately Can You Describe Yourself?

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age. Before each trait, please write a number indicating how accurately that trait describes you, using the following rating scale:

1	2	3	4	5	6	7	8	9
Extremely Inaccurate	Very Inaccurate	Moderately Inaccurate	Slightly Inaccurate	Neither Inaccurate nor Accurate	Slightly Accurate	Moderately Accurate	Very Accurate	Extremely Accurate

____ Bashful	____ Energetic	____ Moody	____ Systematic
____ Bold	____ Envious	____ Organized	____ Talkative
____ Careless	____ Extraverted	____ Philosophical	____ Temperamental
____ Cold	____ Fretful	____ Practical	____ Touchy
____ Complex	____ Harsh	____ Quiet	____ Unereative
____ Cooperative	____ Imaginative	____ Relaxed	____ Unenvious
____ Creative	____ Inefficient	____ Rude	____ Unintellectual
____ Deep	____ Intellectual	____ Shy	____ Unsympathetic
____ Disorganized	____ Jealous	____ Sloppy	____ Warm
____ Efficient	____ Kind	____ Sympathetic	____ Withdrawn

Flow State Scale

Please answer the following questions in relation to your experience in the event you have just completed. These questions relate to the thoughts and feelings you may have experienced during the event. There are no right or wrong answers. Think about how you felt during the event and answer the questions using the rating scale below. Circle the number that best matches your experience from the options to the right of each question.

Rating Scale:

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

	Strongly disagree				Strongly agree
1. I was challenged, but I believed my skills would allow me to meet the challenge.	1	2	3	4	5
2. I made the correct movements without thinking about trying to do so.	1	2	3	4	5
3. I knew clearly what I wanted to do.	1	2	3	4	5
4. It was really clear to me that I was doing well.	1	2	3	4	5
5. My attention was focused entirely on what I was doing.	1	2	3	4	5
6. I felt in total control of what I was doing.	1	2	3	4	5
7. I was not concerned with what others may have been thinking of me.	1	2	3	4	5
8. Time seemed to alter (either slowed down or speeded up).	1	2	3	4	5
9. I really enjoyed the experience.	1	2	3	4	5
10. My abilities matched the high challenge of the situation.	1	2	3	4	5
11. Things just seemed to be happening automatically.	1	2	3	4	5
12. I had a strong sense of what I wanted to do.	1	2	3	4	5
13. I was aware of how well I was performing.	1	2	3	4	5
14. It was no effort to keep my mind on what was happening.	1	2	3	4	5
15. I felt like I could control what I was doing.	1	2	3	4	5
16. I was not worried about my performance during the event.	1	2	3	4	5

17. The way time passed seemed to be different from normal.	1	2	3	4	5
18. I loved the feeling of that performance and want to capture it again.	1	2	3	4	5
19. I felt I was competent enough to meet the high demands of the situation.	1	2	3	4	5
20. I performed automatically.	1	2	3	4	5
21. I knew what I wanted to achieve.	1	2	3	4	5
22. I had a good idea while I was performing about how well I was doing.	1	2	3	4	5
23. I had total concentration.	1	2	3	4	5
24. I had a feeling of total control.	1	2	3	4	5
25. I was not concerned with how I was presenting myself.	1	2	3	4	5
26. It felt like time stopped while I was performing.	1	2	3	4	5
27. The experience left me feeling great.	1	2	3	4	5
28. The challenge and my skills were at an equally high level.	1	2	3	4	5
29. I did things spontaneously and automatically without having to think.	1	2	3	4	5
30. My goals were clearly defined.	1	2	3	4	5
31. I could tell by the way I was performing how well I was doing.	1	2	3	4	5
32. I was completely focused on the task at hand.	1	2	3	4	5
33. I felt in total control of my body.	1	2	3	4	5
34. I was not worried about what others may have been thinking of me.	1	2	3	4	5
35. At times, it almost seemed like things were happening in slow motion.	1	2	3	4	5
36. I found the experience extremely rewarding.	1	2	3	4	5

WBSI

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by circling the appropriate letter beside each.

