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The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC) Approach with Wheelchair Rugby Athletes

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BARRY UNIVERSITY
COLLEGE OF NURSING AND HEALTH SCIENCES

The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC)
Approach with Wheelchair Rugby Athletes

BY

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MIAMI SHORES, FLORIDA

To the Dean of the College of Nursing and Health Sciences:

I am submitting herewith a thesis written by Andrew Corbett entitled "The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC) Approach with Wheelchair Rugby Athletes." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science with a major in Movement Science.

Dr. Kimberly Cologgi, Thesis Committee Chair

We, members of the thesis committee,
have examined this thesis and recommend its acceptance:

Chair, Department of Sport and Exercise Sciences

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Abstract

In the current sport psychology literature there is a lack of intervention-based studies that would inform best practices in applied settings for adaptive athletes. The present study investigates the use of the Mindfulness-Acceptance-Commitment (MAC) Approach with wheelchair rugby athletes. Questionnaires were administered prior to the intervention, at the midpoint of the intervention, and after the intervention to evaluate trends of the scores. These questionnaires were used to measure flow, interoceptive awareness, and mindfulness in sport. The Dispositional Flow Scale-2 (DFS-2) was used to measure flow, the Multidimensional Assessment of Interoceptive Awareness (MAIA) to measure interoceptive awareness, and the Mindfulness in Sport (MIS) to measure sport mindfulness. After the intervention, the researcher conducted a semi-structured interview to glean additional information from the participants. Information from the interviews combined with observations made by the first author were used to give context to the results of the participants. Case study 1 highlights the importance of gaining experience and knowledge in the sport as well as the potential interactions between mindfulness and interoceptive awareness. Case study 2 gives context to use of the MAC Approach with unique individual considerations such as Attention Deficit Hyperactivity Disorder as well as how joining a new team might affect perceptions of the constructs measured. Case study 3 highlights the potential importance of continuity of timing of sessions for a participant. The preliminary findings from the study support the application of the MAC Approach with wheelchair rugby athletes, which should be explored in greater depth in future research studies.

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Table of Contents

CHAPTER I	
Introduction	1
Statement of the Problem	2
Purpose	3
Research Questions	3
Significance	4
Assumptions	5
CHAPTER II	
Literature Review	6
Mindfulness	6
Mindfulness-based Interventions in Athletics	7
Mindfulness and Flow	10
Flow and the MAC Approach	11
Wheelchair Athletes, Mindfulness, and Interoceptive Awareness	12
The Mindfulness-Acceptance-Commitment Approach	13
Efficacy of the MAC Approach	16
Use of Mental Skills Training with Wheelchair Sports	17
Mindfulness and Wheelchair Athletics	19
History and Development of Wheelchair Rugby	20
CHAPTER III	
Methods	22
Participants	22
Procedures and Design	22
Instrumentation	23
Participant Characteristics	23
Dispositional Flow Scale-2	24
Multidimensional Assessment of Interoceptive Awareness	24
Mindfulness Inventory for Sport	25
Semi-structured Interview	25

Data Analysis	26
CHAPTER IV	
References	27
CHAPTER V	
Introduction	34
Method	38
Participants	39
Procedures and Design	39
Instrumentation	40
Participant Characteristics	40
Dispositional Flow Scale-2	40
Multidimensional Assessment of Interoceptive Awareness	41
Mindfulness Inventory for Sport	41
Semi-structured Interview	42
Data Analysis	43
Case Study 1: Mike	43
Results	43
Dispositional Flow Scale-2	43
Multidimensional Assessment of Interoceptive Awareness	44
Mindfulness Inventory for Sport	45
Discussion	46
Case Study 2: Frank	50
Results	50
Dispositional Flow Scale-2	50
Multidimensional Assessment of Interoceptive Awareness	52
Mindfulness Inventory for Sport	52
Discussion	53
Case Study 3: Anne	57
Results	57
Dispositional Flow Scale-2	57

Multidimensional Assessment of Interoceptive Awareness	58
Mindfulness Inventory for Sport	59
Discussion	60
Conclusion	62
Limitations	64
Future Research	65
References	66
APPENDICES	70
Appendix A: Barry University Informed Consent Form	70
Appendix B: Contact Email	72
Appendix C. Semi-Structured Interview Guide	73
Appendix D: Demographics Questionnaire	74
Appendix E: Dispositional Flow Scale-2	75
Appendix F: Multidimensional Assessment of Interoceptive Awareness	77
Appendix G: Mindfulness Inventory for Sport	80
Appendix H: Tables and Figures	81
Appendix I: IRB Forms	88

List of Figures

Figure 1. Mike DFS-2 Global Scores	44
Figure 2. Mike DFS-2 Subscale Scores	44
Figure 3. Mike MAIA Subscale Scores	45
Figure 4. Mike MIS Subscale Scores	46
Figure 5. Frank DFS-2 Global Scores	51
Figure 6. Frank DFS-2 Subscale Scores	51
Figure 7. Frank MAIA Subscale Scores	52
Figure 8. Frank MIS Subscale Scores	53
Figure 9. Anne DFS-2 Global Scores	58
Figure 10. Anne DFS-2 Subscale Scores	58
Figure 11. Anne MAIA Subscale Scores	59
Figure 12. Anne MIS Subscale Scores	60

CHAPTER I

INTRODUCTION

In recent years, the Paralympics Games have grown in popularity and exposure. The London 2012 Paralympic Games broadcast to 115 different countries, which was an increase of 30% from the 2008 Paralympic Games. Similarly, the Rio 2016 Paralympic Games were covered in 154 different countries and exposure continues to grow (Paralympic Movement, 2016). As exposure continues along with an increased awareness of different adaptive sport domains, more professionals will work with individuals, teams, and organizations as they seek out various avenues to improve performance. As with other performance fields, improvements can be facilitated through improved coaching, strength and conditioning, nutrition, and other factors. This also includes mental performance consulting, specifically sport psychology.

When working with adaptive athletes, it is important to have research that supports evidence-based practice specifically with adaptive athletes. While researchers have begun to investigate best practices with adaptive athletes, most studies investigate the differences between adaptive athletes and able-bodied athletes (Henschen, Horvat, & French, 1984; Cox & Davis, 1992; Campbell and Jones, 1997; Pensgaard, Roberts & Ursin, 1999; Dieffenbach & Statler, 2012). While other authors have written about the unique considerations for this population (Martin, 1999; Martin, 2005; Hanrahan, 1998; Asken, 1991) there is limited research on specific interventions and case studies informing best practices with athletes and performers in other domains.

Mindfulness-based interventions have been shown to be efficacious with several different populations, across various domains (Gardner & Moore, 2012; Kaufman, Glass,

& Arnkoff, 2009; Wolanin & Schwanhausser, 2010; Zhang et al., 2016; Ivarsson, Johnson, Andersen, Fallby, & Altemyr, 2015; Baltzell, Caraballo, Chipman, & Hayden, 2014; Gustafsson, Skoog, Davis, Kenttä, & Haberl, 2015). Research has begun to link mindfulness with flow, which is a state believed to produce improved performance (Cathcart, McGregor, & Groundwater, 2014). Additionally, mindfulness-based interventions have been shown to have potential ancillary benefits outside of increased levels of mindful behaviors such as reduced incidence of injury, increased acceptance of emotional experiences, and improved skill acquisition in novices (Ivarsson et al., 2015; Baltzell et al., 2014; Gustafsson et al., 2015; Zhang et al., 2016).

The mindfulness intervention proposed for the present study is the Mindfulness-Acceptance-Commitment (MAC) Approach (Gardner & Moore, 2007). This approach developed from Acceptance and Commitment Therapy (ACT) was adapted for athletic populations. The MAC Approach was designed to promote the acceptance of internal experiences while focusing on relevant performance cues. Important aspects of the MAC Approach are the acceptance of internal processes and a focus on actions and choices in the service of personal performance and life values (Gardner & Moore, 2007). To achieve the goals of the MAC Approach, a specific protocol is used and tailored to each performer.

Statement of the Problem

Research investigating sport psychology interventions and best practices in different performance domains is growing; however, adaptive athletes, and wheelchair athletes in particular, are underrepresented populations (Porretta & Moore, 1996; Sherrill, 1999; Bawden, 2006). Researchers have compared the psychological profiles of athletes

with disabilities and able-bodied athletes, but few studies have investigated interventions with adaptive athletes to help improve performance (Henschen, Horvat, & French, 1984; Cox & Davis, 1992; Campbell and Jones, 1997; Pensgaard, Roberts & Ursin, 1999; Dieffenbach & Statler, 2012). Researchers have found that wheelchair athletes are interested in working with sport psychology consultants (Page, Martin, & Wayda, 2001); however, few intervention-based studies with adaptive athletes have been conducted.

Purpose

The purpose of the present study is to investigate the efficacy of the MAC Approach at improving measures of flow, interoceptive awareness, and mindfulness in sport within a specialized population. To achieve this aim, a combination of qualitative case study research and quantitative measures will be utilized in order to investigate the perspective of members of the wheelchair rugby community. Case study research may have any combination of objectives including description, understanding, prediction, and/or control of the individual (Woodside, 2010). For the purposes of this study, the context is a wheelchair rugby player participating in a Mindfulness-Acceptance-Commitment (MAC) Approach. As described by Stake (1995), this case study would be an intrinsic case study as the focus is on the case itself. Through the use of case study research, the researcher will be able to gather pertinent information to augment the quantitative data collected throughout the study. This will allow for context to be given about the perceptions of wheelchair athletes on the MAC Approach.

Research Questions

1. Can the MAC Approach increase an adaptive athlete's self-report measures of interoceptive awareness?

2. Does the MAC Approach increase an adaptive athlete's perception of dispositional flow on a self-report measure?
3. Can the MAC Approach increase adaptive athlete's self-reported mindfulness in sport through the use of awareness, non-judgmental thinking, and refocusing?

Significance

Overall, the field of sport psychology is lacking research with adaptive athletes. Researchers have investigated the motivations for sport participation (Wu & Williams, 2001; Molik et al., 2010; Lindemann & Cherney, 2008), the benefits of sport participation (Lundberg, Bennett, & Smith, 2011), and psychological profiles of adaptive athletes (Henschen, Horvat, and French, 1984; Pensgaard, Roberts, & Ursin, 1999; Dieffenbach & Statler, 2012), yet limited research looks into interventions for adaptive athletes. The significance of this study is to provide greater understanding about mindfulness-based interventions when working with a wheelchair rugby athlete. For this population, the disabilities that the athletes live with may stem from a traumatic injury or incident and the individuals must learn to live with and compete with these physical limitations. Previous research into ACT suggests that acceptance-based strategies suit the needs of individuals that have to live with physical limitations (Kangas & McDonald, 2011). Additionally, mindfulness-based interventions have shown benefits outside of sport and promoting general wellbeing of athletes (Mahoney & Hanrahan, 2011). The use of a mixed-method case study design provides in-depth knowledge about a particular case and the experience of the athletes in the study. As stated by de Bressy de Guast, Golby, Van Wersch, and d'Arripe-Longueville (2013), more case studies mixing qualitative and quantitative methods are needed for individuals with physical disabilities. This study will

provide more applied knowledge and understanding about interventions with this population. This study will bolster the current findings in the research literature about wheelchair athletes.

Assumptions

It is assumed that the participant of the study will be honest, providing an unbiased recount of their experience in the research study and answering the surveys as accurately as possible. It is also assumed that the athlete does not have previous experience with mindfulness and is new to the practice of mindfulness.

CHAPTER II

LITERATURE REVIEW

Mindfulness

Mindfulness is an increasingly popular modality that has been used in different contexts and is growing in Western culture. The practice of mindfulness first began with Buddhist meditation, and has now become an increasingly popular trend within mental health in Western society. Kabat-Zinn (2003) defines mindfulness as the "...awareness that emerges through paying attention on purpose, in the present moment, and nonjudgementally to the unfolding of experience moment by moment" (p. 145). Another way to understand mindfulness is the involvement of nonjudgmental observation of internal and external stimuli as they occur (Baer, 2003). While the origins of mindfulness came from Buddhist meditation, it has become more secular, and has removed the religious aspects of the practice (Baer, 2003). As mindfulness meditation began to take root in Western society, mindfulness-based interventions emerged in different contexts such as hospitals rehabilitation and behavior therapy (Baer, 2003). The basis of these interventions is the attentiveness and awareness developed through meditation (Kabat-Zinn, 2003).

