

# **Mindfulness Skills Training for Elite Adolescent Athletes**

**by**

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M.A., Simon Fraser University, 2011

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in the

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## Ethics Statement



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- a. human research ethics approval from the Simon Fraser University Office of Research Ethics,

or

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## **Abstract**

The present study explores psychological skills training (PST) and performance in a population of elite adolescent athletes. Clinical sport psychology research has recently begun to assess mindfulness as a psychological skill; mindfulness focuses on present moment non-judgmental awareness and acceptance of one's internal state and affect. The present study was a novel mindfulness intervention focusing on teaching 38 elite adolescent soccer players mindfulness skills in six-one hour training sessions. It was expected that participation in the mindfulness training would yield increases in self-reported performance, self-efficacy and emotion regulation. Participants completed the dependent measures pre-intervention, post-intervention and three-months after the start of the intervention. Significant improvements in performance and self-efficacy were observed; however, no significant changes in emotion regulation were observed. The results were significant at the three-month measurement. This six-session developmentally modified mindfulness intervention is a promising advance in the field of sport psychology and performance enhancement with young athletes. The importance of adapting and targeting mindfulness interventions for working with adolescent athletes and specific methodological considerations are discussed.

**Keywords:** mindfulness; sport psychology; adolescent; meditation; performance

## **Dedication**

I dedicate this work to my mom, brother, grandparents, and Christopher. Were it not for your love, generosity and support, none of this would be possible. I share my pride and joy in this project with you. Thank you.

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First and foremost, I would like to acknowledge and thank the athletes who participated in my study. These young men were incredibly open minded and eager to learn, and I will always recall with admiration their trust in the process of this intervention as a beautiful demonstration of profound commitment to athletic development. There are not enough expressions of gratitude that I can extend to the staff of the team, in particular, C.F. His support in the implementation of my study was unfailing, and his belief in the work was integral to the success of my program. THANK YOU!

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# Chapter 1. Introduction

Across competition level, age and discipline, athletes continually strive to perform at a high level. Injury, team de-selection and underdeveloped technical skills may impede performance; in addition, psychological issues often affect an athlete's performance. Research advances in sport psychology have revealed psychological skills as an important factor in athletic performance. Most elite athletes begin their sport at a very young age and, as their sport specific skills develop over time, so do their psychological skills. Athletic organizations are now focusing on the importance of developing psychological skills among young elite athletes. Teaching these skills early on may help the athlete develop more adaptive ways to cope with the emotional demands of performing at a high level.

The present study explores psychological skills training (PST) in a population of elite adolescent athletes. Recently, clinical sport psychology research has begun to assess mindfulness as a psychological skill; mindfulness focuses on present moment non-judgmental awareness and acceptance of one's internal state and affect, even in times of stress. The paradox of mindfulness and sport is inherently clear: how can one reconcile the outcome orientation of competitive sport with the present moment acceptance attitude of mindfulness (Birrer, Rothlin & Morgan, 2012)? In a recent theoretical piece exploring the application of mindfulness to sport, Birrer et al (2012) point out that many athletes have unknowingly integrated forms of mindfulness (e.g., present-moment focus, acceptance of uncomfortable physical states, etc) into their psychological skills repertoire. For example, athletes learn by experience the tragic irony of mentally focusing on winning: once mental energy is spent on winning, the athlete is distracted from the task he or she is attempting to complete, decreasing the chances of the desired outcome (Birrer, Rothlin & Morgan, 2012). Consequently, the application of mindfulness is relevant to sport as an athlete must be able to perform even when experiencing distressing or intense emotional and physical states. Furthermore, learning

to sit with these uncomfortable states is integral to managing arousal and affect. As such, successful regulation of intense emotional and physical states is essential to athletic performance at all levels of skill and competition. Athletes also must believe that they are capable of performing to the best of their abilities. Emotion regulation, self-efficacy and athletic performance are important parts of athletic development that change throughout the adolescent athlete's developing career (Weiss, 1991; Zimmerman & Iwanski, 2014). Given that these skills develop over time and with experience. Mindfulness interventions need to integrate age appropriate modifications that are sensitive to the needs of working with younger populations. To date, research has not included a developmental perspective on mindfulness skills training and performance enhancement specifically, and the current study aims to address these gaps in the literature.

## **Mindfulness**

Mindfulness refers to attending to the here and now, paying attention to the present moment and experience. Mindfulness is described as a “moment to moment non-judgmental awareness” (Kabat-Zinn, 2005, p. 24) of affective, cognitive and sensory experiences that occur naturally. Grounded in Eastern philosophy (Kabat-Zinn, 2005), the practice of mindfulness has developed over thousands of years. Contemporary researchers have become interested in studying mindfulness, and employing mindfulness interventions in a variety of clinical and normative populations. Over the last forty years, mindfulness has expanded into the realm of applied clinical psychology, with early interventions concentrated on practicing traditional mindfulness meditation. Mindfulness interventions have been demonstrably useful in populations with stress and chronic pain (Kabat-Zinn, Lipworth & Burney, 1985), Borderline Personality Disorder (Linehan 1993a; Linehan 1993b; Linehan 2015), depression (Khoury et al, 2013) and anxiety (Roemer, Orsillo, & Salters-Pedneault, 2008). These interventions focus on directing one's attention to the present experience and engaging in non-judgmental awareness of internal and external cognitive and physical experiences in each moment (Kabat-Zinn, 2005) in order to develop a new, more neutral way to relate to difficult thoughts, feelings and emotions (Bernier et al, 2009).

A recent review of the mindfulness literature indicated that mindfulness based interventions approach treatment from focusing on “understanding and altering the functionality of thoughts, feelings and behaviours,” rather than attempting to change or control these internal experiences (Zack, Saekow, Kelly & Radke, 2014, p. 46). Zack et al (2014) noted that mindfulness based approaches show promise with chronic conditions such as chronic pain, recurrent depression, chronic suicidality, and Borderline Personality Disorder, which are often quite difficult to treat and tend to be ongoing conditions resistant to treatment. Another recent meta-analysis of 209 studies of heterogeneous clinical samples indicated that mindfulness based therapy shows small to moderate effect sizes in pre-post studies compared to active treatments such as psychoeducation, supportive therapy, relaxation, imagery and art therapy (Khoury et al., 2013); mindfulness based treatment was also more effective than Cognitive Behaviour Therapy. Clinically, mindfulness based treatment demonstrated large and clinically significant effect sizes in the treatment of anxiety and depression, and it is more effective in treating psychological disorders than it is in treating physical or medical conditions (Khoury et al., 2013).

## **Mindfulness in Sport**

Mindfulness has important implications for sport psychology, which will be outlined below. This new avenue of inquiry has expanded in applied sport psychology over the last ten years, and recently the focus has centered on mindfulness interventions and performance enhancement among elite athletes. Theoretically grounded interventions are centre stage in current sport psychology literature. A recent literature review concluded that mindfulness based interventions in sport psychology research have a “strong early foundation” of theoretical underpinnings and empirical support (Gardner and Moore, 2012). Mindfulness in sport performance enhancement focuses on PST, attention, and optimal performance (Moore, 2009). There are a growing number of recent studies that demonstrate the empirical promise of this intervention in sport, which are reviewed below.

Mindfulness interventions have focused on a number of different factors as facilitating performance enhancement. Traditional approaches to PST and interventions

in performance enhancement suggest that optimal performance in sport is likely to result as athletes develop the capacity to control emotions, cognitions, and physical sensations (Moore, 2009). Generally traditional PST interventions focus on the development of the following skills: goal setting, imagery, self-talk, and physical relaxation (Birrer & Morgan, 2010). In an attempt to bring about an optimal state for performance, traditional PST skills focus on changing ones current physical and/or mental state. Some examples of skills are using positive self-talk instead of negative and using deep breathing to change one's anxious state to a relaxed. The theory behind the application of these techniques is that increases in performance may be achieved by better controlling disruptive internal experiences (e.g., anxiety, negative thoughts, uncomfortable physical sensations) by training the athlete in paying attention to and regulating arousal levels. Traditional PST interventions have been demonstrated to increase positive affective states and reduce negative ones (Birrer & Morgan, 2010), but the findings are less clear in terms of increases in athletic performance as a result of these internal changes (Gardner and Moore, 2012; Moore, 2009). Nevertheless, these traditional approaches are widely used and reported as helpful among elite athletes (Gardner & Moore, 2012).

Mindfulness approaches take an alternative means to traditional PST interventions. From this perspective, peak performance does not revolve around the reduction or control of internal states, but instead emphasizes neutrally paying attention to present experiences, such as cognitive and affective states. As a result of engaging in a here and now approach, the athlete has an attentional focus on task-specific external stimuli and can make behavioural choices that support their physical pursuit (Gardner & Moore, 2012; Moore, 2009). From a cognitive perspective, this approach of non-judgment frees up more cognitive resources for engaging in the task at hand (Van den Hurk et al., 2010). The mindfulness approach contrasts with the traditional PST approach that relies on attempting to control or change ones thoughts and feelings, which may take more mental energy than neutrally relating to one's cognitive and affective experiences.

Related to PST, being able to focus and sustain one's attention on the task at hand is central to a favourable performance. Through the increased attentional control and experiential acceptance achieved by practicing mindfulness, athletes become more automatic in detecting and directing their attention to the sport specific task without

neglecting important external information (Marks, 2008). From a mindfulness perspective, the athlete experiences an enhanced mental efficiency through the mental flexibility of orienting attention required by mindfulness practices. Mindfulness demands an individual to continue to successively orient and re-orient his or her attention to visual, cognitive, affective and physical sensations that come up at any given time (van Den Hurk, et al, 2010). Consequently, athletes may be more able to efficiently direct their attention the task at hand without missing other important cues such as their internal state and external environment (Gardner & Moore, 2012). With an automated process of sustaining, returning to, and switching attention, cognitive resources can be efficiently allocated with lower levels of perceived effort, availing more cognitive capacity to focus on a target task. Hence, the practice of directing and redirecting attentional resources reduces the likelihood that one will pay attention to disruptive cognitions or emotions (e.g., anxiety, pain). This mindful way of relating to internal experiences increases the potential to experience a heightened awareness of their environmental context while absorbed in on-task attention.

### ***Mindfulness and Flow/Optimal Performance***

Mindfulness and present moment awareness have been related in the literature to performance enhancement and attentional focus, and recent research suggests that mindfulness is also directly relevant to achieving optimal performance, or “flow.” Flow has been defined as an optimal mental state involving total task absorption in an activity or experience (Csikszentmihalyi, 1990). The total task absorption and peak performance in flow may be a result of the present moment focus and task-specific attention found in mindfulness experiences. Recent studies have attempted to understand how mindfulness and flow are related to optimal performance outcomes in high performance athletes.

Recent research has investigated the relationship between flow and mindfulness, with results indicating that flow and mindfulness are positively correlated (Kee & Wang, 2008). For instance, Kee and Wang investigated the relationship between flow, mindfulness and psychological skills in 182 university athletes and the results suggested that more mindful athletes reported higher flow scores. Further to these positive findings, Bernier, Thienot, Codron and Fournier (2009) conducted a qualitative analysis of flow

and mindfulness in 10 elite swimmers (mean age = 20), which consisted of semi structured qualitative interviews in which athletes described both an optimal flow experience and poor experience in competition. The results revealed several themes consistent with Csikszentmihalyi's definition of flow. A novel finding in this study - inconsistent with traditional definitions of flow - was the heightened state of bodily awareness in preparation for competition in which the athletes did not attempt to avoid physical sensations, even if the feelings were unpleasant. The authors argued that this bodily sensation awareness is more akin to mindfulness than flow, particularly because participants described non-judgmentally accepting unpleasant or difficult sensations (Bernier et al, 2009). This qualitative analysis revealed that athletes do have optimal performance ("flow") in the way that Csikszentmihalyi defines it, but there is also a more physical, mindful aspect to these experiences in the recollections of athletes. In general, qualitative analyses are exploratory and relied on athletes' ad hoc recollections of intense emotional performances. Affective experiences are subject to hindsight bias: one may have a vivid recollection of the experience, but may not necessarily reflect the reality as it unfolded (Bernier et al, 2009). This limitation points to the difficulties of measuring fairly ambiguous concepts such as flow and mindfulness. If you ask someone if he or she is having a flow experience, and he or she answers you, he or she is no longer in the flow! Therein lies a challenge that researchers and those who develop measures to assess flow face: how does one effectively measure something that once measured, is no longer what it purports to be?

In an attempt to address how individual athletes experience mindfulness and flow, Aherne, Moran and Lonsdale (2011) conducted a small scale initial evaluation of the efficacy of a mindfulness-training program with thirteen "high performance" university athletes (mean age 21 years). Six athletes completed a mindfulness intervention, which consisted of an informational handout outlining the nature and characteristics of mindfulness and how it is applied to sport, and a mindfulness CD (Breath, Breath and Body, Standing Yoga and Body Scan) to guide the intervention for six weeks. Participants had a timetable to guide their practice at home, and received daily text message reminders to complete the mindfulness exercises. Seven athletes were assigned to the control condition, and were not provided any additional attention or instruction during the experiment. The athletes completed a self-report measure of flow (Flow State Scale-2) in regard to their experiences immediately following a training

session, and a measure of mindfulness (Cognitive and Affective Mindfulness Scale-Revised) prior to the intervention and immediately following the six-week intervention. The results revealed that athletes who underwent mindfulness training reported increases in mindfulness and flow scores (Aherne et al, 2011). The researchers concluded that mindfulness training is a promising strategy to help athletes achieve a flow state and as a result, enhance performance.

Cathcart, MacGregor and Groundwater (2014) conducted a correlational study with 92 elite athletes (mean age 18 years) from a variety of different sports to address the relationship between mindfulness and flow in an elite athlete population. Overall, athletes from individual versus team sports did not differ in terms of their reported levels of mindfulness or flow. Furthermore, the results of the study revealed stronger correlations between flow and mindfulness in individual sport athletes compared with team sport athletes, and paced compared with non-paced sports. The authors concluded that, overall, athletes do not differ on their levels of mindfulness or flow, but the athletes do differ significantly on the strength of the relationship between the two. The authors suggested that this difference might be because those in non-paced team sports pay more attention to external cues beyond the individual's control whereas individual athletes in paced sports have developed observational, present-moment awareness skills due to pacing during sustained exertion. These findings imply that mindfulness and flow may have different functions depending on sport type and whether or not the athlete is on a team. In addition, there may be a qualitatively different relationship between mindfulness and flow across sport type and team.

At this juncture, it is important to consider how mindfulness training can impact the experience of flow and optimal performance. Collectively, the extant literature suggests that athletes who have taken part in mindfulness training experience higher levels of flow. In other words, mindfulness training can lead to flow experiences, which is a cornerstone of optimal performance. So although one cannot be trained to reach a state of flow, training in mindfulness can be a step in the direction towards flow: flow is a place that people can get to when they are truly mindful. Research has demonstrated that flow is attainable in athletic performance, and that enhancing mindfulness is related to flow experiences (e.g., Aherne, Moran & Lonsdale, 2011). It follows that athletes would benefit from training in mindfulness as a way to experience the effortless, optimal



performance that occurs when one is in the flow. Furthermore, this brings an important issue into perspective regarding the difference between the traditional approaches to PST and mindfulness. The PST strategies around controlling and changing one's affective or physiological states may inhibit the athlete finding a way to return to a place of flow. In a state of flow, the athlete is controlling nothing and is completely absorbed in the process. Mindfulness is letting go as a way to flow. Mindfulness training becomes a strategy to get the athlete back to the place that leads them to experience flow. Ultimately, mindfulness is a strategy that can be practiced as a means to achieve task absorption, optimal performance, or flow.

### ***Mindfulness and Self-Efficacy***

Self-efficacy refers to an individual's belief in his or her ability to perform a given task to reach a certain outcome (Bandura, 1997). In sport, self-efficacy is likened to a situation-dependent form of confidence, and in fact self-efficacy is often colloquially referred to as self-confidence in sport (Moritz, Feltz, Fahrback & Mack, 2000). The sport psychology literature has consistently demonstrated that self-efficacy is important to performance enhancement (Moritz et al, 2000; Mellalieu & Hanton, 2009). There are some suggestions in the literature that meditation and relaxation training may be helpful to aid in the development of self-efficacy (Mellalieu & Hanton, 2009).

Self-efficacy has been investigated in sport for years, and the literature adopts the perspective that self-efficacy beliefs are not judgments about skill level or lack thereof, but are related to what an athlete believes he or she can achieve with the skills that they possess (Bandura, 1997). Once these self-efficacy beliefs have been developed, they have an impact on behavioural and cognitive processes (Moritz et al, 2000). In a recent investigation, Pineau et al (2014) examined the relationship between self- and team-efficacy beliefs, mindfulness and flow in a group of rowers. The authors created their own measure of self- and team-efficacy, specifically related to rowing (Rowing Efficacy Inventory-Individual and Rowing Efficacy Inventory-Team). The authors wished to investigate the utility of this measure as an assessment of rowing efficacy from an individual and team perspective. Fifty-eight rowers (average age 28 years) from varying skill and competition levels completed questionnaires assessing self- and team-efficacy, mindfulness (Five Facet Mindfulness Questionnaire), flow (Dispositional Flow

Scale-2), and sport confidence (Carolina Sport Confidence Inventory). The results suggested that mindfulness is significantly correlated with flow, and that self-efficacy beliefs were significantly correlated with flow, mindfulness and sport confidence. The results also demonstrated that those athletes who reported being more aware of present-moment experiences reported higher self-efficacy. Hence, increasing mindfulness in athletes may aid in the enhancement of self-efficacy. The authors suggested that in order to develop better training programs for athletes, future study should examine whether the development of mindfulness enhances self-efficacy, as this may in turn increase the likelihood of experiencing flow and optimal performance (Pineau et al, 2014). This correlational study represents the first scientific investigation examining the relationship between mindfulness and self-efficacy.

In summary, self-efficacy focuses not on a judgment of a situation, but on an evaluation and belief about one's ability to successfully carry out a given task. This relates clearly to the non-judgmental nature of a mindfulness framework. Although distinct, mindfulness and self-efficacy as constructs in sport psychology appear to be related. The increased physical and mental awareness that comes from mindfulness training may aid in experiences of success in sport, thereby increasing an athlete's efficacy beliefs. It remains to be seen in future research whether or not a more causal relationship between self-efficacy and flow and mindfulness exists.

