Implementing Langerian Mindfulness to Increase Flow Experience During Tennis Performance

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Abstract

Enhanced athletic performance can lead to a more fulfilled experience. By simultaneously enhancing performance and overall experience in athletic settings, one potentially reaches a higher propensity for flow, an optimal mental state of heightened experience and performance (Jackson, 1996; Kee & Wang, 2008). Mindfulness, specifically Langerian Mindfulness, has previously been shown to be useful in increasing one's performance in a variety of settings (Langer et al., 2010). Given that Langerian Mindfulness has been shown to increase performance, this study intends to investigate whether Langerian Mindfulness can increase performance in an athletic setting, while also increasing one's propensity for experiencing the flow state.

So far, there are a limited number of interventions developed for athletes to enhance their performance through mindfulness techniques (Birrer, Rothlin & Morgan, 2012). The current study seeks to create another resource for athletes, by developing a potential mindfulness intervention that could be useful in the augmentation of performance, leading to the increase of the propensity of experiencing a state of flow. One path to increasing the propensity of experiencing flow would be to increase one's mindfulness. However, the current tools to do so in athletic settings revolve around the use of mindfulness meditation to increase dispositional mindfulness (Birrer et al., 2012). This intervention has proven difficult to implement in athletic settings due to the difference of the context of the activity and the practice of the intervention (Kee &

Wang, 2008). When one is athletically performing during an activity, it is very different than when one is meditating in a quiet setting. There needs to be more accessible way in which individuals can access a higher state of mindfulness during practice and performances. Langerian Mindfulness in athletic settings provides a unique approach that allows for novel distinctions of the present moment to enhance athletic performance through the increase in mindfulness during the activity.

This study will be an experiment implemented in a tennis setting, investigating whether providing participants with mindfulness prompts while conducting a tennis practice will increase their performance in a tennis task, and in turn increase their likelihood of experiencing flow. Participants will be tennis players with previous tennis experience. This study hypothesizes that Langerian Mindfulness will increase performance during a tennis activity and increase the propensity of experiencing the flow state. The study focuses on developing a way in which athletes can enhance their performance by allowing for a more accessible means of increasing mindfulness during practices. While this study only uses tennis players as its population, the findings of this research can be implemented across many areas of performance. The focus on the development of an intervention that can be implemented, regardless of the context, will be useful across all mediums of performance.

Dedication

I dedicate this thesis to my parents, Byron and Brenda James, and my family who have supported me through this journey with amazing patience and love.

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I would like to express great gratitude to my thesis advisor, Dr. Ellen Langer, and to my research advisor Dr. Dante Spetter for their encouragement and guidance throughout this research project. I would also like to thank Dr. Elizabeth Ward for her support and patience throughout this journey.

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Chapter I

Introduction

In the advancement of psychological approaches, there has been a shift towards a more holistic approach that focuses on human experiences (Privette, 1983), which has led to further investigation of the positive effects of mindfulness on both health and performance outcomes (Paganini & Philips, 2015). Through the investigations of these positive effects, researchers have shown that mindfulness can be useful in improving quality of life (Kabat-Zinn et al., 1992; Langer, 2009; Paganini & Philips, 2015; Zilcha-Mano & Langer, 2016). Addressing the mind's role in human experience, Csikszentmihalyi (1990) states that "how we feel about ourselves, the joy we get from living, ultimately depend directly on how the mind filters and interprets everyday experiences" (p. 9). This suggests that there is a relationship between an individual's processing of events and his or her quality of life.

Csikszentmihalyi's connection between mental processing and positive affect could be linked to abilities of emotional intelligence. Emotional intelligence refers to the ability of an individual to perceive, understand, and manage emotions, along with the ability to incorporate emotions in the facilitation of thought processes (Ahmad & Hashmi, 2015; Kamath, 2015). Given these characteristics, it seems as though Csikszentmihalyi was referring to a form of emotional intelligence being a predictor of experience of joy and quality of life.

Mindfulness, a state of awareness of internal experience and external stimuli (Carson & Langer, 2006; Kabat-Zinn, 1994; Langer et al., 2010), has been shown to increase levels of emotional intelligence when participants are instructed through mindfulness practice (Kamath, 2015). Given that mindfulness relies on aspects of attention and awareness, it would follow that emotional intelligence and emotional awareness would be positively affected with proper instruction.

Researchers have also suggested that by increasing positive affect and emotional intelligence, an individual will also be able to increase performance outcomes (Ahmad & Hashmi, 2015; Brose, Lovden, & Schmiedek, 2014; Moradi, Nima, Ricciardi, Archer, & Garcia, 2014). Similarly, Marin and Bhattacharya (2013) found that higher emotional intelligence levels lead to higher experiences of the flow state in music performance. While they caution the extension of these findings into other realms of performance outside of music, it is interesting to note the connection between emotions and flow experience.

In response to an evaluation of experiences during performance, many athletes have described a mental state in which they feel an effortless fusion of the body and mind, deeper concentration, and a feeling of transcendental performance in the present moment (Kaufman, Glass & Arnkoff, 2009). This mental state has been defined as *flow* (Csikszentmihalyi, 1990). While flow is an optimal mental state, reaching flow has proven to be difficult. The elusive nature of flow could be due to the fact that flow is comprised of several components (Kaufman et al., 2009).

Given Csikszentmihalyi's (1990) definition of flow, in order to reach this mental state, it would necessitate aspects of emotional intelligence and mindfulness, such that the individual would have to be mindful of the experience of the body and mind in the present moment. It would seem that mindfulness, aforementioned as a tool to increase levels of emotional intelligence, could be a tool to increase levels of flow experience as well, resulting in higher levels of performance.

Due to mindfulness' connection to higher levels of flow and performance, mindfulness is increasingly being implemented in Sport Psychology as a tool to increase performance outcomes (Kee & Wong, 2008; Bernier, Thienot, Codron & Fournier, 2009; Langer, Djikic, Pirson, Madenci & Donohue, 2010). A bridge between flow and mindfulness has been forged, yet the nature of the relationship between the two constructs is still in the early stages. Further investigation is necessary to discover ways of promoting the flow state, as it has proven to be an elusive mental state to achieve. This study investigates the implementation of mindfulness practice as a way to achieve the flow state through increasing present moment experience and resulting in higher levels of performance.

Optimal Experience and Peak Performance

Csikszentmihalyi (1990) states that the construct of flow is comprised of two main facets: optimal experience and peak performance. In order to experience flow, one has to incorporate both constructs in the moment, transforming the experience of a simple performance into one that is transcendental in nature. Due to this elevating

nature of the flow experience, it is one that tends to shift the organization of the self following the experience. Csikszentmihalyi (1990) mentions that experience of the flow state creates further complexity of the self, given that the state of flow provides a sense of overall organization amongst the connection between the mind and the body. Once an individual reaches a level of optimal experience that creates a path towards peak performance, an altered identity of the self is developed, creating order to mental processing and actions, resulting in actions seeming effortless at times (Csikszentmihalyi, 1990).

Csikszentmihalyi (1990) describes optimal experience as a psychological state in which the individual's body and mind are actively engaged to the fullest potential during an activity. Csikszentmihalyi (1990) also notes that the key to this phenomenon is active participation in the event. It is not a passive experience that one allows to occur. With active involvement, the experience is shaped into a higher form, pushing the individual to fully engage in the present moment (Csikszentmihalyi, 1990).