Mindfulness-based interventions have been used in different fields for different purposes. One of the most well-known intervention programs based on mindfulness is mindfulness-based stress reduction (MBSR) founded by Jon Kabat-Zinn (1990). In a meta-analysis of studies using MBSR, Grossman, Niemann, Schmidt, and Walach (2004) found a moderate effect size of approximately .50 when looking at controlled and uncontrolled studies. It was also concluded that MBSR is beneficial for individuals with

both clinical and nonclinical problems. More specifically, mindfulness-based interventions have been found to help reduce stress symptoms (Baer, 2003; Grossman et al., 2004), improve wellbeing (Brown & Ryan, 2003), decrease binge eating and emotional eating (Katterman, Kleinman, Hood, Nackers, & Corsica, 2014), improve sleep quality and duration (Hülshager, Feinholdt, & Nübold, 2015) and improve physical health in general (Grossman et al., 2004).

While the practice of mindfulness meditation is understood as being present and nonjudgmentally being aware of stimuli, Hölzel and colleagues (2011) sought to understand the theoretical underpinnings for the effects of mindfulness. Holzel and colleagues looked at four components that caused the psychological benefits found in literature. The four components identified were (1) attention regulation, (2) body awareness, (3) emotion regulation (including reappraisal, exposure, extinction and reconsolidation) and (4) change in perspective on the self. The authors (Holzel et al, 2011) defined attention regulation as the ability to focus on a single object and being able to bring attention back to that object when distracted. Body awareness is focusing on an internal experience such as breathing. Emotion regulation involves evaluating emotions in a nonjudgmental and accepting manner, while the change in perspective on the self is described as not viewing identity as a static entity.

Mindfulness-based Interventions in Athletics

Around the turn of the century as research on mindfulness in other fields expanded, mindfulness-based interventions were introduced as a method for improving athletic performance and functioning (Gardner & Moore, 2004). These interventions seek to change the relationships individuals have with internal experiences instead of

attempting to change internal processes (Gardner & Moore, 2012). Gardner and Moore (2007) state that traditional models of understanding performance difficulties emphasized negative emotions and distorted thoughts. Conversely, acceptance-based approaches view experiential acceptance as a key component to successful performance. Gardner and Moore described experiential acceptance as the ability of the performer to accept negative thoughts, physiological arousal, or emotions and stay attentionally and behaviorally engaged. While experiential acceptance is considered a facilitator of performance, experiential avoidance is viewed as detrimental to performance. Experiential avoidance occurs when the performer attempts to control the content and intensity of internal experiences. When attempting to regulate these states, the performer focuses their attention and behavior away from the task, which in turn reduces performance.

Despite the relative youth of mindfulness-based interventions for sports performance, as compared to traditional mental skills training, numerous studies have investigated the efficacy of mindfulness-based interventions. When Gardner and Moore (2012) reviewed the literature on mindfulness-based interventions, they found these types of interventions to be “probably efficacious” based on the American Psychological Association’s Task Force criteria. A variety of performance domains have been studied such as archery (Kaufman, Glass, & Arnkoff, 2009), volleyball (Wolanin & Schwanhausser, 2010), golf (Kaufman et al., 2009), soccer (Baltzell, et al., 2014; Ivarsson, et al., 2015), Swedish national-level junior athletes (Gustafsson et al., 2015), field hockey (Wolanin & Schwanhausser, 2010), and darts (Zhang et al., 2016).

Other studies have looked into using mindfulness-based interventions to improve specific aspects of performance, as opposed to researching how to achieve a state of

optimal performance. In a study of three Division I basketball teams, Gooding and Gardner (2009) found levels of mindfulness, competitive experience, and practice free throw percentage were predictive of competition free throw shot percentage.

Additionally, they found no relationship between the consistency and length of pre-shot routines and competitive free throw percentage (Gooding & Gardner, 2009). In a follow-up study one year after participation in a MSPE program, the researchers found increases in overall trait mindfulness and decreases in task-related worries and task-irrelevant thoughts (Thompson, Kaufman, De Petrillo, Glass, & Arnkoff, 2011). The authors also state that mile times for the runners improved and golf scores improved, though it is hard to attribute those improvements in performance to the program after such a long duration.

Not only have the interventions been found to increase performance, some studies have found ancillary benefits of mindfulness-based interventions for athletes. A study of elite junior soccer players found that a mindfulness-based program might reduce the incidence of injury of athletes (Ivarsson et al., 2015). The researchers propose this improvement may be a byproduct of mindfulness practice. Research into mindfulness has shown that practice stimulates changes in the anterior cingulate cortex, which houses executive attention (Hölzel et al., 2007). The researchers posit that these changes increase the players' ability to pay attention to relevant stimulus, which reduces the probability of injury occurring. Baltzell et al. (2014) also investigated a mindfulness-based program for soccer players. In a qualitative study of collegiate soccer players, they found that players reported enhanced mindfulness, awareness and acceptance of emotional experiences after a six-week mindfulness meditation training for sport. The researchers suggest that the improvement of acceptance of emotional experiences stems from developing the ability

to identify and accept negative emotions, which leads to a perceived improved ability to respond to those experiences. Gustafsson and colleagues (2015) conducted a study with elite junior athletes and found that mindfulness had a negative correlation with perceived stress and burnout. The proposed mechanism of change was that positive and negative affect acted as a mediator between mindfulness and burnout. To this end, mindfulness has been found to be associated with less negative affect (Brown & Ryan, 2003). Outside of elite-level athletes, Zhang et al. (2016) found that mindfulness-based interventions improved skill acquisition in novice dart throwing. There have also been indices outside of sport that suggest mindfulness-based interventions can be used as an effective modality for stress management (Sharma & Rush, 2014). These additional findings support the use of mindfulness-based programs to improve performance across a variety of domains.

Mindfulness and Flow

In the research literature, mindfulness-based interventions have been used as a means to enhance some aspect of performance or to improve a performer's ability to experience a state known as flow, which is often associated with peak performance. Csikszentmihalyi (1990) describes flow as being in a state of optimal performance that occurs when a balance between the challenges and perceived capabilities is achieved. While in this state, the performer is fully engaged with the present moment. Other terms have been used interchangeably with flow such as being "in a zone" or "in the groove" (Jackson & Csikszentmihalyi, 1990, p. 186, p. 20).

Jackson (1995) interviewed elite athletes to better understand what facilitates, prevents, and disrupts flow. She proposed that concentration was a factor that facilitated

flow experiences. The cognitive barriers to flow experiences reported by the athletes were thinking too much, being concerned about what others were doing or thinking, and worrying about other competitors. Based on these reportings, Jackson (1995) suggests that flow requires present-moment, non-judging concentration on a particular task, which aligns with skills that an individual develops through mindfulness meditation practice (Kabat-Zinn, 2003). Stemming from this definition of complete engagement in the present activity, research has investigated links between mindfulness and mindful behaviors and flow experiences. Cathcart, McGregor, and Groundwater (2014) found a correlation between mindfulness and flow in elite athletes. These correlations were stronger for athletes in individual and pacing sports compared to team and non-pacing sports. Similarly, Kaufman, Glass and Arnkoff (2009) assessed a four-week program called Mindful Sport Performance Enhancement (MSPE) to find if the program affected flow states, mindfulness, and performance in archers and golfers. The findings suggest that this mindfulness-based program may enhance flow and mindfulness in athletes. Lastly, in a few studies of university athletes, researchers (Aherne, Moran, and Lonsdale, 2011; Kee & Wang, 2008) found interactions between measures of flow and participants who underwent mindfulness training. Additionally, levels of mindfulness had a positive relationship with mental skills adoption and flow dispositions. These findings suggest that increasing mindfulness may result in increased flow experiences in athletes.

Flow and the MAC Approach. Studies investigating the efficacy of the MAC Approach reflect the findings of other mindfulness-based intervention studies suggesting a connection between increased levels of mindfulness and flow. In a study included in Gardner and Moore (2007), athletes who participated in the MAC approach reported

greater overall flow experiences than athletes who participated in a traditional psychological skills training program. Schwanhausser (2009) supported these findings in a case study investigating the MAC approach with an elite adolescent swimmer. The participant reported increased experiences of flow after the intervention. In a study of novice dart players, Zhang et al. (2016) found that individuals who participated in a MAC approach modified for a Chinese population had increased measures of flow than those who were in the control group. These studies investigating the MAC approach suggest that this particular intervention is similar to other mindfulness interventions and may be an avenue to increase flow experiences.

Wheelchair Athletes, Mindfulness, and Interoceptive Awareness

Interoception is defined as the sense of the physiologic condition of the body. This involves the processing of information that arises from within the body such as emotion, conscious awareness and behavior (Mehling et al, 2013). Interoceptive awareness is an individual's ability to distinguish these conditions in the body. Interoceptive awareness has been conceptualized using other terms such as somatic awareness and body awareness by researchers (Mehling et al, 2012). Previous research into the interoceptive awareness labeled it as maladaptive and used it to describe magnified focus on physical symptoms, rumination, and catastrophizing (Cioffi, 1991). In recent years, body awareness has been described as beneficial when paired with nonjudgmental acceptance and experiencing physical sensations in the present moment (Fogel, 2009), which aligns with the tenets of mindfulness discussed in previous sections. Interoceptive awareness is viewed a multidimensional process that encompasses and distinguishes between different modes of attention to body awareness (Mehling et al.,

2012). In recent studies, improved interoceptive awareness has been shown to have a beneficial impact of individual's physical and mental health (Chow and Tsang, 2007; Davis, Strasburger, & Brown, 2007; Rosenzweig et al., 2007; Morone, Greco, & Weiner, 2008).

In wheelchair sports, athletes are likely to have experienced some type of spinal cord injury (Bauerfeind, Koper, Wiczorek, Urbanski, & Tasiemski, 2015). These athletes have concerns related to the injury as well as long-term wheelchair usage. Outside of injuries and complications related to sport participation, these athletes have other concerns related to the spinal cord injury and long-term wheelchair usage. Researchers have found that individuals using wheelchairs who experienced spinal cord injury tend to experience chronic pain (Jensen, Hoffman, & Cardenas, 2005; Turner, Cardenas, Warm, & McClellan, 2001). Studies of interoceptive awareness have explored mind-body therapies, such as mindfulness-based interventions, and recent studies have begun to explore the potential ability to improve interoceptive attentional styles with pain (Mehling et al., 2013). This suggests that mindfulness-based interventions may be a method to improve interoceptive awareness of wheelchair athletes. This could improve their relationships with chronic pain and may bolster performance in their sport.

The Mindfulness-Acceptance-Commitment Approach

The Mindfulness-Acceptance-Commitment (MAC) Approach was developed by Frank Gardner and Zella Moore after the authors experienced frustrations with the inconsistent results of traditional mental skills training when working with athletes in applied settings. This, paired with a lack of consistent empirical data supporting the use of traditional mental skills training, led to mindfulness being explored as sport specific

intervention. The basis of the MAC Approach is experiential acceptance and the ability to accept internal processes. These notions are key to optimal performance, which is contradictory to the traditional approaches, which focus on regulating negative internal stimuli. Gardner and Moore state the main difference is traditional mental skills training approaches focus on modifying outcomes without targeting the specific psychological processes (Gardner & Moore, 2007). In the views of Gardner and Moore (2007), optimal performance should be understood as active absorption in the task instead of attentiveness to the self.

The purpose of the MAC approach is to promote acceptance of internal experiences while focusing on the relevant performance cues. The goals of the approach is to develop: (1) mindful, nonjudging, present-moment attention (mindfulness); (2) acceptance of internal processes such as thoughts, emotions, and bodily sensations; (3) a willingness to remain in contact with those sensations; (4) a focus of attention on performance-relevant cues, contingencies, and situationally appropriate actions and choices in the service of personal performance and life values (commitment) (Gardner & Moore, 2007). To achieve these goals, the MAC approach has a specific protocol to be followed.

The initial steps involve conceptualizing the performer, which involves assessing the athlete through interviews, behavioral observations, and psychological testing. After conceptualization is case formulation, which Gardner and Moore (2007) state is composed of the following steps: (1) contextual performance demands; (2) current performance-relevant skill development; (3) relevant situational demands; (4) transitional and developmental issues; (5) unique psychological characteristics: performance and

nonperformance schemas; (6) direction of attentional focus (self versus task) during performance; (7) cognitive responses; (8) affective responses; (9) behavioral responses; (10) readiness for change and levels of reactance. The final step is classifying performance issues.

