EFFECTS OF A MENTAL SKILLS TRAINING PROGRAM ON PERFORMANCE IN DISTANCE RUNNERS

by

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DEDICATION

This is dedicated to my family who encourage and stand behind me during the ups and downs of life.

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ABSTRACT

Introduction: Anxiety affects nearly 20% of the United States population and can have a significant impact on athletic performance. However, athletes can mitigate the effects of performance anxiety through the use of mental skills and mindfulness training. **Purpose:** The aim of this study was to determine if a mental training and mindfulness intervention could reduce anxiety and enhance performance in distance runners. **Hypothesis:** The hypothesis of the study was that athletes would experience less anxiety, increased levels of mindfulness, and improved performance following a four-workshop intervention. **Methods:** Distance runners engaged in a mental skills and mindfulness training program where we measured pre, during and post-anxiety levels. Anxiety was measured on the Competitive State Anxiety Scale-2 (CSAI-2) with modifications to the scale to measure intensity of cognitive and somatic anxiety, and self-confidence, and mindfulness was measured with the Kentucky Inventory of Mindfulness Skills (KIMS). In addition, running performance and effort was measured pre, during and post intervention. **Analysis**: Means and standard deviations were calculated to investigate variable-level differences. In addition, to investigate participant-level effects, we created individual athlete narratives. **Results:** Overall, scores for cognitive and somatic anxiety for all three athletes were below the midpoint of the scale indicating that the athletes in general had low levels of both types of anxiety. Mindfulness scores stayed relatively consistent during the program. **Discussion:** Changes in anxiety varied depending on individual athletes while changes in mindfulness were minor for all participants. These

relatively small changes highlight that duration of the intervention may play a role in how effective an MST and Mindfulness program may be for athletes and future studies should aim to extend the duration of the intervention for both MST and Mindfulness past 4-weeks.

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CHAPTER ONE: INTRODUCTION

Anxiety

Anxiety, or a persistent fear or worry that causes great amounts of stress and impairment of daily tasks like play, work, and relationships (American Psychiatric Association, 2013), can negatively influence us in a variety of contexts. Within the United States, anxiety affects 40 million adults: 18.1% of the population (Anxiety and Depression Association of America, 2018). High-performance environments such as sports, are not immune to these challenges as a key component of these environments is stress. Stress causes an increase in anxiety levels. During a stressful situation, the central nervous system is triggered, and a flood of chemicals are sent into the bloodstream (Lacke, 2018). Stress can be described as a mental or emotional strain resulting from adverse or very demanding circumstances (Dictionary, retrieved online 1/2020). Two basic forms of stress are identified, eustress, or a positive form of stress, and distress, the negative form. Stress differentiates from anxiety in that stress is more transient. If an individual experiences stress in sports it may lead to performance anxiety which can be defined as an unpleasant psychological state in reaction to a perceived threat concerning the performance of a task under pressure (Cheng & Hardy, 2016).

In a sport context, two factors during competition leads to a perception of fear or worry and thus, to the state of anxiety: (a) when the outcome is unknown, especially as it relates to performance and (b) when high value is placed on the performance outcome (Pineschi & Pietro, 2013). In sport, an athlete might experience anxiety prior to

competing in a race or before a big game due to the athlete not knowing the outcome and the high value, they place on performing well. Anxiety can be viewed as an emotional response, identified by a subjective feeling of tension, apprehension, nervousness, and worry, which is associated with an activation of the autonomic nervous system (Pineschi & Pietro, 2013; Spielberger, 1979). These feelings are typically not enjoyable and has been shown to negatively influence performance (Patel, Hatim, & Terry, 2010). For example, an athlete before a race may experience negative thoughts such as "I am not prepared" or "I am not good enough to be racing against these other athletes." These thoughts could be debilitating to their performance. Therefore, an athlete's inner dialogue is important to their success in sport. During high performance situations the human body sends out warning signals meant to prepare us for what is to come, this essentially is meant to protect us, like in situations where we are under pressure or stress, or when we are in a high-pressure environment such as pre-race or prior to a game. (Cheng & Hardy, 2016). Martens, Vealey, and Burton (1990) found that individuals who view sporting situations as threatening respond in a state of fear and worry.

Anxiety Symptoms

There are two primary ways in which stress and anxiety manifests, either from a cognitive or physiological manner. The cognitive (mental) components consist of negative thoughts pertaining to success or negative self-evaluation (Martens, et al., 1990) while the somatic (physiological) components relate to an increase in heart rate, shortness of breath, sweaty hands, knots in the stomach, tense muscles, cold sweat, and other symptoms (Pineschi & Pietro, 2013).

> Cognitive signs are those in our mind or thoughts and include indecision, a sense of confusion, negative thoughts, poor concentration, irritability, fear, forgetfulness, a lack of confidence, images of failure, negative self-talk, feeling weak, inability to follow instructions, and thoughts of avoiding participation. (Patel et al., 2010, p. 327)

In addition to the cognitive and somatic signs of anxiety, anxiety may manifest in behavioral outcomes that others can pick up on and notice. These behavioral signs include avoidance of or making and keeping eye contact, irritability, and other types of defensive mechanisms (Patel et al., 2010). Prior to a performance, an athlete may start to feel the signs of anxiety arising, but anxiety symptoms can occur at any point before, during, or after the event (Patel et al., 2010). Due to all of these symptoms, anxiety can cause athletes to underperform. In order for an individual to overcome anxiety, athletes must incorporate skills that better prepare them for anxiety and deal with anxiety in these high-pressure situations.

Anxiety and Performance Relationship

Anxiety has been shown to influence performance. Anxiety could distract and take away from one's performance, in fact it may be one of the most prominent factors that distinguishes between competitive and non-competitive athletes (Wolframm & Micklewright, 2011). Even though there is sufficient evidence that anxiety negatively influences performance (Pineschi & Pietro, 2013), there is a need to further study how to combat performance anxiety. According to Patel, Hatim, and Terry (2010), certain amount of performance anxiety is considered normal and healthy. However, anxiety can become extreme in certain situations and may lead to a detrimental performance. An

example of this overwhelming situation would be an athlete becoming overwhelmed with negative thoughts before a game, feeling cold, clammy hands, and letting those thoughts and physiological symptoms impact performance. Over time, anxiety can become worse or more controlled based on the individual's experiences with anxiety. There are a variety of factors that may contribute to the development, severity, and persistence of performance anxiety related to sport participation (Patel et al., 2010). In order for optimal performance to take place, an athlete must find a way to cope with various competition stressors in order to focus on the task-relevant information. Participating in a Mental Skills Training (MST) program could teach an athlete how to mitigate the effects of performance anxiety. In fact, how an athlete interprets anxiety plays a greater role in performance than anxiety intensity according to Love, Kannis-Dymand, & Lovell, (2018). Through training, athletes can learn skills to help combat anxiety and turn it into a way to enhance performance.

Mitigating the Effects of Performance Anxiety

One way that has been shown to enhance performance and overcome anxiety is through Mental Skills Training (MST). MST teaches athletes to utilize skills so that they can overcome mental barriers. There is evidence showing the use of pronounced psychological skills among elite performers to control emotional arousal and reach optimal psychological states (Wolframm & Micklewright, 2011). Skills that have been shown to be effective and produce positive results are imagery (visualizing oneself in great detail performing how they want), goal setting (structured planning and setting of sporting goals to reach a desired performance outcome), and positive self-talk (the ability to think positively and focus on performance enhancing thoughts; Wolframm &

Micklewright, 2011). These mental training skills (goal setting, imagery, and positive self-talk) have been shown to be beneficial to athletes (Bertollo, Saltarelli, & Robazza, 2009; Wolframm & Micklewright, 2011). Incorporating these skills into an athlete's training program could be essential to manage the effects of performance anxiety. Essentially, MST can promote positivity in an individual that positively influences performance. However, not all athletes are aware of mental skills training and, thus, may not make the changes needed to increase performance. Mental skills training provides athletes with a tool to aid in combating performance anxiety.

An additional skill utilized by endurance athletes is Mindfulness. Whereas MST enables an athlete to set goals, practice positive self-talk, and work on the imagery of their performance, mindfulness is an ability to focus on the present moment in order to reach a state of flow. Mindfulness will help an athlete focus entirely on a present moment and not worry about what their thoughts are at a current time as they are merely experiencing the competition as it happens. This present focus allows an athlete to be more focused on their athletic performance and should eliminate many of the worries associated with competition. Combining both MST and Mindfulness will enable athletes to better deal with performance anxiety and perform to the top-level of their abilities.

Athletes' performance is influenced by their anxiety, however, by learning and implementing techniques that combat performance anxiety athletes may manage the symptoms of anxiety (Pineschi & Pietro, 2013). Therefore, the purpose of this study was to implement a four-week intervention MST program with runners to determine how MST impacts anxiety and objective performance. I hypothesized that MST would reduce anxiety in runners and participants would see positive impacts on their performance.

Performance anxiety was measured pre-and post-intervention on the Competitive State Anxiety Inventory 2 (CSAI-2), mindfulness was measured through the Kentucky Inventory of Mindfulness Skills (KIMS), and, lastly, a performance and effort questionnaire were filled out by the participants to measure running performance and effort.

As with any study there were limitations. Limiting factors in this study was time to implement the intervention, group size, and the focus on only runners. Although this is a very specific population, runners require significant amounts of self-discipline and determination as most training and racing is completed alone. Distance running is demanding both physically and mentally requiring vast amounts of effort. Additionally, running likely leads to fatigue and pain, which can cause negative thoughts that interfere with running mechanics, pace, and motivation (Dreyer, 2004). Running is also a sport where the outcome is unknown, and athletes place high levels of value on their performance. Due to such, this group was an ideal population to implement a mental skills training and mindfulness program.

CHAPTER TWO: LITERATURE REVIEW

Anxiety, especially if athletes do not have the appropriate coping skills, can negatively impact sport performance (Patel et al., 2010). In fact, Bertollo et al. (2009) claim that how athletes deal with anxiety may be one of the most important predictors of performance in sport. If athletes could learn skills intended for them to cope with anxiety levels, they may have a much better chance of performing to their full capability (Wolframm & Micklewright, 2011). This literature review will look at theories and models of performance anxiety, overview direction and intensity of anxiety, investigate how anxiety influences performance, explore past athlete interventions to deal with anxiety, and then overview a program that will aim to teach athletes the skills needed to deal with anxiety.

Stress, Arousal, and Anxiety

In order to establish a common language, it is important to define key terms. Stress, arousal, and anxiety have been used by many to describe similar phenomena. However, in the context of this study, exact definitions will be used to eliminate potential confusion. Stress can be defined as a mental or emotional strain resulting from adverse or very demanding circumstances (Dictionary, retrieved online 1/2020). Stress has two main forms and can either be positive or negative. Eustress is positive and can increase focus, while distress is negative and has the potential to cause anxiety leading to a decrease in performance (WJEC Sports Psychology retrieved online 2/2020). On the other hand, arousal is a mix of physiological and psychological activity in an individual (Carter,

2019). Arousal is simply body activation ranging from deep sleep to high levels of excitement. Finally, anxiety is a "persistent fear or worry that causes great amounts of stress of daily tasks like play, work, and relationships" (American Psychiatric Association, 2013). In sport, anxiety can manifest in two ways; somatic and cognitive. Somatic anxiety is the physiological component consisting of, but not limited to, an increase in heart rate and breathing rate, hands and feet becoming sweaty and cold, and knots in the stomach (Patel et al., 2010). Conversely, cognitive anxiety is the mental component of anxiety and consists of negative thoughts pertaining to success or negative self-evaluation. Examples include thoughts such as "I am not good enough", "I am unprepared", and "I didn't practice hard enough" (Martens et al., 1990). Anxiety can take different forms and has the potential to influence performance. In essence, the three terms differ in that stress is a stimulus from a particular situation where the response is either positive or negative, arousal is the psychological state that prepares the body for action, and anxiety is the negative perception from the situation which results in cognitive (negative thoughts) and somatic (sweaty palms) symptoms, or sometimes both (WJEC Sports Psychology retrieved online 2/2020). With the proper skills, this detriment to performance may be mitigated. To help explain the impact anxiety can have on performance several critical theories and models will be overviewed next.

Anxiety and Performance Relationship

Stress may be caused by a number of factors including illness, sleep, environment, level of importance placed on an event, and uncertainty of the outcome. How important an event is to an athlete has the potential to increase the level of stress. For instance, a home game may cause an athlete to put added stress on themselves in

order to perform well. Additionally, not knowing what the outcome may be will result in increased levels of stress which, in turn, may result in an increase in levels of anxiety leading to a decrease in level of performance. For example, if an athlete places great importance on a race and is uncertain of the outcome or how well they will perform, then it would be more likely they would experience stress and, ultimately, a decline in performance. This decrease in performance could be due to the fact that it is more difficult to perform well in stressful situations. There are various mechanisms that can explain the anxiety-performance relationship including the Integrated Model of Anxiety and Perceptual-Motor Performance, the Processing Efficiency Theory, and Theory of Attentional and Interpersonal Style

Nieuwenhuys and Oudejans (2012) overviewed three ways that stress may inhibit performance in the integrated model of anxiety and perceptual-motor performance. Specifically, they stated there are three operational levels that represent the various ways that anxiety can influence performance. These levels are attentional, interpretational, and behavioral. In this model, to what degree each level is affected by anxiety influences its impact on performance. Furthermore, individual differences and task characteristics may play a role in how anxiety influences performance. First, the model indicates attentional effects manifest in individuals' ability to maintain focus over time. In other words, the individual has trouble concentrating and becomes distracted in stressful situations. In a sport context, an athlete whose attention wanders might focus on opposing players and not their own movements causing movement rigidity and overall slowness. Second, anxiety may lead to misinterpretation of information. For example, events involving uncertainty are highly affected at the interpretational level, an example being a running

race where the outcome is unknown and the athlete is afraid of how they will perform, leading them to misinterpret the anxiety as fear. Finally, the model overviews that behavioral effects include increases in heart rate, blood pressure, and breathing frequency, all somatic components of anxiety. As an example, in a high-pressure race, a runner might have difficulty controlling their breathing at the start line which causes a loss of focus on their race plan, and ultimately, poor performance.

Within the integrated model of anxiety and perceptual-motor performance (Nieuwenhuys & Oudejans, 2012), various processes, concepts, and mechanisms are introduced as a way to describe how anxiety influences performance. In the model, perceptual-motor behavior is viewed as an active, self-repeating process in which individuals integrate three key behaviors: perception, selection, and action. First, individuals will orient themselves and perceive different action possibilities represented in their environments (perception). Next, individuals will select preferred courses of actions (selection). Lastly, individuals will detect and use information to coordinate their movements in fulfillment of these action(s) (action). Within this model three operational levels are recognized as a way for anxiety to exert its influence on an individual, identifying which level and to what degree of breakdown in performance will allow an athlete to understand how to best address their anxiety. A second explanation describing the arousal-performance relationship is the Processing Efficiency Theory (PET) and is covered next.

One explanation for the decrease in performance experienced in the arousal-performance relationship that has been proposed is loss of processing efficiency. In the Processing Efficiency Theory, Eysenck and Calvo (1992) introduced an inverse

relationship between anxiety and efficiency of processes. In other words, as anxiety increases, the ability to process information efficiently decreases. For example, worrying too much about the previous play in a baseball game takes away from attentional resources needed for the current and upcoming plays. Processing efficiency theory explains this worry of previous plays as taking up important cognitive space that could be utilized for present and future tasks, thus impacting the level of performance. A final model that aims to explain the anxiety performance relationship is the Theory of Attentional and Interpersonal Style (TAIS).

Finally, outlining the influence of anxiety on performance is the Theory of Attentional and Interpersonal Style. As Nideffer (1976) explained in the Theory of Attentional and Interpersonal Style (TAIS), focus of attention shifts between two dimensions, one of width (broad to narrow), and a dimension of direction (internal or external). Nideffer (1976) identified two intersecting dimensions that would result in four separate attentional styles. These separate types of styles are named focused, systematic, strategic, and aware and stem from the two intersecting dimensions of external and internal attention styles. Internally focused attention depends upon an individual's thoughts and feelings. Examples of these attentional dimensions working in conjunction with each other include a narrow-internal focus of concentration to assess your breathing rate, whereas a narrow-external focus is needed to perform the physical task of running the racecourse or catching the ball. Another type of attentional style as hypothesized by Nideffer is systematic. The systematic style represents a narrow-internal focus of concentration and focuses on the preparatory or rehearsal phase of competition. For example, a runner imagining their race before the gun goes off. The third style, strategic attention represents

a broad-internal focus of concentration and looks for patterns over time to develop strategies for the future. For example, a coach making changes in a game. Finally, aware attentional style requires an athlete to take into account the whole situation, representing the broad external focus of concentration. For example, an athlete being keenly aware of all that is going on around them which may lead to poor decisions if not processing fully. The key take away from the theory is that it identifies ways in which athletes shift between the different attentional styles, indicating that performance may be hindered if too much attention is devoted to one of the styles over the other. Further, if athletes are utilizing the wrong type of attentional style, they might also experience a decrease in performance.