### ***Mindfulness Interventions***

Trends in current literature indicate that mindfulness training may be an appropriate intervention for performance enhancement among elite athletes. Contemporary studies are now attempting to elucidate underlying factors that may make the mindfulness approach an attractive and effective alternative or adjunct to traditional PST approaches. A small number of recent studies, reviewed below, have investigated mindfulness interventions (e.g., Mindfulness Acceptance Commitment (MAC) and Mindful Sport Performance Enhancement (MPSE)) for performance enhancement, ranging from case studies to open trials (e.g., Bernier et al, 2009; Gooding & Gardner, 2009; Kaufman, Glass & Arnkoff, 2009; Lutkenhouse, 2007; Thompson et al, 2011; Wolanin & Schwanhausser, 2011).

A recent study investigated a manualized approach to mindfulness training: the Mindful Acceptance Commitment (MAC) intervention (Wolanin & Schwanhausser, 2010). This approach included 7 sessions addressing the following domains: 1) preparing the client with psychoeducation; 2) introducing mindfulness with cognitive diffusion; 3) introducing values and values driven behaviour; 4) introducing acceptance; 5) enhancing commitment; 6) skill consolidation and poise – combining mindfulness, acceptance and commitment; and 7) maintaining and enhancing mindfulness acceptance and commitment. This study sought to examine the efficacy of MAC as an intervention to enhance performance, and to examine the potential moderating effect that MCS-SP (Gardner & Moore, 2006) classifications may have on performance. The MCS-SP ratings suggest different levels of psychological functioning, which also directly relate to mindfulness approaches (Wolanin & Schwanhausser, 2010). Twenty Division 1 NCAA field hockey and volleyball players participated in the study, with 13 in the MAC condition and 7 in the control condition. The control group received no intervention. Participants were assessed using the MCS-SP, and 6 were classified in the Performance Development stage, which consisted of those who have developed their physical skills to their maximum potential and can utilize skills to enhance physical performance, while 5 were classified in the Performance Dysfunction category (Wolanin & Schwanhausser, 2010). The outcome measures included coach ratings of performance, a metacognitions questionnaire, and a generalized anxiety disorder questionnaire. The results demonstrated the positive effect of MAC: those in the MAC treatment group had significantly greater increases in coach performance ratings over the course of the season compared to those in the control group. The performance enhancement effect was small, however, as the MAC group had an overall 3.2% increase. The authors suggested that athletes seeking or obtaining performance enhancement interventions are not a homogeneous group: 67% of the athletes in the Performance Development group (those not experiencing psychological dysfunction) had improved coach performance ratings, suggesting that the intervention is particularly useful for athletes who are not experiencing psychological barriers to their performance. The intervention showed little effect on performance for athletes classified in the Performance Dysfunction group. These athletes were currently dealing with problems in their performance, and were not focusing on developing their performance to a higher level.

There are adaptations to the MAC protocol that can be used for those athletes who meet Performance Dysfunction classification, but this protocol was not used in the study (Wolanin & Schwanhausser, 2010) – such adaptations may have elicited different results for the athletes experiencing Performance Dysfunction.

The findings of Wolanin and Schwanhausser's (2010) study reveal a salient topic in sport psychology: the fine line between performance and clinical issues. One can postulate that if the Performance Dysfunction group had treatment targeting their clinical symptoms, and these symptoms were in remission prior to beginning a MAC intervention, subsequent MAC interventions may have had a different effect on their performance. As with the previous studies reviewed, Wolanin and Schwanhausser's (2010) study employed a small sample size. Furthermore, due to the small sample size, the results were not tested parametrically. With these methodological issues in mind, what can we say about athletes with subclinical psychological issues when we are only discussing the results of five individuals? Specific design issues in this study are also noteworthy. The participants were self-selected into the intervention condition, and the coaches were not blind to the intervention groups. These limitations notwithstanding, this study does add to the literature because it lends some support to the efficacy of MAC as an intervention for performance enhancement with athletes who do not experience subclinical problems.

Gooding and Gardner (2009) investigated the phenomenon of mindfulness among collegiate basketball players. The authors measured mindful attention awareness (MAAS) and sport competition anxiety (SCAT) by self-report. Participants also completed 50 non-competitive free throws as a baseline. At the end of the season, the investigators calculated the percentage of free throws that participants made (vs. missed), and the length of each athlete's pre-shot routine during the season (via video footage). The participants were 17 players from three different NCAA Division 1 men's basketball teams. The results revealed that levels of mindfulness significantly predicted free throw accuracy with increases in performance suggesting that a mindfulness intervention may increase a team's overall success (Gooding & Gardner, 2009). Game and practice free throw percentages were significantly correlated; however, the results did not support the hypothesis that a consistent pre-shot routine would predict competitive free throw performance. Finally, the findings suggest that the effects of

mindfulness on performance are independent of anxiety, lending support to the position that it is not arousal that predicts poor (or strong) performance, but rather the ability to be aware and attend to on-task cues and sensations in the midst of experiencing anxiety or stress (Gooding & Gardner, 2009). Although these findings are positive, there are a few limitations to note. For instance, the study represents a rather small sample size as it included 17 NCAA athlete participants. More importantly, the study relied on a correlational design, and unfortunately the significant findings between the variables do not equate causation. Hence, although the authors found results suggesting that high levels of mindfulness are associated with increased performance, the design of the study does not allow for causal inferences to be made. Further, the inclusion of only free throws limits the ability to understand the results more broadly within the sport, and to understand more general levels of performance enhancement. For instance, one could be good at three-point shots, but consistently perform at a lower level when shooting free throws. Gooding and Gardner's study of mindfulness and free throw performance in basketball players still leaves many more applied, causal questions unanswered.

Following the promising results of the qualitative analysis discussed earlier, which revealed that mindfulness and acceptance were linked to optimal performance states (flow), Bernier and colleagues (2009) examined the effectiveness of mindfulness and acceptance training on performance. This study sought to test the effect of a PST program for performance enhancement based on mindfulness and acceptance in 7 young elite golfers (mean age = 15) over the course of a season; a traditional PST control group was included (n=6). The mindfulness program used in the study was an adapted training program from Mindfulness Based Cognitive Therapy (MBCT), supplemented with Acceptance Commitment Therapy tools (Bernier et al, 2009). These training sessions took place across four modules where mindfulness and acceptance exercises were completed in session. In-session practice was supplemented with home practice twice a week, wherein participants listened to audio recordings of exercises, and completed a body-scan exercise once a day (Bernier et al, 2009). Following the mindfulness training, participants were instructed to integrate mindfulness and acceptance skills into their pre-performance routines and these routines were practiced and repeated during golf training sessions. Overall, the goal was to be able to play effectively while experiencing high levels of anxiety and unpleasant or distracting thoughts by committing to each shot through focusing on the relevant object, rather than

on unpleasant thoughts (e.g., feeling tired, bored, angry, anxious) (Bernier et al, 2009). Process and outcome measures used in the study included: national rankings pre- and post-intervention, and “behavioural indicators” defined with each golfer at the beginning of the program (Bernier et al, 2009). The researchers also conducted qualitative interviews with each golfer and the coach before the introduction of the intervention, at the end of the four-month training, and after the competitive season. Several other quantitative self-report mental skills assessment tools were used. The results from qualitative interviews revealed that every golfer in the mindfulness condition enhanced their national ranking while only two in the PST control group did so, and all athletes reached their performance-based behavioural indicators. The authors concluded that regularly practicing mindful awareness during the off season and in competition helped the athletes to perceive and manage their activation states more efficiently, and therefore play under higher levels of anxiety, which led to increases in performance outcomes (Bernier et al, 2009).

Although Bernier et al's (2009) study included a small sample of mostly qualitative data, and did not utilize an established or manualized treatment, it demonstrated that athletes who participated in a mindfulness intervention evidenced increased levels of performance compared to athletes who completed a traditional PST program. This study was conducted with 15-year-old adolescents and it is unclear whether this is an intervention appropriate for this age group. A limited number of studies have adapted mindfulness interventions for youth in general, but as of yet, there have been no modifications made for mindfulness approaches for performance enhancement in young athletes. Surprisingly, the authors do not address this as a limitation; yet, it is an important issue to consider, as most psychological treatments and interventions used with younger populations are modified in order to be appropriate for the developmental stage of the participants. This is a consideration that could have significant impact on the results of such investigations, and requires further scientific inquiry.

An evaluation of Mindful Sport Performance Enhancement (MPSE) with recreational athletes was completed with 33 recreational athletes. MPSE is a four-week mindfulness intervention for athletes. The athletes participating in this study attended four weekly sessions. In these sessions, athletes were taught to apply mindfulness skills to sport by practicing and discussing mindfulness exercises in session and on their own.

Over three-quarters of the athletes in the original study reported that mindfulness training increased enjoyment of their sport. In addition, self-reports of mindfulness and related attributes increased significantly following the intervention (Kaufman, Glass & Arkhoff, 2009). The authors did not observe any significant increases in flow, but did note that certain variables negatively correlated related to flow such as anxiety and perfectionism, and positively correlated with confidence and mindfulness. Although the authors did not find any quantitative differences in performance, post-workshop written feedback from the athletes revealed that the athletes perceived that the workshop benefited their performance and they expected additional benefits in the future. Due to the nature of the performance data collected, other than speculating about the athletes' perceptions, the authors were unable to make any specific claims regarding the effect that the intervention had on performance.

Thompson et al (2011) conducted an evaluation of a mindfulness intervention (Mindful Sport Performance Enhancement (MPSE)) with a group of recreational athletes. The study was a longitudinal investigation examining whether the performance effects of mindfulness training would be evident in a one-year follow-up, as opposed to immediately following the intervention. The authors received follow up data from 25 of the original 52 participants in the Kaufman et al (2009) study, and the results revealed that there were significant performance changes from post-test to one-year follow-up among the athletes, though there was no control group with which to compare the outcomes. This longitudinal study is a promising advance in the exploration of the efficacy and long-term outcomes of mindfulness interventions. However, the majority of participants did not regularly practice mindfulness, so it cannot be ascertained whether the performance gains were due to their use or internalization of mindfulness strategies.

Kabat-Zinn (2005) states that integrating a mindfulness practice into one's daily life is paramount to mindfulness being helpful: one must practice mindfulness often, daily, in order to enjoy the benefits that it offers. A recent meta-analysis of 209 empirical studies corroborates this commonly accepted notion about mindfulness practice: the length of the intervention itself did not consistently moderate the efficacy of Mindfulness Based Therapy, but actual duration of home practice emerged as a better efficacy predictor (Khoury et al, 2013). Mindfulness practice needs to be a part of daily life, both in sport and in one's personal life. Further longitudinal research needs to be conducted

with athletes, assessing fidelity to mindfulness practice, in order to understand the long-term implications of mindfulness interventions.

There are a number of methodological issues mentioned earlier related to the studies reviewed. In general, studies tend to have smaller sample sizes, lack a control group, participants in the interventions were generally self-selecting, and the studies were non-randomized and non-blind. These methodological issues make it difficult to determine to what extent mindfulness interventions are efficacious for enhancing performance in sport. Furthermore, as previously discussed, issues related to measuring mindfulness are considerable. In order to determine the efficacy of an intervention, one must be able to control extraneous variables. Unfortunately this was not possible in many of the studies to date. As such, it is unclear what the mechanisms of change are. What is it specifically about mindfulness interventions that make them work? Many authors have hypothesized about what it may be. For example, reduced cognitive load due to focused attention; less focus on control, leading to reduced anxiety; emotion regulation; and increased self-confidence (Moore, 2009). The studies reviewed here mainly included research with clinically normative athletes, although the results of one study revealed an important distinction between clinical problems and performance issues in sport psychology. Because the findings demonstrated greater performance enhancement for athletes without subclinical psychological dysfunction, there is a possibility that MAC or mindfulness approaches are more suitable for well-functioning athletes. As such, adaptations have been made to accommodate for psychological issues in recent editions of the MAC protocol (Moore, 2009). This distinction points to the importance of assessing for subclinical problems in athletes, and addressing these issues before addressing performance issues.

In addition to the consideration of clinical issues in the administration of mindfulness interventions, developmental considerations also need to be addressed. Due to the recent emergence of the field of mindfulness in sport, it is not yet the case that there are developmentally informed and sensitive modifications to the available protocols. This oversight could possibly lead to different outcomes in some of the studies reviewed, as the cognitive and emotional development of children and youth differ from adults. In particular, mindfulness encompasses the ability to regulate emotions effectively: teenagers often struggle to cope with overwhelming emotions. To do so



under emotional pressure in athletic competition might be even more challenging than it is for adults. Therefore, mindfulness interventions used with youth should include developmentally appropriate adaptations and consider the issue of age, and not simply assume that children and youth are “mini-adults.” For instance, Tan and Martin (2012) modified an adult mindfulness protocol for use with adolescents, and used language targeted for a grade six reading level, reduced the length of the meditation exercises by more than half, utilized brief, frequent exercises that were age-appropriate (e.g., mindful drawing, eating, listening to music), and provided simple handouts outlining the activities after each session. Such modifications can make the concept and practice of mindfulness more accessible to young people.

The empirical investigation of mindfulness in sport psychology is in its beginnings. In the past ten years, a small group of researchers have been working to understand mindfulness in sport and to develop interventions and manuals for clinicians for applied use with athletes. To date, researchers have not satisfactorily demonstrated the efficacy of the intervention beyond small open trials and correlational studies. Of course, this is where any field of scientific investigation begins. The usefulness of mindfulness in sport is emerging now, and as there are theoretically grounded treatments that are gaining speed and support as useful for athletes, this literature will continue to expand. This is an exciting place to be in the field of mindfulness in sport performance enhancement: to date, studies with elite non-collegiate athletes have not been completed, differences between adolescent and adult athletes have not been investigated, longitudinal studies assessing mindfulness interventions with elite athletes have not been conducted, and a randomized controlled trial has been conducted but is not published.

In the past ten years researchers have moved away from the traditional approaches in applied sport psychology and proposed a new way of conceptualizing PST. These researchers saw potential in a practice that has been around for thousands of years, and in the field of psychology for decades. Mindfulness approaches to performance enhancement were investigated as a result of the dearth of empirical literature supporting the clinical efficacy of traditional approaches to PST (Moore, 2009) and the research to date shows promise. Although traditional PST interventions based

on emotional control and changing thoughts are valuable skills to teach in sport psychology, there is room for some acceptance of a new approach to an old problem.

## **Emotion Regulation in Sport: Mindful Considerations**

Emotion regulation is also an emerging field of interest, investigated in a number of fields within psychology. As such, the operational definition of emotion regulation as a construct has been difficult. Contemporary researchers have referred to emotion regulation as the evocation of thoughts or behaviours that influence which emotions people have, when people have them and how people experience or express them (Gross, 1998).

Athletes experience intense positive and negative emotions before, during and after competition. These emotional states need to be managed in order to focus on the task at hand, therefore regulating affect is a key psychological skill in sport. Much of the evidence for the efficacy of emotion regulation in sport is derived from the necessity of effectively managing anger and anxiety in practice and competition (Uphill, McCarthy & Jones, 2009). Traditionally, cognitive strategies such as situation selection, situation modification, attention deployment, cognitive change and response modulation have been used to understand emotion regulation. In contrast, Uphill, McCarthy and Jones (2009) suggest that strategies that might inhibit the appraisal of emotions when they enter one's consciousness may prove more efficacious than attempts to modulate emotional responses. This difference implies that a proactive approach to regulating one's emotions may be more effective than a reactive approach. Thus, evidence suggests that, rather than controlling or changing an emotion once it has arisen, athletes may benefit from strategies that focus on the appraisal and acceptance of the present situation to create the most appropriate state for competition.

In a literature review, Salmon, Hanneman and Harwood (2010) proposed a model of cognitive strategies and mindfulness in sport suggesting that mindfulness fosters a more accurate cognitive appraisal process, which can reduce unwarranted physiological activation. This model posits that neurobiological and physiological changes (reduced activation, increased sensory acuity and pain tolerance) and cognitive alterations (enhanced awareness, decreased rumination, improved attention control)

from practicing mindfulness leads to an expansive capacity to nonjudgmentally observe thoughts and sensations. This nonjudgmental observation enhances accurate appraisal and acceptance of challenges relative to coping resources, thereby limiting cognitive reactivity to emotions (Gross, 1998). Furthermore, Salmon and colleagues (2010) suggest that this approach to coping with sustained physical activity (marathon running, in their example) fosters an awareness of potentially dysfunctional thoughts that, when not acknowledged, may increase emotional distress and maladaptive physiological reactions (e.g., physical manifestations of anxiety).

Traditional approaches to emotion regulation focus on suppressing emotional reactions or cognitively reappraising them (Gross, 1998). A mindfulness approach to emotion regulation comes from a different point of view. This perspective is reflected in the writing of Kabat-Zinn (1994) and Nhat Hanh (1987), who both assert that mindfulness involves acknowledging thoughts, feelings and sensations as they occur, noting a tendency to evaluate them, and consciously not engaging in this process. Recent scientific inquiry has demonstrated that mindfulness meditation can improve emotion regulation abilities (Chambers, Gullone & Allen, 2009).

Echoing the sentiments of Salmon and colleagues, Hill and Updegraff (2012) recently conducted a study of emotion regulation. Although it was not with an athlete population, these results could be extended to have implications with athletes. Hill and Updegraff (2012) identified that taking a mindful stance toward one's emotions may be helpful in enhancing emotion regulation by regulating one's emotional reactions, as cognitive appraisals of emotions are central to emotion regulation. In order to complete a task and stay focused, an athlete must be able to limit the cognitive reactions to emotions that come up. Further, a level of emotional awareness is required to be able to manage emotions effectively, as one cannot limit their cognitive reactions to emotions if he or she is not aware of them. Hill and Updegraff (2012) demonstrated that self-reported mindfulness was related to fewer emotion regulation difficulties and lower levels of cognitive reactions to emotions.

At this time, researchers have not yet studied mindfulness and emotion regulation together in a sport context. The reviewed literature suggests that a central focus of psychological intervention in sport is on emotion regulation, and the relationship

between mindfulness and emotion regulation is clear. Hence, there is merit and necessity to study both constructs together in the context of sport.

## **Developmental Considerations in Sport Psychology**

Adolescence is a time of rapid and important change in biological, social, emotional and cognitive development (Santrock, 2015). Some important cognitive changes to consider include increases in critical thinking; increased speed, automaticity, and capacity in attention and information processing; more breadth and content knowledge; a greater range and spontaneous use of cognitive strategies (Santrock, 2015). These normative developmental changes suggest that adolescence is a key time to introduce novel knowledge, new ways of regulating ones attention, and new cognitive strategies. Sport psychology interventions introduced during adolescent development have the potential to be carried on throughout the young athlete's career.