In conjunction with the MAC Approach, Gardner and Moore developed the Multilevel Classification System for Sport Psychology (MCS-SP). The MCS-SP has four classifications: performance development (PD), performance dysfunction (Pdy), performance impairment (PI), and performance termination (PT). PD represents performers who desire to increase performance and have no significant factors that affect performance or require attention. The Pdy classification generally involves performers whose current level of performance has decreased from an established level, certain psychological barriers negatively affect the performer, and psychological or behavioral functioning is chronically or situationally reduced. Performers with in the PI classification are individuals with diagnosable clinical issues and developing psychological skills will most likely not affect performance issues or overall psychosocial functioning. Finally, PT involves situations where preserving the performance career may not be an option due to multiple stressors and difficulties. In both the PI and PT classifications, referrals may be necessary for these performers. After following these steps, use of the MAC approach with the performer begins.

The MAC approach is presented to the performer through a seven-module MAC protocol designed to be delivered in a seven session process though it may be modified as needed to fit the needs of participant. The seven-modules of the protocol are (1) psychoeducation, (2) introducing mindfulness and cognitive diffusion, (3) introducing

values and values-driven behavior, (4) introducing acceptance, (5) enhancing commitment, (6) skill consolidation and poise, and (7) maintaining and enhancing mindfulness, acceptance, and commitment. Psychoeducation involves teaching the participant the theoretical rationale for the MAC Approach, connecting this rationale to the participant's performance experience and how it affects performance, and developing specific goals for the program. The second module further explains the importance of mindful awareness and mindful attention in behavior change as well as introducing cognitive diffusion, which is the ability to separate what the mind tells the participant from objective truth. Module 3 introduces values and values-driven behavior, which explores the important values of the participant and creating an anchor point for the participant. The goal of introducing acceptance is to help the participant understand that emotions are not detrimental to performance, but rather, attempting to eliminate or control emotions hamper performance. Module 5 aims to distinguish the difference between goals and values in order to identify specific behaviors that will optimize performance. Module 6 is designed to help the participant develop and maintain improved behavioral flexibility. The final module is designed to continue developing skills gained in the program and promote the use of these skills following the completion of the program (Gardner & Moore, 2007).

Efficacy of the MAC Approach. Research looking into the MAC approach and similarly designed mindfulness and acceptance-based models has primarily used case study design or small samples (Gardner & Moore, 2012). As of the writing of the article by Gardner and Moore (2012), only the study published in Gardner and Moore (2007) had used a large sample, randomized controlled trial. When looking at 118 Division I

athletes, Gardner and Moore (2007) found a significant difference in the improvement in coach ratings of performance between athletes in the MAC approach group compared to the psychological skills training group. In a similar study with fewer participants, Gross et al. (2016) found that use of the MAC approach with women collegiate basketball players produced improvements in performance when compared to traditional psychological skills training. Aside from the performance enhancement, research into the MAC approach has found improvements in psychological functioning such as improved self-report of concentration and experiential acceptance (Gardner and Moore, 2004), improvement in self-reported behavioral functioning (Lutkenhouse, 2007), and increased self-reported mindful awareness, mindful attention, experiential acceptance, and flow (Schwanhausser, 2009).

Use of MST with Wheelchair Sports

One of the main concerns when working with athletes with disabilities is the lack of information regarding adaptive sports, the different classifications in adaptive sports, and the needs of the athletes in these classifications in the sport psychology literature (Bawden, 2006). Sherrill (1999) states that there is a lack of theory-based knowledge in the area of sport psychology work with athletes with disabilities while Porretta and Moore (1996) found that there is a lack of research in applied sport psychology work with athletes with disability and suggest that more research needs to investigate working with these athletes in competitive environments. de Bressy de Guast et al. (2013) support these earlier findings showing that studies using psychological skills training to improve performance of athletes with disabilities have focused on group settings or individuals

with intellectual disabilities, yet case studies investigating programs with individuals with physical disabilities are limited.

Some of the earliest research into adaptive athletes, in particular wheelchair athletes, was a study by Henschen, Horvat, and French (1984). They found that the psychological profiles of elite wheelchair athletes and elite athletes were similar. According to the authors, the wheelchair athletes demonstrated a more ideal profile than the able-bodied athletes, which may be a result of having to develop their mental skills as a result of their injuries. A later study by Cox and Davis (1992) supported these findings as their study found that athletes with disabilities have superior psychological skills profiles when compared to collegiate athletes. Specifically, the athletes had higher scores on anxiety control, motivation, and confidence. A study by Campbell and Jones (1997) reported that disabled athletes and nondisabled athletes showed a similar precompetition anxiety response. Pensgaard, Roberts, and Ursin (1999) compared Norwegian Olympic and Paralympic athletes and found that the athletes had comparable motivational profiles and used similar coping strategies. More recently, Dieffenbach and Statler (2012) explored the similarities and differences between Paralympic athletes and elite able-bodied athletes. While many of the motivations for participation are the same, different barriers exist such as concerns about lack of access and knowledgeable coaches (Dieffenbach & Statler, 2012).

Outside of the psychological profiles of adaptive athletes, different psychological constructs have been studied with this population. Perreault and Marisi (1997) explored the multidimensional anxiety theory with wheelchair basketball players. The researchers found no support for the theory with wheelchair basketball players. Another study of

wheelchair basketball players investigated the self-determination theory and found that self-determined motivation was associated with enhanced psychological functioning with this population (Perreault & Vallerand, 2007). Martin and Malone (2013) attempted to broaden the understanding of the mental skills used by elite wheelchair rugby players. In the study, researchers found that athletes using a broader set of mental skills were more engaged than athletes who used a limited set of mental skills. Additional studies have explored other constructs such as self-efficacy and affect in wheelchair basketball players and appraisal of sources of stress in elite male wheelchair basketball players (Martin, 2008; Campbell & Jones, 2002).

As previously shown, athletes with disabilities are more similar than different to elite athletes (Dieffenbach & Statler, 2012; Campbell & Jones, 1997; Pensgaard et al., 1999; Henschen et al., 1984) though there is information unique to this population (Martin, 1999; Martin, 2005; Hanrahan, 1998; Asken, 1991). According to Asken (1991), one of the most important differences is the physical and psychological trauma caused by the loss of function. Consultants must also consider altered physical responses, medical problems, and potentially unique motivations to compete. Ultimately, studies have shown that wheelchair athletes are amenable to seeking out sport psychology consultants (Page, Martin, Wayda, 2001).

Mindfulness and Wheelchair Athletics. Despite research growing in the areas of adaptive sports and wheelchair sports in particular, there is a lack of studies investigating the efficacy of different interventions with these populations. Researchers have explored interventions with self-talk with wheelchair basketball athletes (Harbalis, Hatzigeorgiadis, Theodorakis, 2008) and imagery and collective efficacy (Shearer,

Mellalieu, Shearer, & Roderique-Davies, 2009). More recently, de Bressy de Guast and colleagues (2013) used a case study approach to evaluate a psychological skills training program with a wheelchair water-skiing athlete. The athlete perceived the program to be effective in terms of improving performance and mental skills. As only a limited number of intervention studies exist, only one study has investigated mindfulness-based interventions with this population. MacDonald and Minahan (2017) used an eight-week mindfulness intervention. The researchers were measuring whether the program would affect the salivary cortisol and salivary Immunoglobulin-A secretion levels during competition. When compared to the control group, mindfulness training was found to attenuate increases salivary cortisol levels associated with competition.

History and Development of Wheelchair Rugby

Sports designed for athletes with impairment have existed for more than 100 years. As early as 1888, there were sports clubs for the deaf in Berlin; however, it was not until after World War II that adaptive sports began to increase in popularity. In 1944, Dr. Ludwig Guttmann opened a spinal injury center that began by using sport as a rehabilitation technique. From there it developed into a competitive sports for disabilities of varying severity. In 1948, Ludwig organized the Stoke Mandeville Games to take place before the London Olympic Games. Sixteen British athletes competed in archery, and in 1952, Dutch athletes joined the games (Paralympic Movement, 2017).

Around the same time in United States, Jim Winthers developed and began to teach veterans how to ski on one leg. This eventually led to him and others to develop skiing techniques that they began to teach at weeklong clinics (Disabled Sports USA, 2017). These developments led to the first Paralympic Game, which took place in Rome,

Italy in 1960. Since then, the Paralympic Games have mirrored the Olympic Games by taking place every four years. In 1976, the first Winter Games took place in Sweden and the Paralympic Games began to take place in the same locations as the Olympic Games starting with the Summer Games in Seoul, Korea in 1988.

The International Paralympic Committee (IPC) officially recognized wheelchair rugby as a Paralympic sport in 1994 and it was included as a medal sport at the 2000 Paralympic Games in Sydney, Australia; however, wheelchair rugby, originally called Murderball, first began in 1977 when Canadian quadriplegic athletes looked for alternatives to wheelchair basketball. Over the next two decades, wheelchair rugby spread across the globe with 26 countries competing in international events with ten countries currently developing their programs (International Wheelchair Rugby Federation, 2017). The growing popularity of the sport is encapsulated in the Oscar-nominated documentary “Murderball,” which exposed larger audiences to the world of wheelchair rugby (Lindemann & Cherney, 2008).

CHAPTER III

METHODS

The purpose of the present study was to investigate the efficacy of the MAC Approach at improving measures of flow, mindfulness in sport, and interoceptive awareness, using a case study design within a specialized population. To achieve this aim, a combination of case study research and quantitative measures were utilized in order to investigate the perspectives of members of the wheelchair rugby community. This chapter describes the participants of the study, provides an overview of case study and the selected quantitative measures, and describes the procedures that followed throughout data collection and analysis.

Participants

The sample of participants includes three current wheelchair rugby players (n = 3). The Individuals under the age of 18 were not included.

Procedures and Design

The study employed a mixed-method design. Prior to giving consent, the participants were informed about the purpose of the study. After giving consent, a pseudonym was given to the participant to ensure confidentiality. Descriptive information about the participants was collected. The intervention consisted of seven one-hour sessions delivered by the researcher, previously demonstrated to be effective by Gardner and Moore (2007). The sessions, as outlined above, were completed in the following order, with at least 5 days between each session, per the protocol: (1) psychoeducation, (2) introducing mindfulness and cognitive diffusion, (3) introducing values and values-driven behavior, (4) introducing acceptance, (5) enhancing commitment, (6) skill

consolidation and poise, and (7) maintaining and enhancing mindfulness, acceptance, and commitment. To evaluate the efficacy of the MAC Approach and establish trends, three questionnaires were administered prior to the start of the protocol, after the third session, and at the end of the seven sessions. The Multidimensional Assessment of Interoceptive Awareness (MAIA) was used to evaluate interoceptive awareness. The Mindfulness Inventory for Sport (MIS) was used to measure mindfulness behaviors in the participants' sport. The Dispositional Flow Scale-2 (DFS-2) was used to measure changes in participants' propensity to experience flow. At the end of the protocol, a semi-structured interview was conducted to study and report the participants' experience with the MAC Approach. Afterwards, the researcher transcribed the interviews. The transcripts were sent to participants to review to ensure the accuracy of their reports. Prior to recruitment of participants, a former wheelchair rugby player piloted the questionnaires and interview questions.

Instrumentation

Participant Characteristics. Eight individuals consented to participate. Of the eight, six participants completed the pre-survey. One participant ($n = 1$) did not complete any sessions, two participants ($n = 2$) completed the first session and three participants ($n = 3$) completed participation in the study, who will be detailed in the following section.

Mike is a 31-year-old male wheelchair rugby player. At the time of the study, he had played wheelchair rugby for 3.5 years. He is classified as a .5 player.

Frank is a 36-year-old male wheelchair rugby player. At the time of the study, he had played wheelchair rugby for 14 years. He is classified as a 3.5 player.

Anne is a 26-year-old female wheelchair rugby player. At the time of the study, she had played wheelchair rugby for 6 years. She is classified as a .5 player.

Dispositional Flow Scale-2. The Dispositional Flow Scale-2 was designed to measure the frequency of flow experiences in general (Jackson & Eklund, 2002). This scale has nine subscales: Challenge-Skill Balance, Action-Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Loss of Self Consciousness, Transformation of Time, and Autotelic Experience. The scale has 36 questions and is answered on the Likert scale from 0 (strongly disagree) to 5 (strongly agree). The DFS-2 items have a reliability estimate ranging from .78 to .86 (Jackson & Eklund, 2002).

Multidimensional Assessment of Interoceptive Awareness (MAIA).