Optimal experience is a necessary component of flow, as it is essential for one to be completely present and engaged in the moment in order to reach the level of mental awareness that flow requires (Jackson, 1996). Given the shared similarities between flow and optimal experience, the two constructs tend to overlap in some characteristics. However, it is possible for optimal experience to occur without flow (Jackson, 1996). Examples of this are not limited to performance situations. Imagine a musicophile intently listening to a piece of music. While the individual listens to the sounds, he or she becomes completely enthralled in each note of the passage. The individual

experiences the music in his or her body, allowing the stream of sounds pass through the body as if feeling the sensations of the music in the present moment. The individual is completely present in the moment of processing the moment, leading to a state of elevated experience. While this example is indeed optimal experience, it does not comply with the experience of the flow state, given the lack of performance. The individual in this case is only listening and engaging in awareness of the present moment and is not producing an action to compliment this engagement.

Csikszentmihalyi and LeFevre (1989) found that the frequency of optimal experience did not rely solely on the situation, but relied more on the mental state of the individual. The quality of the experience is dependent upon the motivation, engagement, concentration and affect of the individual (Csikszentmihalyi & LeFevre, 1989). This can be examined in the previous musicophile example; in order for the individual to elevate his or her experience from simply hearing the piece of music to an optimal experience of fully engaging in the listening of the same music, the catalyst appears to be the mental state of the individual, not the activity.

In this example, the experience of listening to the music extends beyond the auditory facets of the event. The individual is motivated to listen closely, engaging fully to the passage, concentrating on certain aspects of the notes, while also experiencing shifts in affect during the experience. These characteristics shift the experience from a passive encounter to an active experience. Optimal experience combines elevated levels of mental engagement with the active process of experiencing the event.

Another key component of flow is peak performance. While peak performance also involves heightened characteristics, it is separate from optimal experience. Instead of being dependent on the mental state, it relies solely on the functioning of the individual. In short, it is action specific. Peak performance can be defined as optimal functioning during an experience in which an individual uses his or her potential to the fullest degree (Jackson, Thomas, Marsh, & Smethurst, 2001; Privette, 1983). It does not require a specific skill set or a certain level of mastery to achieve peak performance. It is adapted to highest possible performance of the individual involved.

Similarly to optimal experience, peak performance can be experienced independently of both flow and optimal experience. For instance, consider a person that has been hypnotized to perform a certain action. If the individual is required to perform at their highest potential, they would do so without the proper levels of optimal experience. The individual would perform the task to the best of their ability, but would do so with decreased levels of consciousness. The body would be acting without the necessary levels of awareness to be considered optimal experience (Privette, 1983).

Csikszentmihalyi (1990) emphasizes that flow experience revolves around a transformation of aspects of the self. Flow can only be experienced when both peak performance and optimal experience are present in the given moment. If one considers the transformation of the self, it also only occurs during the combination of these two constructs. The self cannot enhance itself during peak performance alone, due to the fact that the individual is only completing a task to full potential. Elements of growth are

not necessarily present, as the only focus is reaching current levels of individual potential.

Similarly, optimal experience is not enough to singularly create growth of the self. While it is similar in feeling to the flow state, it lacks the necessary blueprint of change for the self, given that the self is not the central agent of action. If, for example, an optimal experience involves listening to music, the moment is controlled not by elements of self, but by external factors. The music is driving the experience, and the individual is a recipient of the event. Take other examples of a person undergoing optimal experience, such as receiving a massage, enjoying a bath, or taking a walk through nature. In all cases, the individual is not the central agent of action, signifying that growth cannot be controlled by the individual. Similar to peak performance, the experience can be reproduced, but not extended beyond the specific task.

The growth of the self through flow occurs only when the two constructs are combined. If, for example, one reaches peak performance during a run through nature while also undergoing optimal experience, the individual will be able to internalize the feeling of the optimal experience to create a pattern for reaching this state during performances in the future. Csikszentmihalyi (1990) implies that this is how experiencing flow creates order to the sense of self. As optimal experience increases positive affect and allows for less effort during performance, the individual is able to transcend previous training and reach new levels of experience and performance in the future.

Flow

As shown in Figure 1, flow can be best defined as the optimal mental state that combines the implementation of both peak performance and optimal experience (Csikszentmihalyi, 1990; Jackson, 1996; Jackson, Thomas, Marsh, & Smethurst, 2001). What differentiates flow from the previous two constructs, optimal experience and peak performance, is that flow necessitates a combination of peak performance and optimal experience, such that the activity at hand is challenging enough for the individual to be fully present in the moment, while the individual perceives the activity as one that he or she is equipped with the necessary skills to complete (Csikszentmihalyi & LeFevre, 1989). The combination of these two complex constructs makes entering into the state of flow difficult. Not only does one have to perform to their full potential, but also has to be fully engaged and motivated in the situation.

The flow state, as defined by Csikszentmihalyi (1990), is comprised of several other dimensions, which can be considered dimensions of the unique event of the combination of peak performance and optimal experience. These nine dimensions include challenge skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on the task at hand, paradox of control, loss of self-consciousness, transformation of time, and autotelic experience (Jackson, 1996; Csikszentmihalyi, 1990). Table 1 provides a brief description of each dimension, highlighting how each dimension relates to flow.

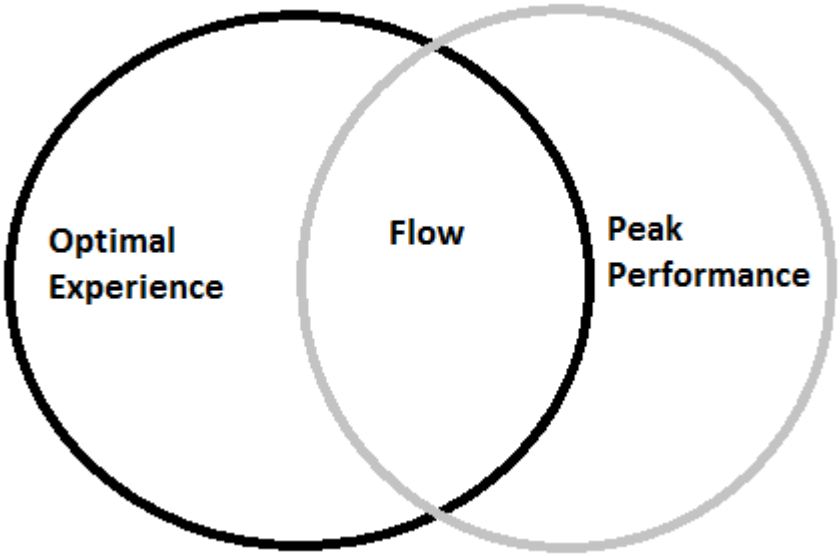

Figure 1. Venn diagram of the relation between optimal experience, peak performance, and the flow state. This diagram displays howv the flow state is experienced through the overlap of optimal experience and peak performance.

With a closer look at the flow dimensions, one can begin to see how they relate to the combination of optimal experience and peak performance. Challenge skill balance, unambiguous feedback, concentration on the task at hand, clear goals and action-awareness merging seem to be features stemming from peak performance, while paradox of control, loss of self-consciousness, transformation of time, and autotelic experience seem to be aspects stemming from optimal experience. The combination of the two constructs – optimal experience and peak performance – is clearly in effect, almost equally, in the development of flow.