Cote's (1999) Developmental Model of Sport Participation (DMSP) indicates a need to consider developmental stage when designing sport psychology programs for youth. In Cote's model, youth are said to develop through three different stages of sport participation, and the psychological needs and skills of the athlete in each stage are different. The first stage is sampling, in which athletes (5-12 years of age) engage in a variety of sports, focusing on the enjoyment and development of physical skills. In the specializing stage, youth 13-15 years of age begin to limit the number of activities and specialize in their sport, and there is a growing emphasis on performance. Finally, investment (age 16 +) is the stage in which youth increase their commitment and engage in intense practice and deliberate development of skills and competitive strategies (Cote, 1999). The psychological skills needed by the athletes vary across stages, and the need to target different skills for the developmental stage of young athletes is salient. In this view, developing mental skills earlier will aid in the consolidation of such skills and promote healthy coping and an expanding repertoire of psychological skills as an elite athlete (Holland et al, 2010).

A qualitative study (Holland et al, 2010) examined the mental skills and mental qualities that elite adolescent rugby players viewed as important. Holland and colleagues' analyses (2010) revealed that there are specific mental qualities that appear

to be relevant to the developmental stage of youth. Adaptability and self-awareness emerged as important themes which had not previously been identified as important mental skills among adult athletes (Holland et al, 2010). Self-awareness is an important quality in terms of PST, as for one to be able to identify their psychological process, one has to be self-aware. This important distinction reveals that there are unique aspects to working with young athletes that are fundamentally different from working with adults. In particular, there are mental qualities and skills that are specifically relevant to adolescence that must be considered. As such, sport psychology techniques and approaches used with youth may need to consider the specific developmental and psychological needs of young athletes.

According to Visek, Harris and Blom (2009) current sport psychology interventions do not adequately address the developmental needs of youth. Many of the useful interventions currently offered work quite well with adult, elite or collegiate populations, but fail to incorporate developmentally appropriate modifications into their models. From Visek, Harris and Blom's (2009) perspective, youth fall into one of three developmental categories: mid childhood (~6-11 years old), early adolescence (~10-14 years old), and mid adolescence (~15-17 years old). The authors report that the developmental category is not discrete or mutually exclusive, as depending on each youth's unique physical and emotional maturation, stages may be reached at different ages. Each developmental stage holds a different set of developmental milestones encompassed in physical, emotional, cognitive and social domains – the authors posit that each of these stages requires consideration in terms of intervention (Visek, Harris & Blom, 2009).

Children in the mid childhood range can master most physical tasks and toward the end of this stage may reach puberty. Cognitively, children at this stage think concretely, do not reason abstractly and have shorter attention spans, begin to experience more complex emotions, and can be sensitive and empathic. Youth in the stage of early adolescence are going through more significant changes than other stages; physically, youth are beginning puberty and experiencing growth spurts, cognitively adolescents are able to reason more abstractly and hypothesize, but struggle to link situations, feelings and events together. Emotionally, youth in early adolescence can be prone to emotional outbursts and, socially, adolescents experience a strong need

to belong and begin to place more importance on friendships. Finally, youth in mid adolescence should not be mistaken for adults; even though youth are physically mature, and begin to think more abstractly and consider issues of morality and meaning, they are still teenagers who struggle to manage their emotions, and are beginning to understand the need for independence and individuality (Visek, Harris & Blom, 2009).

In their model, Visek and colleagues (2009) emphasize the need for developmental considerations in youth sport psychology. Even though at times youth appear to be quite adult in their functioning, their developmental stage greatly impacts what intervention to use, and how to implement it. To address this gap in the literature, Visek et al (2009) proposed the Youth Sport Consulting Model (YSCM): a sport psychology model, which incorporates the unique developmental needs of youth. Drawing on developmental theory and applied sport psychology models, YSCM is a six-stage model, with developmental considerations and modifications in each stage. Of importance to the current line of inquiry, the authors note that in the intervention stage, practitioners should select empirically supported interventions (e.g., Cognitive Behaviour Therapy), and make developmental and sport-specific modifications as necessary, using language that is clear, concise and direct (Visek et al, 2009). The YSCM assumes that the practitioner is well versed in developmental issues specific to athletes. Grounded in developmental and sport literature, the YSCM demonstrates that the field of sport psychology currently fails to address the specific and unique needs of youth in sport psychology intervention. Ultimately, the authors suggest that the sport psychologist needs to use clinical judgment and knowledge of developmental psychology in order to make modifications and adaptations to work with adolescent populations.

In a recent paper, Henricksen, Larsen, Storm and Ryam (2014) discuss the unique needs of the adolescent athlete. Their qualitative study revealed that adolescent athletes need a more holistic approach to sport psychology, which emphasizes psychological skills for their sport and their personal life. In addition, effective interventions need to involve the athlete's environment (e.g., coaches, teammates etc.), and should be considered as a part of their overall, long-term athletic development. These findings suggest that interventions focused on the development of skills that can carry over into the athlete's personal life and long-term career are the most helpful. It is important to begin any training, physical or psychological, with athletes at a young age to

develop their skills to the fullest. Rather than a few sessions or seasons with a sport psychologist, the athlete should have skills developed early on so that the skills can continue to be practiced and refined throughout their sports career and their life. This should be the measure of an effective sport psychology intervention.

Indeed, youth sport psychology is a nascent field of scientific inquiry. Young athletes who are introduced to PST at a younger age tend to utilize the skills and engage in sport psychology services later in their athletic careers (Henricksen et al., 2014). Furthermore, offering PST to athletes at a younger age helps them to develop psychological skills, which can be practiced over time and incorporated into their repertoire of managing stress outside of sport as well. Not only are PST interventions teaching skills to enhance performance, they also are life skills that the athlete can draw upon at any time. Youth are the future of the field of sport psychology, and the sooner athletes are exposed to psychological skills, the more prevalent the work will become, which will serve to both provide youth with lifelong skills as athletes, and increase public awareness of psychology in sport.

## **Mindfulness in Youth Sport**

Recent reviews, studies and theoretical models have only begun to address the need for psychological skills interventions designed with the developmental needs of the adolescent athlete in mind (e.g., Briegel-Jones et al., 2014). As discussed above, developmental adaptations for traditional PST in youth sport have been suggested, but these suggestions tend to be vague and not grounded in theory. With respect to developmental modifications for mindfulness approaches with adolescent athletes, to date this represents a gap in the literature. However, there is a growing body of research emerging investigating mindfulness approaches with children and adolescents, and the results are positive (e.g., Burke, 2010; Zoogman, Goldberg, Hoyt & Miller, 2015).

A recent review of mindfulness based interventions for youth (Zack, Saekow, Kelly & Radke, 2014) revealed important implications for using this approach with adolescent populations. Zack et al (2014) note that the psychological qualities that adolescents possess, such as openness and eagerness to learn, fit well with a mindfulness approach and the notion of starting anew each time you practice

mindfulness. In addition, youth are well suited to these interventions, as much of mindfulness training focuses on experiential practice (Zack et al, 2014). Many of the studies reviewed found that developmental modifications were made, such that the interventions were age-appropriate for working with adolescents. For instance, the language was changed to suit the age of the participants, the exercises were shortened, more exercises were included, less time was spent in didactic experiences, and treatment and session length were reduced. Furthermore the authors noted that when mindfulness interventions are conducted within a group setting, the social milieu provides opportunities for the adolescent to model and learn from peers as they engage in mindfulness activities (Zack et al, 2014). The authors noted that the studies to date indicate that mindfulness based approaches with adolescents show much promise, and therefore warrant further study (Zack et al, 2014).

Two recent meta-analyses of mindfulness-based approaches among clinical and non-clinical populations revealed that there is “reasonable” support for the feasibility of mindfulness-based approaches with children and adolescents (Burke, 2010), and the effect sizes are more supportive of mindfulness approaches with clinical samples compared with non-clinical samples (Zoogman et al, 2015). These meta-analyses both recommend that future researchers consider adapting mindfulness-based approaches for the unique developmental needs of children and youth, for instance, shorter session length, focusing on sensory observation, having caregivers involved in supporting treatment, and having frequent and engaging activities (Burke, 2010; Zoogman et al, 2015).

## **Mindfulness and Emotion Regulation in Youth Sport**

Although research investigating the emotions of young athletes is extensive, studies about emotion regulation specifically in adolescent athletes is limited. In particular, there are no studies examining emotion regulation and mindfulness in adolescent athletes to date. The studies in the adult literature reviewed above will have to suffice as a guideline for understanding emotion regulation and mindfulness in adolescent athletes.



In spite of the lack of evidence relating to emotion regulation among adolescent athletes, research investigating emotion regulation in developmental psychology is expanding and current. In a review, Zeman and colleagues (2010) draw our attention to emotion regulation in childhood and adolescence as a developing area of scientific inquiry. The authors propose a developmental trajectory for emotion regulation: during childhood, children begin to understand and express emotion as each year passes, and emotion regulation developments later in the emotional life of the child (Zeman et al, 2010). Once a child reaches late childhood/early adolescence, the social and emotional implications for emotion dysregulation become a motivating factor in making conscious choices to inhibit emotional reactivity (Zeman et al, 2010), and thus adolescents adapt to their environments, and learn to engage in modulation of their emotional responses.

Zeman and colleagues (2010) posit that successful emotion regulation is associated with social competency and positive emotional development. Conversely, recent research has found that poor emotion regulation is implicated in both internalizing (e.g., anxiety, depression) and externalizing disorders (e.g., oppositional defiant disorder, conduct disorder), peer rejection, and interpersonal relationship problems (Zeman et al, 2010). Zeman and colleagues (2010) suggest that future work incorporate “positive psychology” and further investigation to understand the etiology, processes, and mechanisms of emotion regulation and how it is associated with both normative and non-normative development.

## **Summary and Hypotheses**

In the past ten years researchers have proposed a new way of conceptualizing PST in sport: using mindfulness - the non-judgmental present moment awareness and acceptance of one’s cognitive and physical state - as an intervention for performance enhancement. Mindfulness approaches to performance enhancement were created out of questions regarding the state of the empirical literature supporting the status quo (Moore, 2009). The application of mindfulness is relevant to sport for several reasons. First of all, an athlete must be able to perform to the best of their ability while experiencing intense emotional and physical states. Ergo, successful regulation of difficult emotional and physical states is essential to optimal athletic performance. The

robust relationship that exists between mindfulness and emotion regulation suggests that mindfulness training may be an avenue to increase emotion regulation sport. Secondly, mindfulness has been shown to enhance both self-efficacy and performance – two related, but distinct concepts. Self-efficacy is the belief that an individual has in his or her ability to carry out a given task, and previous research has demonstrated a consistent relationship between self-efficacy and performance, and more recently investigations have pointed to a link between self-efficacy and mindfulness. Ultimately, many sport psychology interventions are centered on ways to manage variables that impede or enhance performance, and have sought to understand different psychological and personal factors that are related to optimal performance.

Recent inquiry has revealed the importance of exposing young athletes to sport psychology. Certainly, youth sport psychology is a field in its early beginnings and investigators suggest that those working in sport psychology need to consider that youth are the future of the field (Visek et al., 2009). In spite of the clear importance of working with adolescent athletes in a psychological context, recent reviews, studies and theoretical models have failed to address the need for interventions that are adapted to meet the developmental needs of adolescent athletes. The extant literature has made reference to the necessity of developmentally informed modifications to sport psychology interventions with adolescent athletes, but these suggestions tend to be vague and have not been applied in clinical research. Further inquiry is required to advance the field of sport psychology with young athletes, as the state of the current literature does not adequately address the unique developmental context of working with youth athletes.

The emergence of alternatives to traditional PST in sport has ignited interest in investigating the appropriateness of mindfulness for use with athletes. Mindfulness appears to be an important and appropriate intervention for elite adolescent athletes in particular, as intense sensations and thoughts come up regularly while engaging in sport at a high level. For instance, young athletes often feel physical discomfort from hours of training and experience intense emotions related to performance or important games. With a mindfulness approach to PST, the athlete learns to shift how he or she relates to thoughts. They can learn to non-judgmentally become aware of these sensations and at the same time, let go of them in order to re-focus on the task at hand. Not only are mindfulness skills an excellent fit for PST for young athletes, mindfulness also is an

excellent life skill that young athletes can carry with them into adulthood. As discussed above, mindfulness approaches have been adopted for working with athletes in general in order to enhance performance, and mindfulness approaches have been adapted for working with clinical and normative adolescents, but no studies to date have included developmentally appropriate adaptations for working with adolescent athletes. This is a novel area of inquiry, with several gaps remaining to be addressed.

The present study was a mindfulness skills training intervention with a population of elite adolescent athletes. The study sought to investigate the impact of this mindfulness skills training program on self-efficacy beliefs related to athletic performance, self-assessed athletic performance, and self-reported emotion regulation. The mindfulness skills training program included developmentally informed modifications made for working with adolescent athletes. Participants attended six mindfulness training sessions (four weekly consecutive sessions, followed by a two month break, and then two booster sessions), which consisted of a review of the previous week's session, an introduction to the current session, teaching and then actively practicing two formal mindfulness exercises, processing any roadblocks to practicing outside of the session, answering questions and assigning home practice. The athletes completed the dependent measures prior to the intervention, immediately following the initial four sessions, and then after completing two booster sessions, two months later. It was expected that participation in the mindfulness intervention would yield increases in self-reported self-efficacy and self-reported athletic performance and increases in self-reported emotion regulation across from pre-intervention to post-intervention and following the booster sessions, and from post-intervention to following the booster sessions. The hypotheses were as follows: (1) significant improvements in self-efficacy would be observed both from pre-intervention to post-intervention and following the booster sessions and from post-intervention to following the booster sessions, (2) significant improvements in self-reported athletic performance would be observed in performance from pre-intervention to post-intervention and following the booster sessions and from post-intervention to following the booster sessions, (3) significant increases in emotion regulation would be observed from pre-intervention to post-intervention and following the booster sessions and from post-intervention to following the booster sessions.

## **Chapter 2. Methods**

### **Design**

This preliminary trial utilized a single-group longitudinal design. Athletes completed measures pre- and post-intervention, and after completing two booster sessions approximately three-months after the intervention began, at the conclusion of the competitive season. Participants also completed a mindfulness practice tracking sheet of their practice during the four weeks of the intervention (between pre- and post-intervention time points).

### **Participants**

A total of thirty-eight individuals consented to participate in the study. One participant dropped out of the study due to injury, and thirty-seven attended at least four of six-mindfulness training sessions. Participants were 14-19 year old males (M age=16.09, SD=1.29) enrolled in a full-time soccer residency academy in the lower mainland of British Columbia. 34.2% were Caucasian, 10.5% were of mixed ethnic origin, 5.3% were South Asian, 5.3% were black, 2.6% were Asian, 18.4% indicated other ethnicities, and 21% did not report on their ethnicity. On average, participants had been involved in playing soccer for 10.9 years, practiced 11.2 hours a week, and competed 4.0 hours each week.

### **Recruitment**

Ethical clearance from SFU Research Ethics Board was obtained and standard ethical guidelines regarding the voluntary, confidential and anonymous nature of the research were adhered to. This investigation included elite adolescent soccer players.

The participating soccer academy provides youth with training opportunities focused on performing at a professional level upon graduation from high school. The program is designed to maximize a player's potential through a "soccer lifestyle" philosophy linking technical and personal development. In order to conduct research with this team, the principal investigator and senior supervisor approached the head coach and the team's head of sports medicine and science to request permission to complete the intervention with appropriate and willing athletes with two of the academy's teams (one team of athletes aged 16-19 "U 18", and another aged 14-16 "U 16"). Team staff enthusiastically agreed to have the study take place, and granted access to approach all team members to participate. Participation was not mandatory.

Given that these athletes train and compete together six days a week, and in some cases live together in billet homes, it was not feasible to randomly assign participants to experimental and control groups without concerns of cross-group communication. Similarly, it was not appropriate to compare a group of such elite and specialized athletes to another group of youth who play soccer recreationally, for instance. This academy is one of only a few specialized training facilities of this kind in Canada, which accepts only the highest performing youth from across North America and abroad. As such, there is not an available equivalent comparison group readily available.

## **Procedure**

An introductory meeting with the team occurred in February 2013. In this meeting, the procedure and rationale for the study were explained and questions about participation were answered. Athletes interested in participating were provided with a package containing the parent and participant informed consent form, study information, and pre-test self-report measures. Prior to participating in the study, a signature from a parent/guardian was required for those participants under the age of 16. Participating athletes provided their caregiver with the study information sheet and consent form for signature following the information session (if necessary) and returned the relevant parental and/or participant signed consent forms with the completed study materials at the first training session.

The intervention occurred in four initial training sessions (March 8, March 13, March 25 and March 27, 2013), and two follow up sessions (June 6 and 12, 2013), held in a multipurpose room in the arena where the team trains. Each session lasted just over one hour and focused on developing and practicing mindfulness skills that can later be used in practice and competition. Throughout the duration of the first four sessions, participants were asked to practice the skills and keep track of their practice in between sessions and return the tracking sheets at the fourth session.

The same questionnaire package completed at the beginning of the intervention was re-administered one week following the fourth intervention session (April 2013), and again after the two booster sessions six-weeks later, at the end of the competitive season (June 2013). Youth were provided with envelopes and as necessary, pre-paid postage, to return the completed questionnaires. After the sixth session, any study materials that had not yet been returned by participants were collected, and the youth were debriefed about the intervention, and encouraged to continue practicing their mindfulness skills.

## **Materials**

### ***Mindfulness Skills Training Protocol***

The mindfulness skills training manual is provided in Appendix A, and a brief outline of each session is presented in Table 1. The psychological skills taught focused on different aspects of mindfulness, including awareness of breathing and bodily sensations, and acceptance of thoughts, emotions and sensations in a nonjudgmental way. Specific mindfulness skills were taught with a focus on their relation to use in sport. Two therapists co-led each session; the psychoeducational and experiential aspects of each session were split between the two leaders. The therapists had 2-4 years of experience in providing evidence-based treatment to children, youth and adults in individual and group settings, and additional experience in mindfulness and working with young athletes. The principal investigator (K.A.B.), a doctoral student in clinical psychology, led each session, and two other female doctoral students in clinical

psychology co-led three sessions each (T.R.H. and C.R.M.). The principal investigator trained the co-leaders in the mindfulness skills training manual.