Interoceptive awareness was measured using the Multidimensional Assessment of Interoceptive Awareness (MAIA) (Mehling et al. 2013). The MAIA is a self-report questionnaire comprised of 32 items. The assessment contains eight subscales that measure different methods of attending to interoceptive body sensations. The subscales of the assessment are noticing, not-distracting, not-worrying, attention regulation, emotional awareness, self-regulation, body-listening, and trusting. The items are scored on a six point Likert scale ranging from 0 (never) to 5 (always). The scores of each subscale are averaged with higher averages related to greater interoceptive awareness for that subscale. Mehling et al. (2012) demonstrated construct validity of the items as well as reliability of items with a Cronbach's Alpha ranging from .66 to .87. Construct validity and reliability was confirmed in studies of individuals with low back pain (Mehling et al.,

2013), a Chilean population sample (Valenzuela-Moguillansky & Reyes-Reyes, 2015), and a German population sample (Bornemann, Herbert, Mehling, & Singer, 2015).

Mindfulness Inventory for Sport (MIS). The MIS was developed to assess mindfulness in sport settings, as previously developed instruments were used in clinical settings and were designed to assess mindfulness in daily life (Thienot et al., 2014). The inventory has fifteen items with three subscales. Five items are designed to measure awareness. An example of an awareness item, “I am aware of thoughts that are passing through my mind.” Five items measure non-judgmental thinking and an example of one item is “When I become aware that I am thinking about a past performance, I criticize myself for not being focused on my current performance.” Five items are designed to measure refocusing. An example is “When I become aware that some of my muscle are sore, I quickly refocus on what I have to do.” The athlete rates each item on a scale ranging from 1 (not at all) and 6 (very much). The scores are totaled, with higher scores indicating greater frequency of mindful behaviors. The subscale of non-judgmental thinking is reverse scored. Thienot et al. (2014) found preliminary evidence of construct and factorial validity and a Cronbach’s alpha coefficient greater than .77 for internal reliability for the three subscales.

Semi-structured interviews. Semi-structured interviews were conducted with the participants following the conclusion of the intervention. This format was chosen for the present study because the researcher can tailor questions used in the interview process to focus on areas and topics of interest as opposed to an unstructured interview, which risks finding information not pertinent to the research questions. The semi-structured interview involved an opening statement and predetermined general questions designed to elicit a

conversation about the participants' experiences. Supplementary probing questions were designed to draw additional information not discussed during the interview.

Kvale (2007) suggests interviews involve two important aspects. First, is how the interviewer introduces themselves to the person being interviewed. This is to develop rapport; however, due to study design, rapport should already be built between the interviewer and interviewee. Second, is what questions are going to be asked. To ensure the quality of the interviews, a pilot interview will be performed to refine the designed questions and remove biases from the process. The researcher will take hand written notes during the interview in addition to audio recording the interviews to ensure that the interviews will be transcribed verbatim.

Data Analysis

To analyze the changes in flow, interoceptive awareness, and mindfulness in sport, the scores of the pre-test, midpoint, and post-test results of the DFS-2, MAIA, and MIS were plotted to determine individual trends of the participants during the intervention.

Following the methodology of case study research (Creswell, 2007), the interviews and observations were used to create a description of the case. From there the research analyzed themes found in the case present the key emergent themes. Finally, the researcher reported on the meaning of this case.

Chapter IV

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Chapter V

Introduction

In recent years, the Paralympics Games have grown in popularity and exposure. The London 2012 Paralympic Games broadcast to 115 different countries, which was an increase of 30% from the 2008 Paralympic Games. Similarly, the Rio 2016 Paralympic Games were covered in 154 different countries and exposure continues to grow (Paralympic Movement, 2016). As exposure continues, along with an increased awareness of different adaptive sport domains, more professionals will work with individuals, teams, and organizations as they seek out various avenues to improve performance. As with other performance fields, improvements can be facilitated through improved coaching, strength and conditioning, nutrition, and other factors. This also includes mental performance consulting, specifically sport psychology.

While researchers have begun to investigate best practices with adaptive athletes, most studies investigate the differences between adaptive athletes and able-bodied athletes (Henschen, Horvat, & French, 1984; Cox & Davis, 1992; Campbell and Jones, 1997; Pensgaard, Roberts & Ursin, 1999; Dieffenbach & Statler, 2012) and other authors have written about the unique considerations for this population (Martin, 1999; Martin, 2005; Hanrahan, 1998; Asken, 1991). Of the limited number of intervention studies, researchers have explored self-talk (Harbalis, Hatzigeorgiadis, Theodorakis, 2008) and imagery and collective efficacy (Shearer, Mellalieu, Shearer & Roderique-Davis, 2009) with wheelchair basketball athletes. Similarly, De Bressy de Guast, Golby, Van Wersch, & d'Arripe-Longueville (2013) evaluated a psychological skills training program with an elite athlete competing disabled water-skiing, and MacDonald and Minahan (2017)

studied the effects an eight-week mindfulness intervention and its effect on salivary cortisol levels prior to competition.

Research has shown mindfulness-based interventions to be effective in improving performance in athletes (Gardner & Moore, 2012). Other studies have found mindfulness-based interventions to be efficacious with several different populations, across various domains (Gardner & Moore, 2012; Kaufman, Glass, & Arnkoff, 2009; Wolanin & Schwanhausser, 2010; Zhang et al., 2016; Ivarsson, Johnson, Andersen, Fallby, & Altemyr, 2015; Baltzell, Caraballo, Chipman, & Hayden, 2014; Gustafsson, Skoog, Davis, Kenttä, & Haberl, 2015). Additionally, mindfulness-based interventions have been shown to have potential ancillary benefits outside of increased levels of mindful behaviors such as reduced incidence of injury, increased acceptance of emotional experiences, and improved skill acquisition in novices (Ivarsson et al., 2015; Baltzell et al., 2014; Gustafsson et al., 2015; Zhang et al., 2016).

Additionally, research has begun to link mindfulness with flow, which is a state believed to produce improved performance (Cathcart, McGregor, & Groundwater, 2014). Csikszentmihalyi (1990) describes flow as being in a state of optimal performance that occurs when a balance between the challenges and perceived capabilities is achieved. While in this state, the performer is fully engaged with the present moment. Other terms have been used interchangeably with flow such as being “in a zone” or “in the groove” (Jackson & Csikszentmihalyi, 1999, p. 186, p. 20). In a study included in Gardner and Moore (2007), athletes who participated in the MAC approach reported greater overall flow experiences than athletes who participated in a traditional psychological skills training program. Schwanhausser (2009) supported these findings in a case study

investigating the MAC approach with an elite adolescent swimmer. The participant reported increased experiences of flow after the intervention. Zhang et al. (2016) found that individuals who participated in a MAC approach modified for a Chinese population had increased measures of flow than those who were in the control group. These studies investigating the MAC approach suggest that this program may be an avenue to increase flow experiences.

Another concept related to mindfulness is interoceptive awareness, described as an individual's ability to distinguish different conditions in the body. Interoceptive awareness has been conceptualized using other terms such as somatic awareness and body awareness by researchers (Mehling et al, 2012). This relates to athletes using wheelchairs as it is likely that these athletes have experienced some type of spinal cord injury (Bauerfeind, Koper, Wiczorek, Urbanski, & Tasiemski, 2015). Outside of injuries and complications related to sport participation, these athletes have concerns related to the injury as well as long-term wheelchair usage. Researchers have found that individuals using wheelchairs who experienced spinal cord injury tend to experience chronic pain (Jensen, Hoffman, & Cardenas, 2005; Turner, Cardenas, Warm, & McClellan, 2001). Studies of interoceptive awareness have explored mind-body therapies, such as mindfulness-based interventions, and recent studies have begun to explore the potential ability to improve interoceptive attentional styles with pain (Mehling et al., 2013). This suggests that mindfulness-based interventions may be a method to improve interoceptive awareness of wheelchair athletes. This could improve their relationships with chronic pain and may bolster their ability to perform in their sport.

The mindfulness intervention proposed for the present study is the Mindfulness-Acceptance-Commitment (MAC) Approach (Gardner & Moore, 2007). The MAC Approach was designed to promote the acceptance of internal experiences while focusing on relevant performance cues. Important aspects of the MAC Approach are the acceptance of internal processes and a focus on actions and choices in the service of personal performance and life values (Gardner & Moore, 2007). To achieve the goals of the MAC Approach, a specific protocol is used and tailored to each performer.

To summarize, research investigating sport psychology interventions and best practices in different performance domains is growing; however, adaptive athletes are underrepresented populations (Porretta & Moore, 1996; Sherrill, 1999; Bawden, 2006). Researchers have compared the psychological profiles of athletes with disabilities to able-bodied athletes, but few studies have investigated interventions with adaptive athletes (Henschen, Horvat, & French, 1984; Cox & Davis, 1992; Campbell and Jones, 1997; Pensgaard, Roberts & Ursin, 1999; Dieffenbach & Statler, 2012). While researchers have found wheelchair athletes are interested in working with sport psychology consultants (Page, Martin, & Wayda, 2001), few intervention-based studies with adaptive athletes and wheelchair athletes in particular have been conducted.

The purpose of the present study is to investigate the efficacy of the MAC Approach at improving measures of flow, interoceptive awareness, and mindfulness in sport, specifically looking at a single case study, within a specialized population. To achieve this aim, a combination of qualitative and quantitative measures will be utilized to investigate the perspective of athletes of the wheelchair rugby community. Case study research may have any combination of objectives including description, understanding,

prediction, and/or control of the individual (Woodside, 2010). For the purposes of this study, the context are wheelchair rugby players participating in a Mindfulness-Acceptance-Commitment (MAC) Approach. As described by Stake (1995), this case study would be an intrinsic case study as the focus is on the case itself. Through the use of case study research, the researcher will be able to gather pertinent information to augment the quantitative data collected throughout the study. This will allow for context to be given about the perceptions of wheelchair athletes of the MAC Approach. As stated by de Bressy de Guast et al. (2013), more case studies mixing qualitative and quantitative methods are needed for individuals with physical disabilities. This study will provide more applied knowledge and understanding about interventions with this population and will bolster the current findings in the research literature about wheelchair rugby athletes.

Methods

The purpose of the present study was to investigate the efficacy of the MAC Approach at improving measures of flow, mindfulness in sport, and interoceptive awareness, specifically looking at a single case study, within a specialized population. To achieve this aim, a combination of case study research and quantitative measures were utilized to investigate the perspectives of members of the wheelchair rugby community. This chapter describes the participants of the study, provides an overview of case study and the selected quantitative measures, and describes the procedures that followed throughout data collection and analysis.

Participants

The sample of participants included three current wheelchair rugby players (n = 3). The mean age of the participants was 31 years old and the mean years of experience in wheelchair rugby was 7.67 years. There were two male participants (n = 2) and one female participant (n = 1).

Procedures and Design

The study employed a mixed-method design. Prior to giving consent, the participants were informed about the purpose of the study. After giving consent, a pseudonym was given to participants to ensure confidentiality. Descriptive information about participants was collected. The intervention consisted of seven one-hour sessions delivered by the researcher, previously demonstrated to be effective by Gardner and Moore (2007). The sessions were completed in the following order, with at least 5 days between each session, per the protocol: (1) psychoeducation, (2) introducing mindfulness and cognitive diffusion, (3) introducing values and values-driven behavior, (4) introducing acceptance, (5) enhancing commitment, (6) skill consolidation and poise, and (7) maintaining and enhancing mindfulness, acceptance, and commitment. After each session, the first author recorded notes about the progress of the participants and discussed their cases with the second author. To evaluate the efficacy of the MAC Approach and establish trends, three questionnaires were administered prior to the start of the protocol, after the third session, and at the end of the seven sessions. The Multidimensional Assessment of Interoceptive Awareness (MAIA) was used to evaluate interoceptive awareness. The Mindfulness Inventory for Sport (MIS) was used to measure mindfulness behaviors in the participants' sport. The Dispositional Flow Scale-2

(DFS-2) was used to measure changes in participants' propensity to experience flow. At the end of the protocol, a semi-structured interview was conducted to study and report the participants' experience with the MAC Approach. Afterwards, the researcher transcribed the interviews. The transcripts were sent to participants to review to ensure the accuracy of their reports. Prior to recruitment of participants, a former wheelchair rugby player piloted the questionnaires and interview questions.

Instrumentation

Participant Characteristics. Eight individuals consented to participate. Of the eight, six participants completed the pre-survey. One participant ($n = 1$) did not complete any sessions, two participants ($n = 2$) completed the first session and three participants ($n = 3$) completed participation in the study, who will be detailed below.

Mike is a 31-year-old male wheelchair rugby player. At the time of the study, he had played wheelchair rugby for 3.5 years. He is classified as a .5 player with limited experience with mindfulness.