Table 1

Descriptions of Each Dimension of the Flow State

Dimension of Flow	Description
Challenge-skill balance	Perceived balance between situational challenge and one's skills
Action-Awareness merging	Deep immersion in the activity where action becomes spontaneous or automatic
Clear goals	Goals defined in advance and individual knows exactly which action to execute
Unambiguous feedback	Clear and immediate feedback, not requiring analysis or reflection
Concentration on the task at hand	Placing full attention on aspects of the task
Paradox of control	Paradox of not being in complete control, but feeling that it is possible to be in control
Loss of self-consciousness	Self concern based on exterior judgment diminishes with increase in unity with environment
Transformation of time	Sense of time is altered or distorted
Autotelic/enjoyable experience	Overall experience is enjoyable

Note. (Csikszentmihalyi, 1990; Jackson, 1996)

It is also interesting to observe how the dimensions incorporate different aspects of the two constructs. For instance, loss of self-consciousness seems to mainly stem from optimal experience, but also incorporates certain aspects of peak performance. The individual is fully immersed in the task at hand to the degree that concern for the self disappears, due to the fact that a sense of unity with the environment is fostered (Jackson, 1996). However, this feeling of unity can only occur during actions of engagement in the task, or during performance.

Privette (1983) provides a comparison of the different qualities of both optimal experience and peak performance and how they relate to flow, allowing one to observe the escalation of complexity of the flow state. From this detailed analysis of several characteristics of the three constructs, one can begin to observe how the individual psyche is affected during each state. For instance, when assessing a person's awareness of his or her existence, one can observe the transformative nature each construct can have on the sense of self. An individual undergoing optimal experience may feel a loss of self due to the fact that optimal experience is often described as transcendental in nature (Csikszentmihalyi, 1990; Privette, 1983). Alternatively, during peak performance, the individual may feel a strong sense of self due to the focused nature of the performance. Once the individual is in a flow state, however, the sense of self merges together as a combination of the two. The sense of self during the flow state is more of an understanding of the role he or she is playing in the moment. The individual may also experience a loss of ego as the person's sense of self-consciousness decreases in the moment (Privette, 1983; Jackson, 1996). Being in the flow state is a combination of the

two experiences, evolving the sense of self into one that allows for a conscious transcendental experience, displaying how the combination of optimal experience and peak performance can be transformative in regards to the psyche.

Jackson (1996) underlines the difficulty of defining the construct of flow experience. In this qualitative study, Jackson interviews twenty-eight elite level athletes about their experience when they have entered the flow state. Investigating if the flow experience of these individuals is consistent across sports, athletes from seven different sports were interviewed. Jackson (1996) then compared the responses of the athletes to the several dimensions of the flow state, as described by Csikszentmihalyi (1990). With these comparisons, Jackson was able to validate the dimensions of the flow state through the responses of the athletes.

While all of the nine dimensions of the flow experience outlined by Csikszentmihalyi (1990) were present in the responses of the athletes, some of the dimensions were more represented than others. For example, the transformation of time dimension was only represented by 29% of the athletes, while action awareness merging dimension was experienced by 86% of the athletes. The variation in representation seemed to be due to the difference in the approaches of the sport. Transformation of time, or a sense of time speeding up or slowing down, may be experienced differently between sports, given that some sports require different task demands around time.

For example, a javelin thrower, who experienced this dimension of time transformation, stated that he was able to engage in this aspect during certain moments

of holding his position for a period of time. In contrast, swimmers stated that this dimension was not appropriate for them given that they are very aware the pace clock as they move through their tasks (Jackson, 1996). These differences indicate that there may be different experiences of the flow state depending on the task and the task demands. Thus, reaching a state of flow may take a different path, depending on the sport. If the time transformation dimension is not as relevant to swimmers as the clear goals dimension, then developing a protocol to specifically target the more relevant dimension may be of interest to investigate. While in previous (1996; 1998; 2001) studies, Jackson breaks down which dimensions of the flow state overlap the most between sports, Jackson does not report the frequency of dimension responses within each sport, in order to compare whether certain dimensions are better served in some sports rather than others. It would be useful to understand whether certain tasks may require specific aspects of flow more than others.

Examining a similar point, Wrigley and Emmerson (2011) investigated whether Jackson's Flow State Scale-2 (FSS-2; 1998) could be a useful measure of flow in live musical performance. The researchers measured the flow experience of 236 undergraduate and postgraduate students enrolled in a music conservatory program. The FSS-2 was administered directly after an evaluated performance, which required the musicians to play differing styles of classical music for duration of 20-45 minutes. The students' performance instruments were piano, strings, woodwind, voice, and brass. All were accompanied by a piano during the performance, except for those who were performing on the piano.

Through an analysis of the experience of the different dimensions of the flow state, Wrigley and Emmerson (2011) found similar results to Jackson's previous studies (2001; 2004). Comparing the results of the current study's population of musician with the results of athletes from Jackson's studies, Wrigley and Emmerson (2011) found that the results of the musicians' experience of flow were consistent with the results of the athletes, signifying that the FSS-2 is a valid measure of flow for live musical performances.

In addition to this, the researchers came across in interesting result between the experimental groups. The different instrument groups reported similar levels of experience across all dimensions of flow, except for the piano group. The piano group achieved a significantly lower score in the clear goals dimension than the other instrument groups, while the clear goals dimension was also the highest scoring dimension across all instrument groups.

While the authors did not elaborate on why this result was observed, it could be due to the difference in task requirements between performances, eluded to earlier in this section. The piano group was the only group of musicians that were conducting a solo performance; the other instruments were required to be accompanied by a piano during their performance. The piano group was also the only group to continuously process the interactions of sound from one instrument during the performance, while the other instrument groups had to continuously engage with the performance of the piano accompaniment, resulting in a different musical task altogether.

The clear goals dimension is described as having a sense of goals in advance of action while understanding clearly what the next steps in the performance will be. This dimension will have a different expression, or level of experience, within a person constantly having to play in a duet compared to an individual performer who can constantly set the pace and tone of the performance. There is still a need to have clear goals within both forms of performance, which is indicated by the clear goals dimension scoring higher than any of the other nine dimensions. This indicates the need to observed not just how the flow state is experienced generally across all activities, but also whether there is a difference between the levels of experience of each of the dimensions that shifts depending on the task.

Achieving flow during athletic performance is increasingly difficult, as there are often times a vast array of stimuli and distractions that may prevent the individual from approaching some of the necessary components of the flow state. Additionally, Csikszentmihalyi (1990) claims that outside of the rare occurrence, one cannot simply experience the flow state on command because an individual usually enters the state by chance or spontaneously. However, Csikszentmihalyi (1990) adds that it is possible to manipulate the experience of flow by providing the individual with facilitating conditions. These conditions could be through the utilization of psychological skills that promote flow during performances (Jackson, 2001; Kee & Wang, 2008). Recently, there has been an increase in attempts to uncover techniques that could promote the formation of these psychological skills (Bernier et al., 2009; Kaufman et al., 2009;

Jackson et al., 2001). The common factor observed in these studies is an emphasis on the growth of mindfulness within the individual to promote flow states.

Mindfulness

There are two major frameworks of mindfulness that differ in their foundation. Kabat-Zinn defines mindfulness as a state of attention that is non-judgmentally and intentionally focused on one's experience in the present moment (Kabat-Zinn, 1994; Kee & Wang, 2008; Birrer, Rothlin, & Morgan, 2012). There is an emphasis on acceptance and non-judgmental aspects within this framework, and mindfulness is mainly promoted through the practice of mindfulness meditation, which promotes the development of mindfulness techniques through the practice of intentional self-regulation and meditation (Baltzell & Akhtar, 2014).

The focus of work from this framework usually leans towards ways of increasing dispositional mindfulness over time, or individual proneness of experiencing mindfulness in daily activities. By participating in mindfulness activities over an extended period of time, the participants increase skills of regulating their attention, allowing for less wandering of the mind during activities (Bishop et al., 2004).