Several explanations of why performance decreases with increases of arousal are presented. In the model created by Nieuwenhuys and Oudejans (2012), researchers indicate that anxiety can decrease an athletes' attention to distractions, cause information to be misinterpreted, and lead to an athlete not being fully prepared to run a race because of physiological symptoms. Additionally, processing efficiency theory, described by Eysenck and Calvo (1992), hypothesized an inverse relationship between anxiety and the efficiency of processes. Lastly, Nideffer (1976) explained that there are four attentional styles stemming both from external and internal focus which can negatively impact performance if the wrong attentional style is utilized by athletes in a stressful situation. Next, I will overview theories and models focused on the arousal-performance relationship and describe how these models can explain the arousal-performance relationship.

Theories and Models on Performance Anxiety

Stress can influence our ability to perform to our potential. Research has shown that each athlete has an optimal level of arousal before performance will be influenced

negatively. How athletes view the environment will influence their arousal levels and, ultimately, impact their performance. Several models have been utilized to help explain this performance-anxiety relationship and relevant models will be explained in this section.

The first model to explain anxiety was the drive theory (Hull, 1952; Spence and Spence, 1966). Hull proposed that "drive" was the term used to describe the arousal experienced to fill both psychological and physical needs. In the drive model, the more arousal one experienced the higher level of performance they would achieve. Therefore, one needed a high level of arousal to perform well. However, what this theory did not take into account was the fact that an individual could be over aroused and, thus, performance would drop. Also absent in this model is the concept that there is an optimal level of arousal that one needs to maximize performance. A second limitation for the theory was that only well-learned tasks were taken into consideration when describing the performance-arousal relationship. If the task was not well-learned, more arousal past a certain point led to poorer performance. In response to these shortcomings, further theories were needed to explain this relationship.

As the drive theory only explained the performance-anxiety relationship in well-learned tasks, Yerkes and Dodson (1908), hypothesized the inverted-U model of arousal. In the Inverted U model, as an athlete's level of physiological arousal increases, their performance increases up to a certain point. At this point, at the midpoint of arousal, performance peaks. After this midpoint, any increase in arousal results in a steady decreased level of performance. The limiting factor of this model is that the Inverted U was created without the differentiation of the two types of anxiety. Instead, the model only focuses on physiological arousal and neglects to include the impact of cognitive arousal.

As it is likely that both physiological and cognitive arousal might impact performance, the absence of cognitive anxiety is a limitation of this model. In conclusion, it is beneficial that this model emphasized the idea that too much arousal can be detrimental to performance, but further elaboration is needed to explain the arousal-performance relationship.

As the Inverted U hypothesis indicated there is an optimal level of arousal for performance but provided no distinction between the various components of anxiety, another model was needed to explain this relationship. A third model to explain the arousal-performance relationship is the catastrophe model. In response to the shortcoming of the Inverted U, the catastrophe model integrates both physiological and cognitive anxiety into the explanation of the arousal-performance relationship. The Catastrophe model proposes a relationship between cognitive anxiety, physiological arousal, and performance (Hardy, 1990). Hardy indicated that the relationship between arousal and performance is described as having an inverted U-shape when cognitive anxiety is low. This means that absent of cognitive anxiety, there is an optimal level of arousal and any increases to that level results in a small decrease. However, Hardy described increased levels of cognitive anxiety as having a hugely negative impact on performance when physiological arousal reached a certain point. In this final relationship, when both cognitive anxiety and physiological arousal were high, performance experienced a catastrophe or sudden drop in performance. This second relationship suggests that in order to return to a state of optimal performance, a lower level of arousal has to be achieved. The cusp catastrophe model provides the groundwork for explaining the multidimensional nature of how athletes experience arousal and perform in stressful situations (Janelle, 2002). Both of these models explain performance changes and provide a rationale for why these changes

occur. Ultimately, both theories indicate that as athletes experience anxiety, their attention becomes limited. In high performance situations this could become detrimental, leading to a decrease in performance. Therefore, it is vital within performance contexts like sport to understand how to control anxiety as it directly impacts attention.

Theories and models have been used over the years to help explain the anxiety-performance relationship. These theories have aided in understanding what individuals experience under stress, typically enhanced in high performance situations. In addition to the theories to understand this relationship, how anxiety is interpreted by athletes (i.e., direction versus intensity of anxiety) has been studied to determine if these interpretations can influence performance.

Direction and Intensity of Anxiety

In addition to the theories explaining the arousal-performance relationship, how athletes interpret situations could also impact how they perform. Two of those interpretation aspects are the direction and intensity of the arousal. For example, in sport, the level of intensity would be how much anxiety an athlete experiences prior to a race. In addition to the amount of anxiety one perceives, the direction of how they see the anxiety impacts performance. Specifically, athletes may see anxiety as being either debilitative or facilitative to their sport performance. For example, an athlete who sees high levels of anxiety as facilitative would see these symptoms as beneficial to achieving their goals and having the ability to cope with whatever comes their way. In contrast, an athlete who saw their symptoms as debilitative would have negative expectancies regarding their goals and feel less control over the outcome. In other words, intensity of anxiety focuses on the level of arousal experienced whereas the interpretation of their symptoms is the direction. For

example, an athlete who experiences sweaty hands is experiencing a high level of anxiety (intensity) but how they perceive that symptom (positively or negatively) will determine the direction of the arousal (Jones & Hanton, 1996).

Past studies have indicated that direction of anxiety influences performance to a greater degree than anxiety intensity (Jones & Hanton, 1996). Specifically, whether anxiety is facilitative, that is aiding in performance, or debilitative, or taking away from performance, comes down to whether that particular athlete's attitude toward the symptoms is positive or negative. Jones and Hanton (1996) found that elite athletes viewed anxiety differently than novice athletes which partially explained their performance differences. Specifically, they examined how athlete's perception of anxiety influenced whether or not anxiety was viewed as being facilitative. Competitive swimmers, who either represented their region (state) or country, were asked to complete two questionnaires; a modified version of the Competitive State Anxiety Inventory-2 and the Goal Attainment Expectancy Scale, 1 hour prior to competitions. The CSAI-2 was used to measure cognitive and somatic anxiety levels. In addition to the types of anxiety, a directional scale was added where the participants could mark whether the symptoms were facilitative or debilitative to performance. The Goal Attainment Expectancy Scale measured athletes' outcome, performance, and process goals and their expectations in meeting those goals during the swim performance. Swimmers, on average, had 8 years of experience and swam 7 times a week. The results of this study indicated that all of the athletes set at least one goal, and most of them set at least 2 goals. In addition, nearly half of the athletes perceived their anxiety symptoms to be facilitative while only 23% of the participants reported their symptoms to be debilitative. Regardless of the type of goal individuals set, the level of

intensity did not differ between groups who expected to meet their goal and those who did not expect to meet their goal. However, those individuals who expected to meet their goal perceived anxiety (both cognitive and somatic) as facilitative while those who did not expect to meet their goal viewed their anxiety as debilitative. This finding indicates expecting to succeed at previously set goals can be facilitative to performance as it might give athletes a sense of control for their performance. In conclusion, a relationship has been shown between expectations of meeting goals and an athlete's perception of anxiety as whether their anxiety symptoms are facilitative or debilitative toward performance.

To further study how the interpretation of anxiety influenced performance, Kais and Raudsepp (2005) completed a study with professional athletes in basketball and volleyball. In this study, athletes completed the CSAI-2 and a facilitative/debilitative measure prior to their warm-up phase before the game. In addition to these measures, performance was measured on a Likert scale (1 = played worse than usual; to 10 = played much better scored) evaluated by the coach and assistant coach. The researchers found that athletes rated somatic anxiety as more facilitative toward performance (M=3.97, SD=6.01) when compared to cognitive anxiety (M=1.05, SD=6.75). Further, there was a weak negative relationship between intensity and direction of somatic anxiety, intensity and direction of cognitive anxiety, and intensity of self-confidence with both intensity of cognitive and somatic anxiety. Additionally, the results indicated there was a positive relationship between cognitive anxiety intensity and athletic performance with no other factors related to performance. However, a limitation of the study was that performance was measured as a subjective measure of coach evaluation and could have been more objectively measured (e.g., points or rebounds) instead. Therefore, future studies should

have a clearer measure of actual performance and could do this by combining both an objective measure and subjective view from a coach.

Multiple studies (Jones & Hanton, 1996 and Kais & Raudsepp, 2005) have shown that how an athlete views anxiety can influence their performance. Whether anxiety is viewed as being facilitative (supporting performance) or debilitative (taking away from performance) is largely determined by the individual. Limitations of these studies include performance being measured in a subjective manner which may not lead to less reliable results. Direction and intensity of anxiety has been shown through the previous studies to have an influence on performance. Therefore, athletes must learn skills to combat such. Interventions helping athletes learn mental skills will enable them to use anxiety to facilitate performance.

Interventions for Athlete's Sport Anxiety

In a review by Patel et al., (2010) he indicated that having a certain amount of performance anxiety is considered normal and healthy. However, anxiety may become extreme in situations and lead to a detrimental performance limiting how an athlete performs. Over time anxiety could become worse or more controlled based on the individual. There are a variety of factors that may contribute to the development, severity, and persistence of performance anxiety related to sport participation. Patel indicated that for most young athletes (high school to college age), different strategies can be utilized to cope with anxiety, with one of the most effective being a behavior approach. A behavior approach is the most common approach utilized by athletes experiencing anxiety. The most popular behavior approach is cognitive behavioral therapy (CBT), where the athlete works with a therapist/mental coach to address the major negative thoughts and behaviors

associated with their anxiety (Patel et al., 2010). Evidence has shown the behavioral approach works in the long-term and show positive results towards effectively combating anxiety. One primary way that athletes can learn to cope with anxiety is learning skills aimed at anxiety management. There are various methods and skills an athlete can utilize in either reducing anxiety or reframing anxiety into being facilitative towards performance. Mental skills training and mindfulness techniques are two methods in which athletes can learn to mitigate the effects of performance anxiety.

Many endeavors that humans pursue potentially can be influenced by anxiety (Levitt, 1967). Research has been dedicated to performance anxiety within sport and has shown several ways for individuals to combat the effects of such anxiety (Jones & Hardy, 1990). However, some of the skills athletes use to combat anxiety do not naturally develop. Therefore, these skills must be taught through explicit interventions. In order to learn skills that address performance anxiety, athletes take part in programs or interventions to learn such skills. Typically, an intervention will take place over multiple weeks, and athletes are instructed to practice the skill being taught between sessions in the sport in which they are performing. When integrating mental skills training (MST), or a dedicated program to teach mental skills to enhance performance, Pineschi and Pietro (2013) recommend three distinct phases of teaching a technique to the athlete. First, a briefing phase or presentation of the technique to the athlete should be completed. After the briefing phase, athletes should be allowed time to incorporate the technique into practice. Last, analysis should be completed to determine if the athlete can carry out the skills effectively. An example of this process would be to teach a group of athlete's goal setting strategies, practice amongst the group in a workshop session, then have athletes continue refining their goals during the

week of practice leading into the next session. In this way, practitioners provide athletes time to practice the techniques learned and, in doing so, allow athletes to use these skills to better combat their anxiety.

Athletes' performance may be influenced by their anxiety, however, by learning and implementing techniques that combat performance anxiety athletes can manage the symptoms of anxiety (Pineschi & Pietro, 2013). Further, MST interventions have been done in the past and indicated that athletes better cope with anxiety following engagement of these programs. Pineschi and Pietro completed a review that described how implementing psychophysiological techniques effected athletes states of arousal. In the review, the authors indicated that athletes could learn techniques that empower them to overcome the negative symptoms of anxiety. MST involves a dedicated program to teach others skill that they can use to combat symptoms such as performance anxiety**.** A few example techniques and skills that an athlete could learn in an MST program are goal setting, imagery, and self-talk. A program can take place over the course of several sessions covering multiple weeks or simply be a one occasion event (Harwood & Thrower, 2019). Additionally, programs can be single skilled (single strategy) or cover a variety of skills (multi-strategy) (Harwood & Thrower, 2019). In a single strategy intervention only one of the skills is covered during the course of an intervention whereas, in multi-strategy interventions topics such as goal setting, imagery, and self-talk are covered together. It is important to teach these skills so that athletes can be prepared to combat performance anxiety.

In past studies (Bertollo, et al., 2009; Pineschi & Pietro, 2013), MST has been shown to be an effective technique for aiding performance among elite and advanced

performers. For example, Bertollo et al., (2009) determined that athletes could benefit from a MST program that featured imagery, positive self-talk, and goal setting. The purpose of the study was to determine what mental preparation strategies elite pentathletes utilized. Participants were fourteen elite level pentathletes who took part in an interview process during the buildup to competing in the 2004 Olympic Games. Following this interview process, the researchers asked the participants "Would you tell me what mental preparation strategies and behaviors you usually adopt in the days preceding an important competition?'' with further clarifying questions such as "What routines do you follow to prepare yourself?" and "Do you mentally rehearse your performance?" (Bertollo et al., 2009, pg. 246). Common mental preparation strategies reported from the athletes included visualization techniques, positive self-talk, and goal setting. Additionally, in a review of the psychological characteristics utilized by elite and successful athletes, Krane and Williams (2006) found that athletes used a variety of cognitive and behavior skills aimed to improve performance including goal setting and imagery (Krane & Williams, 2006). Further, Orlick and Partington (1988) found that Olympic level athletes applied mental skills to their training so that they could reach a peak of optimal readiness, with common skills identified by athletes that included imagery, focusing on positive thoughts, and setting practice goals. These studies found that, overall, implementing a program to include such strategies is important to reach optimal performance in a positive manner in elite level performers.

To further examine how MST provided athletes with a tool to aid in combating performance anxiety, Wolframm and Micklewright (2011) sought to determine how non-elite athletes could benefit from an MST intervention. In the study, an MST program was

implemented with non-elite equestrian riders to determine how the intervention would influence performance anxiety. Over the course of six weeks, the riders took part in a program where skills such as goal setting, imagery, and self-talk were practiced two hours a week with an instructor and participants engaging in an additional 15-20 min. of their own time practicing the skills learned on a daily basis. The riders were instructed to have two competitions prior to the intervention and one within two weeks post intervention. A modified version of the CSAI- 2 was used both before and after the intervention to measure somatic arousal (SA), cognitive arousal (CA), and self-confidence (SC). Researchers found a positive effect on performance, suggesting that pre-competition anxiety was turned from performance inhibiting to a more stable point of control, where more energy could be focused on performing well. Even though this study is informative, it had a small group to analyze performance and was done with athletes from a unique sport (equestrian). Another limiting factor to consider with this study is there was no way to account for whether the participants actually took part in the individual time of practice. If this individual practice was measured, this could have led to a better understanding of which mental skills were being utilized by the athletes. This study indicates that performers who are better equipped at using mental skills to help facilitate the emotional arousal experienced from anxiety are able to manage anxiety and perform at their highest level. In conclusion, this study showed that non-elite riders can learn skills to help them better facilitate the effects of pre-competition anxiety, however there was no clear indication of which mental skills the athletes utilized, and it was conducted on a unique population of athletes.

As stated previously, past research has indicated a number of mental skills have been effective in combatting performance anxiety in the athletic domain. Specifically, goal setting, imagery, and self-talk have shown to be effective in helping elite-level athletes deal with anxiety in a number of competitions (Bertollo et al., 2009; Krane & Williams, 2006; Wolframm & Micklewright, 2011). Therefore, our intervention incorporated three mental skills; goal-setting, imagery, and positive self-talk. While these skills focus on changing or modifying existing negative thoughts or behaviors, another skill, mindfulness, might be useful in helping athletes stay in the present moment and aid in mitigating the negative relationship between anxiety and performance.