A = Strongly disagree
B = Disagree
C = Neutral or don't know
D = Agree
E = Strongly agree

1.	There are things I prefer not to think about.	A	B	C	D	E
2.	Sometimes I wonder why I have the thoughts I do.	A	B	C	D	E
3.	I have thoughts that I cannot stop.	A	B	C	D	E
4.	There are images that come to mind that I cannot erase.	A	B	C	D	E
5.	My thoughts frequently return to one idea.	A	B	C	D	E
6.	I wish I could stop thinking of certain things.	A	B	C	D	E
7.	Sometimes my mind races so fast I wish I could stop it.	A	B	C	D	E
8.	I always try to put problems out of mind.	A	B	C	D	E
9.	There are thoughts that keep jumping into my head.	A	B	C	D	E
10.	There are things that I try not to think about.	A	B	C	D	E
11.	Sometimes I really wish I could stop thinking.	A	B	C	D	E
12.	I often do things to distract myself from my thoughts.	A	B	C	D	E
13.	I have thoughts that I try to avoid.	A	B	C	D	E
14.	There are many thoughts that I have that I don't tell anyone.	A	B	C	D	E
15.	Sometimes I stay busy just to keep thoughts from intruding on my mind.	A	B	C	D	E

Name:_____ Date_____

5-FACET Mindfulness Questionnaire

Please rate each of the following statements using the scale provided.
Write the number in the blank that best describes <u>your own opinion</u> of what is <u>generally true for you</u>.

1	2	3	4	5
never or very rarely true	**rarely true**	**sometimes true**	**often true**	**very often or always true**

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
_____ 2. I'm good at finding words to describe my feelings.
_____ 3. I criticize myself for having irrational or inappropriate emotions.
_____ 4. I perceive my feelings and emotions without having to react to them.
_____ 5. When I do things, my mind wanders off and I'm easily distracted.
_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____ 7. I can easily put my beliefs, opinions, and expectations into words.
_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
_____ 9. I watch my feelings without getting lost in them.
_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____ 12. It's hard for me to find the words to describe what I'm thinking.
_____ 13. I am easily distracted.
_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
_____ 16. I have trouble thinking of the right words to express how I feel about things
_____ 17. I make judgments about whether my thoughts are good or bad.
_____ 18. I find it difficult to stay focused on what's happening in the present.
_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
_____ 21. In difficult situations, I can pause without immediately reacting.
_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't

find the right words.

_____ 23. It seems I am “running on automatic” without much awareness of what I’m doing.

_____24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn’t be thinking the way I’m thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I’m feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn’t feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I’m doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix B

Clinician's Adherence Scale for Athletic Performance Program

Clinician _____ Rater_____

Date_____ Session # _____

Program/Group Type (check one): ____ Olympic Training Manual Group

____ Mindfulness-Acceptance-Commitment Group

Please rate the clinician on the following:

1. To what extent did the clinician convey the program rationale to group members?

   Poor Fair Good Very Good Excellent N/A

   1……..2……3……..4……5

2. To what extent did the clinician facilitate skill develop among group members?

   Poor Fair Good Very Good Excellent N/A

   1……..2……3……..4……5

3. To what extent did the clinician provide focus and structure (i.e. establish session goals, redirect group members as necessary)?

   Poor Fair Good Very Good Excellent N/A

   1……..2……3……..4……5

4. To what extent did the clinician facilitate skill-building exercises (i.e. mindfulness exercises, worksheet completion)?

   Poor Fair Good Very Good Excellent N/A

   1……..2……3……..4……5

5. To what extent did the clinician provide support to group members to encourage their participation and understanding of skills?

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

6. To what extent did the clinician hold group members accountable for lack of participation or exercise completion?

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

7. To what extent did the clinician review assigned homework and/or assign homework to group members?

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

8. To what extent did the clinician integrate and convey program concepts to group members?

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

Rate the clinician's…

9. Knowledge of athletic enhancement program

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

10. Skill in delivering program

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

11. Appropriate application of program protocol within the context of the session.

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5

12. Overall Performance

Poor Fair Good Very Good Excellent N/A

1……..2……3……..4……5