Sport relevant modifications and adaptations were made to teaching and implementing the mindfulness skills. For instance, athletes were asked to consider ways in which they could utilize mindfulness of emotions when called out for a penalty; mindful movement as a way to re-focus when there has been a stop in play; and mindful stretching during team stretches prior to games.

The intervention included developmental considerations with respect to the language and an accessible approach to teaching the skills (Vissek et al., 2009). To this end, all materials were written and communicated with a grade six reading and comprehension level. Furthermore, in order to accommodate the varying attention levels of adolescent males, the sessions were under one hour (shorter than previous interventions, which lasted approximately 1.5-2 hours), and a participatory, as opposed to didactic approach was used. To further adapt the training to the young athletes, the exercises were kept brief and varied, rather than having lengthy seated meditation exercises, as has been traditionally done in mindfulness interventions. In addition, youth were encouraged to seek out opportunities for mindfulness in their daily life (e.g., listening to music, washing dishes, riding on the bus, etc). Although there was a need to communicate the background and rationale for mindfulness approaches, explanations were kept brief and instead, questions and feedback were encouraged as a way to facilitate comprehension of material. With respect to teaching the mindfulness skills, after instructions were given and questions were answered, the group facilitators participated along with the athletes in the activities. If the athletes expressed uncertainty about the material, the group facilitators always provided personal examples of using mindfulness skills in their own lives. All of these adaptations were made with developmental considerations in mind – the purpose was to engage the youth in participating and understanding the material, and essential to this is having this material be developmentally accessible, and the group facilitators were required to be flexible and relatable in that sense as well.

The structure of each session involved providing a sport specific rationale for the skills being taught, teaching the skills, practicing the skills as a group, discussing how to

practice the skills outside of the session, and finally how to deal with any roadblocks to practice that may occur. At end of the session, the athletes were provided with hand outs of the mindfulness exercises taught in that session with brief instructions explaining the exercise for home practice. The athletes were provided with mindfulness tracking sheets to keep track of their home practice (daily minutes per exercise), and at the end of each session the athletes were encouraged to practice each of the activities taught at least once daily. The structure of the sessions was adapted from previously published mindfulness interventions adapted for sport: MAC (Gardner & Moore, 2007) and MPSE (Kaufman, Glass & Arnkoff, 2009).

The content of the mindfulness training sessions was adapted from the mindfulness skills taught in the MAC program (Gardner & Moore, 2007), MBCT (Segal, Williams & Teasdale, 2002), and DBT (Linehan & Heard, 1992; Linehan 1993a; Linehan 1993b; Linehan, 2015). Group leaders taught the following exercises: mindful breathing and body scan (session one), mindfulness of emotion and mindful movement (session two), mindful stretching and seated meditation (session three), mindful body scan and mindful walking and emotions in sport (session four). Session five and six included a review and practice of the above exercises, and debriefing their experience with mindfulness and a discussion around continued participation.

**Table 1. Details of Sessions in the Mindfulness Skills Training program**

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***Introductory Session***

- Describe mindfulness program and answer any questions
- Distribute consent forms and pre-test packages

***Session 1***

- Collect consent forms and pre-test packages
- Introduction to the program and rationale for mindfulness as a psychological skill in sport
- Brief orientation to mindfulness
- Mindful breathing exercise and discussion
- Body scan exercise and discussion
- Assign home practice, debrief session and discussion

***Session 2***

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- 
- Discussion and review of previous session and homework
  - Mindfulness of emotions exercise and discussion
  - Mindful movement exercise and discussion
  - Assign home practice, debrief session and discussion

### **Session 3**

- Discussion and review of previous session and homework
- Mindful stretching exercise and discussion
- Seated meditation and discussion
- Assign home practice, debrief session and discussion

### **Session 4**

- Discussion and review of previous session and homework
- Feedback regarding preferred exercises and focus for last session
- Body scan and discussion of how to integrate into home practice and training
- Mindful walking applied to soccer and discussion
- Review of all four sessions, discussion and problem solving around barriers to ongoing practice and integrating it into training and competition
- Closing remarks, question and answer, reminder of two booster sessions in two months
- Distribute post-test measures

### **Follow Up Session 1**

- Discussion of home practice
- Review and reorientation to mindfulness
- Mindful breathing exercise related to practice/competition and discussion
- Mindfulness of emotions exercise related to training/competition and discussion
- Mindful walking exercise related to training/competition and discussion
- Debrief session and discussion

### **Follow Up Session 2**

- Discussion and review of previous session with participant feedback on exercises
  - Body scan exercise related to training discussion
  - Mindful stretching exercise related to training and discussion
  - Seated meditation related to training and discussion
  - Discussion and feedback about the exercises and program
  - Closing remarks, question and answer, reminder to continue practicing mindfulness
  - Distribute final measures
-

## ***Background Questionnaire***

All athletes reported on their age, ethnic background, experience with sport psychology, meditation and/or yoga practice, total years of participation in their sport, frequency of current participation of their sport (training and competition hours/week), concerns about their current performance (technical skill, performance in competition, psychological issues related to performance), and concerns about their psychological well being. In addition, participants provided a self-assessment athletic performance, and commented on any current or past injuries that have taken them out of training or competition.

## ***Performance***

In the background questionnaire, athletes provided a self-assessment of their current athletic performance from 1-10 (“Rate your performance thinking of both your athletic ability/potential and athletic performance/ achievement.”). This self-rated measure of performance was selected as the participating team of athletes was known to utilize this type of rating scale to evaluate their performance in training and competition on a regular basis. For this reason, it was deemed an appropriately face valid measure of the athletes’ perception of their performance. In addition, previous research has utilized similar 10-point ratings of performance (e.g., Kaufman, Glass & Arnkoff, 2009; Gardner & Moore, 2012). Further, given that the athletes play different positions and have varying team statistics depending on how many minutes have played and so forth, another more objective measure was not available for data collection. Coach and staff ratings were also not available for collection due to time and resource constraints.

## ***Mindfulness Measures***

The reviewed literature reveals that different measures of mindfulness vary from one factor (Mindful Attention Awareness Scale; Brown & Ryan, 2003) to five (Five Facet Mindfulness Questionnaire; Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). These differences stem from divergent theoretical underpinnings of mindfulness. The Kentucky Inventory of Mindfulness (KIMS; Baer, Smith & Allen, 2004) and Five Factor Mindfulness Questionnaire (Baer et al, 2006) were derived from a skills-based model of mindfulness

practice in DBT (e.g., Linehan, 1993a; Linehan, 1993b, Linehan, 2015), and the Philadelphia Mindfulness Scale (Cardaciotto et al, 2008) and the Mindful Attention Awareness Scale (MAAS; Brown & Ryan 2003) focus on acceptance and attention relating to Kabat-Zinn's mindfulness-based stress reduction practice. In light of the operational definition of mindfulness adopted and outlined in the previous section, the current study will employ two measures of trait mindfulness: the KIMS and the MAAS. The MAAS gives an overall assessment of mindfulness and awareness, and the KIMS provides a more detailed view of the skills and behaviours that comprise mindfulness.

The MAAS measures the trait form of mindfulness and is derived from historical and contemporary Buddhist scholarship on the subjective nature and behavioural expression of mindfulness. In addition, the MAAS incorporates clinical theory and research on the practice and enhancement of mindfulness, and included the guidance of teachers and students of mindfulness who reflected the agreement that mindfulness is fundamentally a quality of attention (Brown et al, 2011). This 15-item self-report inventory assesses mindfulness indirectly, in that the items reflect the absence of mindful attention in various situations. Items are rated on a 6-point Likert scale ranging from 1 (almost always) to 6 (almost never). Scores are derived by computing a mean of the 15 items, with scores ranging from 1 to 6; higher scores reflect an individual being more mindful. The measure has good test-retest reliability, evidence of convergent and discriminant validity (Brown & Ryan, 2003) and a single factor solution with loadings ranging .43 to .78 (MacKillop & Anderson, 2007).

The KIMS is a 39-item self-report inventory that is used for the assessment of mindfulness skills. Mindfulness is defined to include focusing one's attention in a nonjudgmental or accepting the experience occurring in the present moment (Baer et al., 2004). Items are rated on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (almost always or always true). Items reflect either direct descriptions of the mindfulness skills, or they describe the absence of that skill, which are reverse scored. The KIMS yields four scale scores: observing (12 items, score ranging from 12-60), describing (8 items, score ranging from 8-40), acting with awareness (10 items, score ranging from 10-50) and accepting without judgment (9 items, score ranging from 9-45). Observing involves noticing or attending to various internal (cognitions, bodily sensations) and external (sounds, smells) stimuli. Describing taps into labelling, or

noting of observed phenomena by applying words in a nonjudgmental way. Acting with awareness relates to being attentive and engaging fully in one's current activity. Finally, accepting without judgment involves suspending judgment and simply allowing what is happening to be as it is without avoiding, changing, or escaping it. Higher scores on each scale reflect higher levels of mindfulness skill in that domain. The KIMS shows good internal consistency, test-retest reliability and a clear factor structure (Baer, Smith & Allen, 2004).

### ***Emotion Regulation***

Extant literature investigating emotion regulation has long utilized self-report to measure the extent to which one can regulate their emotions. Such questionnaires tend to measure the opposite of emotion regulation: emotion dysregulation. The Difficulties in Emotion Regulation Scale (DERS) is one of the most common measures of emotion dysregulation (Weinberg & Klonsky, 2009). It is a reliable and valid measure of emotion dysregulation among adults (Gratz & Roemer, 2004), and two research groups have recently completed psychometric evaluations of the measure for use with adolescents, revealing suitable reliability and validity for use with adolescents (Neumann, van Leir, Gratz & Koot, 2010; Weinberg & Klonsky, 2009).

The DERS (Gratz & Roemer, 2004) is a 36-item, six-scale self-report measure used to assess problems in emotion regulation. Six items comprise the Nonacceptance subscale, five compose the Goals subscale, six compose the Impulse subscale, six compose the Awareness subscale, eight compose the Strategies subscale, and five compose the Clarity subscale. Items are rated on a Likert scale, with responses ranging from 1 (almost never) to 5 (almost always). Total scores range from 36 to 180. There are no suggested clinical cut off scores for this measure; however, the studies cited above indicate that higher scores indicate greater difficulty with emotion regulation. The DERS total score was used in all analyses.

### ***Mental Health***

In light of the fact that the proposed study measures aspects of psychological functioning among a non-clinical population, a self-report mental health measure was employed. The Youth Outcomes Questionnaire Self-Report (Y-OQ-SR) is a self-report

measure of treatment progress for adolescents aged 12 to 19 (Wells et al, 2003). The YOQ-SR is comprised of 64 items with six subscales designed to assess behavioural and psychological difficulties. The measure takes approximately 7 minutes to complete. Items are presented in a 5-point scale with options including 0 (never), 1 (rarely), 2 (sometimes), 3 (frequently), and 4 (almost always). Seven of the items are written and reverse scored to describe elements of healthy behaviour, and are weighted differently, with scores ranging from 2 to -2. Community and clinical sample norms are provided by the test authors (Wells et al., 2003). This measure yields a total distress score plus subscale scores for the following domains: intrapersonal distress; somatic complaints; interpersonal relations; social problems; and behavioural dysfunction. The YOQ-SR total score has demonstrated high internal consistency, suggesting the value of using the total score as a measure of severity of psychological distress (Ridge et al., 2009). The YOQ-SR has adequate concurrent validity with intercorrelations exceeding the criterion of .75, indicating excellent validity (Ridge et al., 2009). This measure has moderately high temporal stability with a test-retest reliability coefficient of .89 for the total score (Ridge et al, 2009). Total scores range from -16 to 240, where lower scores indicate normative non-clinical aspects of general mental health functioning. Scores greater than 47 indicate clinical concern. The total score was used for the all analyses.

### ***Self-Efficacy***

A self-report measure assessing self-efficacy about performance was also included. The Trait Sport Confidence Inventory (TSCI) developed by Vealey (1986), has been widely used as a measure of athletes' beliefs about their ability to be successful in their sport. This measure has been psychometrically evaluated and has appropriate internal consistency, test retest reliability, and convergent, discriminant and construct validity (Fung et al, 2001; Vealey, 1986). Scores range from 13 to 117, and higher scores indicate higher sport specific self-efficacy and the athlete's belief in their ability to succeed in sport.

### ***Mindfulness Log***

All participants completed a log of their mindfulness practice outside of the intervention sessions. The tracking sheets included a column for each mindfulness skill

taught (e.g., stretching, mindful walking etc.) and a row for the date, and participants were instructed to write the number of minutes spent practicing each skill (if it was practiced) on each day. The Mindfulness Logs were provided to participants at the first session, and were collected one week following the fourth session, so they reported on four weeks of mindfulness practice. A daily average was calculated for all analyses.

## **Chapter 3. Results**

### **Attrition and Missing Data**

In regard to attrition and treatment of missing data, thirty-eight participants consented to the study, and thirty-seven took part in four or more sessions and completed the questionnaire packages. For varying reasons, at each time point a small number of participants did not return the questionnaire package or complete specific questionnaires. One participant's responses were excluded from all analyses due to invalid data. This participant clearly was not responding honestly to any of the items on all three data collection time points, as he rated every single item in a neutral manner. When approached about this, he acknowledged that he was not attending to the questions, and was not responding truthfully. As a result, thirty-six participants completed questionnaires across the three time points, with 33 datasets for time one, 35 for time two and 32 for time three.

With respect to missing data on specific measures, mean imputations were calculated for questionnaires with one or two missing items. Any questionnaires with more than two missing items were discarded from all analyses.

### **Data Analytic Approach**

All descriptive and statistical analyses were completed in SPSS Version 22. With respect to preliminary analyses, all variables were inspected for non-normality, and were transformed when necessary. Potential covariates (e.g., age, history of meditation practice, dispositional mindfulness) that may be significantly associated with the dependent variables at all three time points were examined, and the results did not indicate a need to control for these variables as covariates in any of the analyses. The

small sample size had limited power ( $1-\beta = .55$ ) to detect even moderate effects (Faul, Erdfelder, Lang, & Buchner, 2007).

Regarding primary analyses, three separate repeated measures analyses of variance (ANOVAs) using time (pre-test, post-test and end of season) as the independent variable and performance, self-efficacy and emotion regulation as the dependent variables were run. To follow up on significant effects, pairwise t-tests were conducted to investigate significant differences between the three time points.

For the first hypothesis, a repeated measures ANOVA was run comparing the participants' self-reported self-efficacy (TSCI) across the three time points. To evaluate the second hypothesis, a repeated-measures ANOVA was run comparing participant's self-rated performance across the three time points. Finally, a repeated measures ANOVA was run comparing participant's emotion regulation (DERS) across the three times points.

## Demographics/Descriptive Analysis

Table 2 presents the descriptive statistics for the primary variables.

**Table 2 Means and Standard Deviations for Primary Variables Across Time**

Measure	Pre Test			Post Test			Follow Up		
	n	M	SD	n	M	SD	n	M	SD
Performance	33	7.09	.86	30	7.3	.92	30	7.67	.62
MAAS	33	4.47	.56	33	4.36	.67	32	4.66	.56
KIMS – Observe	33	35.73	7.4	32	32.97	8.39	31	34.19	10.05
KIMS – Describe	33	26.02	4.6	32	26.5	5.74	31	21.18	4.58
KIMS – Awareness	33	32.12	3.58	32	31.08	3.49	31	33.08	4.01
KIMS – Acceptance	33	31.35	6.38	32	32.48	6.86	31	33.55	6.76
Emotion Regulation	33	77.62	19.31	33	79.6	20.86	32	75.53	20.56
Self-Efficacy	33	89.17	11.55	33	89.79	10.9	32	92.51	11.28
Y-OQ-SR	33	32.03	17.68	32	30.32	25.13	32	26.53	26.45
Mean Minutes Daily Practice*	-	-	-	32	14.43	13.58	-	-	-



Measure	Pre Test			Post Test			Follow Up		
	n	M	SD	n	M	SD	n	M	SD
Currently Injured	2	-	-	5	-	-	4	-	-

\* Range 0 – 90 minutes.

## Primary Analyses

Results of the repeated measures ANOVAS are presented in Table 3.

**Table 3 ANOVA Results for Primary Hypotheses – Self-efficacy, Performance and Emotion Regulation by Time**

Dependent Variable	<i>F</i>	<i>p</i>	$\eta^2$
Self-efficacy	1.06	.33	.04
Performance	4.62	.015	.17
Emotion Regulation	.774	.466	.05

### ***Hypothesis 1***

It was anticipated that significant improvements in self-efficacy would be observed in performance from pre-test to post-test and final. Mauchly's test indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 14.67, p = .001$ , therefore the degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ( $\epsilon = .54$ ). The results show that there was no significant effect of time on self-efficacy among the participants,  $F(1.37, 34.3) = 1.06, p = .33, \eta^2 = .04$ . The results reveal that participants' reported self-efficacy did not significantly change over time.

### ***Hypothesis 2***

It was expected that significant increases in performance would be observed from pre-test to post-test and final. A repeated measures ANOVA revealed a significant effect of performance across the three time points,  $F(2, 44) = 4.62, p = .015, \eta^2 = .17$ .

Specifically, performance increased significantly from pre-test to end of season  $p = .025$ , but did not significantly differ between pre-test and post-test, or post-test and end of season.

### ***Hypothesis 3***

It was expected that significant increases in emotion regulation would be observed from pre-test to post-test and final. The results reveal that there was no significant effect of time on emotion regulation among the participants,  $F(2, 50) = .77$ ,  $p = .47$ ,  $\eta^2 = .03$ . The results reveal that participants' reported emotion regulation did not significantly change over time.

## **Post Hoc Analyses**

### ***Team Membership***

In order to better understand the findings above, an analysis with team as an independent variable was completed, as this was not taken into account in the primary hypotheses. This post hoc analysis was completed, as the participants were comprised of youth on two different teams, grouped by age: the U 16 team was comprised of youth aged 14-16 and the U 18 team included youth 16-19. However, age was not a significant covariate with any of the dependent variables. Notwithstanding age, team cohesion and culture may be different across the two teams, possibly affecting the results when analyzed as one group. As such, we were looking at two different teams who may have had a different experience in the intervention so these follow up analyses were completed to investigate any potential differences in the primary hypotheses. The analyses, presented in Table 4, were run with team x time interactions, and also separately by team.