In the early 70's, Ellen Langer approached mindfulness from a different perspective. Stemming from a more cognitive approach, she defined mindfulness as "the process of active awareness of novel distinctions of the present moment that acknowledges that facets of the experience do not have to rely on previously held constructs or experiences" (Langer et al., 2010, p. 662). This approach allows for an

openness of experience that could lead to further growth or changes in one's perspectives due to the perception of stimuli having continuously evolving meanings (Carson & Langer, 2006; Langer et al., 2010; Paganini & Philips 2015).

The key difference between the two frameworks for the purposes of this study is that the Langerian mindfulness allows for a more active and open engagement in a given situation, whereas the Kabat-Zinn framework of mindfulness centers on increasing the regulation of attention over time, as it focuses on increasing dispositional mindfulness through mindfulness meditation. It is also important to note that Langerian mindfulness is implemented in order to decrease mindlessness – a mindset in which the individual relies upon previously held perceptions and constructs during an experience in which the individual does not allow for novel distinctions (Carson & Langer, 2006; Langer, et al., 2010; Paganini & Philips 2015). If an individual were to focus on acceptance during an event, this may promote a mindless state of mind, which in turn may limit the amount of growth and performance during athletic activities (Birrer, Rothlin & Morgan, 2012).

To date, most studies that have investigated techniques on how to increase athletic performance through mindfulness interventions have stemmed from the Kabat-Zinn framework of mindfulness. From their investigation of whether mindfulness could be used as a psychological tool to enhance performance in athletic activities, Berrir, et al. (2012) discuss the idea that mindfulness, specifically the Kabat-Zinn framework of mindfulness, has implications that could potentially inhibit an athlete's performance; one of which is misinterpretation. If a player reflects back at half time of a game with an

acceptance and passive mindset, the player "might be tempted to accept the result at the half-time of a game as an unmistakable fact and therefore accept the thought that his or her opponent is stronger than his or her own team, and thus give up before the end of the game" (Berrir, 2012, p. 9-10). This isn't to say that mindfulness cannot be implemented in sports, but suggests that mindfulness interventions need to be molded to fit an athletic setting in order to prevent misinterpretation.

Given that the Kabat-Zinn framework of mindfulness is based on a more passive role in mental awareness, it is hard to directly implement in the competitive nature of western sports. This limitation was seen as Kaufman, Glass, and Arnkoff (2009) investigated the effects of a mindfulness intervention in archery and golf athletes during a 4 week period. The researchers implemented a self designed mindfulness intervention (MSPE) that was developed based on a combination of techniques from the Kabat-Zinn framework and a sport specific training module. Kaufman et al. (2009) gave mindfulness instruction once a week for four weeks, while instructing the participants to record their experiences in a daily mindfulness log. Measures of dispositional mindfulness, flow, and performance were taken at each of the four mindfulness sessions.

While Kaufman et al. (2009) found that levels of dispositional mindfulness was able to increase over time, they were not able to find an increase in sport performance. Even though the researchers were not able to display an increase in performance, there was a positive correlation with the flow experience and dispositional mindfulness, suggesting the connection between mindfulness and flow experience. The combination of the lack of performance enhancement and the positive correlation between

dispositional mindfulness and flow experience could indicate an issue with the implementation of the tool, and not the tool itself. Mindfulness seems to be useful in increasing flow, but an intervention needs to be designed that can better be implemented into sport practice.

To date, there have not been many empirical studies of the implementation of mindfulness in sport settings. Most studies have investigated this phenomenon through surveys and a singular case study (Schwanhausser, 2009). Because of this, mindfulness protocols in sports practice and performance are still being developed. There is still a need for further, more direct designs of mindfulness interventions in the sports realm.

Kee & Wang (2008) display such a need after finding similar data in their study. The researchers conducted a study investigating the relationships between dispositional mindfulness, dispositional flow, and mental skills adoption. The 182 participants were university athletes in several different sports. The participants were asked to complete a questionnaire that measured dispositional mindfulness through the Mindfulness/Mindlessness Scale (MMS) developed by Ellen Langer, dispositional flow, and performance strategies (Kee & Wang, 2008). With this study, Kee & Wang (2008) became the first to implement the MMS in a sport setting. The researchers found that those that had a propensity to be more mindful were more likely to experience flow states and implement mental skills during competition more often (Kee &Wang, 2008). However, Kee & Wang (2008) concluded that the mindfulness and flow connection found in this study was based on correlation, thus impossible to place causality between the two concepts. Even with this limitation, it is now possible to infer based on the

results from Kee & Wang (2008) that the Langerian framework of dispositional mindfulness can be linked to dispositional flow.

According to Berrir (2012), if mindfulness is to be implemented in athletic settings, the construct should be taken apart to allow for specific elements of mindfulness to be focused on during performances. This argument leads to the idea that Langerian mindfulness may be a more useful framework during sports performance. With the focus of the framework to the awareness of novel details and limiting the acceptance of automatic thought processes and mindlessness (Carson & Langer, 2006; Langer et al., 2010; Paganini & Philips 2015), Langerian mindfulness allows for growth during performances.

Just as Langerian mindfulness seems to be useful in increasing performance in sports settings, the framework should provide evidence of increasing the propensity of experiencing flow states. Flow is an elusive experience, but is symbiotic with mindfulness. As flow is the target state of experience, in which peak performance is occurring simultaneously with optimal experience, increasing mindfulness will in turn increase occurrences of flow (Kee & Wang, 2008).

This study will focus on the implementation of Langerian mindfulness techniques during performance of a tennis activity. We hypothesize that the implementation of Langerian mindfulness techniques during a single tennis practice will increase performance during the session and will result in a larger frequency of flow state experience. By implementing Langerian mindfulness, this will allow for a more direct

route of mindfulness training, giving the individuals tools to implement mindfulness in the moment of the sport context.

Chapter II

Method

This study was conducted as an independent measures experimental study, measuring the effects of Langerian mindfulness techniques on performance on a tennis task and levels of flow state experience. The study included questionnaires as well as a tennis task. The participants were recruited from local tennis clubs, as well as through placement of flyers around recreational areas.

Participants

22 male (*n* = 12) and female (*n* = 10) tennis players from local tennis clubs in the northeastern United States were recruited to voluntarily participate in the study. The participants' age ranged from 18 to 57 (*M* = 39, *SD* = 13.3). Most participants (*n* = 21) had at least 5 years of tennis experience prior to completing the study.

Measures

This study implemented both the Langerian mindfulness scale and the Flow State-2 Scale in order to measure dispositional mindfulness and the experience of the flow state. Both of these scales were issued on paper, as participants took time before and after each task to complete the questionnaires. Performance on the tennis task was also measured throughout the study.

Langer Mindfulness Scale

The Langer Mindfulness Scale (LMS; Bodner & Langer, 2001) is a 21-item questionnaire that measures the dispositional mindfulness of participants. Individuals are asked to rate the degree to which he or she agrees or disagrees with statements concerning their tendency to be open to new ideas, make novel distinctions, and be open to different perspectives. Each individual responded to the statements on a seven-point Likert scale (*Strongly Disagree,* 1; *Strongly Agree,* 7). Higher total scores indicate higher levels of dispositional mindfulness. The LMS has been shown to have a good internal consistency (α = .85; Haigh, Moore, Kashdan & Fresco, 2011).

Flow State Scale-2

The Flow State Scale-2 (FSS-2; Jackson & Eklund, 2002) is a 36-item questionnaire that was designed to be implemented directly after a performance in order to measure the flow state characteristics experienced by the participants. Individuals are asked to rate the degree to which he or she agrees with each item on a five-point Likert scale (*Strongly Disagree,* 1; *Strongly Agree*, 5). Higher scores indicate higher levels of experiencing the flow state. The FSS-2 has been shown to have a good internal consistency (α = .83; Jackson & Eklund, 2002; Jackson & Marsh, 1996).