Frank is a 36-year-old male wheelchair rugby player. At the time of the study, he had played wheelchair rugby for 14 years. He is classified as a 3.5 player with no experience with mindfulness.

Anne is a 26-year-old female wheelchair rugby player. At the time of the study, she had played wheelchair rugby for 6 years. She is classified as a .5 player with limited experience with mindfulness.

Dispositional Flow Scale-2. The Dispositional Flow Scale-2 was designed to measure the frequency of flow experiences in general (Jackson & Eklund, 2002). This scale has nine subscales: Challenge-Skill Balance, Action-Awareness Merging, Clear

Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Loss of Self Consciousness, Transformation of Time, and Autotelic Experience. The scale has 36 questions and is answered on the Likert scale from 1 (strongly disagree) to 5 (strongly agree). Global scores of flow are found by combining the scores of all the items. Global scores range from 36 to 180 with higher scores indicating an increased propensity to experience flow states in general. The DFS-2 items have a reliability estimate ranging from .78 to .86 (Jackson & Eklund, 2002).

Multidimensional Assessment of Interoceptive Awareness (MAIA).

Interoceptive awareness was measured using the Multidimensional Assessment of Interoceptive Awareness (MAIA) (Mehling et al. 2013). The MAIA is a self-report questionnaire comprised of 32 items. The assessment contains eight subscales that measure different methods of attending to interoceptive body sensations. The subscales of the assessment are noticing, not-distracting, not-worrying, attention regulation, emotional awareness, self-regulation, body-listening, and trusting. The items are scored on a six point Likert scale ranging from 0 (never) to 5 (always). The scores of each subscale are averaged with higher averages related to greater interoceptive awareness for that subscale. Mehling et al. (2012) demonstrated construct validity of the items as well as reliability of items with a Cronbach's Alpha ranging from .66 to .87. Construct validity and reliability was confirmed in studies of individuals with low back pain (Mehling et al., 2013), a Chilean population sample (Valenzuela-Moguillansky & Reyes-Reyes, 2015), and a German population sample (Bornemann, Herbert, Mehling, & Singer, 2015).

Mindfulness Inventory for Sport (MIS). The MIS was developed to assess mindfulness in sport settings, as previously developed instruments were used in clinical

settings and were designed to assess mindfulness in daily life (Thienot et al., 2014). The inventory has fifteen items with three subscales: Awareness, Refocusing, and Non-Judgmental Thinking. The athlete rates each item on a six point Likert scale ranging from 1 (not at all) and 6 (very much). The scores are totaled, with higher scores indicating greater frequency of mindful behaviors. Thienot et al. (2014) found preliminary evidence of construct and factorial validity and a Cronbach's alpha coefficient greater than .77 for internal reliability for the three subscales.

Semi-structured interviews. Semi-structured interviews were conducted with the participants following the conclusion of the intervention. This format was chosen for the present study because the researcher can tailor questions used in the interview process to focus on areas and topics of interest as opposed to an unstructured interview, which risks finding information not pertinent to the research questions. The semi-structured interview involved an opening statement and predetermined general questions designed to elicit a conversation about the participants' experiences. Supplementary probing questions were designed to draw additional information not discussed during the interview.

Kvale (2007) suggests interviews involve two important aspects. First, is how the interviewer introduces themselves to the person being interviewed. This is to develop rapport; however, due to study design, rapport should already be built between the interviewer and interviewee. Second, is what questions are going to be asked. To ensure the quality of the interviews, a pilot interview was performed to refine the designed questions and remove biases from the process. The researcher took hand written notes during the interview in addition to audio recording the interviews to ensure that the interviews were transcribed verbatim.

Data Analysis

To analyze the changes in flow, interoceptive awareness, and mindfulness in sport, the scores of the pre-test, midpoint, and post-test results of the DFS-2, MAIA, and MIS were plotted to determine individual trends of the participants during the intervention.

Following the methodology of case study research (Creswell, 2007), the interviews and observations were used to create a description of the case. From there the researcher analyzed themes found in the cases and noted the key emergent themes. Finally, the researcher reported on the meaning of this case.

Case Study 1: Mike

Results

Dispositional Flow Scale-2. Figures 1 and 2 plot the scores of Mike on the Dispositional Flow Scale-2 (DFS-2). Figure 1 shows Mike's global score, which indicates the likelihood that the individual would experience flow states in general. There was a slight increase in the score from 122 at pre-test to 124 at the midpoint. Mike had a global score of 138 at post-test. Figure 2 displays Mike's scores on the DFS-2 subscales. Over the course of the intervention, Mike's scores on the subscales of Action-Awareness Merging, Clear Goals, Unambiguous Feedback, Sense of Control, and Transformation of Time increased from pre-test to post-test. The other subscales remained stable.

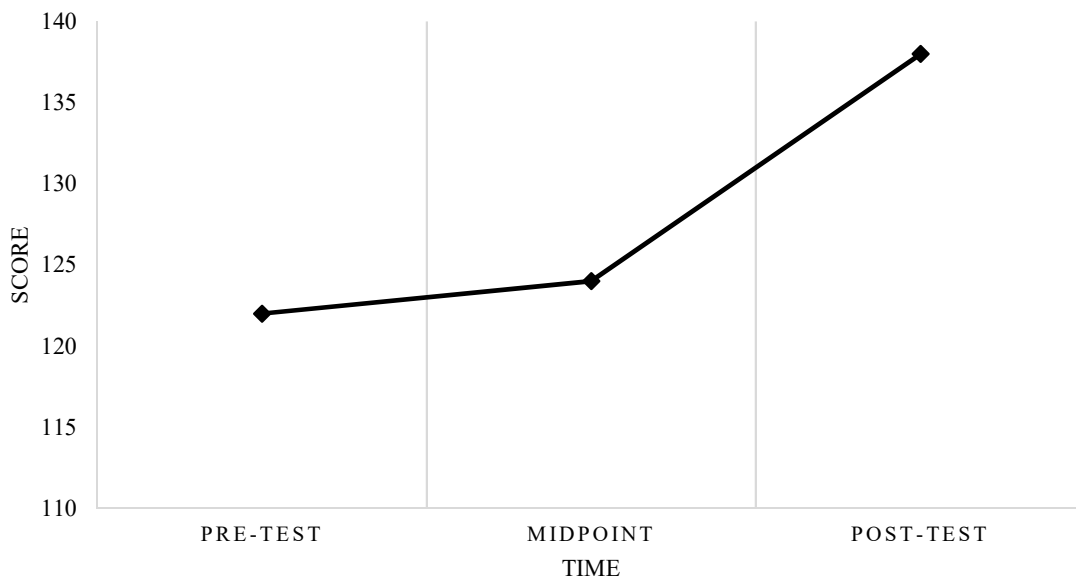


Figure 1. Mike DFS-2 Global Scores

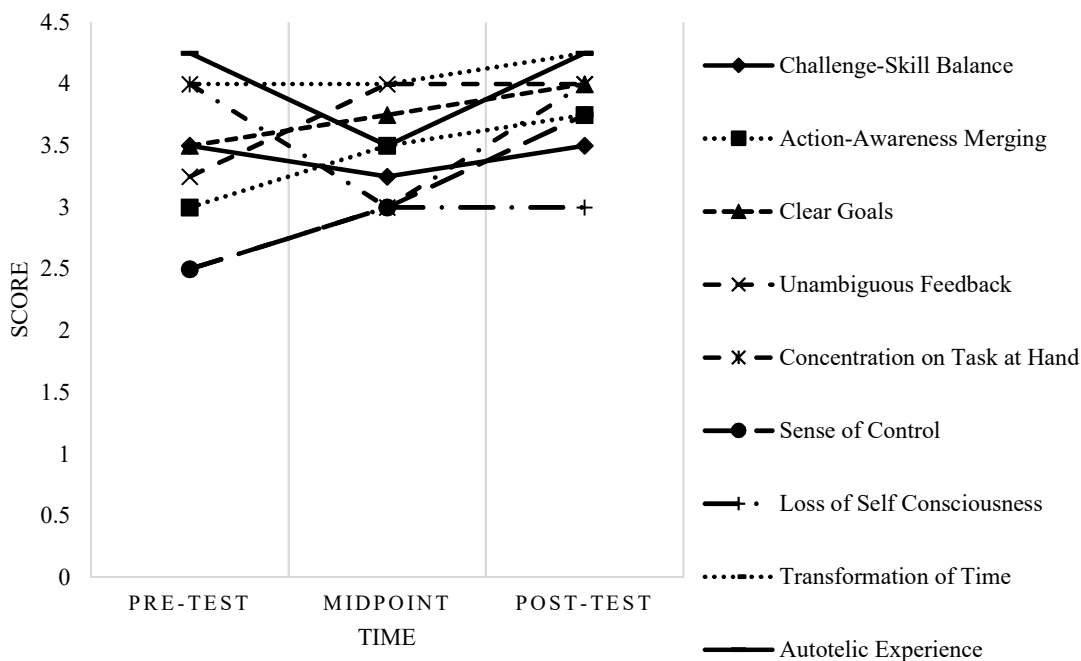


Figure 2. Mike DFS-2 Subscale Scores

Multidimensional Assessment of Interoceptive Awareness. Figure 3 displays Mike's scores on the subscales of the Multidimensional Assessment of Interoceptive Awareness. Over the course of the intervention, the scores on the subscales of Not-

Worrying, Attention Regulation, Body-Listening, and Trusting increased. The subscales Noticing, Not-Distracting, and Emotional Regulation decreased from pre-test to post-test. The subscale of Self-Regulation remained the same.

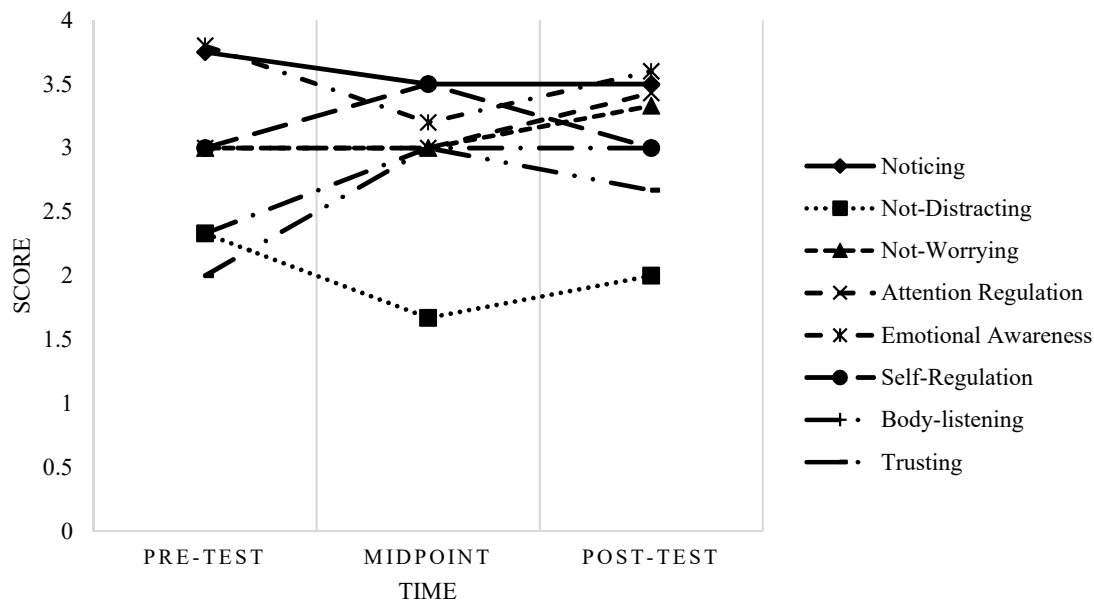


Figure 3. Mike MAIA Subscale Scores

Mindfulness Inventory for Sport. Figure 4 displays Mike's scores on the Mindfulness Inventory for Sport. The scores for Awareness decreased at the midpoint but increased above pre-test levels at post-test. The scores of Refocusing increased at midpoint but decreased below midpoint levels at post-test. The scores on Nonjudgmental thinking remained relatively stable throughout the intervention.