**Table 4 ANOVA Results for Primary Hypotheses by Time – Team Membership (U 16 and U 18)**

Dependent Variable	<i>F</i>	<i>p</i>	$\eta^2$
<i>Team - U 16</i>			

Dependent Variable	<i>F</i>	<i>p</i>	$\eta^2$
<b>Team - U 16</b>			
Self-efficacy	4.36	.02	.27
Performance	3.82	.04	.24
Emotion Regulation	1.66	.21	.12
<b>Team - U 18</b>			
Self-efficacy	.21	.69	.02
Performance	4.71	.02	.34
Emotion Regulation	.69	.50	.05

## Hypothesis 1

To test the hypothesis that increases in self-efficacy would be observed from pre-test to post-test to final, with an interaction of team by time, a repeated measures ANOVA was run with team membership and time as the independent variables, and self-efficacy as the dependent variable. Mauchly's test indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 15.35$ ,  $p = .00$ , therefore the degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ( $\epsilon = .51$ ). With team membership in the model, consistent with the original model, the results show that there was no significant effect of time on self-efficacy among the participants and there was a nonsignificant time x team interaction.

Separate analyses were run for self-efficacy by team membership (U 16 and U 18). In this analysis, the assumption of sphericity was violated  $\chi^2(2) = 14.56$ ,  $p = .001$ , therefore the degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ( $\epsilon = .27$ ),  $F(1.15, 13.84) = .21$ ,  $p = .69$ ,  $\eta^2 = .02$ . The results of repeated measures ANOVAs revealed that the U 16 team evidenced significant increases in self-efficacy over time  $F(2,24) = 4.36$ ,  $p = .02$ ,  $\eta^2 = .27$ , with significant increases observed from pre-test to final  $p = .04$ . On the other hand, the effect of time on self-efficacy was nonsignificant for the U 18 team.

## **Hypothesis 2**

To test the hypothesis that increases in performance would be observed from pre-test to post-test to final, with an interaction of team by time, a repeated measures ANOVA was run with team membership and time as the independent variables, and performance as the dependent variable. Consistent with the original model, with team membership in the model, the findings revealed a significant effect of performance across the three time points. Specifically, performance increased significantly from post-test to follow up and from pre-test to follow up. In addition, there was a significant time x team interaction.

Separate analyses were run for performance by team membership. The results of repeated measures ANOVAs revealed that the U 16 team evidenced significant increases in performance over time  $F(2,24) = 3.82, p = .04, \eta^2 = .24$ . With respect to the U 18 team, the effect of time on performance was significant  $F(2, 18) = 4.71, p = .02, \eta^2 = .34$ . Furthermore, the U 18 team evidenced specific increases from post-test to final  $p = .01$ .

## **Hypothesis 3**

To test the hypothesis that increases in emotion regulation would be observed from pre-test to post-test to final, with an interaction of team by time, a repeated measures ANOVA was run with team membership and time as the independent variables, and emotion regulation as the dependent variable. With team membership in the model, results show that there was no significant effect of time on emotion regulation among the participants and there was a nonsignificant time x team interaction.

Separate analyses were run for emotion regulation by team membership. The results of repeated measures ANOVAs revealed that the both the U 16 and U 18 teams evidenced nonsignificant changes in emotion regulation over time  $F(2,24) = 1.66, p = .21, \eta^2 = .12, F(2,24) = .69, p = .50, \eta^2 = .05$ .

## ***Mindfulness***

As many previous studies have evaluated self-reported mindfulness when completing mindfulness interventions, it was deemed appropriate to include this in a

post-hoc analysis, and as a manipulation check. Repeated measures ANOVAS were run with mindfulness as the dependent variable and time as the independent variable. Table 5 presents the results for the two mindfulness measures used: the MAAS and the KIMS (four separate subscales).

**Table 5 ANOVA Results for Mindfulness by Time**

<b>Dependent Variable</b>	<b>F</b>	<b>p</b>	<b><math>\eta^2</math></b>
MAAS	3.26	.047	.12
KIMS-Observe	4.47	.017	.16
KIMS-Describe	.83	.44	.033
KIMS-Awareness	3.68	.033	.13
KIMS-Acceptance	2.12	.13	.081

A significant effect of time was observed for overall mindfulness measured by the MAAS  $F(2,50) = 3.26, p = .047, \eta^2 = .12$ . Results indicated a significant increase in MAAS scores from post-test to final  $p = .006$ , but not from pre-test to post-test or pre-test to final. In terms of the KIMS, significant effects of time were observed for the Observe scale  $F(2,48) = 3.26, p = .047, \eta^2 = .12$  and the Awareness Scale  $F(2,50) = 3.26, p = .047, \eta^2 = .12$ , but not for the Describe or Acceptance scales.

## **Post Hoc Qualitative Feedback**

Following the intervention, one of the staff members sent an email with some feedback on the mindfulness program. In this email he commented on the structure, content and miscellaneous parts of the mindfulness skills training program. A selection of relevant comments is included in Appendix B.

## **Chapter 4. Discussion**

The aim of the present study was to examine whether a six-session group-based mindfulness intervention for elite adolescent athletes had a positive effect on self-efficacy, performance and emotion regulation. This is the first study to include developmental adaptations and an assessment of self-efficacy and emotion regulation in a mindfulness intervention for performance enhancement in sport (Briegel-Jones et al, 2013).

### **Main Findings and Implications**

This was a sample of elite adolescent male soccer players (mean age = 16) involved in a full-time elite soccer training academy. The statistical results revealed significant improvements in self-reported performance from pre-test to final (post-booster sessions). On the other hand, the findings did not support the hypothesis that significant increases would be observed in self-efficacy for the group overall. The findings did not support the hypothesis the intervention would yield increases in emotion regulation. The findings of each hypothesis will be discussed in depth below.

The results evidenced that a brief, skills-oriented mindfulness intervention resulted in increased self-reported performance over time for elite adolescent athletes. Interestingly, the effect of the intervention increased over time, such that there was no statistically significant increase in the athletes' perception of their performance after one month in which participants partook in four mindfulness skills training sessions, but a significant increase was observed in performance three months after beginning the program, following the completion of two booster sessions. Previous studies have observed performance increases immediately following mindfulness skills training (Gardner and Moore, 2012); while other studies have observed performance increases in a one-year follow-up, but not immediately following the mindfulness intervention (DePetrillo et al., 2009). In the present study, the positive effects of mindfulness on

performance appear to increase over time, and with more sessions. This novel finding is in line with the mindfulness tradition that teaches the importance of a consistent daily meditation practice (e.g., Kabat-Zinn, 2005) to experience the vast benefits that mindfulness meditation can provide in one's life. With extended experience in having a regular mindfulness practice, one becomes more aware of how it is helpful in their life over time. What we observed in this study suggests that for adolescents and adults alike, mindfulness may not be something that comes naturally initially, and feeling comfortable with the here and now comes with practice and integration into daily life. During the initial phase of the study – the first month in which the athletes attended four weekly sessions, the athletes reported on mindfulness practice outside of the intervention. On average, they practiced 15 minutes a day. It is possible that it took some time for the athletes to integrate the mindfulness skills and practice in their daily lives, hence the benefits related to performance and self-efficacy were observed after a few months of practice and using the skills in sport and life outside of sport. Furthermore, in addition to the four initial training sessions, the two follow up sessions seemed to be key to the development and integration of mindfulness skills related to the athletes' training and competition. For instance, the participants had more opportunity to use mindfulness skills during practice and competition, and to integrate these skills into the team culture more generally. In addition, the booster sessions provided an opportunity for the athletes to practice the skills with guidance and to discuss and problem solve any roadblocks to using the mindfulness skills in training and competition. In informal conversations with team members, the staff, coaches and participants shared that the team began to use mindful stretching and breathing during warm-ups in practice and prior to competition.

In contrast to scientific inquiry that has revealed that mindful meditation facilitates increased emotion regulation (e.g., Chambers et al, 2009) and is related to fewer difficulties with emotion regulation and inappropriately reacting to distressing emotions (Hill & Updegraff, 2012), the present study yielded non-significant results related to effect that mindfulness skills training has on emotion regulation. The non-significant finding in the present study may be due to many factors. For instance, across all three time points of the intervention, the participants consistently endorsed high levels of emotion regulation, suggesting that, overall, these young athletes may have already developed appropriate skills to regulate their emotions in daily life. From a young age, elite athletes

must learn how to manage their emotions in order to perform well in their sport. In the case of soccer, if an athlete does not regulate his or her emotions, and he “loses control” (e.g., yelling at a referee, being physically aggressive, or fighting) on the field, he or she receives a yellow card or a red card, or in other sports the errant athlete may get a penalty. Hence, to perform at such a high level, the elite adolescent athlete has been filtered through many channels both in terms of their athletic performance, but also in terms of their psychological development. The young elite athlete is expected to handle him or herself professionally and appropriately even in the face of difficult, overwhelming emotions. Additionally, the measure used to assess emotion regulation was developed for use among clinical, comorbid, challenging populations, so perhaps the measure is not sensitive enough for such a clinically normative, high functioning population. Hence, this measure may not measure higher-level emotion regulation skills that elite athletes use to manage intense emotions experienced in the context of sport. Nevertheless, this finding contributes to the literature in terms of the relevance of emotion regulation and mindfulness among adolescent athletes, as this is the first study to use the DERS with an athlete population. Although the statistical analyses did not reveal any significant differences, it was my impression from informal discussions with the athletes in the present study that the athletes felt better able to manage their emotions, in particular anger and anxiety, at the conclusion of the mindfulness intervention.

The present study also aimed to better understand the impact that practicing mindfulness had on self-efficacy. Overall, the results did not support the hypothesis that the mindfulness intervention would increase self-efficacy; however, the younger group of athletes (U 16 team, aged 14-17) did evidence significant improvements in self-efficacy from pre-test to following the booster sessions; however, due to the small sample size, these results must be interpreted with some caution. Although it is not immediately clear why self-efficacy did not increase significantly overall or for the U18 team, one could speculate that self-efficacy in sport is more stable as a result of age (the age of U 18 team ranged from 16-19). As the older athletes have had more time spent in elite athletic competition, the athletes have had more experience in the highs and lows of sport participation, hence self-efficacy may be less subject to change as it might be for younger athletes. Furthermore, the older athletes have participated in sport for longer, have had more experience, and therefore have had more time to develop their sense of self-efficacy in sport. These speculations point to the importance of focusing on



developing personal and sport-related self-efficacy for younger athletes through mindfulness approaches. In addition, these mixed results may be related to some of the difficulties around defining self-efficacy in sport, as it is a very subjective matter and can be quite context dependent. Nonetheless, a recent study (Pineau et al., 2014) revealed that self-efficacy beliefs were significantly correlated with flow, mindfulness and sport self-efficacy. In particular, Pineau et al's (2014) results demonstrated that those athletes who reported being more aware of present-moment experiences reported higher self-efficacy. Hence, interventions that increase mindfulness in athletes may actually aid in the enhancement of self-efficacy and self-confidence. Further study focusing on mindfulness and sport-specific applications with measures of efficacy beliefs, mindfulness, and performance are necessary to examine how mindfulness-based interventions work to enhance performance.

The current study was among the first to modify a mindfulness skills training programs to meet the developmental needs of adolescent athletes. Recent meta-analyses point to the dearth of research focusing on developmentally sensitive adaptations in mindfulness approaches to working with young people (Zoogman et al, 2014; Burke, 2010), and the developmental needs of children and youth should be considered in designing mindfulness interventions. Some developmental considerations include having shorter sessions due to the shorter attention span of children and youth and decreasing the amount of verbal instruction and complicated language to accommodate the cognitive and language capacities of youth. In addition, mindfulness interventions should include content that is more relevant to young people to maintain their interest and provide mindfulness exercises that are enjoyable for the age group. The current study addressed this gap in the literature, and demonstrated that a mindfulness skills training program designed with modifications for working with young people resulted in increased mindfulness, performance and self-efficacy in an adolescent athlete population.

Overall, the current study addressed several important issues in the field of clinical sport psychology. First of all, this study was one of the first to adapt a mindfulness intervention for use with adolescent elite athletes. These developmentally sensitive modifications made the material more accessible and understandable for young athletes, and future study should consider incorporating similar modifications into

the design of mindfulness interventions. Secondly, the finding that performance increased from post-test to follow up suggests that these effects take some time to be revealed, but can be achieved in a six-session intervention over the span of only a few months. Mindfulness interventions for athletes are hence most successful after athletes have had some exposure to the skills, time to integrate them into their sport and personal life, and time to practice them on a regular basis. These results also imply that beginning mindfulness programs with elite athletes early in their career would provide the greatest benefit, as mindfulness is a skill that is developed over time. In addition, researchers have pointed out that young athletes who are introduced to psychological skills at a young age are more likely to access services and use these skills than mature elite athletes who partake in PST programs later in their career (Henricksen, Larsen, Storm & Ryom, 2014). Third, the findings revealed some challenges in measuring and understanding emotion regulation in a non-clinical population of elite athletes, as the findings were not consistent with previous research indicating that mindfulness increases emotion regulation. Finally, the results revealed data suggesting that there may be a developmental nature to self-efficacy: younger participants' self-efficacy increased significantly from pre-test to following the booster sessions, whereas the findings were not significantly different among older participants. Future study may benefit from better understanding the developmental nature of self-efficacy, and how to address issues around self-efficacy in younger athletes.

## **Limitations**

This study was not without some limitations with respect to design, measurement and participant characteristics. As an initial evaluation of a novel mindfulness skills training protocol, the present study had a small sample size, which resulted in limited power to detect statistically significant differences. Despite this limitation, significant effects were still detected. In addition, the study was uncontrolled due to the lack of an available, appropriate comparison group. Participants in this study were a highly specialized team of elite athletes, and it was not possible to procure a control group with the same level of training and involvement in sport. These athletes were involved in a full-time soccer academy, sponsored by a national professional soccer organization. As a result, a recreational group of same-aged athletes, for instance, would not have been

an appropriate comparison group. In addition, it was not possible to split the group into treatment and control groups, as the athletes train and travel together most days of the week, so the possibility of cross-group communication may have rendered any results tentative and potentially contaminated.

Another concern relates to the issue of maturation. Three months passed from the start to the end of the study. There is a possibility that the increases of self-rated performance were observed due to the athletes' skills developing in the context of their sport, rather than in the context of the mindfulness intervention. Additional measures of performance including team statistics, time spent in play, goals scored and coach ratings may have helped to reduce this potential confound.

The results revealed some specific issues related to the measures selected for the study. The measure used to assess self-efficacy measure may not have been specific enough for this specialized athlete population. The TSCI (Vealey, 1986) was selected for use in this study as it has been validated in research with general athlete populations, and has been used as both a measure of self-confidence and self-efficacy (Mellalieu & Hanton, 2009). On the other hand, recent research studies have developed specific measures of self-efficacy relevant to the sport (e.g., soccer, hockey, rowing) and the particular tasks/skills that the athletes use in their training and competition on a regular basis (e.g., Pineau et al, 2014). Future study should investigate the utility of both sport specific and general measures of self-efficacy. In addition, the measure of performance was not a validated measure of performance and relied on a single item. This measure was not an objective measure of performance, and was likely subject to a significant amount of discrepancy based on individual differences. However, this measure was chosen as the youth in this soccer academy self-rated their performance on regular basis. At the time of the intervention, most of the athletes were doing so on a daily basis at practice, after games and with their coaches. This lends support to the face validity of the performance measure as these youth can mindfully and objectively assess themselves in terms of performance. Hence, this item seemed to have specific relevance to this team, and appeared to be a face valid measure of performance for these athletes. Nevertheless, the measurement of performance could have been improved by having more than one measure for the performance dependent variable. For instance, parallel coach ratings or team statistics could have been used as

additional, more objective dependent variables, and future study should employ more objective measures of performance.

With respect to participant characteristics, there is always a chance that some participants were not responding truthfully. Because the young athletes in the study were involved in the intervention in the context of their participation on elite level soccer soccer team, concerns about socially desirable response sets are raised. This concern is generally present in studies that rely on self-report. Every effort was taken to ensure that participants responded to the questionnaires as directed. The participants were reminded that their responses were anonymous and confidential, in no way would affect their standing on the team, and that honest responses were important to the purposes of the study. In addition, to prevent any bias in the data, datasets with questionable validity were investigated and excluded from the analyses if appropriate.

## **Future Directions**

Mindfulness in sport psychology is an area of great interest for current research as it is an emerging field for performance enhancement in all levels and age groups of athletes. The promising results of the current open trial for adolescent athletes suggest the need for in depth descriptive qualitative analyses and larger scale studies including control groups in order to establish a more detailed understanding of the effect of mindfulness interventions within this population. This is an important step in establishing whether mindfulness interventions are efficacious and empirically validated for athletic performance enhancement in adolescents.

There is much to be learned from the promising results of the current study. The quantitative data revealed that performance increased significantly following participation in the mindfulness intervention. Future research could extend these findings by conducting qualitative analyses with participants in the study to examine what aspects of the mindfulness intervention were the most helpful, what role mindfulness plays in their current athletic performance, and in what way mindfulness is a part of their daily life outside of athletic performance. Anecdotal conversations with the athletes during the current study provided an interesting context to begin to have these conversations;

however, established qualitative data analysis methods are needed to contextualize this important information, and to synthesize it to inform future research with this population.

The present study is among one of the first investigations to include developmentally informed adaptations into a mindfulness training protocol with adolescent athletes. A recent study evaluated the effects of a 10-week yoga intervention with young athletes ( $n = 21$ ; mean age = 13) from national amateur athletic swimming teams (Briegel-Jones et al., 2013). The authors echoed the concerns outlined in the present study regarding developmentally sensitive interventions, and provided specific adaptations in working with young athletes. The brief sessions included in the intervention with the young swimmers taught simple yoga poses and sequences focused on breathing and relaxation. The mixed methods study used quantitative measures to assess mindfulness and dispositional flow and a qualitative survey about how the yoga practice impacted mindfulness, sport preparation, competition and recovery. No statistically significant changes in mindfulness and flow were observed in their quantitative results; however, the qualitative data suggested that participants became more aware of thoughts and feelings, and acted with greater awareness when in training and competition. The authors concluded that the participants experienced enhanced concentration and a greater sense of control, reduced worry, enhanced wellbeing and motivation improvements at levels similar to other mindfulness-based interventions.