Task performance

Performance was measured based on the success of the participants in hitting 15 tennis balls, which were delivered to them from a tennis ball machine, into a rectangular

target area marked on the court with athletic cones. The target area was located opposite-adjacent of the individual's dominant hand (i.e., if a participant is a right-handed forehand hitter, the target area would be placed in the back left portion of the court across from the forehand swing). The target area was marked as 12' x 9', and centered either in the left or right-half of the court, between the back baseline and the service line, corresponding to the participants' forehand swing. A point was given for each ball that was hit inside the target area. Participants completed the tennis task before and after the intervention, and an overall performance score was determined by the difference between the scores of the first and second attempt at the tennis task.

Procedure

Following approval of an institutional review board, individuals were recruited from local tennis clubs to voluntarily participate in the study. Participants met at a designated court once individual sessions were determined. Once informed consent was provided by the participants, each individual was randomly assigned to either the intervention group or the control group. The participants were then instructed to complete the Langer Mindfulness Scale (LMS).

Once the LMS was completed, the participants declared their dominant forehand side, and the target area was assembled. As shown in figure 2, the individuals were placed on the opposite side of the court, where they would receive the balls shot to them from a tennis ball machine. The participants were instructed that once the task

began, they were to hit the 15 balls back across the net into the target area. The individuals were allowed to warm up by hitting 5 balls before the start of the task.

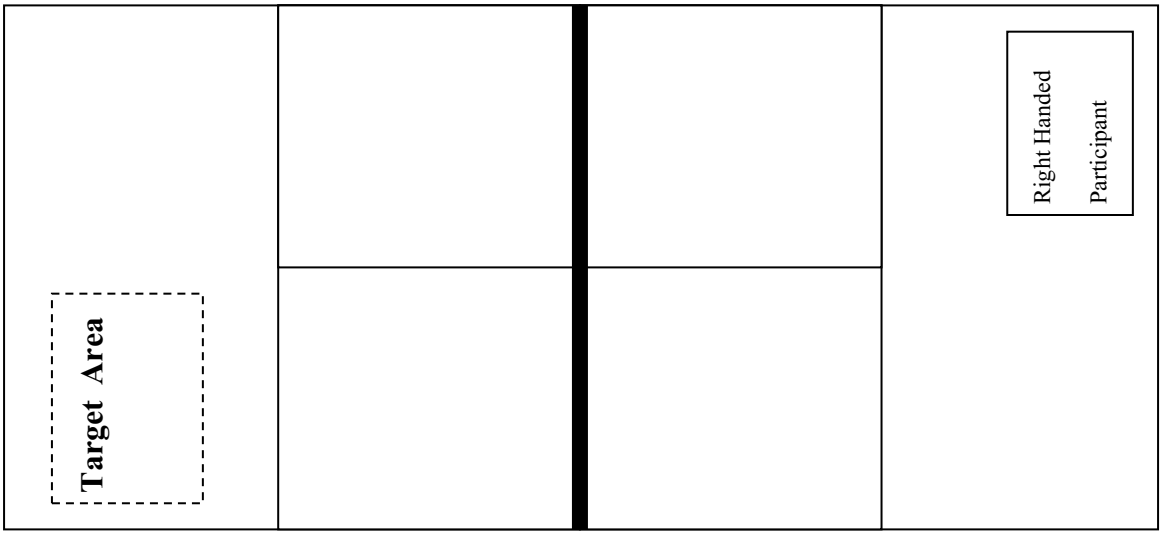

Figure 2. Outline of tennis court setup. This figure displays the location of the target area and participants on the tennis court, depending on their dominant forehand swing. If a participant is right-handed, the individual is positioned to the right, and the target area is to the left, as shown above. If the participant is left-handed, the participant placement and target placement are switched to the adjacent side of the court.

Once the participants hit the initial 15 balls, each individual was given an intervention prompt to read that was catered to their intervention group. The control group received a motivational prompt, instructing them to think back to a time where the participant did something well and to try their best. The intervention group received

a mindfulness intervention prompt, guiding the individuals through aspects of noticing novel distinctions as they prepare for the next round of the tennis task. The instructions include noticing 3 novel details each of the body, the racket being held, and the court. The participants are instructed to close their eyes and cycle through the details they have discovered for two minutes.

After the two minutes, the participants are instructed to take three deep breaths, and to signal when they are ready for the second round of the tennis task. The participants then proceeded to complete the same tennis task as before, aiming to hit the 15 balls into the target area. Once completed, the participants were instructed to complete the Flow State Scale-2 (FSS-2). After all portions of the study were completed, the participants were debriefed.

Chapter III

Results

22 individuals were included in this study: 12 of which were men and 10 were female. After running an independent t-test, there was not a significant difference between genders in performance scores ($t[20] = -.531$, $p > .05$), FSS-2 scores ($t[20] = -.676$, $p > .05$), and dispositional mindfulness scores ($t[20] = .351$, $p > .05$), displaying equal variance between gender across our measures.

Relationship Between Intervention Group and Dispositional Mindfulness

In order to compare the LMS scores between the control and mindfulness intervention groups, an independent samples t-test was conducted. It was observed that there was no significant difference between the intervention and control groups; $t(20) = -1.290$, $p > .05$. These results suggest that the two groups did not differ significantly in their levels of dispositional mindfulness.

Relationship Between Intervention Group and Performance Outcome

An independent-samples t-test was conducted to compare the performance scores between the control and mindfulness intervention groups. There was a significant difference in the scores for both the mindfulness ($M = 3.18$; $SD = 1.079$) and control ($M = 1.73$; $SD = 0.905$) groups; $t(20) = 3.427$, $p = 0.003$. Figure 3 displays a graph of the differences in performance scores between the two groups. As Figure 3 shows,

participants in the mindfulness intervention group had a significantly higher increase in performance score following the intervention.