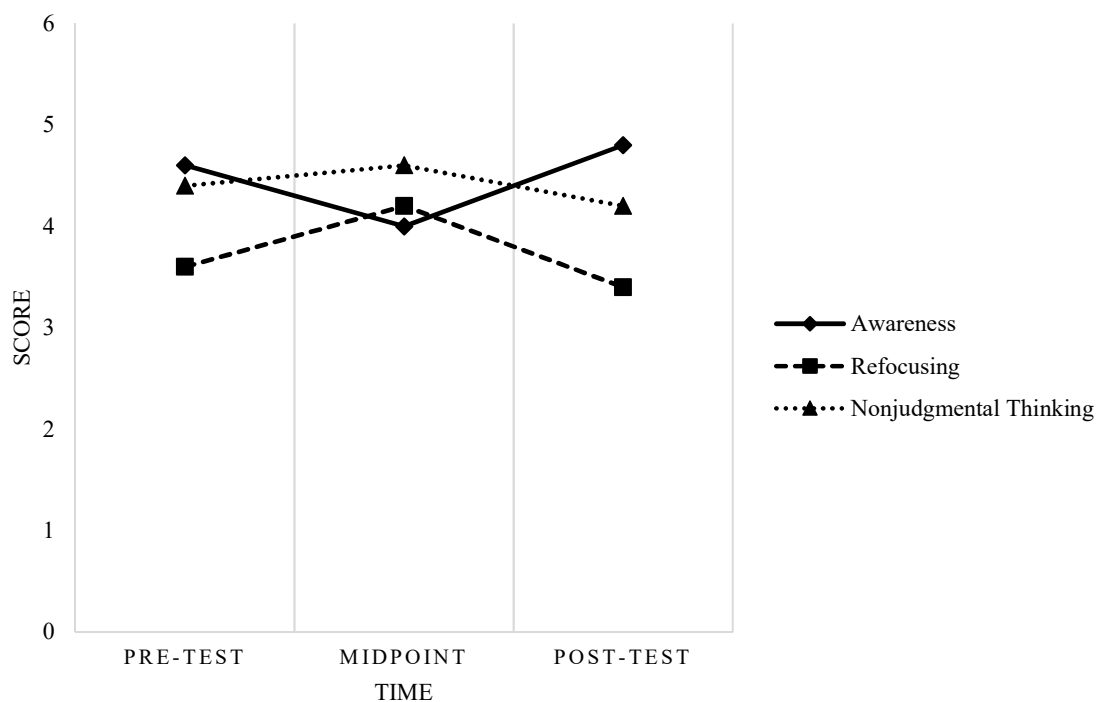


Figure 4. Mike MIS Subscale Scores

Discussion

Mike is a 31-year-old male 0.5 wheelchair rugby player with 3.5 years of wheelchair rugby experience. Previous to his spinal cord injury, he played at a high level in another sport. Over the course of the intervention, Mike would contrast some of his experiences in rugby with his previous athletic experiences. When reflecting on his knowledge about rugby, Mike referenced that he is still learning the sport and trying to improve. This was supported by consistent observed conversations between Mike and the coach about tactics prior to the start of practice, looking for insight from an experienced player on the team that fulfills a similar role for the team, and cutting film to study different techniques and strategies.

Mike, as he put it, is still learning the game, which potentially explains some of the increases on the subscales on the DFS-2 that were seen. Learning more about his

position and his role on the team could have led to an increase on the subscale of Clear Goals. Another subscale that increased was Action-Awareness Merging, which measures the absorption in the task at hand. If an individual is in the learning stage, absorption in the task may be difficult due to increased attention on other factors such as technique and execution. As an individual gains experience and knowledge about an activity, absorption in the task may be more likely to happen. Due to the role that experience may have on these two subscales, it is difficult to infer if the intervention impacted these increases or if they resulted from a natural accumulation of experience.

Despite the role that experience may have on the subscale of Clear Goals, Mike's participation in the intervention may have had a connection to the increase on this subscale. During the post-intervention interview, one of the portions of the intervention that Mike highlighted was the discussion of values and commitment to values-driven behaviors in the pursuit of his goals. As Mike stated, "...I think it is good to set the goals and standards and where I see myself in the future and to try to keep that in the background and to maintain progress towards those goals." Taking the time to evaluate his goals as a wheelchair rugby player and the barriers associated with those goals may have a correlation with his scores on Clear Goals.

The subscales of Unambiguous Feedback and Sense of Control on DFS-2 increased from pre-test to post-test for Mike. Sense of Control refers to the absence of anxiety of not having control while Unambiguous Feedback is the use of internal and external cues to inform the performer about their performance (Czikszenmihalyi, 1990; Jackson & Czikszenmihalyi, 1999). These subscales rely in part on an athlete's trust in their own ability, which potentially relates to the Trusting subscale on the MAIA,

described as experiencing one's own body as safe and trustworthy. Though Mike reported in the post-intervention interview that he did notice a change in body awareness, from pre-test to post-test, his scores on the subscale of Trusting improved, suggesting that an improvement that may have not been captured in the interview. In Mike's case, this specific improvement in interoceptive awareness may have had an effect on his scores on these particular flow subscales.

Related to the increases in the different subscales, during the intervention Mike's global scores on the DFS-2 increased, suggesting an increased propensity to experience a flow state; however, during the intervention and in the post-intervention interview Mike stated that he had not noticed any changes in his ability to experience flow states though he offered a potential explanation for his experience. He explained how there are "...disruptions during the practice. Some people, whether it be a player or coach stopping the play to explain something." His description highlights that some aspects of practice may not be conducive to experience flow states compared to the rhythm that comes during a game. Additionally, Mike explained over the course of the intervention that he believes that the added pressure of game situations would better facilitate experiences with flow. While his global scores suggest improvements, Mike had no context outside of practice to evaluate his experiences with flow as the intervention took place during the off-season.

Previous studies have found that mindfulness-based interventions improve interoceptive awareness suggesting a theoretical overlap. (Mehling et al. 2013). This overlap may help to explain some of the Mike's scores on the MAIA and MIS. On the MIS, Mike's scores on the subscale of awareness increased, suggesting an increased

awareness disruptive stimuli and related internal reactions (Thienot et al., 2014). This increased awareness could be related to his subscale scores of Attention Regulation and Body-Listening on the MAIA, which both increased from pre-test to post-test. Attention Regulation is the ability to sustain and control attention to body sensations and Body-Listening is active listening to the body for insight. Improvement in these abilities would foster an increased awareness of internal reactions. A potential explanation for these improvements is Mike's affinity for a portion of the Brief Centering Exercise, a script used throughout the intervention. The script mentions conceptualizing thoughts as elements of a parade and to imagine watching them pass by (Gardner & Moore, 2007). Mike mentioned using this conceptualization when dealing with particularly stressful situations, which might have facilitated a growth in his ability to be aware of internal processes.

The overlap in mindfulness and interoceptive awareness potentially explains the decrease of Mike's score of Refocusing on the MIS. Mike's score on the subscale of Not-Distracting on the MAIA decreased from pre-test to post-test. Not-Distracting measures the tendency to not ignore or distract oneself from sensations. As Gardner and Moore (2007) describe, attempting to regulate internal processes interferes with task-directed attention. If Mike's tendency to not ignore or distract decreased, it could affect his refocusing ability. Mike's post-intervention interview gives increased depth to these findings. He mentioned that he found the practice during the intervention on refocusing useful stating, "That's where I struggle the most." However, he believes that his ability to refocus has improved due to his experience with the intervention as he explained with the following quote: "I just believe that I will be able to, again, stay in the moment and not be

influenced by outside things, maybe like people, players, or coaches saying things that I maybe don't agree with or frustrate me, to be able to accept those things, you know, as they are and refocus on what I need to do.”

Case Study 2: Frank

Results

Dispositional Flow Scale-2. Figures 5 and 6 plot the scores of Frank on the Dispositional Flow Scale-2 (DFS-2). Figure 5 shows Frank's global score, which indicates the likelihood that the individual would experience flow states in general. There was a slight increase in the score from 116 at pre-test to 118 at the midpoint. Frank had a global score of 133 at post-test. Figure 6 displays Frank's scores on the DFS-2 subscales. Over the course of the intervention, Frank's scores on the subscales of Clear Goals, Concentration on Task at Hand, Sense of Control, Transformation of Time, and Autotelic Experience increased from pre-test to post-test. Unambiguous Feedback decreased from pre-test to post-test. The other subscales remained stable.

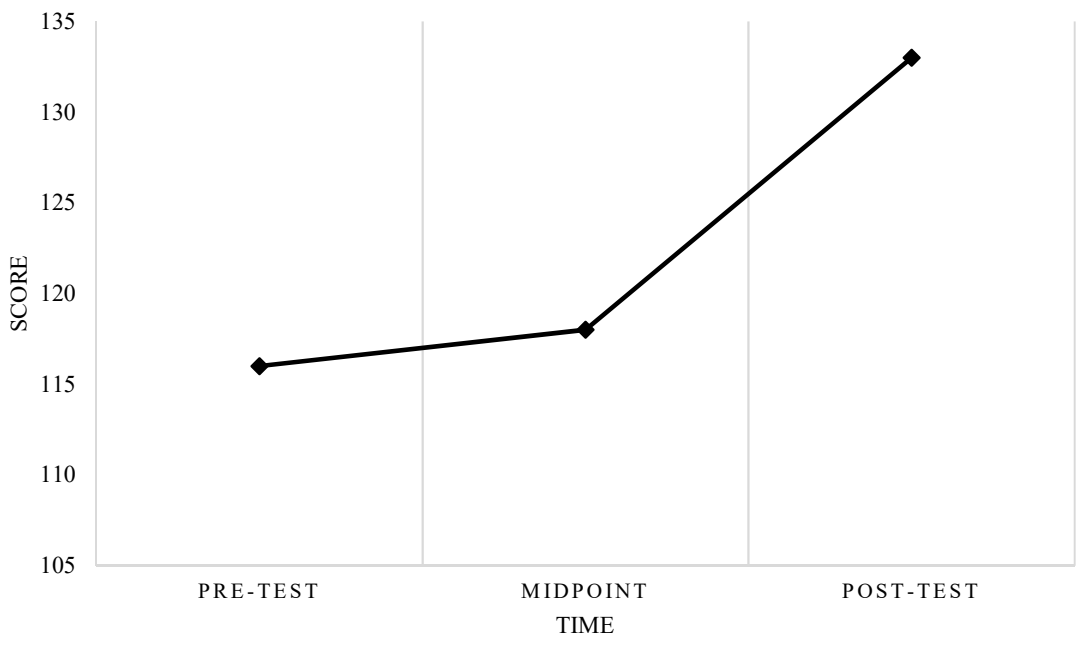


Figure 5. Frank DFS-2 Global Scores

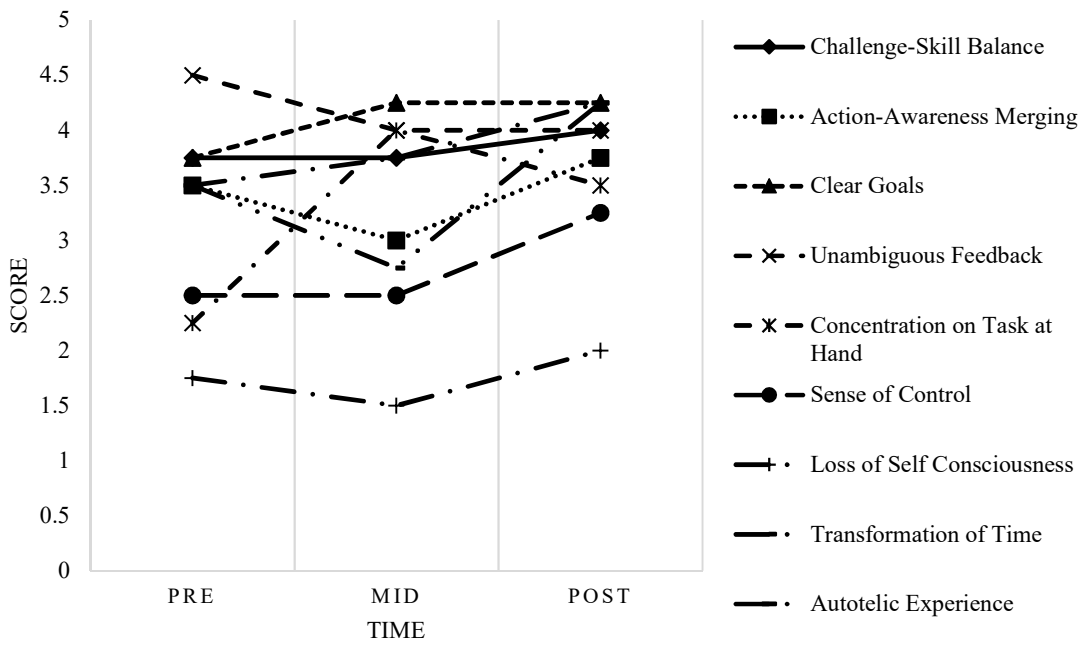


Figure 6. Frank DFS-2 Subscale Scores

Multidimensional Assessment of Interoceptive Awareness. Figure 7 displays Frank's scores on the subscales of the Multidimensional Assessment of Interoceptive

Awareness. Over the course of the intervention, the scores on the subscales of Attention Regulation, Self-Regulation, and Trusting increased. The subscales Not-Distracting and Not-Worrying decreased. The subscales of Noticing, Emotional Awareness, and Body-Listening remained the same.