Taken together, the results of the aforementioned investigation and the present study represent a step toward addressing the lack of previous research aimed at developing more effective and developmentally sensitive approaches to mindfulness in adolescent athletes. Mindfulness approaches have been successfully implemented for youth with mental health conditions, in schools with normative adolescents (Burke, 2010), and for performance enhancement with adult athletes (Gardner & Moore, 2012). By integrating adaptations that target the unique cognitive, performance and psychological needs of youth, the findings presented in the current study reveal preliminary evidence for the effectiveness of mindfulness approaches to performance enhancement with adolescent athletes. As reflected in the qualitative feedback provided by the team staff (Appendix B), the sensitivity to the attention spans and need for engaging activities was noticed and reportedly was helpful in engaging the participants with the material.

In addition to adapting mindfulness interventions for implementation with young athletes, it appears that self-report measures may also need to be modified specifically for working with athletes. A recently published study has suggested that a measure based on the work of Gardner and Moore, the research team who developed the MAC approach to performance enhancement, may be helpful to this end. According to Thienot, Jackson, Dimmock, Grove, Bernier and Fournier (2014), mindfulness measures to date focus on activities of daily living, and are not specifically relevant to sport. Thienot and colleagues (2014) created a measure of mindfulness derived from Gardner and Moore's MAC and from assessing athletes' use of mindfulness as a self-regulating skill to manage distressing or distracting stimuli. The study provides preliminary evidence that the measure is effective, but Thienot and colleagues (2014) offer that future study is required be further refined and validated by other research groups for use in an athlete population. Notwithstanding the above, this new measure allows for a more accurate assessment of the mechanisms underlying mindfulness-based interventions in the context of sport, and is a promising start for a sport specific measure of mindfulness. Furthermore, the current findings point to the importance of modifying measures of performance, self-efficacy and emotion regulation for use with athletes and for specific sports.

Not only are contemporary researchers making adaptations to interventions in working with different populations and sport-specific modifications to measurement, so too are they investigating the experience of athletes who have participated in mindfulness interventions. Such information can provide a rich understanding of the needs of athletes, and their unique perspective on the changes that result from participating in a mindfulness program. A recent qualitative evaluation identified that mindfulness programs for athletes can be improved if we better understand whether there is a shift in mindset that occurs after engaging in sport psychology training that accounts for some of the change in performance (Baltzell, Caraballo, Chipman & Hayden, 2014). The qualitative study included experiences from 7 athletes who participated in a six-week, 12-session mindfulness intervention. Sessions were brief with 20 minutes spent providing psychoeducation about aspects of mindfulness and the exercises for the upcoming session and 10 minutes spent completing mindfulness meditation exercises. The exercises focused on open awareness capacity (observing thoughts and sensations), caring thoughts for self and teammates, concentration

exercises, and practicing acceptance of negative mind states. The qualitative analysis revealed that participants felt more stressed before the program, experienced a new relationship with their emotions after the program, felt better able to manage intense emotions during sport, had an increased focus in competition and practice, had a different relationship with negative emotions on and off the field, had more positive attitudes toward meditation, felt more connected with the team, and felt more inspired (Batzell et al, 2014). Participants also provided recommendations related to improving the program including preferring to do the sessions before practice (as it had occurred after practice), and to give more relevant examples in the intervention. Batzell and colleagues (2014) utilized short thirty-minute sessions, which is in contrast to previous studies using two-to-three hour sessions such as MAC and MPSE. Hence, the authors concluded future studies should evaluate whether brief sessions result in quantitatively increased performance and mindfulness. Consistent with this suggestion, the present study represents a brief intervention (six one-hour sessions), and the findings of increased performance and mindfulness following the intervention are a promising start in this direction. Future research needs to expand on these findings by comparing session length to better understand the specific effects of the length of time spent in the intervention on performance and mindfulness outcomes.

Finally, a recent workshop published in the conference proceedings from the 2013 Applied Association of Sport Psychology Conference has suggested using mindfulness approaches to performance enhancement as an adjunct to some of the more traditional psychological skills used with athletes. Baltzell, McCarthy and Greenbaum (2014) posited that integrating mindfulness skills with traditional PST provides athletes and coaches with the requisite skills to better manage difficult emotions in sport. When one is able to non-judgmentally pay attention to their thoughts and emotions, mental resources are freed up to then select the appropriate mental skill to use that would be the most helpful in that situation (Baltzell, McCarthy & Greenbaum, 2014). In particular, the authors identified that mindfulness strategies can be effectively used with self-talk, cognitively accepting aversive emotions, clarifying and committing to task-focused efforts in performance, and visualizing success while noticing what is good (Baltzell, McCarthy & Greenbaum, 2014). This workshop represents a unique direction that the field of mindfulness in sport psychology may be going: integrating traditional sport psychology techniques with mindfulness techniques for optimal performance.

## Conclusion

The present study sought to better understand how mindfulness interventions are helpful for performance, self-efficacy and emotion regulation for elite adolescent athletes. The results presented here support that mindfulness training can have a significant positive effect on performance and self-efficacy among elite adolescent athletes.

These meaningful findings contribute to the expanding literature at a timely juncture where other research teams are also investigating the more nuanced aspects of integrating mindfulness into the mainstream of sport psychology interventions. The results of this study call for future research in the field to consider a number of issues related to research design and measurement. The present study and recently published studies reveal that: adaptations for working with younger populations both in terms of the intervention and the measures used are important to integrate into research moving forward; in-depth qualitative studies are needed to better understand underlying emotion regulation mechanisms of mindfulness and the relationship to performance enhancement and self-efficacy; research is required to evaluate any differences between brief and more lengthy interventions; longitudinal follow-up studies are required to understand the timing of the effects of the intervention; and large-scale Randomized Controlled Trials are required to provide support for mindfulness as an empirically validated intervention for performance enhancement for young athletes. In addition, descriptive qualitative analyses are necessary to acquire a deeper understanding about the role that mindfulness plays in the life of the young athlete after participating in interventions. The current findings that a developmentally adapted mindfulness intervention had a positive effect on performance and self-efficacy represents a positive and promising step in this direction for this emerging field of clinical sport psychology.



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## Appendix A.

### Protocol for the Mindfulness Skills Training Program

#### Session 1 – One Hour

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What the intervention sessions will involve, expectations of their participation

- Attendance at 4 one-hour sessions, March 13, 25 and 27
- Participate fully in the sessions and ask any questions at any time
- Reminder of confidentiality and voluntary nature of the research to come to research team if they wish to withdraw or have any concerns
- Sessions will involve a short instruction followed by instruction on several “mental skills” that are thought to be helpful for athletes. This is not “therapy,” instead we will teach you skills that you will practice in session and at home.
- Group rules: respect, phones off, keep information shared in the sessions is confidential, do not share it outside of here (e.g., with others outside sessions, other team members or friends, facebook etc)
- Structure for each session: q and a about last session, review of homework, practice new skills, q and a about session, and home practice assignments, which you will keep track of on the mindfulness practice log for the duration of the training program.

Rationale for the intervention

- Delineate importance for performance
- This kind of mental training helps with focus and attention, and managing emotions in sport.
- We will teach exercises here that you can use in a game or practice context, and practicing these skills outside of practice will help with cultivating your attention, focus and concentration.
- Has anyone ever had a “flow” experience, or been in the zone? Can you describe it? Can you stay in the zone once you are there? Is it hard to get back there? These mental exercises can be helpful to get in and stay in a mental state where you are

focused and absorbed in what you are doing. On the one hand you can notice everything that is going on around you, but on the other hand, your attention is so focused on the task that you are doing it all kind of fades away in the periphery.

#### Orientation to mindfulness – definitions of constructs

- The skills we will teach you are called “mindfulness” skills. These practices have been adopted by psychologists to help patients with psychological problems and physical ailments, and recently researchers have demonstrated that it may be helpful for athletic performance.
- Mindfulness relates to athletic performance, because these skills help hone your focus and attention, allowing you to experience the present moment more fully, without being distracted by other things that are not related to what you are doing in the moment (soccer example)
- Although a nice side effect of mindfulness is that you might end up feeling more relaxed or calm your mind, mindfulness is really much more about being awake and present. So, when you practice mindfulness, remain awake to everything that you notice. If you feel more relaxed, that’s a bonus.
- Today we will complete two exercises to better understand and practice mindfulness: mindful breathing and the body scan.
- Time for questions before starting exercises.

#### Mindful breathing exercise and discussion

- Description of mindful breathing, relevance to task of soccer
- This exercise can be done anywhere, anytime. Any of you ever get nervous before a match? Some amount of nervousness and excitement is useful, but if we become too anxious, our muscles get tighter and this can get in the way of you playing your best. We will talk about mindful breathing, which is useful in preparation for competition, to increase focus and relaxation, and to decrease performance anxiety.
- For this exercise, you will sit or lie in a comfortable position. You may close your eyes or leave them open. If you choose to keep your eyes open, focus your gaze on one spot for the whole exercise. We will do ‘mindful breathing’ for 5 minutes.

I will instruct you through the exercise, and you can just silently follow along, you do not need to respond. During that time, you will pay attention to your breath. This means, silently noticing what it feels like as air passes through your nostrils, down your throat and fills your lungs. Does the air feel warm, cool, does it swirl around, does it feel light or heavy, etc.

- Place your hands on your stomach, you want to feel your stomach rise when you breathe in and fall as you breathe out.
- If you notice your mind wandering, that's ok, just notice that and bring your attention back to your breath. Some days we find our minds wander a lot and other days not so much. That's fine. With mindfulness, the goal is to always be bringing your attention back, in this case to your breath. If your mind wanders 100 times, bring your attention back 101 times. Nobody can "fail" at mindfulness, that practicing mindfulness "properly" doesn't mean that you have a blank mind with no thoughts or distractions all the time, and that the most important part of the practice is bringing your attention to your experiences in the present moment.
- Discussion: any questions and concerns. Ideas about how to integrate this into life?

#### Body scan meditation and discussion

- The purpose of the body scan is to bring you physically and mentally into the present moment. When you are in an important match or practicing you need to be present both physically and mentally, completely focused on the task that you are doing. This body scan allows you to begin to create focus and practice cultivating awareness off the field. Through awareness of breath and tuning into your physical body, you can learn to quiet your mind.
- Lay or sit in a comfortable position in a chair or on the floor, arms either by your side or resting gently in your lap. Close your eyes gently, but if you find you drift off, keep your eyes opened slightly looking at the ground 3 or 4 feet ahead of you.
- Start by taking a few deep breaths once you are in a comfortable position. As you inhale, notice your belly expanding, and your lungs taking in air. As you exhale

- notice your body relaxing, and your stomach pulling in naturally. Just observe your breath, inhaling and exhaling on your own time.
- If at any time during this exercise you notice your mind wandering, just notice it. Notice what it is doing silently – thinking, planning, remembering – and then bring your attention back to the exercise to what you are paying attention to.
  - After taking a few breaths, begin to move your attention to your body. Starting at your feet, bring your awareness and attention to your feet. Begin to notice how your feet feel at the point that they are connecting to the ground, the pressure or tingling you may feel on your feet. Bring your awareness to the feeling of your feet in your shoes and socks, the sensations you may feel, pressure, tightness, looseness. Notice the feelings on your toes, between your toes, on the tops of your feet, and the bottoms of your feet, and heels. Just observe the physical sensations, and notice anything you may be feeling. Resist the urge to label, judge, like or dislike what you feel or don't feel. Just observe and be aware of these sensations.
  - Bring your attention up to your ankles, shins and calves. Start to notice any sensations you feel. If you notice any tightness in your muscles, let go of the resistance and tightness and just notice the sensations that are happening in that area. You may feel the sensation of your pants or socks, you may feel your calves resting on the ground or chair. You may even notice some pain or discomfort from training, just notice this sensation and you might notice that you like or are more comfortable with certain sensations, but for the ones you have a harder time with, pay attention to those as well and resist any urges to distract themselves, and let go of judgments. Just allow yourself to be aware of the different sensations you feel.
  - Move your attention and awareness to your knees and the back of your knees. Continue to cultivate a non-judgmental awareness of any physical sensations you notice. Kindly observe the any feelings in your knees. Attend to any sensation you might have with curiosity and interest... What might you discover here?
  - Shift your attention now to your thighs: the front and back, your quadriceps and hamstrings. What do you notice there? You may feel stiff or sore, you may notice

- tingling, or temperature. Notice how your thighs touch the back of your chair or the ground, how this feels on your skin or clothing. If you notice tension or soreness, simply observe this feeling and let it go just as you notice it.
- Remember that if you find your mind wandering, just notice this and observe what it is doing. Do not judge it, but simply return your awareness and focus to your breath and the part of the body you are paying attention to.
  - Now begin to notice your hips and sit bones sitting in the chair or on the ground. Once again, notice any sensations such as tension, temperature, or clothing as you begin to pay attention to this area. Continue to notice the physical sensations avoiding labeling or judging the sensations. If you begin to judge or label, or if your mind wanders, just notice that as well, and bring your attention back to your breath and observing this area of your body.
  - At this time, shift your attention to your lower torso, your stomach and your lower back. Comb through these areas in your mind, observing any sensation you experience. Be sure to keep your abdominal muscles relaxed and soft as you inhale and exhale. Notice how your stomach inflates when you inhale and deflates as you exhale. Simply continue to notice the sensations you experience without labeling or judging them. If you find yourself doing this, just continue to bring your attention back to your breath and refocus on this area of your body.
  - Now bring your awareness to your upper abdomen and lower back, begin to scan this part of your body for sensations. Notice how your ribcage expands and contracts with each long inhale and exhale. Pay attention to any sensations you may feel, positive or negative and bring your awareness to them without judgment or labeling. Just continue to breath and pay attention to this area of your body.
  - Move your awareness up your torso to your chest and upper back. Notice any sensations that you feel here, continuing to do so without judgment or rejection, resisting the temptation to like or dislike the sensations. If you feel any tension in your chest or upper back, just notice this and allow yourself to let it go with each breath. Just inhale and exhale into each sensation you experience.

- Remember that if you find your mind wandering, just notice this and observe what it is doing. Do not judge it, but simply return your awareness and focus to your breath and the part of the body you are paying attention to.
- Shift your attention to your shoulders. You may notice tightness in your shoulders, or tension. If you do, just breathe into those sensations and allow yourself to notice them as sensations, without labeling or judging. Notice how your shoulders rise and fall as you breathe, scan your shoulders for any sensations such as temperature or the way your clothing feels. Just observe these sensations as they are, and continue to breathe in and out slowly.
- Now start to move your attention to your arms, down from your shoulders to your elbows, and from your elbows to your wrists, hands and fingers. You may notice that your arms are resting by your sides, or on the ground. Just notice the sensation of your arms touching your body or the ground. You may feel your muscles, tension in your muscles, if you do, just observe this sensation without judgment, letting go of it and relaxing your muscles with your breath. Just continue to breathe deeply and observe your arms as they are.
- Begin to move up your awareness up your body to your neck. In your mind, scan the front and back of your neck, observing any sensations you might be experiencing. You may feel tension, or tightness, you may also feel your shirt touching your neck. Whatever you feel, just observe it as it is, as a sensation without labeling or judging it. Breathe into any tightness and allow yourself to let go of it with your exhale.
- Remember that if you find your mind wandering, just notice this and observe what it is doing. Do not judge it, but simply return your awareness and focus to your breath and the part of the body you are paying attention to.
- Start to shift your attention up your neck to your head, the top, front, back and sides of your head. Just pay attention to whatever you feel, and observe it as it is, without judgment, like or dislike. If you feel any pain, notice this, and try to imagine letting it go as you continue to breathe in and out deeply. Just notice the

sensations you feel as sensations without any positive or negative label, observing them as they occur in your body.

- Now move your focus to your face, paying attention to any small, subtle sensation you may feel. Scan your forehead, your eyes, your cheekbones, your lips and chin, your ears and hair. Pay attention to any sensation you might feel: the temperature of the air on your skin, how your eyes feel when they are closed gently, the air passing in and out of your nostrils. Observe any small sensation you may experience and just notice it nonjudgmentally, inhaling and exhaling naturally as you do so.
- Continuing to breathe, begin to pay attention to the sensations of your whole body, from the top of your head to the tip of your toes. Allow yourself to notice all of the sensations that you are experiencing at the same time. Just observe these sensations as they occur without labels or judgment, and continue to breathe as you do so.
- When you are ready, bring your awareness back to your breath. Slowly begin to flutter your eyelids open, and bring your awareness back to the room.
- Discussion: questions? Concerns? What did you notice when completing this exercise? Did your mind wander? What did you notice about your breath, body, thoughts that came up? When can you envision practicing this exercise?

Home practice outline – distribute mindfulness log and handouts

- You will track when you practice the skills that we have taught. All we ask is that on the sheet provided you indicate how many minutes you practiced each skill every day. Before next session we would like you to practice the breathing exercise 4 times and the body scan 3 times. Any questions about that?
- We have also provided you with a handout that has the instructions for mindful breathing and the body scan script on it if you need to refer to it.

Summary of session, reminder of next session and Q and A

## **Session Two – One Hour**

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### Review of last session and homework practice

- Discussion of any roadblocks to practice? Suggestions for how they might use body scan and mindful breathing for sport. Personal examples from running, skiing etc...

### Introduce session today

- Mindfulness exercise related to emotions encountered in sport, and movement exercise.

### Mindfulness exercise – mindfulness of emotion

- Discussion about what emotions are. Emotions encompass changes in your neurochemistry, bodily sensations, such as body temperature, heart rate, muscle tension, etc., as well as changes in your facial expressions, body language, and urges/desires.
- Mindfulness of emotion is mainly about attending to the bodily sensations that go along with the emotional state, watching and noticing how they feel and what it's like as they come and go or increase/decrease in intensity.
- What kind of emotions come up when practicing and competing?
- How do they affect you in your game or training – do they facilitate or debilitate your performance? Some people find that emotions facilitate their game... Can anyone think of an example for this (elicit talking about anger being channeled to play with more intensity, or physiological anxiety being a catalyst for energy, e.g., increased heart rate, more vigilant to surroundings, motivator to do well if anxious about the outcome of the game).
- A level of emotion is important to sport: anger, joy, anxiety... Are there any other emotions that people notice when playing? What about positive emotions? Do people spend time celebrating after a goal? How does that impact your attention and focus on the game?
- Even though emotions can be helpful, there are times when emotions can become overwhelming, all encompassing or distracting. Can anyone relate to this? Does anyone want to share an example? Elicit examples related to becoming focused on the emotion, processing the emotion, and then becoming distracted or disengaged



from the game. Maybe they yelled at an official, did a celebratory flip, swore to themselves, or began to have anxious thoughts about what just happened or what will happen next.