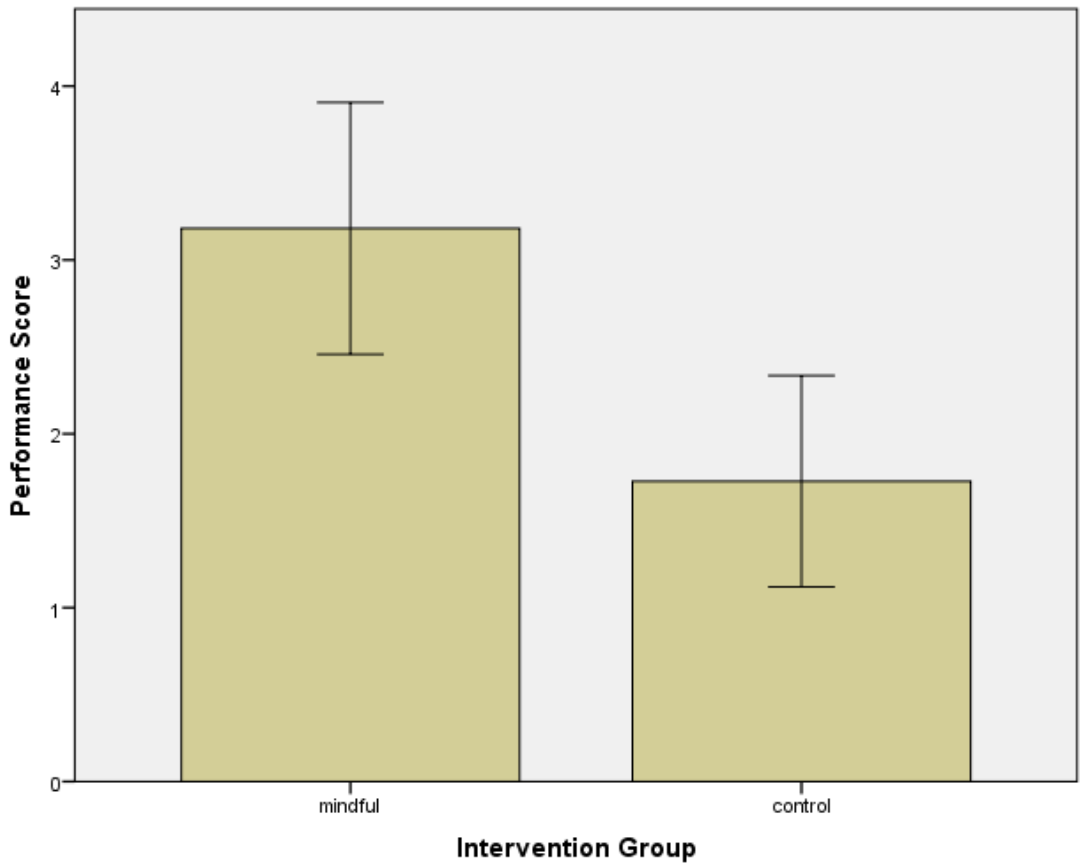

Figure 3. Mean Performance Scores of the Intervention Groups. This figure displays the mean of the performance scores of the mindfulness intervention group and the control group. Performance scores are taken as the difference in scores between the first and second interval of the tennis task.

Relationship Between Intervention Group and FSS-2 Score

An independent-samples t-test was conducted to compare the FSS-2 scores between the control and mindfulness intervention groups. There was a significant difference in the scores for both the mindfulness (M = 148.18; SD = 11.822) and control (M = 127.73; SD = 22.374) groups; t(20) = 2.681, p = 0.017. As Figure 4 displays, the mindfulness intervention group had a significantly higher FSS-2 score, resulting in higher experiences of flow state, according to the FSS-2.

Relationship Between Dispositional Mindfulness and FSS-2 Scores

A correlation analysis was run to assess the relationship between dispositional mindfulness and FSS-2 scores. A significant correlation was not observed; r =.249, p = .264. This result indicates that the dispositional mindfulness scores and FSS-2 scores did not display normal variability when compared to each other, such that an increase or decrease in one scale did not indicate an increase or decrease in the other.

FSS-2 Subscales

Table 2 displays the FSS-2 mean subscale scores and standard deviations for each intervention group. A MANOVA was conducted to examine the association between the FSS-2 subscale scores as dependent variables and the control and mindfulness condition groups as independent variables. Levene's test for equal variance was found to be non-significant across eight of the nine subscales, while significance was found for the Concentration on Task at Hand subscale. No significant intervention group main effect

was found at the multivariate level, Wilks' $\Lambda = 0.45$, $F(9,12) = 1.63$, $p = 0.21$, multivariate η2 = 0.55). However, a trend was observed, as the mindfulness intervention group scored slightly higher than the control group across all subscales. Due to the lack of significance in the multivariate level, no follow-up univariate tests were conducted for the subscales.

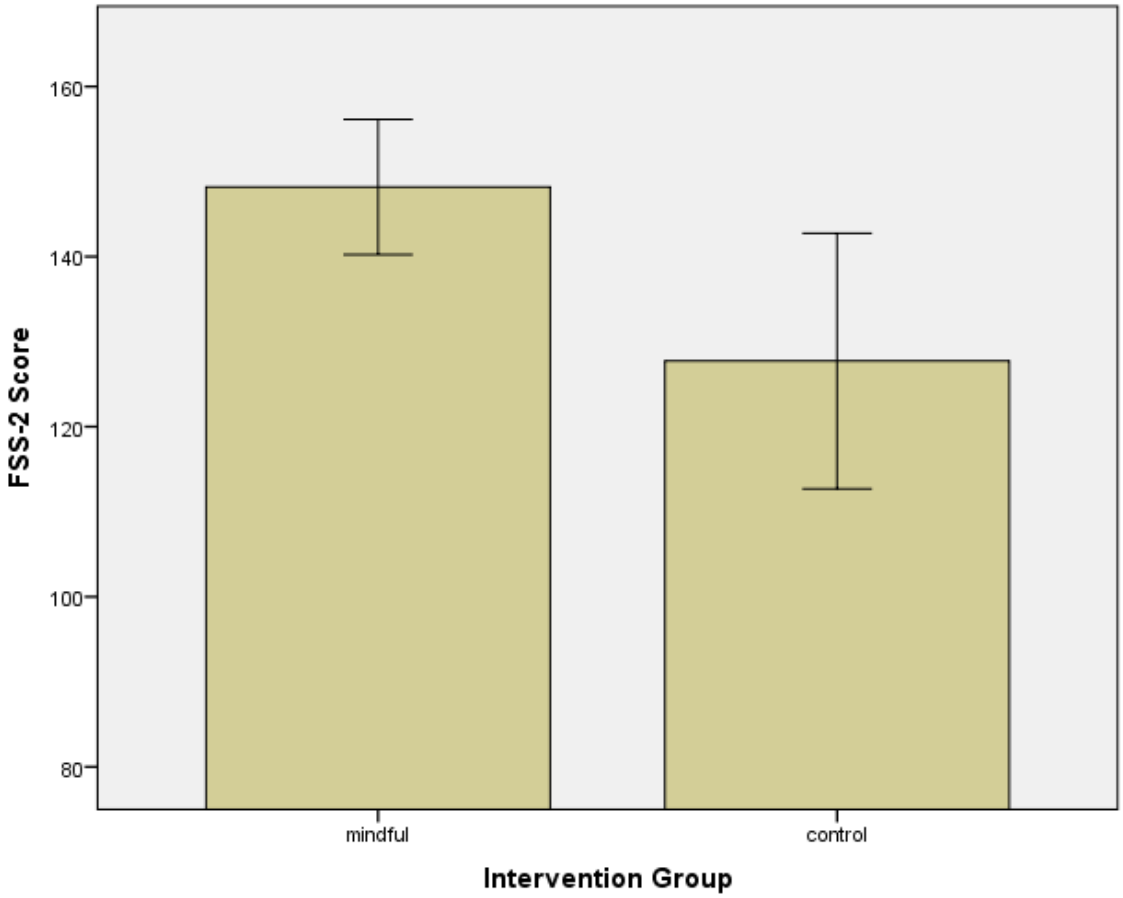

Figure 4. Mean Flow State Scale-2 (FSS-2) Scores of the Intervention Groups. This figure displays the mean FSS-2 scores of the mindfulness intervention group and the control group.

Table 2

Means and SDs of the Dimensions of Flow as a Function of Study Condition

Dimensions of flow	*Control Condition*		*Mindfulness Intervention*	
	M	*SD*	*M*	*SD*
Challenge-skill balance	3.84	0.58	4.3	0.6
Action-awareness merging	3.61	1.07	4.07	0.56
Clear goals	4.16	0.58	4.5	0.4
Unambiguous feedback	3.61	0.58	4.2	0.43
Concentration on task at hand	3.61	1.04	4.48	0.44
Paradox of control	3.2	0.86	4.18	0.61
Loss of self-consciousness	3.5	1.24	4.16	0.69
Transformation of time	2.86	0.94	3.09	0.79
Autotelic/enjoyable experience	3.52	0.84	4.07	0.62

Note. M = mean; SD = standard deviation

Chapter IV

Discussion

The aim of this study was to investigate the effects of Langerian mindfulness techniques on both performance in a tennis task and the experience of the flow state. It was predicted that individuals provided with Langerian mindfulness techniques would perform better in a tennis task compared to individuals in the control condition, while also experiencing higher levels of the flow state. Participants in the mindfulness intervention group performed significantly better on the tennis task than individuals in the control condition, which indicates that the mindfulness intervention was successful in its application. The individuals in the mindfulness intervention group also had significantly higher FSS-2 scores, indicating that the individuals in this group reported a higher level of flow experience following the mindfulness intervention.