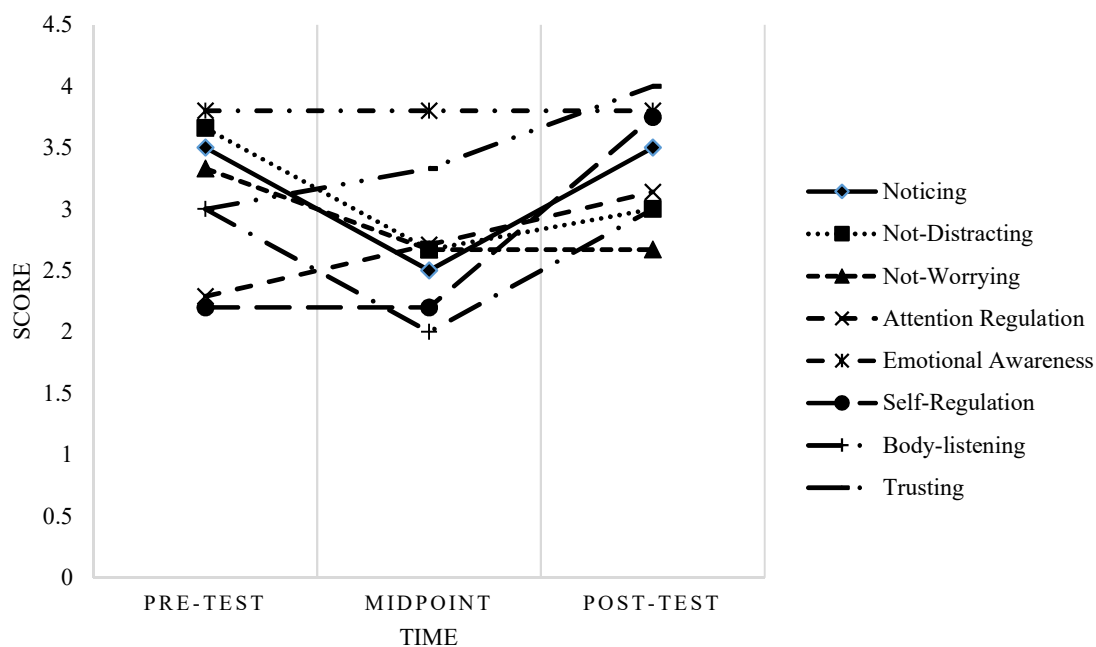


Figure 7. Frank MAIA Subscale Scores

Mindfulness Inventory for Sport. Figure 8 displays Mike's scores on the Mindfulness Inventory for Sport. The scores for Awareness decreased at the midpoint but returned to pre-test levels at post-test. The scores of Refocusing remained stable at midpoint but increased at post-test. The scores on Nonjudgmental trended negative throughout the intervention.

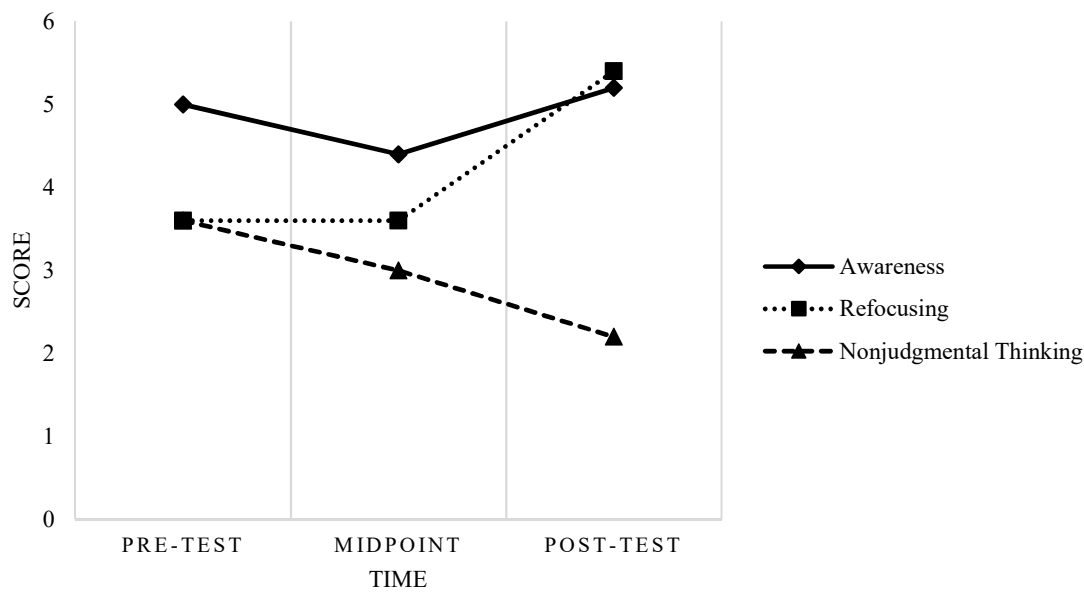


Figure 8. Frank MIS Subscale Scores

Discussion

Frank showed increases on different subscales of the DFS-2. One of the subscales that increased from pre-test to post-test was Clear Goals, which suggests that Frank experienced an improved clarity of his goals and what he wants to achieve. It is possible that this occurred due to the intervention as components of the intervention are focused on defining goals and values; however, other factors may account for this improvement. Frank is a player with 14 years of experience in wheelchair rugby at the beginning of the study suggesting that his goals for the sport are clearly defined, which was supported from observations during the intervention. This evidence works against the intervention as promoting this improvement in Clear Goals. A better explanation for this improvement may be that Frank is still a relatively new member on the team and he is gaining a clearer understanding of his role on the team.

Another DFS-2 subscale increase that may be better explained by factors other than the intervention is Autotelic Experience. Autotelic experiences are those that are

intrinsically motivated and fun in contrast to an exotelic experience, which must be done to achieve a goal (Jackson & Csikszentmihalyi, 1999). Over the course of the intervention, Frank described his history in the sport and how before joining his current team he had retired from rugby. He described to the first author how his time away from the sport highlighted how much he loves the sport, which motivated him to join his current team. The timing of the intervention coincides with Frank being able to consistently practice with his current team. This return to rugby may be the factor driving his increases in Autotelic Experience.

On the Mindfulness Inventory for Sport, Frank had increased scores on the Refocusing subscale from pre-test to post-test, which indicates and improved ability to refocus on goal-related cues. This increase may relate to his increase of scores on the DFS-2 subscales Concentration on the Task at Hand and Transformation of Time. If Frank improved his ability to refocus on goal-related cues, this would improve his ability to remain concentrated on his task. Transformation of Time is experience of time seeming to be either sped up or slowed down due to absorption in the task (Jackson & Csikszentmihalyi, 1990). An increased ability to refocus on goal-related cues could increase Frank's absorption in the task. The subscale of Sense of Control also increased from pre-test to post-test. A potential explanation for this increase comes from Frank's improvement in scores on the Trusting subscale of the MAIA. Having greater trust and comfort in his body would help to facilitate a greater sense of control of actions.

The only subscale on the DFS-2 that decreased from pre-test to post-test was Unambiguous Feedback, which refers to internal and external cues that inform the performer about their performance. This subscale may have decreased as Frank recently

joined the team and was consistently practicing with the team for the first time. As a new member on the team, he is still learning his role. Additionally, him and his teammates are having to adjust to each other's abilities, preferences, and play styles, which may be interfering with Frank's perception of the clarity of feedback.

Over the course of the intervention, Frank's DFS-2 global score increased, indicating an increase in the propensity to experience flow. However, during the post-intervention interview, Frank stated that he had not experienced any change in how often he felt in the zone. He said that without games it is hard for him to evaluate whether there was a change or not. As he stated in the post-intervention interview, "I don't know... I don't think being in the zone will come into play until we get into game situations." Since the intervention took place during the off-season, Frank did not have the opportunity that he felt he needed to appropriately determine if any change took place.

The decreasing scores on two subscales of the MAIA and the decreasing score of the Non-Judgmental Thinking on the MIS are potentially linked to each other as well as to some of the unique characteristics of Frank as a participant. Non-Judgmental Thinking measures the ability to have a non-judgmental attitude towards stimuli and reactions. Throughout the study, Frank's score on this subscale were decreasing. This potentially is linked to the decrease of the scores of the subscales of Not-Distracting and Not-Worrying on the MAIA from pre-test to post-test. Not-Distracting measures the tendency to not ignore or distract oneself from sensations and Not-Worrying measures the tendency not to worry or experience emotional distress with different sensations. Decreases in both of the scores indicate an increase in behaviors that are more judgmental towards stimuli and reactions; however, this might not be the entire story for these scores. Prior to the

intervention, Frank had no experience with mindfulness. During the intervention, Frank potentially learned more about what these types of behaviors looked like, thus increasing his awareness of these specific behaviors. His decrease in scores from pre-test to post-test may be a function of increased knowledge. Another aspect that may have impacted these scores is Frank's Attention Deficit Hyperactivity Disorder (ADHD). When discussing between-session exercises, Frank mentioned that for some of the exercises he experienced some difficulty completing them as designed due to the time required remain still. As Frank stated, "...my ADHD is harming me from doing the meditations, I've always had problems with stopping and being still for ten minutes..." Often he mentioned not completing these activities in full. Conversely, Frank did well completing the sport-specific exercises as they were more interactive, which may have had an impact on the increase on his Refocusing subscale scores.

Throughout the intervention and during the post-intervention interview, an important theme emerged from Frank's experience with the MAC Approach. Due to the nature of his spinal cord injury, Frank mentioned that he can have trouble with his reactions. By the start of the second session of the intervention, Frank described how the skills taught in the intervention helped to improve his reactions in everyday situations that normally cause him frustration. Over the course of the intervention, Frank tended to report improvements occurring outside of rugby before experiencing improvements in rugby. During the intervention, one reason discussed is that situations in rugby are higher stress, which makes it more difficult than in everyday situations. However, at the conclusion of the intervention, Frank reported improvements in rugby as well. When describing his experience with the intervention when relating to his rugby performance he

stated, “I am communicating better, I’m breathing... and it’s making it easier. I don’t know, it’s just, it’s really helped me calm down and I’m not as stressed out as I was when I started this program and it’s really a lot to do with this program.”

Case Study 3: Anne

Results

Dispositional Flow Scale-2. Figures 9 and 10 plot the scores of Anne on the Dispositional Flow Scale-2 (DFS-2). Figure 9 shows Anne’s global score, which indicates the likelihood that the individual would experience flow states in general. There was an increase in the score from 138 at pre-test to 162 at the midpoint. Anne had a global score of 150 at post-test. Figure 10 displays Anne’s scores on the DFS-2 subscales. Over the course of the intervention, Anne’s scores on the subscales of Challenge-Skill Balance, Unambiguous Feedback, Sense of Control, Loss of Self-Consciousness and Autotelic Experience increased from pre-test to post-test. The subscales of Concentration on Task at Hand and Transformation of Time decreased. The subscales of Action-Awareness Merging and Clear Goals remained stable.