Even though MST has been used to enhance performance through athletes learning ways to better deal with mental barriers through mental strategies such as self-talk, thought stopping, goal setting, and imagery as well as mental rehearsal (Whelan, Mahoney, & Myers, 1991), there is some data that does not support certain mental strategies aiding in performance. For example, goal setting did not change performance and could perhaps hinder performance in some cases (Daw & Burton, 1994; Holm, Beckwith, Ehde, & Tinius, 1996). Mindfulness training or staying in the present moment while being aware of yourself and surroundings in a nonjudgmental fashion (Kabat-Zinn, 1994), addresses these shortcomings. In fact, Gardner and Moore (2004) explained that the primary focus of mindfulness was, "to promote a modified relationship with internal experiences (i.e., cognitions, emotions, and physiological sensations), rather than seeking to change their form or frequency (p. 309)." This differs from MST in some key ways. Whereas MST enables an athlete to set goals, practice positive self-talk, and work on the imagery of their performance, mindfulness is an ability to focus on the present moment in order to reach a

state of flow. Mindfulness will help an athlete focus entirely on a present moment and not worry about what their thoughts are at a current time as they are merely experiencing the competition as it happens. This present focus allows an athlete to be more focused on their athletic endeavor and should eliminate many of the worries associated with competition.

Mindful Sport Performance Enhancement (MSPE), a program that aims to teach mindfulness, encourages integrating mindfulness skills that enable athletes to be more aware of the present moment, accepting experiences as they are, learning from these experiences, and incorporating them into their sport and everyday life (Kaufman, Glass, Pineau, 2016). De Petrillo, Kaufman, Glass, and Arnkoff (2009) set out to analyze runners and how mindfulness training can help them overcome the symptoms of anxiety as mindfulness has shown to be an additional tool an athlete can utilize allowing them to focus on the present moment in a non-judgmental way. Specifically, De Petrillo, Kaufman, Glass, and Arnkoff (2009) conducted a study with 25 long distance recreational runners. Nearly half of the athletes took part in a 4-week intervention consisting of 4 sessions on mindfulness training that utilized Kaufman's and Glass (2006) MSPE program. The remaining athletes were part of a waiting list control group who did not take part in the mindfulness training until after the initial workshop (De Petrillo et al., 2009). Following the workshops, athletes who engaged in the workshops had significant decreases in sport anxiety, worry, and perfectionism. Increased mindfulness was thought to allow the athletes to better accept their anxiety which allowed them to focus more fully on their performance. The study was not without limitations. The number of participants was small and including more athletes would be a better indicator of how mindfulness skills taught influenced performance. Further, as mindfulness and MST might be used in conjunction to help

athletes deal with anxiety, studies that utilize aspects from both perspectives may be beneficial. Future studies should take note and increase the number of participants taking part in mindfulness training and keep track of performance in more detail.

MST and mindfulness are two main categories of tools an athlete could use to combat anxiety, and both can be learned through work with a professional in sport psychology. When these skills and techniques are learned and utilized by athletes, their anxiety levels may be managed to levels that negatively influence performance to lesser degrees. Athletes, both at the elite and recreational levels, have the ability to manage performance anxiety with proper training. MST, including utilizing tools such as imagery, positive self-talk, and goal setting, and mindfulness are two ways in which athletes can better handle anxiety involved in sport. MST enables athletes to learn ways to better deal with mental barriers through mental strategies such as self-talk, goal setting, and imagery boosting performance (Whelan et al., 1991) while mindfulness increases the likelihood of a flow state which, in turn, could decrease performance anxiety. In addition, mindfulness enables participants to focus on accepting one's internal state and participate moment-to-moment in a non-judging fashion (Gardner & Moore, 2012). Even though some interventions have shown promise in alleviating anxiety, future research should investigate other means to impact athletes in a positive manner. Therefore, the purpose of this study was to determine how combining MST with Mindfulness training would influence anxiety and performance in distance runners. In essence, we wanted to investigate if running performance could be boosted by taking part in an intervention involving MST and Mindfulness and if the negative effects of anxiety could be mitigated through such an intervention.

CHAPTER THREE: METHODS

Participants

Three distance runners participated in the intervention. This included two male and one female adult athletes who had a history competing in running events at various levels of ability ranging from high level recreational athlete to a professional mountain runner. Their age ranged from 22-34 yrs old. The participants took part in a 4-week intervention with a virtual race assessment pre, during, and post intervention. This time frame allowed the participants the opportunity to practice the skills they learned over the course of the intervention during a competition situation. Each of the athlete's intervention experiences were different. Athlete A was able to go through the entire intervention as planned (4 workshops separated by one week, and a performance assessment pre, during, and post intervention). Athlete B completed the 4-session intervention in 5 weeks due to work constraints and was unable to complete during performance assessment. Athlete C completed the intervention in 4 weeks; however, she was unable to perform the during and post-performance assessment or psychological measures because of an injury.

Participation in the study was voluntary and athlete informed consent was collected prior to initial data collection. Workshops were conducted with one session per week for four weeks. Data was collected prior to the intervention, during the intervention, and following the completion of the intervention. All participant information was confidential and only personnel involved in the study had access to documentation.

Instruments and Measures

Competitive State Anxiety Inventory 2 (CSAI-2)

The CSAI-2, developed by Martens, Burton, Vealey, Bump, and Smith (1990), is a self- report measure that includes 27 items assessing cognitive and somatic anxiety, as well as self-confidence. Athletes were instructed to complete the survey three times, once prior to the intervention and prior to a race, once at the mid-point of the intervention prior to a virtual race or workout effort, and once more prior to a virtual race intensity effort following the four-week intervention. Example sample questions for each of the sub-scales were as follows; cognitive anxiety: "I'm concerned I won't be able to concentrate", somatic anxiety: "My hands are clammy", and self-confidence: "I'm confident because I mentally picture myself reaching my goal". Participant's rated questions on a 4-point Likert scales ranging from 1 (not at all) to 4 (very much so). To score the (CSAI-2), subscale scores are added across all items. Scores range from nine to 36, for each of the three components, with nine an indication of low anxiety/confidence and 36 meaning high anxiety/confidence. According to Kais & Raudsepp (2005) the CSAI-2 has a reliability of .90 for cognitive and .92 for somatic anxiety and self-confidence.

As previous studies have done (Jones & Hanton, 1996 and Kais & Raudsepp, 2005), the inventory was modified to include a scale for "direction" in which each athlete rated the extent to which they experienced intensity of their symptom as being either facilitative or debilitative to their performance on a scale from -3 (very debilitative) to + 3 (very facilitative). The possible direction scores on each subscale could range from -27 to + 27, with a negative score representing a negative (debilitating) perception of anxiety

and a positive score representing a positive (facilitating) perception of the symptoms in terms of their consequences for subsequent performance.

Kentucky Inventory of Mindfulness Skills (KIMS)

The KIMS (Baer, Smith, & Allen, 2004) measures mindfulness in an individual and includes 39-items. Athletes were instructed to complete the survey three times, once prior to the intervention and prior to a race, once at the mid-point of the intervention prior to a race, and once more prior to a race following the four-week intervention. Sample questions included, “I intentionally stay aware of my feelings” and “I pay attention to whether my muscles are tense or relaxed”. Individuals rated themselves on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). The KIMS provides a total mindfulness scores as well as four sub-scale scores for observing (paying attention to bodily sensations, cognitions, emotions, and external sights, smells, and sounds; e.g., “ I pay attention to whether my muscles are tense or relaxed”), describing (placing a label to what is observed such as "worrying about my performance”, or “feeling sad”; e.g., “I can easily put my beliefs, opinions, and expectations into words”), awareness (giving the present moment complete full and undivided attention; e.g., “When I’m doing something, I’m only focused on what I’m doing, nothing else”), and acceptance without judgment (allowing reality to be as it is and not avoid what is happening; e.g., “I tend to evaluate whether my perceptions are right or wrong”). According to Baer and colleagues (Baer et al., 2004), the KIMS measure has shown to have good test-retest reliability, internal consistency, and content validity.

Performance Questionnaire

Designed for this study, this measure asked participants for running performance information. Runners were asked to describe their running experience, and personal best competitive and practice running times. We also included open-ended questions asking participants if their performance changed over time, in what way it had changed, and an opportunity for them to rate their performance on a scale ranging from 1 (poor), to 10 (best). Effort was also rated on a scale ranging from 1 (little), to 10 (full).

Reflection Questionnaire

Designed for this study, this measure asked participants to reflect on the previous weeks Mental Skill and their use of the skill over the last week of training. The survey was administered before meeting for Workshop #3 and following the intervention prior to the athlete's final performance assessment. Questions on the survey included "How much did you practice the mental skill this week?" and "How did it impact your performance?" See appendix F for the complete survey.

Demographics Sheet

Designed for this study, participants completed basic demographics including age, gender, and previous experience running competitively.

Procedures

Following each athlete returning their informed consent, athletes completed the surveys on their own and returned them via email.

Following the introduction and overview phone meeting, the intervention included 4 (30 min.) sessions. Each of the sessions focused on a mental skill or integrated mindfulness training (see Table 1 for schedule and appendices for complete workshop

content). Dr. Eric Martin supervised each of the sessions. All sessions took place over Zoom.

Table 1. Overview of each session for the intervention of mental skills training

Visit #	Mental Skill Learned	Session Overview
1. Initial Meeting (Phone)	Overview/Information Session	Discuss procedure for each session, return/fill out CSAI-2 and KIMS
2. Mental Skills Training Session 1	Goal Setting	Discussion/Individual Time applying goal setting
3. Mindfulness Training Session 1	Mindfulness	Mindfulness training exercise (Breathing Exercise)
4. Mental Skills Training Session 2	Imagery/Visualization	How to practice and apply visualization to running
5. Mental Skills Training Session 3	Positive Self-Talk	Examples/Applying positive self-talk to individual's sport and life

Information Session and Initial Data Collection: (approximately 30 min.)

The information session overviewed the project, introduced the constructs (anxiety and mindfulness), and provided a rationale for why MST is important in athletics. In addition, following this overview, participants were informed that data collection would be voluntary, and participant assent was obtained. Following participant assent, athletes were asked to complete the first set of surveys and a performance measure before the intervention began.

For each of the four workshops, participants were provided information about the construct, and discussion focused on how to implement the MST tool into their running practice. Finally, time was provided during each workshop for the athletes to reflect and discuss how the previous skill was used over the previous week.

Workshop 1: Begin mental skills training, Goal Setting (30 min.

The first workshop focused on goal setting. During the first half of the session, an introduction to goal setting took place, followed by time to create individual goals for the upcoming races and duration of the intervention. During this individual time, participants were given time to ask questions about the topic. At the conclusion of the session, participants were asked to review the goals daily on their own during the week in preparation for the following meeting.

Workshop 2: Mindfulness Training (approximately 30 min.)

The second workshop introduced mindfulness training. Similar to workshop 1, this session was structured to have a learning/teaching period and an application period so the participants could practice what was introduced. At the conclusion of the session, participants were asked to practice mindful breathing on their own during the week in preparation for the following meeting. Before the next workshop athletes completed their performance, measurement and completed the second survey.

Workshop 3: Mental skills training, Imagery/Visualization (approximately 30 min.)

The third workshop focused on imagery/visualization. The first half of the session described how to practice imagery and apply it to running performance. The remainder of the session was devoted to creating and practicing an imagery script. At the conclusion of

the session, participants were reminded to practice what they were taught on their own in preparation for the following meeting.

Workshop 4: Mental skills training, Positive Self-Talk (approximately 30 min.)

The fourth and final workshop introduced positive self-talk. The first part of the session focused on examples of positive self-talk and the session ended with participants applying these phrases to both their running performance and lives outside of sport. Lastly, we focused on tying all of the mental skills together to augment performance and had discussion on how the skills applied to running. Following the workshops, athletes completed the third and final data collection and race effort.

Data Analysis

We assessed how anxiety, mindfulness and performance changed from a pre-workshop level to post-workshop. Descriptive statistics of both the CSAI-2 and KIMS were calculated to investigate each athletes' levels of anxiety (cognitive intensity and direction, and somatic intensity and direction), confidence, and mindfulness at pre, during, and post-intervention. Lastly, to investigate participant-level effects individual athlete narratives were created.

CHAPTER FOUR: RESULTS

Variable-Centered Analyses

Anxiety was measured throughout the study and assessed with scores from cognitive anxiety, somatic anxiety, and self-confidence. Overall, the scores for cognitive and somatic anxiety were below the midpoint of the scale, indicating that the athletes in general had low levels of both types of anxiety. Scores closer to one indicate low anxiety and the average cognitive anxiety score at Time 1 was 2.41 and at Time 3 was 1.33. Somatic anxiety average scores at Time 1 was 1.33 and at Time 3 was 1.94. Self-Confidence increased overall from Time 1 (M = 2.89) to Time 3 (M = 3.17), indicating that the athletes had high levels of self-confidence throughout the program. On average, cognitive anxiety was viewed at Time 1 (M = 2.08) to be more facilitative to performance than Time 3 (M = 1.94), however, somatic anxiety was viewed as slightly more debilitative to performance at Time 1 (M = 1.07) compared to that at Time 3 (M = 1.22). However, it should be noted that athletes viewed both cognitive and somatic anxiety as facilitative at both times. Self-confidence on average was viewed as more facilitative toward performance at Time 3 (M = 2.17) versus Time 1 (M = 2.00)

Throughout the study, mindfulness was measured and assessed on 4 dimensions (Observing, Describing, Acting, and Accepting). Mindfulness scores stayed relatively consistent during the program. However, following the intervention the athletes "describing" mindfulness score increased from Time 1 (M = 3.29) to Time 3 (M = 3.69). In addition, "accepting" mindfulness increased from Time 1 (M = 1.97) to Time 3 (M =

2.38). These changes indicate that the athlete's mindfulness scores were average to slightly above average throughout the program. In addition, "acting" with mindfulness scores stayed the same from Time 1 (M = 3.10) to Time 3 (M = 3.10). Lastly, observing mindfulness scores on average decreased following the intervention at Time 3 (M = 3.75) compared to that at Time 1 (M = 3.83). For all of the subscales, "accepting" mindfulness saw the greatest increase from Time 1 to Time 3 but most of the subscales were high and stayed high throughout the intervention. In terms of comparing the subscales to each other, athletes rated their highest score on "observing" mindfulness. To note, alpha scores were calculated for all subscales and many fell below the acceptable criteria of .70. However, this is not unexpected with the low sample size and additional studies should investigate the internal reliability of these scales.

Table 2 Descriptive statistics for all variables at each time point

Subscale	Mean	SD	Alpha
T1 Cognitive Anxiety	2.41	.89	.82
T1 Somatic Anxiety	1.30	.62	.38
T1 Self Confidence	2.89	.80	.93
T1 Cognitive Anxiety Direction	2.08	.11	.91
T1 Somatic Anxiety Direction	1.07	1.49	.90
T1 Self Confidence Direction	2.00	.92	.98
T1 Observed Mindfulness	3.83	.74	-.36
T1 Describe Mindfulness	3.29	1.88	.40
T1 Acting with Awareness	3.10	1.28	-1.28
Mindfulness			
T1 Accepting Mindfulness	1.97	1.13	.83
T2 Cognitive Anxiety	1.00	NA	NA
T2 Somatic Anxiety	1.33	NA	NA
T2 Self Confidence	1.67	NA	NA
T2 Cognitive Anxiety Direction	0.00	NA	NA
T2 Somatic Anxiety Direction	0.00	NA	NA
T2 Self Confidence Direction	0.00	NA	NA
T2 Observed Mindfulness	4.67	NA	NA
T2 Describe Mindfulness	3.50	NA	NA
T2 Acting with Awareness	3.50	NA	NA
Mindfulness			
T2 Accepting Mindfulness	1.89	NA	NA
T3 Cognitive Anxiety	1.33	.49	.00
T3 Somatic Anxiety	1.94	1.06	.89
T3 Self Confidence	3.17	.86	.18

T3 Cognitive Anxiety Direction	1.94	1.16	- 24.75
T3 Somatic Anxiety Direction	1.22	1.52	.84
T3 Self Confidence Direction	2.17	.71	.00
T3 Observed Mindfulness	3.75	.74	.00
T3 Describe Mindfulness	3.69	1.78	.76
T3 Acting with Awareness Mindfulness	3.10	.72	-1.67
T3 Accepting Mindfulness	2.38	.92	.74

Note: Time 1 had 3 participants, Time 2 had 1 participant, and Time 3 had 2 participants

Participant-Centered Analysis

Individual Athlete Narrative Summaries

Athlete A

Athlete Background

Athlete A was a 22-year-old professional mountain running athlete who ran high school cross-country with a personal best 5k time of 15:45. His reasons for running included “having fun, be competitive, be part of a community, win races!” He is very ambitious with his goals and the intervention revolved around a string of races that were on his radar for the fall season.