Surprisingly, there was not a significant correlation between dispositional mindfulness and performance scores or FSS-2 scores. This indicates that dispositional mindfulness did not play a role in performance scores or experience of the flow state. The mindfulness intervention was successful in increasing performance and the experience of the flow state regardless of individual propensity of experiencing mindfulness. However, this should be taken cautiously, given the small sample size of the study. This is also contradictory to results found by Kee and Wang (2008), who report significant correlations of dispositional mindfulness with levels of dispositional

flow. While this study was using measurements of the state experience of flow instead of dispositional flow, the FSS-2 scores were expected to correlate with the LMS scores.

These results also add new dimensions to our understanding of how flow relates to mindfulness. Previous conceptions of the relationship between flow and mindfulness relied mainly in the dispositional aspect of both constructs. However, these data indicate that mindfulness and flow can have a relationship in the active moment. By implementing Langerian mindfulness, the individual's state mindfulness is increased in the moment of the intervention, resulting in a decrease in mindless mental activity. With the resulting increase in flow experience, these data indicate that flow experience can be augmented through moment-to-moment mental adaptation, as practiced through Langerian Mindfulness.

This approach runs parallel to Bishop et al. (2004)'s operational definition of mindfulness. The authors expressed that there was a lack of clarity on the definition of mindfulness, as a growth in the field was creating discrepancies in the collective understanding of how mindfulness related to psychological approaches. Within their proposed operational definition, the authors suggest that mindfulness is a mode – a way of completing an action – of awareness that involves the regulation of attention to being open, curious and non-judgmental to the present moment of experience (Bishop et al., 2004). In addressing trait mindfulness, the authors conclude that mindfulness is reliant upon the regulation of attention, and therefore is less of a fixed trait as has been described in other works.

If one is to view mindfulness as a particular mental process, then the discrepancies seen in the results of the dispositional mindfulness scores may be understandable. The Langerian Mindfulness techniques encourage the regulation of attention through open awareness, promoting presence in each moment in order to decrease mindlessness. This approach separates the mental processing of the individual prior to the event, centering on what is happening in the present moment. Due to this, an individual's prior level of mindfulness plays little role in the active moment of attention regulation, aside from the ease of implementing the mindfulness techniques.

It would follow, then, that in this framework, it would be possible for someone to have lower levels of dispositional mindfulness and still be able to fully experience the flow state. This would be due to the Langerian Mindfulness' focus on shifting the individuals' mental processing to one that incorporates a mindfulness approach during a specific moment, leading to further openness of experience. If one recalls that Csikszentmihalyi (1990) expressed that experiencing the flow state could be impacted through the increase in facilitating conditions, the conditions created by the Langerian Mindfulness techniques could be enough to increase the frequency of experiencing the flow state without having to go through dispositional mindfulness.

Because of the non-significant results of the MANOVA of the FSS-2 subscale scores between the intervention groups, we were unable to assess if there were specific areas of flow that Langerian mindfulness would be able to enhance more easily than others. However, a trend was observed, as the mindfulness intervention group scored slightly higher than the control group on all of the subscales. This trend, paired with the

significant results of the comparison of intervention group FSS-2 scores, suggests that the mindfulness intervention increases the levels of flow experience.

In accordance with Berrir (2012), the implementation of Langerian mindfulness in this sport setting allowed for a stronger relationship between the mindfulness activity and the sport activity. Alternative methods of introducing mindfulness into sport settings involve a somewhat removed approach, focusing on increasing dispositional mindfulness separate from the sport context through mindfulness meditation. The gap that is created through this separation of implementation is reduced through this form of mindfulness intervention, as this task specific Langerian mindfulness technique creates a way of practicing mindfulness during the moment when athletes need it the most.

This bridge between mindfulness and practice may be the most influential factor in increasing levels of flow experience. It has been understood that the implementation of mindfulness practice increases dispositional mindfulness. Because dispositional mindfulness is one of few ways of measuring mindfulness, it has, by default, been relied upon as the main form of mindfulness when accessing the flow state. Also contributing to this is the current lack of sport specific mindfulness practices being developed in the realm of sport psychology.

With measurements of mindfulness being those of dispositional mindfulness and the lack of in-the-moment mindful-sport practices, the resulting connection to the flow experience is through dispositional mindfulness. However, the results of this study indicate that other connections to the flow state through mindfulness are possible. Our

results not only indicate a significant relationship between Langerian mindfulness implementation and higher experiences of the flow state, but do so while indicating that the relationship between dispositional mindfulness and higher levels of experience of the flow state is non-significant.

Limitations and Future Directions

The results from this study do not rule out the potential connection between dispositional mindfulness and higher levels of flow experience; given a larger sample size, dispositional mindfulness may in fact become a significant predictor of higher FSS-2 scores. These results merely suggest that dispositional mindfulness is not the *only* means of accessing higher levels of flow state experience. By implementing sport specific mindfulness practice, the individual increases their propensity for experiencing flow at the same time as increasing levels of dispositional mindfulness. This may be evidence for a new bridge between athletic performance and Langerian Mindfulness practice.

The main limitation of this study is the low sample size. The sample of 22 individuals was enough to see a significant main effect, but seems to potentially have affected the outcome of some of the secondary data. For instance, while it was observed that the mindfulness intervention group scored significantly higher on the FSS-2, the subsequent tests of the subscales resulted in a non-significant finding. This non-significant MANOVA indicated that there was not a significant difference between groups amongst the nine subscales, even though a trend of higher scores on each scale

for the mindfulness intervention group was observed. Having a smaller sample size leads to higher levels of variation of responses, which has a higher risk of non-significant findings.

Due to the non-significant finding of the MANOVA test, I was unable to assess how the FSS-2 subscale scores of the athletes in this sample differed from the scores of athletes from other samples. I am unaware of a study that compares FSS-2 subscale scores with different task requirements in order to examine whether flow may be experienced in different ways depending on the task. Currently, the understanding of flow is a optimal mental state that is the highest form of presence during performance.

To the best of my knowledge, there has not been discussion on potential variations of the experience of flow. However, it may be that there are different aspects or combinations of characteristics of flow that may result a form of flow that differs in situations. For instance, while the musicians in the five instrument groups in Wrigley and Emmerson's (1992) study all were able to express equal levels of the flow state, the piano players experienced significantly less of the clear goals dimension than the other groups. If flow is an experience, and is comprised of several dimensions, then those dimensions define the experience of the individual. If the individual significantly differs from others in one or more dimensions, then I would argue that the individual would have a different experience of the flow state. The piano players in this study could potentially have experienced flow in a different way than their musical colleagues, which could be a result of the difference in the dimension expression. Investigating this in future studies with athletes and performance artists may prove to open up to concept

of the flow state even more, and provide deeper knowledge of this mental state of performance.

It would also be interesting to investigate whether the scores of the dimensions of the flow state differ depending on the task. For instance, consider a within subjects design, where an individual were to experience flow during a task in one scenario, and then were to experience flow in a different task in a separate, following scenario. It would be interesting to then compare the scores of the dimensions between each task to determine if the dimensions are impacted by the task that is being executed. If the individual reports the same exact feeling of flow across both scenarios, then this could mean that the dimensions are more of a rubric for the experience of flow; meet a certain criteria, and one can experience flow. If, however, the individual reports a different experience of the flow state while also displaying varying scores of the dimensions of flow, then there would be a need to reevaluate the construct of flow that shifts based on combinations of dimensions and tasks.