- It is not that having an emotional reaction is negative, but when we think about emotions in sport in a mindful sense, we want to be sure that we are in the present moment so that our awareness is on the task that we are doing – whether it is running, kicking, waiting, defending, footwork, scoring or blocking... When you are in the game, you need your head in the game too.
- Getting caught up in our emotional reactions, positive or negative, can take us away from what we are doing. What works for people to get back into the game when they find themselves carried away by the stories that revolve around having an emotional reaction or experience? Elicit examples around self-talk, suppressing the emotion, negative perceptions of the emotion... Sometimes trying to refocus after getting distracted by an emotion can be distracting in and of itself. This is where mindful breathing can be helpful. Of course this would have to be at a point in the game where you have a few moments, but you can know that when an emotion, for instance anger at a bad call, comes up, you can utilize present moment focus and awareness as an immediate way to refocus your attention on the game.
- We are going to experiment with mindfulness of emotion today: not reacting or acting on an emotion, but just mentally experiencing the sensations that you may feel as a result of the emotion. In this exercise we will begin to attend to the bodily sensations that go along with the emotional state, watching and noticing how they feel and what it's like as they come and go or increase/decrease in intensity.
- Sitting in a comfortable position let us bring our attention to our breath. Just like last time, sit in an upright position, comfortably in your chair, noticing the quality of your breath and the physical sensations of your body in the chair.
- Now, begin to bring into your mind a recent time that you experienced a difficult emotion during a game or practice. Think of something that you don't mind

sitting with for a few minutes. It does not need to be very important or critical or upsetting, just something that was somewhat difficult for you in the moment it occurred. Maybe you felt angry after a bad call or missing a goal, perhaps you felt anxious before a penalty kick or before an important match, or maybe you were overwhelmed with joy after making an important goal or save. Take your mind back to that moment and begin to see it in your mind.

- Take time to tune into any physical sensations that this emotion brings about. See if you can note, and approach any feelings coming up in your body. Just notice them, and bring your attention to the region of the body where the sensations are the strongest. As we have done before, you can breathe into that sensation, the in-breath can bring your attention to the area, and the out-breath can allow you to feel the sensations, watching how the intensity of the sensation changes and shifts moment to moment.
- As your attention focuses on these sensations and they are present in your awareness, try to adopt an attitude of openness to these sensations, even if they are difficult. Maybe quietly say to yourself: “It is okay” and just stay with the awareness of the sensations and breath with them, accept them and let them be. Avoid holding onto or clinging to sensations/emotions they like or to pushing away or distracting from sensations/emotions they don’t like.
- Your sensations will likely change but they won’t always lessen right away. They are likely to come and go over time, and if they go, they may even come back. The idea is to accept whatever comes and avoid trying to get rid of the emotion. Just stay with it.
- Begin to feel yourself soften, bringing your attention back to the sensations if you find your mind getting distracted by thoughts or judgments. Just notice the sensations, and let go of any tensing or physical stress through your breath. Just breathe with the sensations moment by moment, reminding yourself that “it is ok”.
- As you sit with these sensations, simply noticing them and allowing yourself to feel them in a neutral manner, you may start to notice that the bodily sensations

brought up by the emotion are no longer pulling your attention as much as they were. Perhaps any tension or tingling that was there before is less intense.

- As any sensations of anger, anxiety or frustration remain swirling around in your mind, begin to return your awareness to your breath and allow your breath to be the focus of your attention from this point forward.
- Questions? Thoughts? What did people notice about the intensity of the emotions/sensations as they began to accept their presence? How can you imagine bringing this into your training and competition? It does not have to be an extended period of time, but you could use it during a break in play or heading off the field or even on the sidelines. It is about accepting that you are having an intense emotional experience, and letting it be. As we said before, it is completely acceptable and normal to have intense emotional reactions in sport. What we are suggesting is not getting carried away or distracted by emotions when trying to be present and focused in a game or practice. As we talked about before, you want to be task focused when you are in the game – getting caught up in reacting to emotions takes you away from the task at hand!

Mindful movement practice and discussion

- Now, we will talk another type of mindfulness, mindful movement. Similar to those practices already discussed, the goal of mindful movement is to bring your attention into the present moment. Much like the body scan, when we practice mindful movement, we pay attention to the physical sensations that we experience. Today, we will talk about mindful walking.
- Usually when we are walking somewhere we are doing so on autopilot - we are not paying attention to what we are doing. We don't think ok now I have to shift my weight forward and lift my right heel, arch, toes off the ground, then I have to contract my quadriceps and relax my...etc. This would be ridiculous, we would never get anywhere. Generally, we think about getting where we are going, or are about things that have happened recently, or about things that will happen. Being on autopilot is useful in a lot of ways because we wouldn't be very efficient if we had to think about all the processes involved in walking, running, playing soccer,

etc. However, sometimes being on autopilot can cause problems for us. Give examples of autopilot... Sometimes when we are on autopilot we forget what we are doing or where we are going and we make mistakes. We can miss out on important cues, or can lose out on an experience because we are not fully present and aware of what it is that we are doing.

- The goal of mindful movement is to be in the present moment and aware of what is going on in our bodies in that moment, fully participating in movement. You want to throw your self completely, with awareness, into the present moment or activity you are doing. You can do this in activities you are really well practiced at because when you try to stop and pay attention to your feelings, you have lost it, but if you throw your whole self into the activity, you can do so with complete awareness of the task and awareness of what is happening around you. This is creating the sense of task-focus that we are encouraging you to do. You can completely participate and become task-focused by using mindful movement. This can be helpful when you are learning a new skill. When we are learning a new skill, usually we break it down into steps and practice, practice, practice until it becomes automatic. In those moments it's useful to be mindful of what happens physiologically at every step of the movement, this is helpful in incorporating the new technique quicker. It is also a useful technique to bring you back into the present during a break in a game. For example during a stoppage of play if you are finding yourself feeling overly anxious, angry, excited, etc. (e.g. angry at a bad call, anxious about a penalty kick, excited after scoring...) it might be useful for you to practice mindful walking as you get yourself back into position for play to resume. You can also practice this when you come on the field at the start of a game. Now that we've talked about how it can be helpful and when it's not let's talk about what the practice of mindful walking is.
- What you will be doing is walking slowly, mindfully around the room. Walk slowly enough that you can really feel each movement and what is happening in your body during each movement.

- Begin the exercise by slowly walking, with your eyes open gently, and focused on the ground 3-4 feet in front of you, breathing in and out naturally, feeling yourself become aware with each inhale and exhale breath.
- Walk slowly enough that you can really feel each movement and what is happening in your body during each movement.
- As you move, notice what your heel feels like as it makes contact with the floor.
- With each step, observe what the muscles in your feet, legs, abdomen, and arms are doing. Which muscles are contracting, which ones are relaxing.
- Pay attention to the way your sock feels against your foot... Does it change at different points in your step? What does your foot feel like?
- Observe if there are places in your body that are tight or sore, or maybe relaxed. Pay attention to how being sore or relaxed changes throughout each step.
- Just pay attention to what it FEELS like in your body as you walk slowly around the room.
- When you are done, slow your movement, until you stop moving all together and notice the way this kind of movement feels in your body.
- Any questions? Spend time discussing with the athletes how they might find this useful in practice and competition. When do they find they are on autopilot? When is it helpful and when is it not? How to pay more attention to the present moment and bring awareness to the here and now, focusing on the task. Elicit responses related to refocusing after a bad call, or even refocusing after scoring a goal. The idea is to bring their awareness back to the game and the task that they are completing, rather than getting carried away into task-irrelevant thoughts. Also, are there any other movements that they could consider trying to practice mindfully at home? Perhaps this could relate to their pregame routine – get them out of autopilot where they may be thinking of past and future, but to center them before a game.

#### Home practice outline

- Distribute mindfulness log and this week's handouts
- Mindfulness of emotions (practice 5 times)

- Mindful movement (practice 4 times)
- Reminder to practice exercises from last week: body scan and mindful breathing

Summary of session, reminder of next session in two weeks and Q and A

### **Session 3 – One Hour**

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Review of last session and home practice

- Any questions about the exercises? Any barriers to incorporating them into your practice or routine since our last session? Thoughts on incorporating these exercises into your routine?
- How did the mindful movement exercise go? What kinds of situations did people find themselves doing it in?
- How about mindful emotion? Did anyone notice how the emotions of anger or anxiety pass after just letting them be? It is a different way of relating to your emotions – you can learn that you do not always need to act on an emotion, and similarly you do not need to push it away or ignore it. Emotions pass, just like any other thought that comes to mind.
- What about body scan and mindful breath? Do people need reminders for those? You can do the scan at night before bed, or even before or after practice or a game. What about introducing it into your pregame routine? How might that be helpful?

Today's session: mindful stretching/stretching and seated meditation

Mindful stretching/stretching (adapted from Williams, Teasdale, Segal & Kabat-Zinn, 2007)

- This exercise of gentle stretching stretches can easily be done before or after a practice or game when you are doing warm up or cool down stretching. Today we will complete a few very easy, gentle stretches that are not meant to over exert you or cause any pain or discomfort. The purpose is to pay attention to the sensations that arise in your body.

- Discussion of stretching and mindfulness. Has anyone ever done a yoga class? What was it like? How did it differ from regular stretching or exercises you might do in training? Elicit responses related to relaxation, breathing etc...
- Where are your minds when you are stretching or warming up before a game? Are you concentrating on what you are doing? Or... Thinking about the outcome? Something else? How the team will do? What will happen after? Maybe you have a pre-game routine in your mind that you go through in a pre-game warm up or stretch? What about when you are on the sidelines and are stretching so that your muscles stay loose? Or during a break in the game?
- As we discussed last week, sometimes we can be doing something but our mind is somewhere else completely. *Elicit examples from players relating to thinking about physical/mental discomfort and the outcome of the game. Do the same thing with practice.* Sometimes during pre and post practice stretching, your mind is kind of turned off and you might not actually be thinking about the activity you are doing. This is especially important before practice, as you want to be just as focused in practice and training as you are in your games. You learn how to get this focus and game-readiness through practice – if you show up to practice physically, but not mentally there, you may be more likely to do this in a game situation. If you show up to every practice mentally ready for competition, you can treat your practices as a setting stage for every future game. Try beginning to consider thinking of your time stretching and warming up as time to mentally prepare for the focus required for practice and game. This time will bring the focus that helps you stay task focused when you are out on the field.
- We will all go through this exercise together, and I will guide you through it. I want you all just to pay attention to yourselves and not be distracted by others in the room. We know it is hard to do with so many guys here, but really just try to be in your own bubble focusing on your body and experience. As we have been doing throughout, just stay focused on the task that you are doing and nothing else.

- The purpose of this exercise is to become aware of any physical sensations and feelings we have in our bodies, just like we did in the body scan and mindful walking. Learning to bring mindfulness into physical movement and stretching is another way to learn how to create task-relevant focus and to practice mindfulness in different parts of our lives and sport.
- **\*\*Move chairs to the side of the room \*\***
- We will start by **standing with a tall posture**. Place your feet parallel, about hips-width distance apart. When you are standing, allow your gaze to fall on the floor a few feet in front of you. Try not to lock your knees, keeping just a small-bend in them so that you are not hyper-extending your joints. Allow your arms to rest naturally at your sides.
- Remind yourself that what you are doing is **paying attention to your body through a series of gentle stretches**, noticing any sensations and feelings that come up. Simply observe these sensations as they arise. Throughout this exercise, observe if there are any limitations in movements, and do not try to push past it or compete with yourself or those around you, just notice it, and bring your attention back to the physical sensations you are experiencing. If you do feel any pain, just back off of the exercise to a point where you feel comfortable.
- Just **breathe naturally** throughout this exercise, and try not to hold your breath during the stretches, maintaining a consistent breath throughout the stretches. If you find that your mind is wandering, just gently bring it back to the present, to your breath and the sensations that come up...
- Now on an inhale breath, **slowly begin to raise your arms out to the sides, parallel to the floor**... And on an exhale continue raising them toward the ceiling, and allow your gaze to follow your fingertips toward the ceiling... And then inhale and slowly raise them up until they meet over your head... As you do this, you may notice tension in your arms and shoulders... With your arms stretched up in the air, just notice the sensations as they arise and change... The tension may pass or it may change in intensity, just acknowledge this.



- With your breath moving in and out naturally, with your arms raised in the air, **continue to stretch upward**... Feel your fingertips stretching up towards the ceiling, and your feet planted firmly on the floor... Breathe in and notice the stretch extending from the bottom of your feet all the way up to the tips of your fingers ... Breathe out and notice the stretch extending down from your finger tips through your arms, shoulders, back and torso, down through your legs to the bottom of your feet....
- As we **continue this stretch with your arms reaching up in the air, notice any changes in physical sensations and feelings in your body** ... Notice it with your breath, breathe into each sensation, and let it go with your exhale. Observe how the sensations change with breath. Just notice any feelings that may arise, even if you are feeling tension or discomfort, observe this... If you are experiencing pain (rather than just strain), back out of the stretch and observe the changes in the sensation as they occur...
- Now on an exhale, as slowly as you possibly can, **allow your arms to float back down to your sides**... Try to do this for a count of five breaths, with your arms stretched out to the side as they come down... One... Two... Three... Four... Five... On the exhale of your fifth breath, find your arms resting naturally at your sides again, hanging from your shoulders...
- If you find that your mind is wandering, just gently bring it back to the present, to your breath and the sensations that come up...
- With your **arms relaxed by your sides just allow your eyes to gently close for a few breaths** ... As you inhale and exhale notice the sensations and feelings happening in your body, perhaps observing the sense of release and maybe even relief that happens after having your arms outstretched... Just notice these sensations as they come and go...
- Slowly open your eyes, and now **raise your right arm up, as though you were reaching for something that was just out of your reach**... Bring your awareness back to any sensations that come up in the body and on your breath as it naturally comes in and out... See what happens if you **lift your left heel** as your

right arm is extended in the air stretching up, and then bring it back down ... Notice any sensations that arise... **Now as slowly as you raised your arm, return it back down to your side, and begin to raise your left arm...** Again notice any physical sensations, notice if they feel different than the other side, and just observe this as ‘different’... Naturally breathing in and out, **raise your right heel with your left arm outstretched...** Observe any sensations that arise as you change your physical posture, and then **return your heel to the floor... And again, as slowly as you raised your left arm, return it back to rest at your side...**

- Gently close your eyes and take a few breaths now, noticing any sensations or differences you might feel in your body... Just observe these as they come up... If you find that your mind is wandering, just bring it back to your breath, and then to your body...
- Gently open your eyes and on an inhale breath slowly and mindfully begin to **raise your arms up high** in front of you allowing your gaze to follow your fingertips, keeping them parallel to one another, and as you exhale reach them up to the sky above your head.
- When your **arms are stretched above your head, you may wish to keep them parallel or to grasp your right wrist with your left hand...** And on an exhale breath **slowly allow your body to bend to the left**, with your hips moving gently toward the right forming a big “C” shape with the side of your body... Feel the body extended in a sideways curve from the feet through the torso, ribs, and the arms and hands, breathing naturally... On an exhale breath **return your arms to stretch above your head**, switching your wrist grip to hold your left wrist with your right hand. On an exhale breath **slowly stretch and extend your body over to the right...** With your hips moving gently toward the left forming a C shape with the side of your body as you did before... With your body extended in a curve, feel your torso, ribs, arms and hands curving to the side... Breathe naturally... And then **slowly return your body to a straight position and then float your arms down slowly to rest by your side...** As you stand in a neutral

position, just notice the way that the sides of your body feel... Notice if there is any difference between the two, and just pay attention to any physical sensations that arise...

- Now begin to play with **rolling your shoulders** while letting your arms dangle by your sides... Raise your shoulders **upward toward the ears** as high as they will go, and then **backward, drawing your shoulder blades** together, and then letting them **drop down completely**, and then squeezing your **shoulders together in front of the body** as far as they will go, with the arms still dangling... Continue rolling your shoulders like this, slowly and mindfully, noticing each sensation you feel as you move through the exercise... And now begin to roll them in the opposite direction, feeling the sensations as they arise, just paying attention to them, and noticing the way that sensations come up as you continue to move your shoulders in this way.
- Allow your shoulders and arms again to rest naturally, coming again to a neutral posture, slowly... Closing your eyes gently if you have not already done so... If you find that your mind is wandering, just gently bring it back to the present, to your breath and the sensations that come up... Be still like this until I ask you to open your eyes, and just tune into the sensations in your body after this stretching series... When you are ready, slowly bring your awareness to the room and gently open your eyes.
- Discussion: what was it like? How is this different from what you normally do when stretching? Could you envision doing this while stretching before a match? Why might this be helpful? Any barriers to doing this? Could you let your teammates know that you are going to be stretching quietly during your stretch?

Seated meditation (20 minutes) and discussion (adapted from Williams et al., 2007)

- Now that we have completed specific exercises related to the mindfulness of breath, body, emotion and movement, we will try seated mindful meditation. It is nice to do this after a lot of movement, as we just did with the stretching exercise, as it settles both the mind and the body, as you try to remain as still as is comfortable for the duration.

- Has anyone ever meditated? Or perhaps if you have done a yoga class, there is some time at the beginning or end that is for meditation.
- This practice is more like what you will think of traditional meditation. Because we have done so many exercises with a specific focus, such as breathing, the body scan, working with emotions and mindful movement and stretching, we are now ready to move on to the more advanced practice of seated meditation. Today, we will meditate for approximately 10 minutes, and I will guide you through it.
- During meditation, we want to sit upright, with our spine straight, in a comfortable seat. Traditionally this type of meditation has been done sitting on the floor on a pillow, but many people are comfortable doing this in a chair or anywhere else you can find a comfortable place to sit. When we sit, we sit with some kind of confidence. Sit with our shoulders relaxed. The arms should rest comfortably on the thighs. The main point is to be comfortable, but awake. The idea is not to force yourself to relax; relaxation is sometimes a nice side effect of meditation, but meditation is more about being alert, awake, and fully present in the moment.
- During this meditation we realize that, even though what we're doing is quite simple, many thoughts and judgments about thoughts will come up. We may think about the past, the future, or even think about practicing mindfulness itself. This is a natural tendency of the mind, and does not mean that you are “not doing it right”. Just notice that your attention has drifted and bring it back to your breath. Gently observe what your mind is doing: “thinking, planning, remembering” and send your attention back to your breath and your body as a whole.
- The longer that the meditation continues, the more you may experience sensations arising in your body that you may experience as intense. As this occurs, you may notice that your attention increasingly goes to the intense sensations, of say your bottom on the chair, or the back of your knees on the chair. In these moments of discomfort, experiment with bringing your attention to the area of intensity and notice the quality of the sensations – do not judge it, for instance, my bottom is sore, I want to move, but just notice perhaps a sensation of tingling or heat, begin

to notice if the sensations change over time, or even pass. You may notice that this takes you into noticing and sensing, rather than thinking. This is a way of returning your attention and awareness to the present moment, and you can use your breath as an anchor for refocusing your attention. You can use your breath as a way to bring awareness into different areas of intensity within your body.