Session Overview

Throughout the intervention, athlete A was open with sharing his thoughts and feelings. Where despite his proclaimed lack of fitness he would give his absolute best in every race that he is in, starting with a short 4 mile run through the mountains and post-intervention concluding with a trail marathon. Working through the intervention, athlete

A for the first time placed his goals in writing. He claims this helped him to reflect and focus on the goals more intently rather than obsessing over them all the time. Mindful breathing kept this athlete focused on the present moment and he made a commitment to practice utilizing the skill during easy running sessions where he could focus on his breath as an anchor. Before big races, the athlete liked to visualize himself out on the racecourse, picturing where the race will likely be challenging. Utilizing a familiar trail, he frequently runs, an imagery script was created specifically for the athlete keying in on various senses such as sights, sounds, and smells. Our final session of the intervention was on self-talk and included a back and forth discussion with plenty of examples from previous races on his self-talk. This conversation led to us discussing how his self-talk may change during the race and what could be a productive inner dialogue for him may not be so for someone else. Therefore, we discussed various mantras to use for future races. In our final session on self-talk, I tried to bring all of the skills together. For example, we talked about how imagery and mindful breathing were related and how they impacted his self-talk. Lastly, as like many races this year, his final race was canceled and so we had to adjust his post-intervention performance measure to be an attempt to have the fastest known time up and down one of the local mountains where he lives.

Athlete reflection

At the midpoint reflection, as reported on the reflection scale, athlete A reported practicing the mental skills up to that point (Goal Setting and Mindfulness) “a little of the time”. He also found that this impacted his performance “a little of the time”. Lastly, at the midpoint reflection athlete A utilized the mental skills up to this point in running “a little of the time” as well, noting that he meditated for a few minutes during these two

weeks. For the post intervention reflection, athlete A reported practicing the mental skills (Goal Setting, Mindfulness, Imagery, and Self-Talk) “a little of the time”, indicated he did not think they impacted his performance. Finally, he reflected that he utilized the mental skills training “a little of the time” during running, stating that for his post intervention race he used imagery to picture it going well and practiced thinking positively.

Individual Variable Analysis

Effort and Performance were self-reported by each of the athletes and rated on a scale of 1 to 10 (effort: 1 = little, 10 = full; performance: 1 = poor, 10 = best). Athlete A had high effort and performance ratings throughout the study. Athlete A maintained a high level of effort over Times 1, 2, and 3 (score of eight) (see Figure 1). His self-rated performance increased from seven at Times 1 and 2 to an eight at Time 3 (see Figure 2).

Athlete A’s cognitive anxiety score decreased from Time 1 (23) to at Time 3 (12; see Figure 3). His somatic anxiety scores were maintained from Time 1 to Time 2 (12) with a slight increase at Time 3 (13; see Figure 4). His Self-confidence decreased at Time 1 (23) to Time 2 (15) but jumped to its highest level at Time 3 (31; see Figure 5). In addition to general scores, athletes also reported their perception of anxiety and self-confidence in terms of the direction (facilitative or debilitative to performance) of each construct. Across the study, athlete A reported that cognitive anxiety, somatic anxiety, and self-confidence was facilitative toward performance (see Figure 6,7,8). At Time 1 and Time 3, athlete A reported that cognitive anxiety was facilitative toward performance, with no impact at Time 2 (see Figure 6). Similarly, he interpreted somatic anxiety as facilitative toward performance at Times 1 and 3 with no effect at Time 2 (see

Figure 7). Lastly, he maintained his score of self-confidence at Times 1 and 3 (18) with no influence at Time 2 (see Figure 8).

In terms of mindfulness athlete A exhibited above average levels. For the "observing" mindfulness scale, athlete A increased his score from at Time 1 (3.67) to Time 2 (4.67), however, his score decreased at Time 3 (3.75; see Figure 9). For the "describing" mindfulness scale, athlete A's score at Time 1 (3.88) decreased at Time 3 (3.5; see Figure 10). For the "acting" with mindfulness scale, athlete A increased slightly from Time 1 to Time 2 (3.3 to 3.5), however then decreased to his lowest level at Time 3 (3.0; see Figure 11). Lastly, for the "accepting" mindfulness scale, athlete A increased his score throughout the study from 1.78 to 2 (see Figure 12).

Athlete B

Athlete Background

Athlete B was a 27-year-old recreational level mountain runner who began running to cross-train for hockey during college. Since that time, he has been focusing on being more competitive in his racing. His personal best 5k time is 16:57 and has ambitions of getting a PR whenever he races. Having a background in college-level sports, athlete B was familiar with the mental skills presented during the intervention, however, he had never worked one on one with someone before on these skills. To measure performance for this athlete, a local peak was used to gauge his performance pre-and post-intervention. Similar to athlete A, athlete B had to adjust the timing of his performance measure due to his work schedule. This pushed the intervention 2 weeks behind schedule and the 4 sessions were completed in 6 weeks rather than 4.

Additionally, the athlete did not perform a mid-intervention performance measure because of work responsibilities.

Session Overview

Even though the athlete was not able to engage in a mid-performance race performance, he did complete all aspects of the intervention and there was great dialogue back and forth during each of the sessions. In the goal setting session, the athlete committed to reviewing the goals set forth and he noted that mindful breathing helped during times of high stress stating, “I think that this skill is great for staying focused on the task at hand. It helps keep me in focus if I feel my brain start to wonder or feel like I am getting off the pace.” We created an imagery script for the third session, and he committed to practicing the skills learned as well as reviewing goals for approximately 10 minutes each day. Our final session focused on self-talk where the athlete shared inner dialogue of previous races and, although he is an extremely positive person, we were able to find examples of how negative talk disrupted his performance. A mantra was then identified for him to use “I’ve got this” and imagery along with mindful breathing was tied into the discussion to bring all of the mental skills together in a more complete picture.

Athlete reflection

At the midpoint reflection, athlete B reported practicing the mental skills up to that point (Goal Setting and Mindfulness) “most of the time”. He also reported that the mental skills learned so far impacted his performance “some of the time”. Lastly, at the midpoint reflection athlete B utilized the mental skills up to this point “some of the time”, noting in terms of mindfulness that he “finds it difficult to stay within himself mentally

during easy efforts, finding that it is easier to focus on the task at hand during harder efforts." For the post intervention reflection, athlete B reported practicing the mental skills (Goal Setting, Mindfulness, Imagery, and Self-Talk) "most of the time". Furthermore, he indicated that this practice impacted his performance "some of the time". Finally, he reflected that he utilized the mental skills training "all of the time" during running, stating that he thinks the mental skills training "helps him to stay focused on the task at hand, especially when his mind starts to wonder, and he is getting off pace."

Individual Variable Analysis

Due to his work schedule, athlete B was not able to perform a performance measure at time 2. Athlete B's effort increased from six at Time 1 to eight at Time 3 (see Figure 1). Meanwhile, performance stayed the same at Times 1 and 3 (7; see Figure 2).

Athlete B showed a decrease in Cognitive Anxiety from Time 1 (18) to Time 3 (12) (see Figure 3). His somatic anxiety increased from Time 1 (10) to Time 3 (22) (see Figure 4). Finally, his self-confidence increased from Time 1 (21) to at time 3 (26), indicating a high level of confidence (see Figure 5). Athlete B perceived that cognitive anxiety was more facilitative at Time 3 (17) compared to Time 1 (0) (see Figure 6). However, athlete B viewed somatic anxiety as more debilitative toward performance at Time 3 (14) compared to Time 1 (4) (see Figure 7). Finally, he viewed self-confidence as being more facilitative at Time 3 (21) than at Time 1 (9) (see Figure 8).

In terms of mindfulness, athlete B scored above average on the mindfulness scales during Times 1 and 3. Athlete B's "observing" mindfulness score decreased from Time 1 (3.83) to Time 3 (3.75; see Figure 9). Meanwhile his "describing" mindfulness score showed an increase at Time 1 (3.50) to Time 3 (3.88; see Figure 10). Athlete B increased

his “acting” with mindfulness score at Time 1 (3.0) to Time 3 (3.2; see Figure 11). Finally, Athlete B maintained his score during Times 1 and 3 regarding “accepting” mindfulness (2.78; see Figure 12).

Athlete C

Athlete Background

Athlete C was a 34-year-old former collegiate D1 field hockey player who competed in outdoor track during high school. During her college field hockey career, she ran on her own, and post-college became part of a club cross-country team. Athlete C’s personal best 5k time is 17:05 and she has started in the elite corral at the Boston Marathon where she had a PR of 2:52. To be competitive in races is a priority to athlete C. To note, however, is she was dealing with an Achilles injury that had been flaring up recently. Athlete C was participating in virtual races and these were to be used throughout the intervention as performance measures. However, due to the injury, she only competed in one of these, and that was the pre-intervention performance. This was challenging for the athlete, but she was excited to use the mental skills training in a way that helped her through the injury and recovery process. Being the level of athlete that she is, the mental skills training was familiar to her.

Session overview

The first session on goal setting involved her setting goals for the virtual races this season, with the season culminating in a marathon that she was building toward. In the second session, mindful breathing helped her to relax and stay focused at the moment as she became anxious at the start of races and helped her realize that she starts to breathe heavily just standing at the start of a race. In our third session, athlete C indicated she

creates imagery boards to place her in a mindset of the race or trail she is trying to imagine. These imagery boards are collages of trails she likes to run, or races that she is planning on doing. Therefore, instead of spending time doing an imagery script we talked more in depth regarding the imagery boards she created and the reasons behind choosing certain photos or words. Lastly, we discussed self-talk. Athlete C was extremely open in sharing where her inner dialogue goes when things are not necessarily going the way that she wants which was debilitative to her performance. Because of this negative self-talk, we discussed ways that would be more productive for her self-talk and she created a mantra ("Stay Strong") to help combat the unproductive line of thinking. Unfortunately, due to the injury, athlete C was unable to complete the final performance measure, however, she still committed to devoting 10 minutes daily to the mental skills covered during the intervention.

Athlete reflection

At the midpoint reflection athlete C reported of practicing the mental skills up to that point (Goal Setting and Mindfulness) "most of the time". Reporting that the mental skills learned so far impacted her performance "most of the time". Lastly, at the midpoint reflection athlete C utilized the mental skills up to this point "most of the time". She stated that she was feeling "down" from not being able to perform the hard effort planned due to injury, however she utilized mindful breathing to stay grounded. For the post intervention reflection athlete C reported of practicing the mental skills (Goal Setting, Mindfulness, Imagery, and Self-Talk) "most of the time". Furthermore, she indicated that this impacted her performance "all of the time". She reported that she utilized the mental skills training all of the time during running. Finally, she reflected that she thought the

mental skills training helps her through the injury recovery process. For example, she indicated that “using mental skills and the positive self-talk has really been helping me through this injury.”

Individual Variable Analysis

Athlete C had high levels of effort and performance for the initial assessment prior to starting the intervention of the study (see Figure 1, and 2). Due to an injury, athlete C was not able to perform a performance measure at Time 2 and 3. However, mental skills training reflection during Time 2 and 3 was completed because she still went through each session of the intervention.

Overall, athlete C had high levels of cognitive anxiety (26), somatic anxiety (14), and self-confidence (33) scores at Time 1 (see Figures 3,4,5). Athlete C viewed cognitive anxiety as extremely debilitative toward performance at Time 1 scoring (-15) (see figure 6). She also reported Somatic anxiety as being debilitative toward performance at Time 1 (-3) (see Figure 7). However, she viewed self-confidence as more facilitative toward performance at Time 1 (27) (see Figure 8).

In terms of mindfulness, athlete C demonstrated an above average score during Time 1. Athlete C had high “observing” mindfulness score at Time 1 (4; see Figure 9). In addition, her describing mindfulness score (2.5) was moderate, acting with mindfulness was moderate to high (2.9) and her accepting mindfulness score was low (1.33; see Figure 10, 11, and 12 respectively).

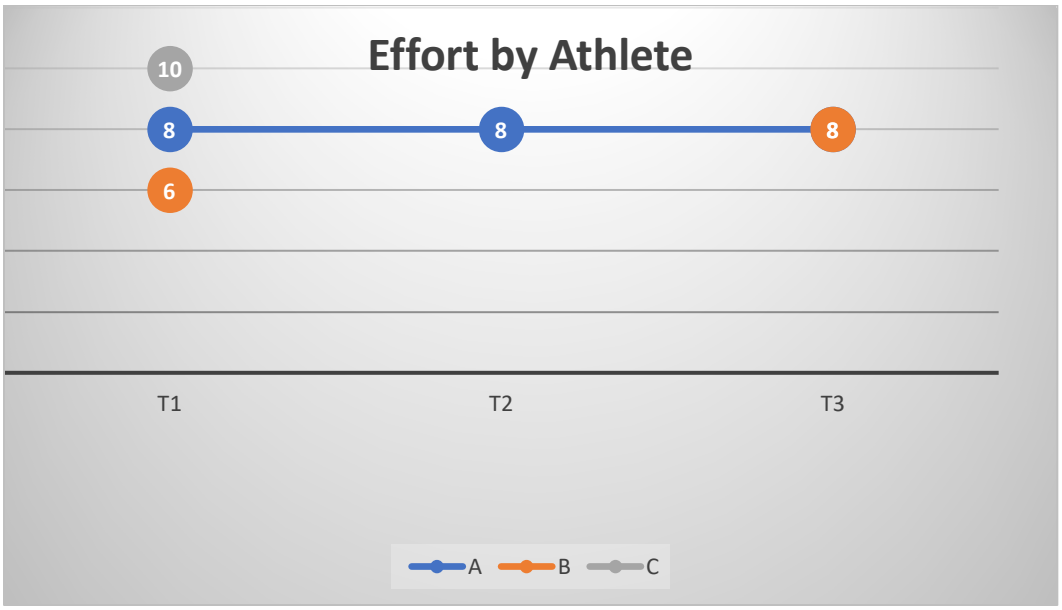

Figure 1. Effort self-ratings throughout the study (scale: 1 = little effort; 10 = full effort)

Overall effort was consistent amongst the participants with all athletes indicating moderate to high levels of effort throughout the program.

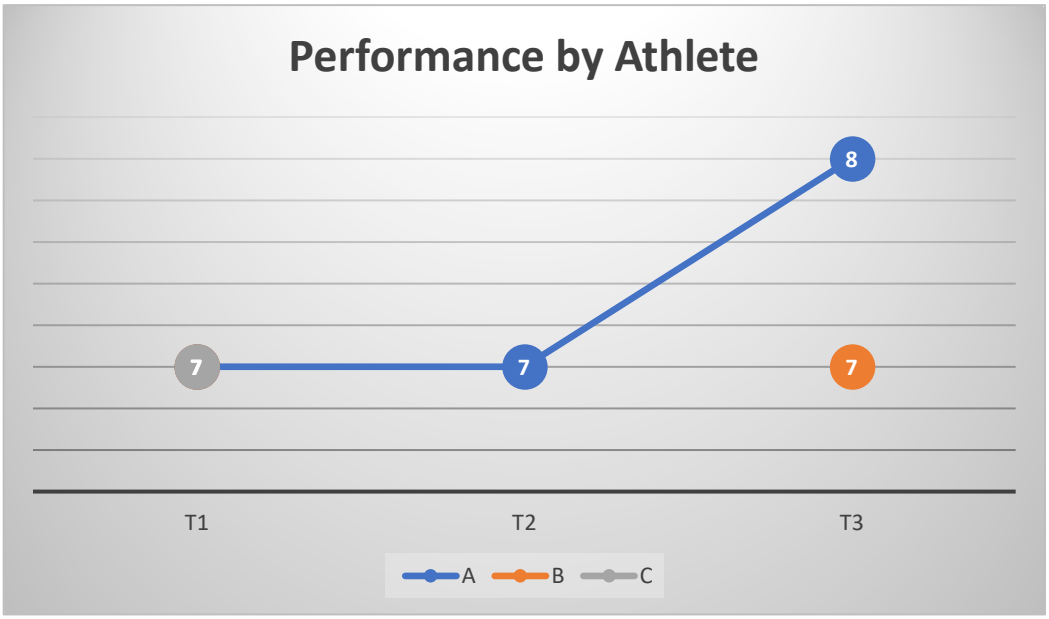

Figure 2. Performance self-ratings throughout the study. (scale: 1 = poor performance, 10 = best performance)

Performance stayed relatively consistent throughout the study with athlete A increasing in performance at time 3 and athlete B maintaining the same performance at both time 1 and Time 3.