If we are able to deepen the understanding of the concept of flow, then it may be possible to develop a mindfulness intervention that can more directly target this phenomenon. This study was able to develop a mindfulness technique that was catered to the specific sport being studied. If it is possible to not only develop a technique that can be developed for the specific practice, but one that can also further target the specific dimensions of the flow state experience, this will create radical change in performance and practice. While this study created a starting point in targeting the

increase in flow state experience, it may be possible to further target this phenomenon for greater levels of enhancement.

While this study was able to produce significant results, one should be cautious in the interpretation of these results due to the small sample size. While a significant main effect was obtained, follow-up studies should be conducted to further understand the relationships between Langerian mindfulness, flow, and performance. It would be recommended to repeat this study with a higher number of participants. Also, it may be of interest to investigate dispositional mindfulness levels following the intervention in addition to immediately before the intervention. While dispositional mindfulness may not be affected so quickly, it may prove to be a good measure of how the mindfulness intervention affects the individual's levels of mindfulness in the present moment. .

Discovering a deeper understanding of the relationship between mindfulness, flow experience, and performance will be beneficial for many performers across several avenues of sport and performing arts. Currently, there are only a few approaches being implemented when investigating how mindfulness techniques can enhance flow experiences. These techniques are usually founded on aspects of dispositional mindfulness, focusing on how to enhance mindfulness through repetitive meditation practices. While focusing on the increase of dispositional mindfulness can be useful for some individuals, it creates a broader boundary in performance enhancement in others, due to the lack of knowledge of how to apply such techniques to performance specific environments that are often opposite in nature to the peaceful, soothing surroundings of the meditation environment.

This study provides the groundwork of creating a bridge between mindfulness, flow experience, and performance enhancement. By implementing Langerian Mindfulness techniques, which are able to be molded to fit several scenarios, individuals were able to apply the practice directly into their session, immediately. The practice was able to be specialized and applied in a way that is more accessible to all participants. It would be beneficial to complete a follow up of this study that involves the comparison of the implementation of these techniques across several other sports and performing arts practices. By displaying how these techniques can be consistently applied to several practices through individualization and malleability, it will greatly shift how many performers practice and enhance their craft. By exploring how to enhance accessibility in future studies, more paths towards enhancing several aspects of performance will be created.

Appendix A

Personal Outlook Scale (Langer Mindfulness Scale)

Instructions: Below are a number of statements that refer to your personal outlook. Please rate the extent to which you agree with each of these statements. If you are confused by the wording of an item, have no opinion, or neither agree nor disagree, use the "4" or "NEUTRAL" rating. Thank you for your assistance.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

I like to investigate things.	1 2 3 4 5 6 7
I generate few novel ideas.	1 2 3 4 5 6 7
I am always open to new ways of doing things.	1 2 3 4 5 6 7
I “get involved” in almost everything I do.	1 2 3 4 5 6 7
I do not actively seek to learn new things.	1 2 3 4 5 6 7
I make many novel contributions.	1 2 3 4 5 6 7
I stay with the old tried and true ways of doing things.	1 2 3 4 5 6 7
I seldom notice what other people are up to.	1 2 3 4 5 6 7
I avoid thought provoking conversations.	1 2 3 4 5 6 7
I am very creative.	1 2 3 4 5 6 7
I can behave in many different ways for a given situation.	1 2 3 4 5 6 7
I attend to the “big picture."	1 2 3 4 5 6 7

I am very curious.	1 2 3 4 5 6 7
I try to think of new ways of doing things.	1 2 3 4 5 6 7
I am rarely aware of changes.	1 2 3 4 5 6 7
I have an open-mind about everything, even things that challenge my core beliefs.	1 2 3 4 5 6 7
I like to be challenged intellectually.	1 2 3 4 5 6 7
I find it easy to create new and effective ideas.	1 2 3 4 5 6 7
I am rarely alert to new developments.	1 2 3 4 5 6 7
I like to figure out how things work.	1 2 3 4 5 6 7
I am not an original thinker.	1 2 3 4 5 6 7

Appendix B

Flow State Scale-2

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

Rating Scale:

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I was challenged, but I believed my skills would allow me to meet the challenge.	1	2	3	4	5
2. I made the correct movements without thinking about trying to do so.	1	2	3	4	5
3. I knew clearly what I wanted to do.	1	2	3	4	5
4. It was really clear to me that I was doing well.	1	2	3	4	5
5. My attention was focused entirely on what I was doing.	1	2	3	4	5
6. I felt in total control of what I was doing.	1	2	3	4	5
7. I was not concerned with what others may have been thinking of me.	1	2	3	4	5
8. Time seemed to alter (either slowed down or sped up).	1	2	3	4	5

9. I really enjoyed the experience.	1	2	3	4	5
10. My abilities matched the high challenge of the situation.	1	2	3	4	5
11. Things just seemed to be happening automatically.	1	2	3	4	5
12. I had a strong sense of what I wanted to do.	1	2	3	4	5
13. I was aware of how well I was performing.	1	2	3	4	5
14. It was no effort to keep my mind on what was happening.	1	2	3	4	5
15. I felt like I could control what I was doing.	1	2	3	4	5
16. I was not worried about my performance during the event.	1	2	3	4	5
17. The way time passed seemed to be different from normal.	1	2	3	4	5
18. I loved the feeling of that performance and want to capture it again.	1	2	3	4	5
19. I felt I was competent enough to meet the high demands of the situation.	1	2	3	4	5
20. I performed automatically.	1	2	3	4	5
21. I knew what I wanted to achieve.	1	2	3	4	5
22. I had a good idea while I was performing about how well I was doing.	1	2	3	4	5
23. I had total concentration.	1	2	3	4	5

24. I had a feeling of total control.	1	2	3	4	5
25. I was not concerned with how I was presenting	1	2	3	4	5
26. It felt like time stopped while I was performing.	1	2	3	4	5
27. The experience left me feeling great.		1	2	3	4
5					
28. The challenge and my skills were at an equally high level.	1	2	3	4	5
29. I did things spontaneously and automatically without having to think.	1	2	3	4	5
30. My goals were clearly defined.	1	2	3	4	5
31. I could tell by the way I was performing how well I was doing.	1	2	3	4	5
32. 1 was completely focused on the task at hand.	1	2	3	4	5
33. I felt in total control of my body.	1	2	3	4	5
34. I was not worried about what others may have been thinking of me.	1	2	3	4	5
35. At times, it almost seemed like things were happening in slow motion.	1	2	3	4	5
36. I found the experience extremely rewarding.	1	2	3	4	5

Appendix C

Mindfulness Instruction Prompt

Mindfulness

Consider these three steps during your break.

1. Notice 3 new details about your body. This can be details about your posture, your stance, size of your hands, etc.
2. Notice 3 new details about the racket you are holding. This can be the strings, the grip, end piece, weight, etc.
3. Notice 3 new details about the court. This can be the lines of the court, the height of the net, cracks on the court, size, etc.

Read through this prompt as many times as you like. Close your eyes and take three deep, long breaths while cycling through the 9 details you noticed while on your break.

Hand this form back to the experimenter when you are ready to begin the experiment again.

Appendix D

Control Group Instruction Prompt

Motivation

Think back to a time when you felt most motivated to do well. Remember what it felt like to succeed and know that you are capable of succeeding again. Return this form back to the experimenter, and do your best in the second part of this experiment.

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