- Any questions before we begin the guided meditation? We will give some instruction throughout and then let you just be in silence for a period of time. We will let you know when the exercise is complete.
- Keep your head in a natural position with the chin tucked slightly in. Gently close your eyes. If you find that you need to move or shift, do so gently and slowly.
- During meditation we begin to relate to our mind in an accepting, nonjudgmental way, similar to the ways we have been doing so in previous exercises. We begin to notice our breath, the breath is what we're using as the basis of our mindfulness technique. Your breath brings you back to the present moment. The breath is constant, while the thoughts that pass through our mind are changing.
- As you sit, feel the sensations of your body. Then notice what sounds and feelings, thoughts and expectations are present. Allow them all to come and go, to rise and fall, like the waves of the ocean. Be aware of the waves and rest seated in the midst of them. Allow yourself to become more and more still.
- When you begin to feel settled into the feeling of your breath moving in and out of your body, allow your awareness to expand to the other sensations in your body as a whole. Don't accentuate or alter the breath at all, just notice it.
- As any thoughts come up, imagine that the thoughts in your mind are like clouds floating by in the sky. Just notice them floating past and quietly return your attention to the present moment.
- In the face of all these thoughts, it is difficult to be in the moment and not be swayed. Just continue to gently acknowledge that your mind is wandering, and again bring your attention back to your breath.
- As we come out of meditation, just begin to notice your body in the room again, expand your awareness from your breath and physical body to the room around

you. Slowly flutter open your eyelids, and notice any new sensations you feel as you come out of this meditation

- Any questions? Concerns? Compare and contrast with other exercises we have done so far? What can you do when your mind wanders, they you urges to move, scratch an itch and so on? Meditation can be frustrating for some people, as their minds continually wander, but that's OK, as the whole practice is to bring your mind/awareness/attention to the present moment. If your mind wanders, as all minds do, you get more practice!! The more that you practice this type of meditation, the easier it will be to cultivate mindfulness in your life and in your sport. If you can come to your breath and the present moment during quiet seated meditation, you will be able to cultivate and manage your awareness and focus more effectively on the field. Provide coaching around practicing meditating at home – how long? When? Where? Any time is better than no time! Anywhere is better than no where! Provide examples from our lives, elicit examples from them incorporating it into daily life, and then reaping benefits of being calm and focused when they are in moments of stress or anxiety.

Home practice review for the upcoming week

- Review breathing exercise and body scan if necessary, ask if people need more handouts and provide them
- We will give out the final mindfulness log for you to track for one week – we want you to do it after the final session Wednesday and then when we return to give you your next set of questionnaires next week, we will collect the homework logs then. Doing any exercise for a short period of time often is better than doing one long session. So, 5 minutes every day is good enough!
- Body scan – have people been doing this exercise? When is it helpful to do it? How might it be helpful before or after a match? Paying attention to the physical sensations in the body is a good way to practice paying attention to the mind: cultivating the focus and attention that you need on the field... What about before bed, maybe to quiet your mind if your thoughts are taking over as you are trying

to go to sleep before a match? Do two body scans before we collect the mindfulness logs next Monday.

- Seated meditation – some people find this challenging to incorporate, and even though it is simple, it is not easy! When do you envision doing this? Any ideas about how to practice this skill in an easy way? Elicit responses related to pre-game routine of quieting the mind to deal with any “outcome” focus that might be distracting. Try doing seated meditation 3 times for any duration of time.
- Mindful stretching – you don’t have to do this sequence as we did it today, as you guys are stretching every day in training. Try to bring some mindfulness into stretching before or after games, notice what it is like on days where you stretch mindfully and when you don’t. We can discuss this in our next meeting, and brainstorm ways to make this useful for you guys in your training. Do you stretch every day? Try to do it mindfully! Do mindful stretching 4 times in the next week.
- Mindful walking– this is again a way to bring some present moment awareness into your daily practice. You may do this when walking on the field before a game... Or maybe during a break in play... You can even do mindful movement when you have other activities that you do mindlessly – can anyone think of anything in training, or even at home that they do on autopilot? Next time try doing it mindfully, just as we did in last week’s session. You walk every day! Try to do mindful walking 4 times before next week.
- As with last time, do mindful breathing every day if you can! Even if it is just for one minute!
- Don’t forget to keep track of your skills at the end of the day on your mindfulness log... Does anyone need another one? Remember to bring it in next week!

Summary of session, reminder of next session and Q and A

## **Session 4 – One Hour**

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Review of last session and home practice

- Discussion around any barriers to home practice. What exercises they found helpful and which ones they did not? Do guys find certain exercises better in different situations? Did you notice yourself being mindful when you least expected it? Regular practice makes it easier to incorporate this into your life, and then into your training and performance – just like when learning new technical skills, you need to practice. We are teaching you mental skills, which also require practice to reap the benefits of increased attention, awareness and focus while engaged in your sport.

#### Body scan and discussion

- Discuss body scan home practice – what has it been like? Are people able to do this on their own, or is it helpful to have it be guided? Once you have practiced it a few times, it is much easier to do it just in your own mind, so you may want to review the instructions a couple times before you do it, and as you guide yourself through the exercise just remind yourself of the mindful principles of just returning your attention to your breath and body and the specific area that you are focusing on.
- Recall that the purpose of the body scan is to bring you physically and mentally into the present moment. When you are in an important match or practicing you need to be present both physically and mentally, completely focused on the task that you are doing. This body scan allows you to begin to create focus – this is a way to practice cultivating awareness and focus off the field. Some people find it relaxing as well, but it is not necessarily the goal of the body scan to relax, it is more about cultivating focus and awareness through breath and tuning into your physical body. This allows your mind to “quiet”. Do people ever notice that their minds can be “busy,” with lots of thoughts going through them, focusing on the past, future or worrying about little things, or boredom? As you are learning, the goal of this training is to quiet the mind, and allow those thoughts to just settle, and pass, as thoughts always do just pass...
- Guide group through body scan exercise from session one.



- Discussion: was it any different today than the first body scan that we did in the first session? What do you notice now? Elicit responses to see if they can more easily engage in mindfulness now than at the beginning...

#### Walking meditation applied to emotion in soccer

- We are going to return to mindful movement. Similar to those practices already discussed, the goal of mindful movement is to bring your attention into the present moment. Much like the body scan, when we practice mindful movement, we pay attention to the physical sensations that we experience. Today, we will talk about mindful walking.
- The goal of mindful movement is to be in the present moment and aware of what is going on in our bodies in that moment. We can use it to bring our awareness back to the present moment when we have lost our focus.
- Sometimes when you are out on the field you can be really present in what you are doing: you are on, you are completely focused in the game. This is where you want to be. However, there are other times when you can be unaware, not at all in the current moment, but worrying about the outcome of the game, thinking about fatigue, caught up in an emotional reaction of anger or frustration at a bad call or a mistake, and so on. These moments take us out of the game – the more that we practice mindfulness, the less challenging it is to bring ourselves back to the present moment when our minds wander in a game. Mindful movement is another way to bring yourself back to the present moment when you find that your mind is wandering off task in a game.
- For example you may be thinking about what you are going to have for dinner during a stoppage of play, or maybe you are finding yourself feeling overly anxious, angry, excited, etc. (e.g. angry at a bad call, anxious about a penalty kick, excited after scoring...) it might be useful for you to practice mindful walking as you get yourself back into position for play to resume. You can also practice this when you come on the field at the start of a game as a part of a pregame routine.
- Since we have given you a couple of examples, try to bring into your mind a situation where mindful movement might be helpful. You may have had a hard

time getting your focus back to the game when feeling angry or anxious at a bad call or maybe during the final seconds of a big match. Maybe your mind was drifting off while you were on the sideline for the first half of the game and you are about to get called out to play. Try to bring yourself back to that moment in your mind as we go through this exercise. Imagine the temperature of the field, the physical sensations in your body, the way that any emotions feel in your body... Try to imagine this scene as if it were happening right now. Keep your eyes open gently as you do this, but try your best not to pay attention to the room around you... Just pay attention to this scene in your mind, becoming mindful of the sensations you are experiencing.

- Now that you have the scene in your mind, begin to walk slowly around the room, moving easily past the others moving through the room, passing by them mindfully just as you observe your thoughts passing through your mind with a nonjudgmental observation. Walk slowly enough that you can really feel each movement and what is happening in your body during each movement. For example, notice what your heel feels like as it makes contact with the floor. Notice what the muscles in your feet, legs, abdomen, and arms are doing. Which muscles are contracting, which ones are relaxing. What does your sock feel like against your foot, does it change at different points in your step. What does your foot feel like? Notice if there are places in your body that are tight, sore, relaxed, etc. How does that change throughout each step?
- You may notice that thoughts or emotions come up, just allow the thoughts to pass by, without any judgment. If you notice an anxious thought come, just label it an anxious thought, and return your attention to the sensation you feel while walking... Your foot connecting to the ground, your muscles contracting and relaxing as you shift your weight from left leg to right... Just continue to pay attention to the sensations you feel with each step you take.
- Just pay attention to what it FEELS like in your body to walk slowly around the room, and allow your thoughts to come and go as they do...

- When you are done, slow your movement, until you stop moving all together and notice the way this kind of movement feels in your body.
- Any questions? Doing something as simple as walking mindfully can help you to refocus when emotions have been stirred up and are interfering with your focus – mindful walking can help you refocus and get your mind back into the present moment, away from taking the time to think about and make judgments about your emotional reaction.
- Spend time discussing with the athletes how they might find this useful in practice and competition. What is it like to do this while imagining a game scenario? The purpose is to pay more attention to the present moment and bring awareness to the here and now, focusing on the task. When you become overwhelmed or have a reaction during a game, this can help you refocus and bring your attention back to what you are doing. Less time is spent focusing on the emotion or thought you have (e.g., “What a bad call! That ref is brutal! Or, “Oh man, the game is riding on this penalty kick! I better get it!”), distracting you from what you are doing. You now can bring your awareness back to the present moment and refocus on the game. You will notice that the thoughts you had can pass quite quickly and you do not need to act on them (e.g., yelling at a ref, or becoming overwhelmed with anxiety)... This can take only a few moments of paying attention to your movement. The idea is to bring their awareness back to the game and the task that they are completing, rather than getting carried away into task-irrelevant thoughts.
- Since we did this earlier on, has anyone found any other movements that they could consider trying to practice mindfully at home? Perhaps this could relate to their pregame routine – get them out of autopilot where they may be thinking of past and future, but to center them before a game.

#### Summary of all four sessions and discussion of ongoing practice

- Brainstorm strategies to continue practicing mindfulness – e.g., it does not always have to be “I am going to sit down and meditate,” but you can begin to bring a mindful approach to many things... Walking to school, stretching during training, mindful training drills that are really automatic, body scan before or after a game

as a part of your routine... Elicit responses related to incorporating it into training and games... Mindfulness of emotions when experiencing intense emotions during a game or training session etc etc

- Ongoing practice should be near daily, and try to incorporate it into one activity that you do each day... The best way to make this happen is to have it be a part of your training routine. You have to practice mindfulness – as you may have noticed, it was probably not easy to do this all the time... This is for most of you, a new way to relate to your thoughts and physical sensations, and may have been challenging at times. Similar to how it is when you learn any new skills, the only way for it to become easier and more comfortable is to practice. I know that each and every one of you is capable of committing yourself to practice, and this is another aspect of your training, your “mind training” that you can commit to for your sport. Also know that you can do ANYTHING mindfully. If you want to reap the benefits of task-focus awareness and mindfulness on the field, try practicing it in some activities off the field. Brushing teeth, walking, talking with friends, watching TV etc. Again, we want you to have as many opportunities to practice this as possible – by practicing off the field, you will become more adept at mindfulness, and then on the field you are more able to stay in the present moment, not letting your thoughts or reactions to events take over your mind.
- What might make it hard to keep up a mindfulness practice? What if you forget it all? Decide it’s too much work? You don’t have the time and so forth? We will provide you with handouts so that you don’t forget the exercises – so that part is covered! However, it can be hard to keep up with something new, and to integrate that into your lives. Any ideas for how to keep it going? Maybe making a commitment to yourself to a certain amount of minutes per week? Or always doing mindful breathing in your pre-or post-game routine? Remember, you are working on your physical body every day, so try throwing in some work on your mind as well!
- Remind athletes that they have one week to complete the mindfulness practice log and return it to team staff.

- Reminder that next week we will distribute the post-test questionnaires. They should complete all items on the questionnaires and to respond honestly.  
Reminder that we will have them complete another round of questionnaires at the end of the season.
- We will take a break for two months and have two follow up sessions in June. We will give them more information about this closer to the date. These will be just to brush up on the mindfulness skills they have already learned and a way to remind them of the exercises that we have been working on this month. They will be under an hour and we will do 2 or 3 exercises in each.
- Hand out extra copies of the practice handouts for them to take home.

### **Follow Up Session 1 – One Hour**

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Check in

- how the season has been going, home practice, if people are still practicing mindfulness skills even though they were not asked to track it. Any barriers to practice? What exercises, if any worked better for them? Any questions about the practice?

Today's session

- we will do three short exercises, just as a refresher in case anyone forgot what the exercises were, and when they might be useful: mindful breathing, mindfulness of emotions and mindful walking.

Reorientation to mindfulness

- Mindfulness skills help hone your focus and attention, allowing you to experience the present moment more fully, without being distracted by other things that are not related to what you are doing in the moment – which for you guys is playing soccer. Remember how we talked about task-focused attention? Practicing

mindfulness helps you stay on task, without being distracted with information or thoughts/emotions that are not relevant to what you are doing.

- Although a nice side effect of mindfulness is that you might end up feeling more relaxed or calm your mind, mindfulness is really much more about being awake and present. So, when you practice mindfulness, remain awake to everything that you notice. If you feel more relaxed, that's a bonus.

Mindful breathing exercise and discussion (repeated from earlier session)

Mindfulness of emotion practice and discussion (repeat exercise from earlier session)

Mindful movement practice and discussion (repeat exercise from earlier session)

Wrap up

- Discuss importance of home practice, answer any questions that came up today, barriers to home practice? As with last time, do mindful breathing every day if you can! Even if it is just for one minute!
- Reminder of next follow up session next week: final session for the mindfulness training program.

### **Follow Up Session 2 – One Hour**

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Check in and q and a

- How has practice gone? Any roadblocks? Discussion around integrating exercises into daily life.

Plan for the day

- Today we will do three short exercises, just as a refresher in case anyone forgot what the exercises were, and when they might be useful: body scan, mindful stretching and seated meditation.

Body scan and discussion (repeated from earlier session)

Mindful stretching and discussion (repeated from earlier session)

Seated meditation and discussion (repeated from earlier session)

Wrap up

- Discuss importance of home practice, daily answer questions about barriers to continuing to practice the skills.
- Answer any questions about mindfulness and the training program
- If anyone is interested in seeking further sports psychology consultation on an individual basis, PhD students like the three of us see people at the CPC at SFU and will provide the phone number should anyone wish to see someone for individual support.
- Thank team members for their participation.
- We will share the results if they want, and bring extra copies of the study information sheet so that they have our contact information should they wish to obtain the results.
- Distribute final questionnaires: remind participants that they need to be completed by the following week.

## **Appendix B.**

### **Post Hoc Qualitative Feedback**

Following the intervention, a staff member who was highly involved in the implementation of this intervention with the team sent an email with feedback on the program. From this staff member's perspective, some of the strengths of the structure included the length of the sessions ("I think the break up into approx 1 - 1.5 hour sessions was perfect"), the structured activities and player participation ("Having the players actively participate was good too. Our players would come from school and possibly also an early morning workout, so engaging them was critical at that point in the day; Getting the players to answer questions was good"), having assigned home practice ("Having short amount of homework was a good idea to keep their thoughts and interest ticking over from session to session."), and the progression of building the skills each week ("From week to week the content seemed to have a logical progression."). In addition, he commented on the importance of the way that the information was communicated to the players, for instance holding the attention of the participants ("It is difficult to capture the attention and interest of 15-18 year old boys and I thought you (and your team!) did an excellent job of this") and having two co-leaders deliver the sessions in tandem ("Having different voices convey the info was also helpful, especially since the other voices (your coworkers) did a great job.").

In addition to a solid endorsement of the program, the staff member also made some suggestions for running a similar program in the future. For instance, adding a final session that summarizes the entire program ("I think that a final session could have been added to really recap and even go over many of the techniques again to reinforce and really solidify the learning process."), having a smaller room so the players could hear better and be more focused ("I think the sessions were much more effective in the smaller room. In the larger banquet room, it was easier for players to get distracted and lose focus. It was also more difficult to hear you from the back in the larger room."), focusing on specific points when not engaging in activities ("When you weren't doing a structured exercise, perhaps changing your intonation or really emphasizing a certain point would help to really engage/garner interest from the players."), and being aware of sport specific terminology ("When I asked for feedback from some of the players,



participants referred to a part in the talk where they were supposed to visualize themselves "kicking a goal" or "scoring a head goal"... it was something that the players remembered for some reason and pointed out that it was not "proper soccer terminology".)

Overall, the team was pleased with the intervention and many players reportedly benefited from it, and there are of course those who are not as invested in engaging in sport psychology as well.

"If we transfer this to soccer, I think there were some valuable pearls that players could take away. Not all players were receptive to this training and that will always be the case. But I told them that even if they picked up one small nugget of info that helps you going forward in your sporting and personal career, that it will have been worthwhile. Being mindful can be used in so many instances in sport and it can also help to support some of the other larger components of sports psych such as goal setting, focus, dealing with pressure..."