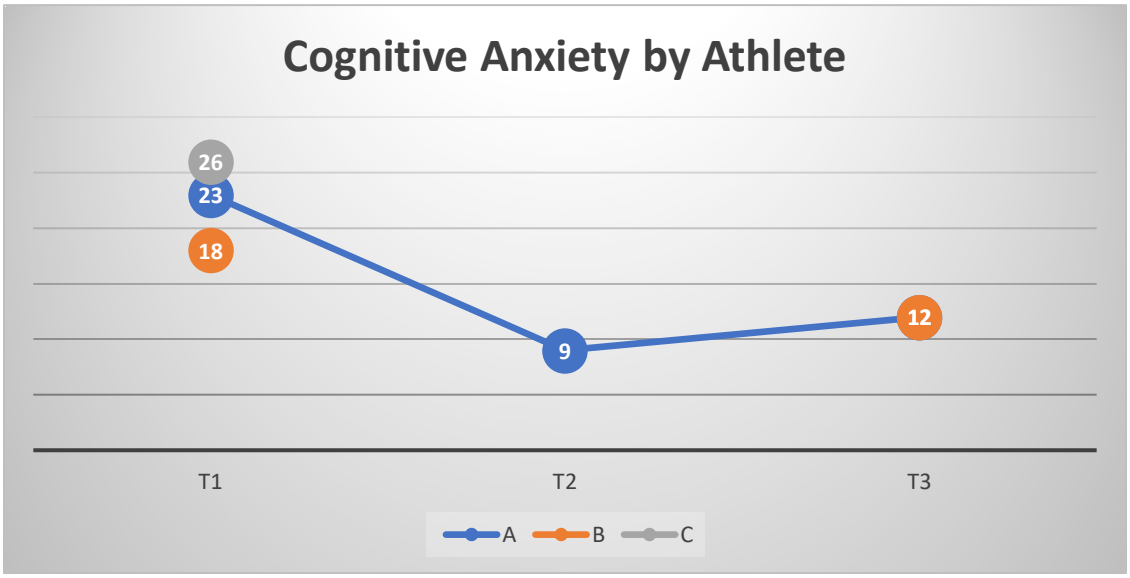

Figure 3. CSAI Cognitive Anxiety scores for all athletes. (scale: 9 = low anxiety, 36 = high anxiety)

Athlete A's cognitive anxiety score decreased during the study; athlete B showed a decrease in cognitive anxiety at Time 3, and athlete C had high anxiety at Time 1.

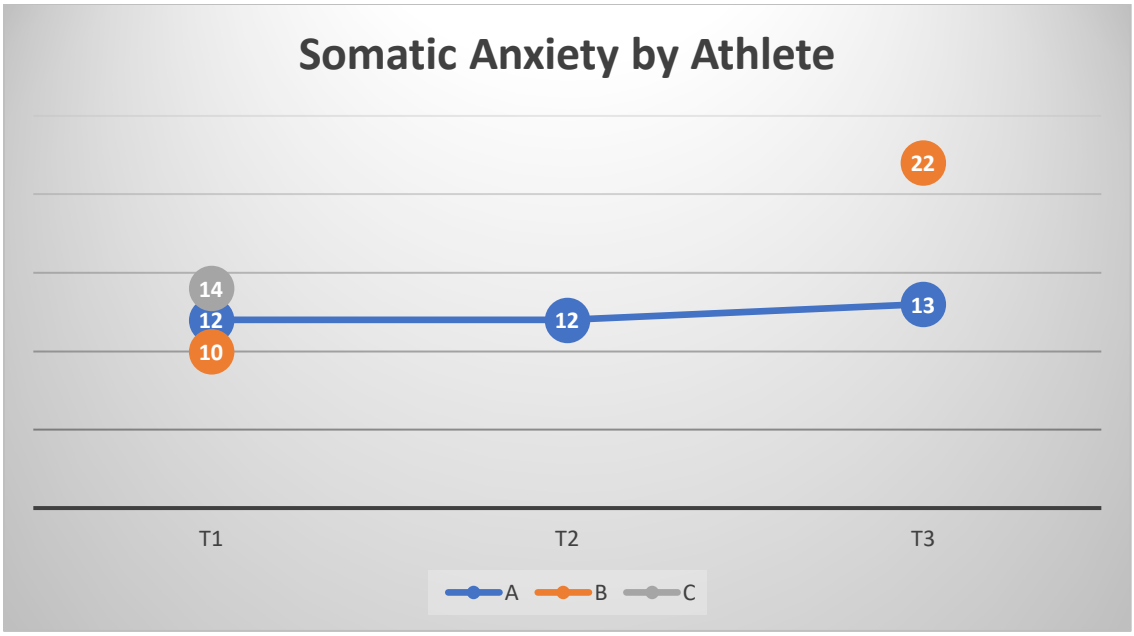

Figure 4. **CSAI Somatic Anxiety scores for all athletes. (scale: 9 = low anxiety, 36 = high anxiety)**

Athlete A's somatic anxiety increased slightly from Time 1 and Time 2 to Time 3, athlete B showed an increase in somatic anxiety from Time 1 to Time 3, and athlete C had moderate somatic anxiety at Time 1.

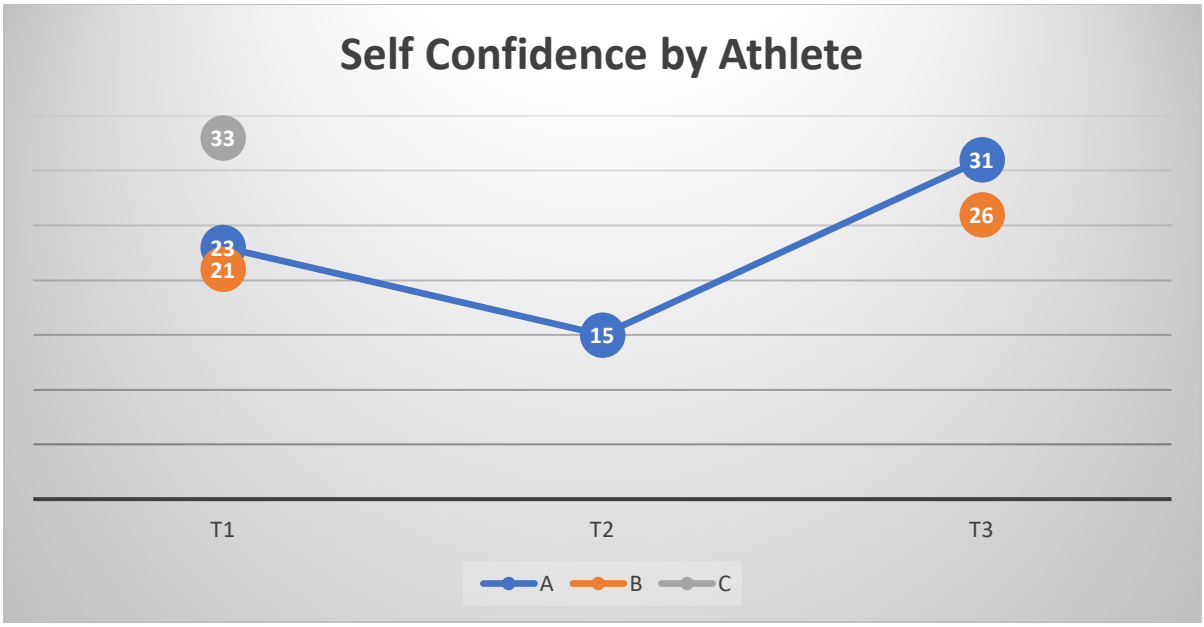

Figure 5. **CSAI Self-Confidence scores for all athletes. (scale: 9 = low self-confidence, 36 = high self-confidence)**

Athlete A showed an increase in self-confidence at Time 3 compared to Time 1, athlete B increased self-confidence from Time 1 to Time 3, and athlete C had very high self-confidence at Time 1.

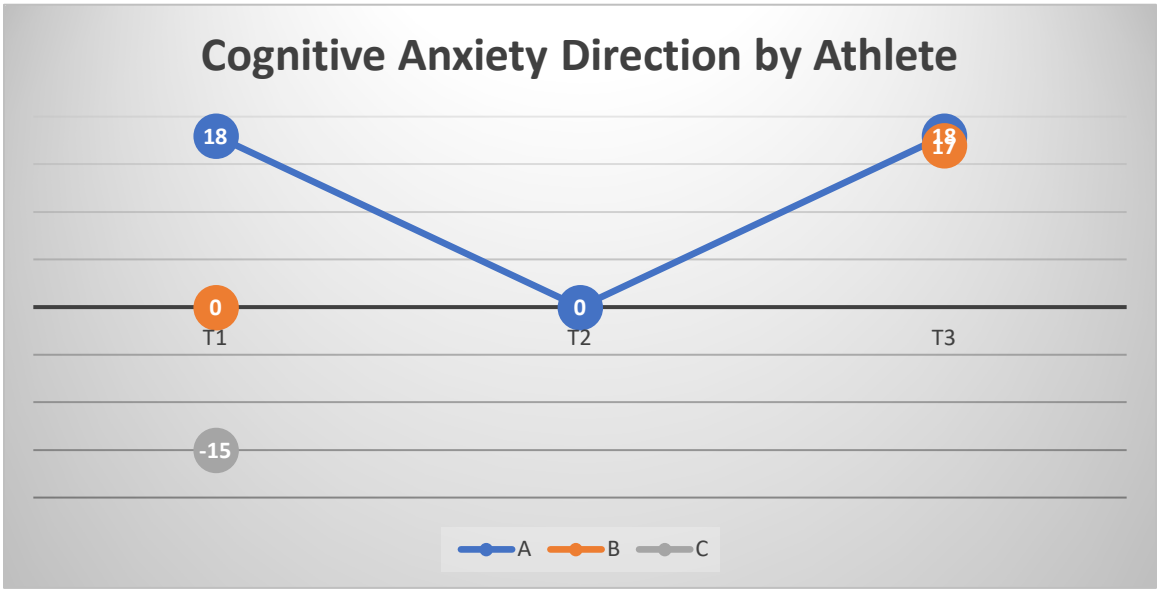

Figure 6. **CSAI Cognitive Anxiety Direction scores for all athletes. (scale: -27= debilitative to performance, 27= facilitative to performance)**

Athlete A interpreted cognitive anxiety as facilitative to performance across the study, athlete B perceived cognitive anxiety to be more facilitative at Time 3 compared to Time 1, and athlete C viewed cognitive anxiety to be debilitative toward performance at Time 1.

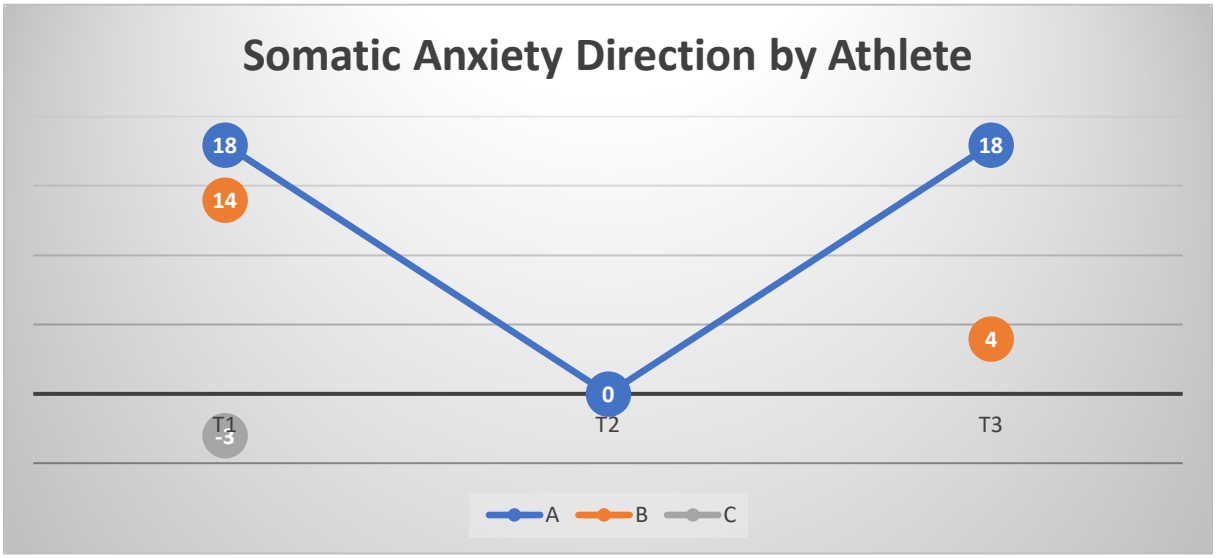

Figure 7. CSAI Somatic Anxiety Direction scores for all athletes. (scale: -27= debilitative to performance, 27= facilitative to performance)

Athlete A viewed somatic anxiety as facilitative throughout the study, athlete B viewed somatic anxiety as more debilitative at Time 3 than that at Time 1, and Athlete C saw somatic anxiety as debilitative at Time 1.

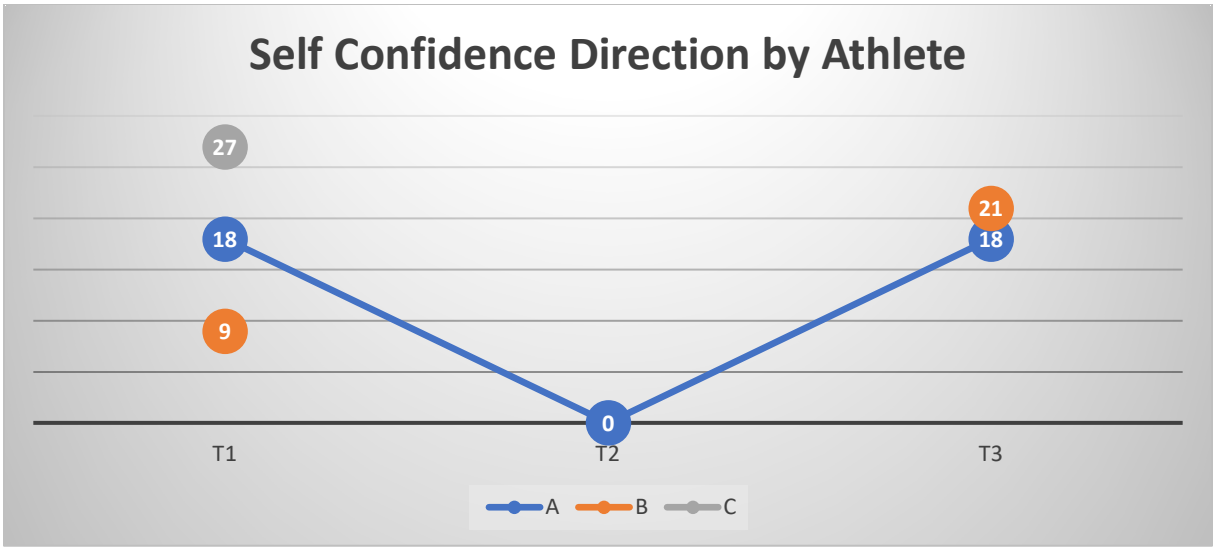

Figure 8. CSAI Self-Confidence Direction scores for all athletes. (scale: -27= debilitative to performance, 27= facilitative to performance)

Athlete A viewed self-confidence as facilitative throughout the study, athlete B viewed self-confidence as more facilitative at Time 3 compared to Time 1, and Athlete C saw self-confidence as facilitative at Time 1.

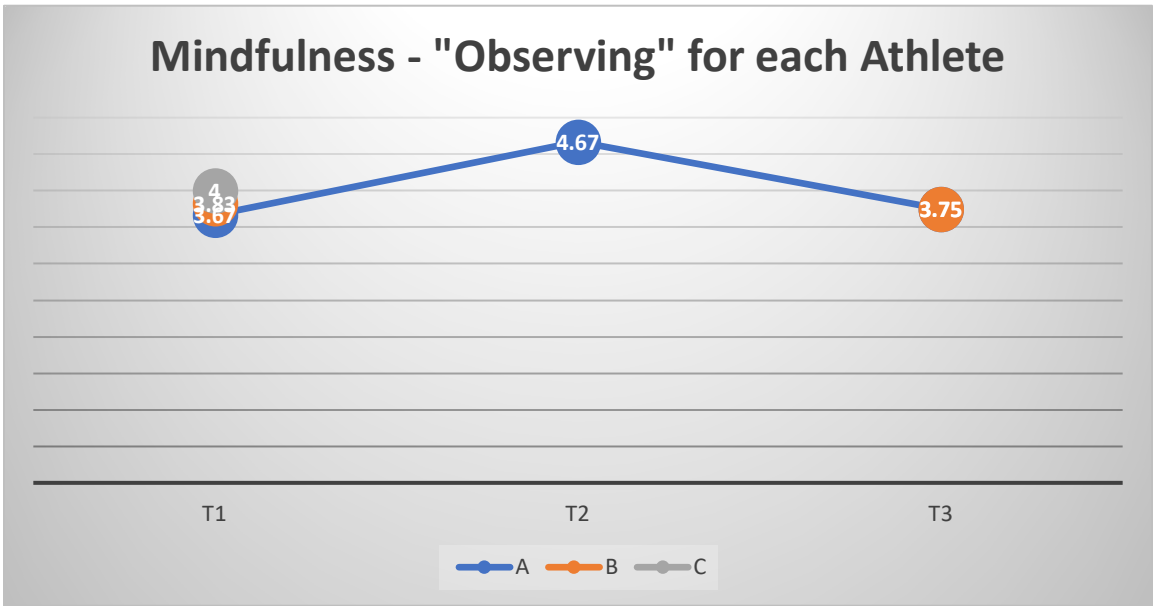

Figure 9. KIMS Observing Mindfulness scores for all athletes. (scale: 1= low mindfulness, 5= high mindfulness)

Overall, “observing” mindfulness scores stayed relatively consistent during the program for all athletes and was relatively high for all athletes.

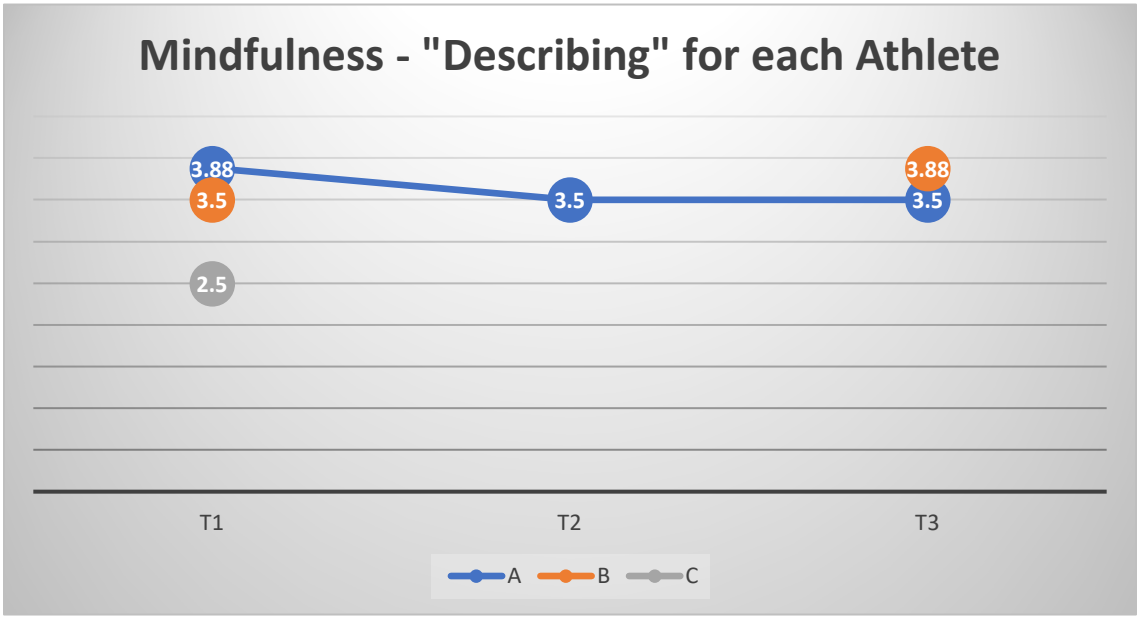

Figure 10. KIMS Describing Mindfulness scores for all athletes. (scale:1= low mindfulness, 5= high mindfulness)

“Describing” mindfulness scores decreased for athlete A from Time 1 to Time 3 and increased from Time 1 to Time 3 for athlete B. Athlete C had moderate levels of describing mindfulness at Time 1.

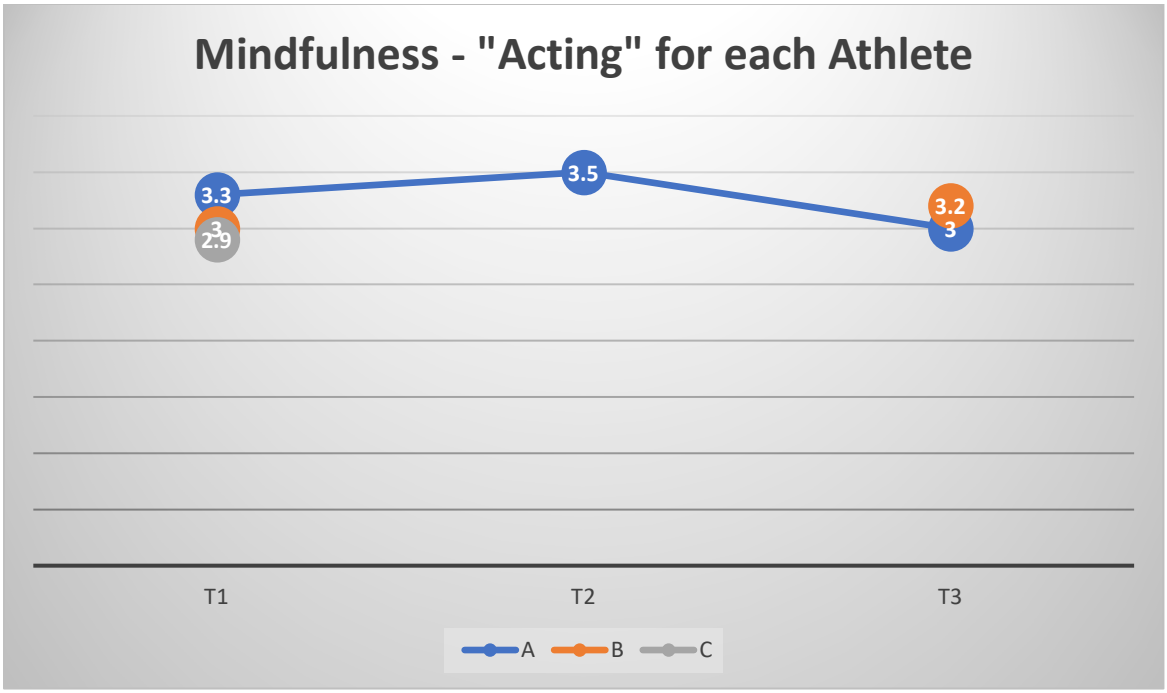

Figure 11. KIMS Acting with awareness Mindfulness scores for all athletes. (scale: 1=low mindfulness, 5=high mindfulness)

Overall, "acting" mindfulness scored stayed relatively consistent during the program for all athletes and all athletes had relatively high scores on the scale.

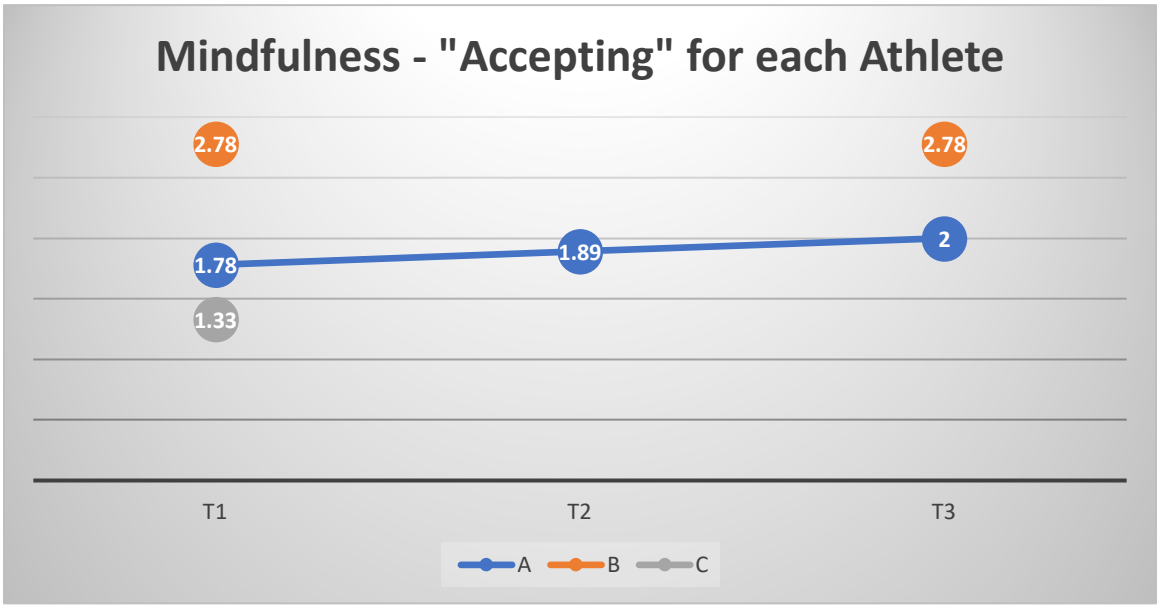

Figure 12. KIMS Accepting Mindfulness scores for all athletes. (scale: 1=low mindfulness, 5=high mindfulness)

"Accepting" mindfulness scores increased from Time 1 to Time 3 for athlete A while athlete B saw no change in their scores. Athlete C had low levels of accepting mindfulness at Time 1.

CHAPTER FIVE: DISCUSSION

The purpose of the current study was to determine if an MST and mindfulness intervention could reduce anxiety and enhance performance in distance runners. With this purpose in mind, we implemented a four-week long MST and mindfulness intervention for adult, non-collegiate, runners. We hypothesized that MST would reduce anxiety in runners and that the athlete's performance would improve throughout the study. Specifically, we believed that following our intervention athletes would have the tools necessary to combat anxiety, increase mindfulness, and improve performance. According to Nieuwenhuys and Oudejans (2012) one way anxiety may influence performance is through the misinterpretation of information. For example, an athlete competing in a race where the outcome is unknown, and they are afraid of how they will perform, may lead to anxiety. Our program specifically targeted this aspect by focusing on three mental skills; goal-setting, imagery, and positive self-talk, and combining those with mindfulness. For our results, athlete A did show an increase in self-reported performance throughout the study, athlete B maintained his performance level during times 1 and 3 (but his effort improved), and athlete C was unable to complete the performance measure during times 2 and 3. Therefore, our results indicate that some self-assessed performance ratings increased during the course of the study but it would be difficult to draw any significant conclusions regarding performance from our small number of participants. Furthermore, performance was measured subjectively amongst the participants. Future interventions might benefit from finding a way to evaluate performance objectively. Due to the

circumstances surrounding our intervention, our athletes were not able to compare objective time measures over time with similar race stressors (e.g., no races were being conducted due to Covid-19). Therefore, we recommend that future interventions try to have all athletes compete on the same course with similar racing conditions throughout the intervention so comparisons can be made from their finishing times, a more objective measure.

In terms of anxiety, the changes in anxiety were dependent on individual athletes. This is not surprising as past studies have shown that each athlete has an individual optimal zone of activation (Hanin, 2000) and performance will deteriorate when an athlete's anxiety falls outside of that optimal zone. As we did not specifically investigate athlete's preferences, these zones should be explored further in the future. In our study specifically, both athlete A and athlete B saw their levels of cognitive anxiety decrease from Time 1 to Time 3. However, athlete A saw a slight increase and athlete B saw a large increase in somatic anxiety from Time 1 to Time 3. In comparison to Somatic anxiety, Cognitive anxiety might have decreased for both athletes due to the nature of our mental skills training program. Specifically, the program addressed cognitive symptoms (e.g., negative thoughts, fear, lack of confidence, images of failure and thoughts of avoiding participation) much more compared to somatic symptoms (e.g., sweaty hands and knots in the stomach). The Inverted U model can help explain stating that, as an athlete's level of physiological arousal increases, their performance increases up to a certain point. At this point, the midpoint of arousal, performance peaks. Therefore, somatic anxiety may not have been problematic because our athletes saw a decrease in their cognitive anxiety levels. This is especially important as Hardy's (1990) catastrophe

model explained that a catastrophe, or significant decrease of performance, was most likely with high levels of both physiological and cognitive anxiety. Therefore, if athletes saw a decrease in cognitive anxiety the increase in somatic anxiety, although minor, most likely would not have resulted in large decreases of performance. Our intervention focused more on the cognitive aspects of anxiety because past studies have shown that elite and advanced athletes benefit from an MST program focusing on cognitive anxiety featuring imagery, positive self-talk, and goal setting (Bertollo et al., 2009). Future interventions might benefit from focusing on both cognitive and somatic anxiety; however, the changes in cognitive anxiety were promising especially in relation to the negative effects hypothesized by catastrophe theory.

An additional factor that may influence performance is the interpretation of anxiety in terms of whether it is seen as either facilitative or debilitative. Our study indicated that athletes had different interpretations of the two types of anxiety. At Time 1, athlete B viewed cognitive anxiety as being somewhat debilitative toward performance, however at Time 3 he perceived cognitive anxiety as being facilitative to performance. Athlete A on the other hand maintained his positive view of cognitive anxiety at Time 1 and 3. However, he viewed it as unrelated to performance at Time 2. A possible explanation of this difference of views is that MST gave athletes more awareness to skills that can be used to aid performance in terms of cognitive anxiety. Specifically, our intervention focused on teaching particular skills that combat cognitive anxiety more effectively (e.g., goal setting, imagery, visualization). For example, athlete B wrestled with negative thoughts and learning how to turn those negative thoughts into productive self-talk which might have led him to view his ability to handle cognitive anxiety as more

developed, and thus more facilitative, post-intervention. Past interventions have shown that anxiety can negatively impact an athlete's ability to perform to the level they are capable. In fact, anxiety may be one of the most prominent factors that distinguishes between competitive and non-competitive athletes (Wolframm & Micklewright, 2011). Past studies have shown that elite and advanced athletes benefit from an MST program (Bertollo et al., 2009). The mental skills utilized in previous studies included imagery, goal setting, and positive self-talk (Wolframm & Micklewright, 2011) which paralleled our own intervention, likely creating a change in our athletes. Finally, our study found that athlete C, in particular, viewed somatic and cognitive anxiety as debilitative at the start of the intervention. This perception might have changed over the course of the intervention, however, due to injury, the athlete could not finish the performance assessments which would have indicated if a change did occur. Future studies should keep in mind individual differences between participants and focus a section of the intervention on how this anxiety can be perceived that, ultimately, influences performance.

Past research has shown there are shortcomings from an MST only intervention. For instance, goal setting in some cases was found to hinder performance (Daw & Burton, 1994; Holm, et al., 1996). This shortcoming can be addressed by implementing both mindfulness and MST into a single program. Where MST teaches athletes to set goals, work on imagery, and practice self-talk, mindfulness teaches an athlete to stay in the present moment, focusing on the athletic event as it happens. Therefore, because both typical MST and mindfulness could work together to help athletes cope with stress, the current study integrated both with athlete's reporting their mindfulness changed

throughout the study. Specifically, athlete A showed an increase in "observing" and "accepting" mindfulness, whereas athlete B increased his "describing" and "acting" mindful scores across Time 1 and Time 3. The change in mindfulness for athlete A and athlete B from Time 1 to Time 3 might have been due to the mindful breathing exercise conducted during the intervention as well as in practice times when athletes were asked to integrate mindful breathing into their running which may have made them more aware of mindfulness as a whole. In past studies, increased mindfulness was thought to allow athletes to better accept their anxiety which allowed them to focus more fully on their performance. In our intervention, we saw athlete A's performance and athlete B's effort increase which might be a result of the increased mindfulness. Therefore, future interventions would benefit from integrating additional attention on implementing mindfulness into an existing mental skills program to enhance an athlete's overall sport performance.

Overall, the changes in mindfulness for participants were minor, but this is not unexpected given the length of the intervention. Specifically, our intervention was only 4-weeks long and only one workshop session was devoted to mindfulness. The duration of the intervention may play a role in how effective an MST and Mindfulness program may be for athletes. For instance, Wolframm and Micklewright (2011) conducted a six-week MST intervention that showed performers who were better equipped at using mental skills to help facilitate the emotional arousal experienced from anxiety were able to manage anxiety and perform at their highest level. Another study on Mindfulness consisted of 4 sessions in a 4-week intervention (De Petrillo et al., 2009). Combining both MST and Mindfulness training in a 4-week long workshop may have been too much

content for a short time frame. Future studies should aim to extend the duration of the intervention for both MST and Mindfulness past 4-weeks. Increasing the duration of the intervention would ensure that the athletes are allowed sufficient time to implement the MST and Mindfulness training into their physical training and provide additional time for developing the skills. Additionally, this added time frame would allow for athletes who may have an injury or scheduling issue to still complete the study as planned. Specifically, we are suggesting that the sections that integrate mindfulness training be longer. In this study, mindful breathing was introduced, however there are additional aspects of mindfulness that could be covered time permitting.

Elite-level athletes routinely practice mental skills training on their own in the time leading up to their performance. Of the three athletes who participated in this study, two of them played sports at the college level, and the other athlete was a professional level mountain runner. Past literature shows that elite-level athletes routinely participate in preparation strategies that include imagery, positive self-talk, and goal setting (Bertollo et al., 2009). These athletes might have been exposed to a similar program or had experience with the skills that might have made them more open to the program than other novice athletes. Further, self-selection bias may have been an additional limiting factor. Specifically, athletes in the study started off with low anxiety scores and above average mindfulness scores which might indicate that they were different from athletes who might not have volunteered for such a program. Therefore, results should be interpreted with these factors in terms of participants in mind. Within our study, athletes were asked to practice MST during the week between sessions and report their actual use of the skill. For example, athlete A reported practicing the mental skills “some of the

time" and used them during running "some of the time", meanwhile athlete B reported practicing the mental skills "most of the time" and reported utilizing the skills during running "all of the time". These ratings indicate that participants vary in their utilization of skills both between sessions and during running. Although we had a reflection questionnaire and a reminder to practice the MST, future studies might want to focus on something else to hold participants accountable for utilizing the MST during the intervention such as a daily log of their MST and Mindfulness. If athletes only use of the skill is during one-on-one sessions, it is unlikely to have much of a benefit to the athlete's overall performance. Further, there was some lack of clarification on what was considered "some of the time" or "all of the time" on the scale and this ambiguity may have created more subjectivity to interpretation than what was intended. Therefore, future research may benefit from a clear definition on the utilization of MST between sessions.

Although our study consisted of a small sample size, there were benefits to working with only a few athletes. Mental skills training that works for one athlete may not work for another. For example, one athlete in a high stakes race may have difficulty controlling their breathing on the start line, and another may find themselves distracted during the race. Therefore, learning skills that are specifically tailored for that athlete's ability to cope with anxiety enhances their opportunity to perform to their full capability (Wolframm & Micklewright, 2011). Our study could tailor the individual session for each athlete, something not mentioned in previous studies. For instance, modifying the imagery session to focus on the imagery collage that athlete C had created for one of her goals would not have been possible in a more generic intervention program. Although changing sessions to fit the athlete works well with individuals, team sports would not be

able to have such freedom because all athletes would need to be included in the group sessions. Another benefit of having an individual vs team approach is that some athletes can view anxiety as being either facilitative or debilitative differently and an individual approach allows for further exploring these topics. Therefore, tailoring the MST or mindfulness session around an individual athlete would benefit them and their ability to combat performance anxiety.

Even though our study was designed to minimize performance anxiety to enhance performance, one athlete specifically mentioned using the skills to cope with her injury. As Arvinen-Barrow et al., (2015) stated, mental skills training is important for the sports injury process "as a behavioral response potentially influencing both the cognitive appraisals and emotional response to the injury situation (p. 189)." In describing her use, athlete C said, "using mental skills and the positive self-talk has really been helping me through this injury." Furthermore, as the injury progressed, athlete C began "feeling down" and utilized mindful breathing to help feel "grounded". These skills were not specifically taught for this use but demonstrates that the transfer of skills to novel situations like injury is possible. However, most athletes underutilize MST for injury rehab. In fact, only 27% of the athletes reported utilizing MST during injury rehabilitation (Arvinen-Barrow et al., 2015). Future studies would do well to focus on this gap of athletes not utilizing MST for injury rehab as it could be a resource for struggling athletes.

Overall, self-assessed performance ratings increased during the intervention. Further, cognitive anxiety levels decreased and were viewed as more facilitative toward performance at the time of the final survey for both athletes A and B. In terms of

mindfulness, overall mindfulness changes were minor and dependent on the individual athlete. With these changes, a program that integrates both MST and Mindfulness into one intervention seems to have benefitted athletes. However, because mindfulness only changed slightly, future studies should include additional mindfulness sessions in their overall program. The lack of mindfulness training in our study is a limiting factor that might have contributed to the minor change of mindfulness amongst the participants. A major takeaway from our study is that athletes are going to respond differently to MST and Mindfulness training, and future studies should consider implementing a program that is tailored toward an individual athlete instead of a “one size fits all” approach. Lastly, we suggest implementing more accountability for practicing the mental skills training between sessions to ensure athletes are utilizing the skills outside of the one-on-one sessions.

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APPENDIX A

Workshop Outlines (Goal Setting, Mindfulness, Imagery, Positive Self-Talk)

Session 1: Goal Setting

Opening Questions:

Welcome athlete and start off by asking a few questions:

What are your experiences with Goal Setting? Was it helpful? When was it not?

Have you implemented Goals before? What did that look like? (Posted, written down, etc)

Keep an open discussion going

Simple Definition of a Goal according to Merriam-Webster

"The end toward which effort is directed" In other words focus on accomplishing a standard set forth.

Go through briefly to help give a background on goal setting and sport

According to Gould (2001), goal setting can facilitate improvement in performance by following a set of guidelines. First, goals must be specific and measurable with a timeline in mind. Second, goals shall be challenging yet attainable. Next, short and long-term goals must be taken into consideration. A focus should involve both performance and process improvements, and the outcomes along with those. Additionally, goals should

involve practice and competition settings. Furthermore, the positive wording of goals is important. Included in the process is the goal achievement strategy, and support systems, both are recommended to help achieve set goals. Writing down and evaluating the goals is vital to achieving such.

Goal Setting Benefits

Improves Performance

Decreases Anxiety

Improves Confidence

Provides Purpose

First, goals shall be…

Specific- Precise in the goal, for example, improve run time up Green Mountain by 30 seconds

Measurable- Ability to track the goal, for example, what are previous best times over the course

Action-**O**riented- Set goals that focus on specifics of a course, for example improving running fast on technical downhill terrain

Realistic- Challenging yet attainable, seconds vs minutes over a course for example

Timed- Have a deadline in mind that will motivate you and give you ample time to work towards keeping you focused on achieving your goal.

Ask the athlete to critique these goals - Improve my uphill running (lacking specific, measurable, and timed) What would be a better way of writing this goal? How about this one? Improve my uphill running by completing a month focused on vertical elevation gain during October and accumulating 100K feet of vertical during that timeframe.

There are 3 types of goals we will discuss today, outcome, performance, and process goals.

Outcome goals- focus on results, for example placing on the podium.

Performance goals- focus on improvements relative to one's performance, for example improving your time on a trail segment, if it's 20 minutes now, shoot for 19 minutes.

Process goals- identify the procedures one must engage in order to perform well, for example, the training involved to achieve the outcome goal may involve 2 race intensity workouts per week.

The Why

Example of my own goals to help facilitate further discussion

Have fastest time on Strava up Cervidae (main approach) = **Outcome goal**

The How

Improve my previous best time by 30 seconds before October 15th = **Performance Goal,** Intense workouts on steep terrain 2x per week = **Process Goal**

Activity to Close Meeting

Goals give you purpose in something to strive for. Keeping in mind specific and measurable, challenging and attainable, short and long-term, be both process and outcome-oriented, include practice and race-specific scenarios, worded in a positive tone, and enable an ability to evaluate the goals along the way.

Set three to five goals about running, and other aspects of life. Follow the template provided if you would like and place somewhere for the goals to be viewed daily.

Session 2: Mindfulness

Beginning:

Start by welcoming athlete and asking how they have been doing with reviewing their goals. Next, asking about their experience with mindfulness.

What has been your experience with mindfulness? Did someone facilitate the session? What did you learn?

Introduction to Mindfulness

To be a great athlete one must train the mind additionally to the body. Today will be centered on mindfulness as a way for you as an athlete to focus primarily on the present moment and reduce the hindrance of performance from anxiety.

Mindfulness is staying in the present moment while being aware of yourself and surroundings in a nonjudgmental fashion (Kabat-Zinn, 1994).

*Highlight- Purpose, Present, and Non-judgmental

Further questions for discussion

How often do you find yourself distracted from what you're supposed to be doing?

Do you find it hard to even notice that you're pulled off task? (cell phones, social media, negative thoughts)

What's something that you can do fully focused and present?

What types of things are you doing when you noticed you get easily distracted?

How would improved attention help you there?

*Make the connection to mindfulness here, a focused attention/breath practice will help you learn to sustain attention over time, apply this specifically to running, perhaps a scenario where I have done this in a race or during a hard workout etc. Focusing on breathing rate and stride rate

Practice:

Now I will lead you through an ~10min-mindful breathing exercise to train the aspect of being present in a non-judgmental way.

I ask that you focus on your breath, and if you notice your mind wandering bring it back to the breath this will be your anchor to focus on

We begin this 10-minute focused-attention practice by bringing ourselves into a comfortable seated posture . . .

**

the body upright and stable . . . as you breathe

**

aware of your posture, as you lower or close your eyes, whichever you prefer

***

and bring your attention to your body sitting in the chair

******

noticing where your body makes contact with the chair . . .

****

where your back makes contact with the back of the chair

****

Noticing whatever sensations may be arising in the hands and fingers, in contact with each other, or your lap or resting by your side

******

aware of your feet making contact with the ground, or your shoes

******

aware of the body, moving with the breath

****

feeling the expansion of the chest and rib cage on the inbreath . . . and noticing how it softens and recedes on the outbreath

**** breathing in

**** and breathing out

****

and from time to time, when you notice the arising of thoughts as you probably already have, and will no doubt experience again and again . . . whenever you notice the mind getting distracted with thoughts, memories, images . . . in that moment of mindful awareness you've woken up

****

breathing in

****

and breathing out

****

noticing the breath flowing through the body

****

coming to sense the body as grounded, anchored, here, in this moment

**

as the breath flows through the body . . . and the body moves with the breath . . .

** ******

returning to the breath when you notice the mind moves away from it

****

Left on its own the mind can wander in a thousand different directions

** it can get caught up in memories of the past. . . things that happened just a few moments ago or years ago . . . or wrapped up in worries about a future . . . that may never come to pass

** this is a practice of bringing oneself back, again and again . . . of bringing oneself more firmly into the present . . . into this moment

****

breathing in you are aware of your breathing in . . . breathing out you are aware of breathing out.

****

in

*****

and out

*****

in

*****

Out

****

gently following the breath . . . this breath

********** not trying to control the breath in any way

**

just observing the breath that's happening right now

****

it's occurring quite naturally all on its own

***

it's as if you're being breathed,

****

and you’re observing

** allowing

****

and feeling the breath, as it moves through the body

****

when you find yourself lost in thought creating a story or an image in the mind

remember, the breath

**

return again and again to the breath,

****

allowing this moment to be just as it is

**

and in doing, so seeing more clearly this moment as it truly is

********** and . . . when you're ready . . . in the next moment or two . . .

with an awareness of doing so . . . lifting the gaze . . . opening the eyes

Reflection:

To conclude the session, ask questions to lead a discussion of their experience, which can be used to highlight the concepts taught…..

What did you notice during that practice?

Were you aware of your mind wandering?

Where did it go when you noticed you were not focused on your breath (past/future)? •

Was it easy to bring it back to where you wanted it?

Were you aware of any body sensations?

How did you feel when your mind wandered?

This mindfulness session utilized a simple everyday behavior (Breathing) to help us become more aware of our thoughts and habits. Increasing our mindfulness can be applied to training for and competing in various activities such as running!

Session 3: Imagery

Beginning

Start by welcoming athlete and asking how they have been doing with reviewing their goals, and if they have practiced mindful breathing. Next, ask about their experience with imagery.

What do you know about imagery?

Introduction to Imagery

Imagery enables us to utilize all of our senses to create and/or recreate an experience in our mind (Vealey & Greenleaf, 2001). Allowing athletes to essentially program the mind in addition to the body in order to reach optimal performance levels in practice and racing. Imagery has been shown to decrease anxiety while increasing self-confidence and motivation (Vealey & Greenleaf, 2001). Athletes are encouraged to make the image as vivid as possible, through incorporating as many senses as they can. Imagery can be both internal and external perspectives. **Internal** perspective involves seeing oneself from behind our own eyes, the image would look like it normally does while experiencing it in real time. **External** perspective would include seeing oneself from the outside, as if watching oneself perform in a movie. According to Vealey and Greenleaf (2001), athletes who have better imagery ability initially benefit to larger degrees, however, all athletes can improve the quality of their imagery with time and practice.

You are starting your run up Bear Canyon; the dirt beneath your feet makes a crunching sound, the smells of fall fill the air ********The air is crisp ***** the sound of the creek brings focus to the moment and you capture the sight of birds as they flutter amongst the trees******** with leaves of gold and red which gently blow in the breeze.***** Big puffy clouds fill the sky. *****The climb begins to steepen; legs are starting to work hard now*** and you notice your breath rate increasing *****focusing on the breath you stay in the moment. ***Leaving you feeling free and thankful for this opportunity you run.

Now I will lead you through a practice of imagery focusing on internal and external perspectives.

We are going to do this by building a script that we can work through.

Vividness (Internal)

Place yourself in a familiar place where you usually train for your goal event, a particular trail, loop on the greenbelt, the track to do specific workouts.

What does it smell like?

What are the colors, shapes and forms that you see?

What sounds do you hear?

How do you feel?

Are your hands getting sweaty, is the heart rate rising

Now imagine yourself in the same setting, but this time there are many spectators there. It is race day. Imagine yourself getting ready to perform. You are now on the start line, surrounded by other participants. Try to experience this image from inside your body. See the spectators, your family, friends and other competitors. Try to hear the sounds of the noisy crowd, talking, your friends and family yelling encouragement, and the particular sounds that you associate with the start of a race. Re-create the feelings of nervous anticipation and excitement that you have before competing.

Not stressful at

Self-Awareness (External)

Think back and choose a past performance in which you performed very well. Using all your senses, re-create that situation in your mind. See yourself as you were succeeding, hear the sounds involved, feel your body as you performed the movements, and re-experience the positive emotions. Perhaps it was effortless, and the perceived exertion was low for the intensity and pace you were running. Try to pick out the characteristics that made you perform so well (for example intense concentration, feelings of confidence, optimal arousal, more relaxed, running free). After identifying these characteristics, try to determine why they were present in this situation. Think about the things you did in preparation for this particular race or workout.

Surface- stress, race, bailing, running not perfect but fine, don't give a shit,

What are some things that may have caused this great performance?

End with- Now you have a script to go through at anytime to visualize your performance. I ask that you go through this along with reviewing goals and mindful breathing.

Controllability (Internal)

Choose a running skill that you want to improve on. (Perhaps its descending technical terrain, or climbing steep slopes with poor footing, or closing the final miles of a marathon) Begin practicing the skill over and over. See and feel yourself doing this from inside your body. If you make a mistake or perform the skill incorrectly, stop the image and repeat it, attempting to perform perfectly every time. Re-create past experiences in which you have not performed the skill well. Take careful notice of what you can improve on. Now imagine yourself performing the skill with those improvements. Focus on how your body feels as you go through different points of the run performing the skill correctly. See in your mind an image of the ideal performance.

End the meeting with (External)

Imagine in your mind what you do well. If you're a great climber, visualize yourself being a climber. If you are a great downhiller, visualize yourself crushing the downhill. If you're a great closer than visualize yourself passing others to finish the race. Visualize the special skill that separates you from the rest-the skills that make you better because you possess them.

Share template for the athlete to build their own imagery practice from.

Session 4: Positive Self-Talk

Beginning:

Start by welcoming athlete and asking how they have been doing with reviewing their goals. Next, asking about their experience with mindfulness, imagery, what's working and not?

Do you notice an inner dialogue? What is it like when you are running? How about racing?

Introduction to Positive Self-Talk

Self-talk is simply the internal dialogue we have with ourselves. Positive self-talk has the potential to enhance performance through control of emotions. There are a variety of ways that runners can utilize self-talk to boost their performance such as, skill acquisition, correcting poor habits, performance preparation, focus, creating the proper mood for performance, and for boosting confidence (Zinsser, Bunker, & Williams, 2001). Focusing primarily on the concept that self-talk should be kept short and simple, focus on what the athlete is trying to do, focus on the present, and recognize current self-talk habits turning negative statements positive (Zissner et al., 2001).

How often do you notice your self-talk? Really highlight this. When? Where? Doing what exactly? What part of the race? During workouts? When you are tired? Etc.

Would you talk to a friend or loved one that way?

Activity with Athlete

Athletes will be asked to write down their negative thoughts that they have had during training and racing. (For example, I'm not good enough, I didn't train hard enough, I can't win) Perhaps even encourage future athletes to keep a record of their thoughts for the day.

Next, the athlete will be asked to come up with ways to change the negative tone of their self-talk into positives. (For example, I am good, I have trained to the best of my ability, I have won before) Think about "Is the way I'm talking to myself helping me perform?" This way they don't have to think "I'm in last place - I'm awesome" but rather "I'm in last place, need to push past tightness and get back in the race".

Lastly the athlete will be asked to write down a cue word or mantra they could use to identify the thoughts thus prompting the need to change into a positive tone. (For example, I've got this, Focus, Calm)

Utilize imagery in practice using the mantra or cue word. (For example, I picture myself deep in a race on a long climb and repeating “I’m made for this”)

APPENDIX B

Competitive State Anxiety Inventory 2 (CSAI-2)

The following are several statements that performers use to describe their feelings before a performance or competition. Next please rate the extent to which you experience as being either positive or negative to your performance. Read each statement and circle the appropriate number to indicate how you feel right now—at this moment. There are no right or wrong answers. Do not spend too much time on any one statement.

		Not at all	Somewhat	Moderately So	Very Much So	Very Negative			No effect	Very Positive		
	Example Question	1	**2**	3	4	-3	-2	-1	0	**1**	2	3
1	I am concerned about this performance.	1	2	3	4	-3	-2	-1	0	1	2	3
2	I feel nervous.	1	2	3	4	-3	-2	-1	0	1	2	3
3	I feel at ease.	1	2	3	4	-3	-2	-1	0	1	2	3
4	I have self-doubts.	1	2	3	4	-3	-2	-1	0	1	2	3
5	I feel jittery.	1	2	3	4	-3	-2	-1	0	1	2	3
6	I feel comfortable.	1	2	3	4	-3	-2	-1	0	1	2	3
7	I am concerned I may not do as well in this performance as I could.	1	2	3	4	-3	-2	-1	0	1	2	3
8	My body feels tense.	1	2	3	4	-3	-2	-1	0	1	2	3
9	I feel self-confident.	1	2	3	4	-3	-2	-1	0	1	2	3
10	I am concerned about losing or doing poorly.	1	2	3	4	-3	-2	-1	0	1	2	3
11	I feel tense in my stomach.	1	2	3	4	-3	-2	-1	0	1	2	3
12	I fell secure.	1	2	3	4	-3	-2	-1	0	1	2	3

13	I am worried about performing well.	1	2	3	4	-3	-2	-1	0	1	2	3
14	My body feels relaxed.	1	2	3	4	-3	-2	-1	0	1	2	3
15	I'm confident I can meet this challenge.	1	2	3	4	-3	-2	-1	0	1	2	3
16	I'm concerned about performing poorly.	1	2	3	4	-3	-2	-1	0	1	2	3
17	My heart is racing.	1	2	3	4	-3	-2	-1	0	1	2	3
18	I'm confident about performing well.	1	2	3	4	-3	-2	-1	0	1	2	3
19	I'm worried about reaching my goal.	1	2	3	4	-3	-2	-1	0	1	2	3
20	I feel my stomach sinking.	1	2	3	4	-3	-2	-1	0	1	2	3
21	I fell mentally relaxed.	1	2	3	4	-3	-2	-1	0	1	2	3
22	I'm concerned that others will be disappointed with my performance.	1	2	3	4	-3	-2	-1	0	1	2	3
23	My hands are clammy.	1	2	3	4	-3	-2	-1	0	1	2	3
24	I'm confident because I mentally picture myself reaching my goal.	1	2	3	4	-3	-2	-1	0	1	2	3
25	I'm concerned I won't be able to focus.	1	2	3	4	-3	-2	-1	0	1	2	3
26	My body feels tight.	1	2	3	4	-3	-2	-1	0	1	2	3

27	I'm confident of coming through under pressure.	1	2	3	4	-3	-2	-1	0	1	2	3

APPENDIX C

Kentucky Inventory of Mindfulness Skills (KIMS)

Read each statement and fill in the circle that appropriately indicates the best description of your own opinion of what is generally true for you.

		Never	Almost Never	Sometimes	Fairly Often	Very Often
	Example Question	O	O	O	O	O
1	I notice changes in my body, such as whether my breathing slows down or speeds up.	O	O	O	O	O
2	I'm good at finding the words to describe my feelings.	O	O	O	O	O
3	When I do things, my mind wanders off and I'm easily distracted.	O	O	O	O	O
4	I criticize myself for having irrational or inappropriate emotions.	O	O	O	O	O
5	I pay attention to whether my muscles are tense or relaxed.	O	O	O	O	O
6	I can easily put my beliefs, opinions, and expectations into words.	O	O	O	O	O
7	When I'm doing something, I'm only focused on what I'm doing, nothing else.	O	O	O	O	O
8	I tend to evaluate whether my perceptions are right or wrong.	O	O	O	O	O
9	When I'm walking, I deliberately notice the sensations of my body moving.	O	O	O	O	O
10	I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound.	O	O	O	O	O
11	I drive on "automatic pilot" without paying attention to what I'm doing.	O	O	O	O	O
12	I tell myself that I shouldn't be feeling the way I'm felling.	O	O	O	O	O

13	When I take a shower or bath, I stay alert to the sensations of water on my body.	O	O	O	O	O
14	It's hard for me to find the words to describe what I'm thinking.	O	O	O	O	O
15	When I'm reading, I focus all my attention on what I'm reading.	O	O	O	O	O
16	I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	O	O	O	O	O
17	I notice how foods and drinks affect my thoughts bodily sensations, and emotions.	O	O	O	O	O
18	I have trouble thinking of the right words to express how I feel about things.	O	O	O	O	O
19	When I do things, I get totally wrapped up in them and don't think about anything else.	O	O	O	O	O
20	I make judgments about whether my thoughts are good or bad.	O	O	O	O	O
21	I pay attention to sensations, such as the wind in my hair or sun on my face.	O	O	O	O	O
22	When I have sensation in my body, it's difficult for me to describe because I can't find the right words.	O	O	O	O	O
23	I don't pay attention to what I'm doing because I'm daydreaming worrying or otherwise distracted.	O	O	O	O	O
24	I tend to make judgments about how worthwhile or worthless my experiences are.	O	O	O	O	O
25	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.	O	O	O	O	O
26	Even when I'm feeling terribly upset, I can find a way to put it into words.	O	O	O	O	O

27	When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things.	O	O	O	O	O
28	I tell myself that I shouldn't be thinking the way I'm thinking.	O	O	O	O	O
29	I notice the smells and aromas of things.	O	O	O	O	O
30	I intentionally stay aware of my feelings.	O	O	O	O	O
31	I tend to do several things at once rather than focusing on one thing at at time.	O	O	O	O	O
32	I think some of my emotions are bad or inappropriate and I shouldn't fell them.	O	O	O	O	O
33	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.	O	O	O	O	O
34	My natural tendency is to put my experiences into words.	O	O	O	O	O
35	When I'm working on something, part of my mind is occupied with other topics, such as what I'll be doing later, or things I'd rather be doing.	O	O	O	O	O
36	I disapprove of myself when I have irrational ideas.	O	O	O	O	O
37	I pay attention to how my emotions affect my thoughts and behavior.	O	O	O	O	O
38	I get completely absorbed in what I'm doing, so that all my attention is focused on it.	O	O	O	O	O
39	I notice when my moods begin to change.	O	O	O	O	O

APPENDIX D

Performance Questionnaire

1. What are your personal best competitive and practice running times for the 5K, 10K, Marathon?
2. What are your personal goals for participating in running? (Examples- Stay healthy, be competitive, win a race)
3. Please rate your current running performance on a scale from 1 (poor) to 10 (best).
4. Rate the level of effort you have put into running this season on a scale from 1 (little) to 10 (full).

APPENDIX E

Reflection Questionnaire and Demographics Sheet

For the following questions please indicate how often you practiced the mental training skill by filling in the appropriate circle.

		None of the time	**A little of the time**	**Some of the time**	**Most of the time**	**All the time**
	Example Question	O	O	O	O	O
1.	How often did you practice the mental skill this week?	O	O	O	O	O
2.	How often did this impact your performance?	O	O	O	O	O
3.	Did you utilized the metal skill for running this week?	O	O	O	O	O

Do you have any other feedback regarding the mental skill?

_____

_____

Demographics Sheet

1. Age-
2. Gender-
3. Previous experience running competitively?

APPENDIX F

Complete Survey

Mental Skills Training and Mindfulness Survey

Demographic Information

Thank you for agreeing to participate in this survey. All responses are confidential.

Directions: Please answer the following questions by filling in the best response.

Gender

O Male

O Female

O Non-Binary/third gender

O Prefer not to say

O Prefer to self describe:_____

Age (in years) _____

What has been your running experience? Did you compete outside of high school cross-country? College? (please describe):

_____

_____

_____

Performance Questionnaire

What are your personal best competitive and practice running times for the 5K, 10K, Marathon? (please describe)

_____

_____

_____

_____

What are your personal goals for participating in running? (Examples- Stay healthy, be competitive, help my team win state)

_____

_____

_____

Please rate your current running performance on a scale from 1 (poor) to 10 (best).

Rate the level of effort you have put into running this season on a scale from 1 (little) to 10 (full).

Part I

The following are several statements that performers use to describe their feelings before a performance or competition. Next please rate the extent to which you experience as being either positive or negative to your performance. Read each statement and circle the appropriate number to indicate how you feel right now—at this moment. There are no right or wrong answers. Do not spend too much time on any one statement.

		Not at all	Some what	Moderately So	Very Much So	Very Negative			No effect	Very Positive		
	Example Question	1	**2**	3	4	-3	-2	-1	0	**1**	2	3
1	I am concerned about this performance.	1	2	3	4	-3	-2	-1	0	1	2	3
2	I feel nervous.	1	2	3	4	-3	-2	-1	0	1	2	3
3	I feel at ease.	1	2	3	4	-3	-2	-1	0	1	2	3
4	I have self-doubts.	1	2	3	4	-3	-2	-1	0	1	2	3
5	I feel jittery.	1	2	3	4	-3	-2	-1	0	1	2	3
6	I feel comfortable.	1	2	3	4	-3	-2	-1	0	1	2	3
7	I am concerned I may not do as well in this performance as I could.	1	2	3	4	-3	-2	-1	0	1	2	3
8	My body feels tense.	1	2	3	4	-3	-2	-1	0	1	2	3
9	I feel self-confident.	1	2	3	4	-3	-2	-1	0	1	2	3

10	I am concerned about losing or doing poorly.	1	2	3	4	-3	-2	-1	0	1	2	3
11	I feel tense in my stomach.	1	2	3	4	-3	-2	-1	0	1	2	3
12	I fell secure.	1	2	3	4	-3	-2	-1	0	1	2	3
13	I am worried about performing well.	1	2	3	4	-3	-2	-1	0	1	2	3
14	My body feels relaxed.	1	2	3	4	-3	-2	-1	0	1	2	3
15	I'm confident I can meet this challenge.	1	2	3	4	-3	-2	-1	0	1	2	3
16	I'm concerned about performing poorly.	1	2	3	4	-3	-2	-1	0	1	2	3
17	My heart is racing.	1	2	3	4	-3	-2	-1	0	1	2	3
18	I'm confident about performing well.	1	2	3	4	-3	-2	-1	0	1	2	3
19	I'm worried about reaching my goal.	1	2	3	4	-3	-2	-1	0	1	2	3
20	I feel my stomach sinking.	1	2	3	4	-3	-2	-1	0	1	2	3
21	I fell mentally relaxed.	1	2	3	4	-3	-2	-1	0	1	2	3
22	I'm concerned that others will be disappointed with my performance.	1	2	3	4	-3	-2	-1	0	1	2	3

23	My hands are clammy.	1	2	3	4	-3	-2	-1	0	1	2	3
24	I’m confident because I mentally picture myself reaching my goal.	1	2	3	4	-3	-2	-1	0	1	2	3
25	I'm concerned I won’t be able to focus.	1	2	3	4	-3	-2	-1	0	1	2	3
26	My body feels tight.	1	2	3	4	-3	-2	-1	0	1	2	3
27	I'm confident of coming through under pressure.	1	2	3	4	-3	-2	-1	0	1	2	3

Part II

Read each statement and fill in the circle that appropriately indicates the best description of your own opinion of what is generally true for you.

		Never	Almost Never	Sometimes	Fairly Often	Very Often
	Example Question	O	O	O	O	O
1	I notice changes in my body, such as whether my breathing slows down or speeds up.	O	O	O	O	O
2	I'm good at finding the words to describe my feelings.	O	O	O	O	O
3	When I do things, my mind wanders off and I'm easily distracted.	O	O	O	O	O
4	I criticize myself for having irrational or inappropriate emotions.	O	O	O	O	O
5	I pay attention to whether my muscles are tense or relaxed.	O	O	O	O	O
6	I can easily put my beliefs, opinions, and expectations into words.	O	O	O	O	O
7	When I'm doing something, I'm only focused on what I'm doing, nothing else.	O	O	O	O	O
8	I tend to evaluate whether my perceptions are right or wrong.	O	O	O	O	O
9	When I'm walking, I deliberately notice the sensations of my body moving.	O	O	O	O	O
10	I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound.	O	O	O	O	O

11	I drive on “automatic pilot” without paying attention to what I’m doing.	O	O	O	O	O
12	I tell myself that I shouldn’t be feeling the way I’m felling.	O	O	O	O	O
13	When I take a shower or bath, I stay alert to the sensations of water on my body.	O	O	O	O	O
14	It’s hard for me to find the words to describe what I’m thinking.	O	O	O	O	O
15	When I'm reading, I focus all my attention on what I’m reading.	O	O	O	O	O
16	I believe some of my thoughts are abnormal or bad and I shouldn’t think that way.	O	O	O	O	O
17	I notice how foods and drinks affect my thoughts bodily sensations, and emotions.	O	O	O	O	O
18	I have trouble thinking of the right words to express how I feel about things.	O	O	O	O	O
19	When I do things, I get totally wrapped up in them and don’t think about anything else.	O	O	O	O	O
20	I make judgments about whether my thoughts are good or bad.	O	O	O	O	O
21	I pay attention to sensations, such as the wind in my hair or sun on my face.	O	O	O	O	O
22	When I have sensation in my body, it’s difficult for me to describe because I can’t find the right words.	O	O	O	O	O
23	I don’t pay attention to what I’m doing because I’m daydreaming worrying or otherwise distracted.	O	O	O	O	O

24	I tend to make judgments about how worthwhile or worthless my experiences are.	O	O	O	O	O
25	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.	O	O	O	O	O
26	Even when I'm feeling terribly upset, I can find a way to put it into words.	O	O	O	O	O
27	When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things.	O	O	O	O	O
28	I tell myself that I shouldn't be thinking the way I'm thinking.	O	O	O	O	O
29	I notice the smells and aromas of things.	O	O	O	O	O
30	I intentionally stay aware of my feelings.	O	O	O	O	O
31	I tend to do several things at once rather than focusing on one thing at at time.	O	O	O	O	O
32	I think some of my emotions are bad or inappropriate and I shouldn't fell them.	O	O	O	O	O
33	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.	O	O	O	O	O
34	My natural tendency is to put my experiences into words.	O	O	O	O	O
35	When I'm working on something, part of my mind is occupied with other topics, such as what I'll be doing later, or things I'd rather be doing.	O	O	O	O	O
36	I disapprove of myself when I have irrational ideas.	O	O	O	O	O

37	I pay attention to how my emotions affect my thoughts and behavior.	O	O	O	O	O
38	I get completely absorbed in what I'm doing, so that all my attention is focused on it.	O	O	O	O	O
39	I notice when my moods begin to change.	O	O	O	O	O

Part III

Reflection Questionnaire

For the following questions please indicate how often you practiced the mental training skill by filling in the appropriate circle.

		None of the time	**A little of the time**	**Some of the time**	**Most of the time**	**All the time**
	Example Question	O	O	O	O	O
1.	How often did you practice the mental skill this week?	O	O	O	O	O
2.	How often did this impact your performance?	O	O	O	O	O
3.	Did you utilized the metal skill for running this week?	O	O	O	O	O

Do you have any other feedback regarding the mental skill?

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