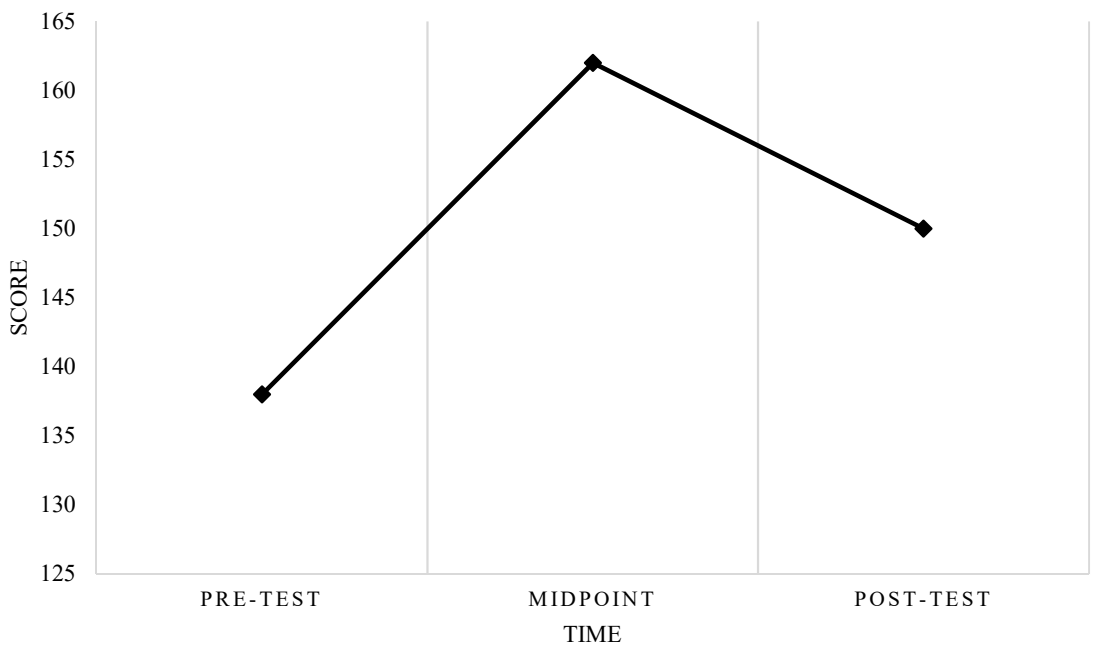


Figure 9. Anne DFS-2 Global Scores

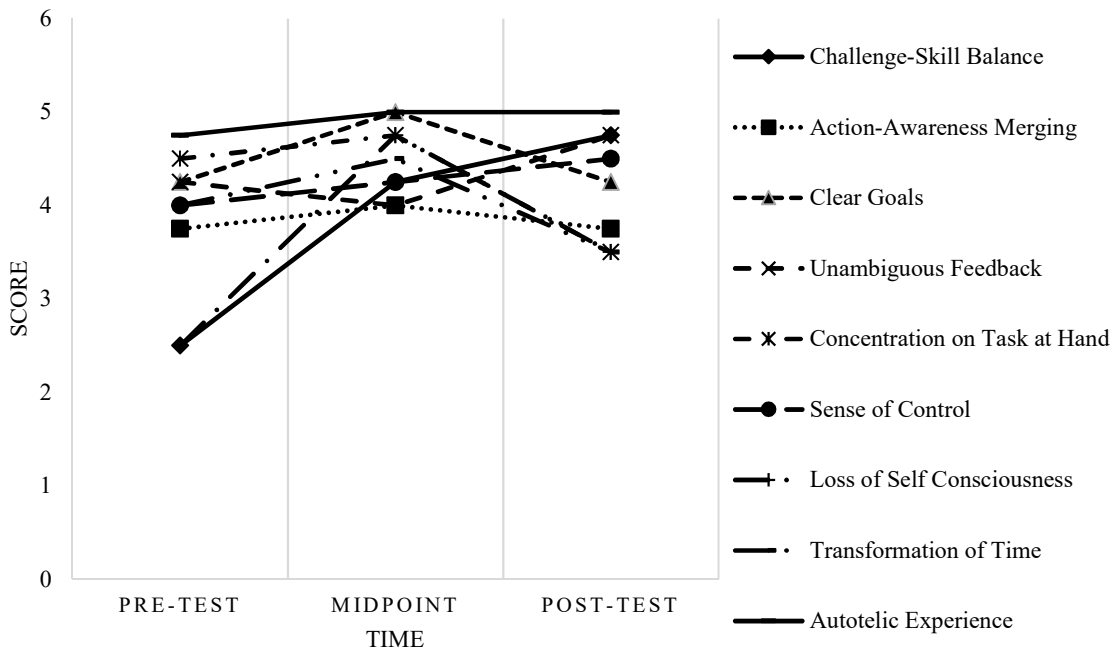


Figure 10. Anne DFS-2 Subscale Scores

Multidimensional Assessment of Interoceptive Awareness. Figure 11 displays Anne's scores on the subscales of the Multidimensional Assessment of Interoceptive

Awareness. Over the course of the intervention, the scores on the subscales of Self-Regulation and Trusting increased. The subscales Noticing, Not-Distracting, Not-Worrying, Attention Regulation, and Emotional Regulation decreased. The subscale of Body-Listening remained the same.

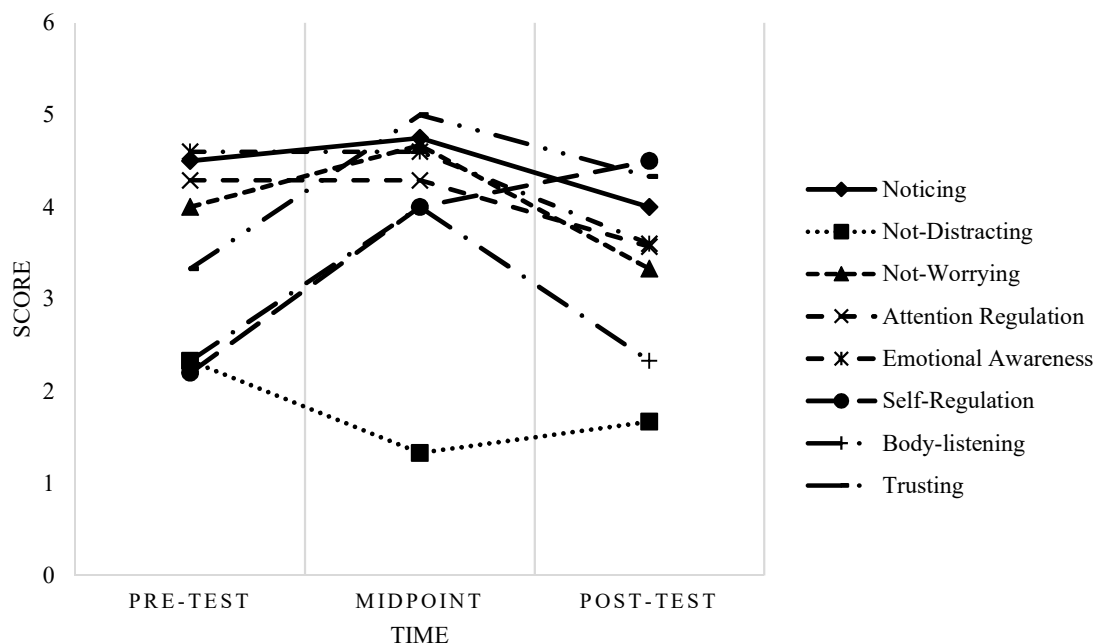


Figure 11. Anne MAIA Subscale Scores

Mindfulness Inventory for Sport. Figure 12 displays Anne's scores on the Mindfulness Inventory for Sport. The scores for Awareness decreased from pre-test levels at post-test. The scores of Refocusing increased at midpoint and remained stable at post-test. The scores on Nonjudgmental thinking increased at midpoint and returned to pre-test levels at post-test.

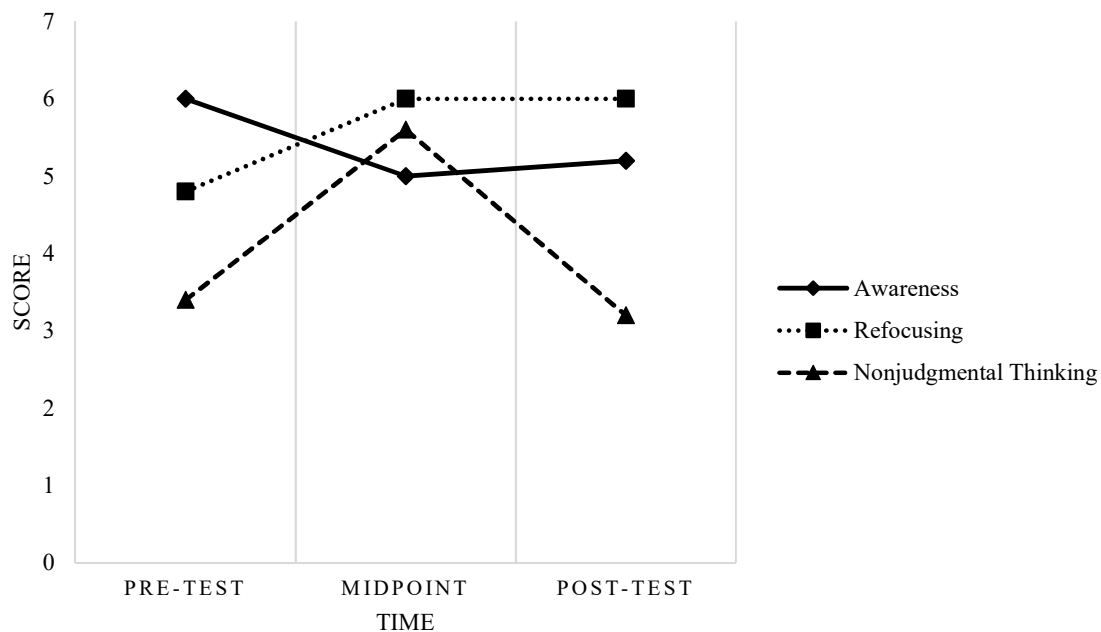


Figure 12. Anne MIS Subscale Scores

Discussion

Anne's scores on the different instruments and their respective subscales appear inconsistent at first glance and some of the results seem to be contradictory or at odds with one another. For example, the DFS-2 subscales of Loss of Self-Consciousness, Action-Awareness Merging, and Transformation of Time are related as they reflect an improved absorption in the task and decrease attention to the self (Jackson & Csikszentmihalyi, 1999). In Anne's case one subscale increased, another decreased, and another returned to pre-test levels at post-test. Making the situation even more contradictory is that Anne fully bought into the intervention from the outset. This is evidenced by her not only completing all of the between-session exercises, but also recording her experiences in a journal and bringing it to sessions to help her recount her experiences.

When visually inspecting the different figures, a common trend is visible. Many of the scores spike at the midpoint assessment and then either drop or level out. When looking at the scores from pre-test to midpoint, all of the subscales of the DFS-2 increased. On the MAIA, five of the subscales increased, two remained at pre-test levels, and one decreased. On the MIS, two of the subscales increased and one scale decreased. The contrast between the trends of scores from pre-test to midpoint and the trends of scores from midpoint and post-test suggest that something occurred between the midpoint and post-test. Upon closer examination of the dates of the sessions, there was a greater continuity of sessions from pre-test to midpoint. There were no cancellations of sessions during this phase. From midpoint to post-test there was greater interruption of sessions. Sessions with Anne occurred on Sunday's before practice. From midpoint to post-test, three sessions had to be postponed because the practice facility was closed on Mother's Day, Father's Day, and for Memorial Day Weekend. This created a less conducive environment for development of the skills taught during the intervention. The inconsistent and contradictory scores suggest that these interruptions disrupted Anne's experience of the program.

Due to her commitment to the intervention process and adherence to the between-session exercises, it is possible that Anne's scores would have continued trending positively without the cancellations. This is supported by discussions during sessions as well as in the post-intervention interview. During the intervention process, Anne recounted ways in which she used the skills being taught in the program both in rugby and in her personal life as well. In both areas, she reported improvements in interpersonal interactions. This utility in both rugby and everyday life was reinforced in her post-

intervention interview with Anne stating, “Well, it’s definitely grown to a daily useful skill, it’s something that I can use during rugby and during normal life.”

Conclusion

The purpose of the present study was to use case study to investigate the use of the MAC Approach with wheelchair rugby athletes. The information gleaned from the three participants suggest viability for using the MAC Approach in applied settings. The participants had varying changes in self-report measures of flow, interoceptive awareness, and mindful behaviors in sport and all three participants reported positive experiences with the intervention. Certain characteristics of the sport may have contributed to some of the similar scores that emerged between the participants. For example, all the three participants reported subjective improvements in the ability to refocus and for Frank and Anne, this was supported by their self-report measures. These changes may be attributable to the intervention though the structure of wheelchair rugby may be conducive to the development of refocusing. After each score, the teams transition from offense to defense or vice versa and this small break creates a rhythm in play that gives athletes a chance to redirect their focus to the new role.

When looking at these case studies, the changes in interoceptive awareness varied and depended on the individual, outside of the subscale of Trusting which increased with each participant. Previous research suggested that mind-body connection interventions may be a method to improve interoceptive awareness (Mehling et al., 2013). The findings of the present study do not fully support this; however, this may be that the MAC Approach is designed to increase task-focused attention rather than targeting interoceptive awareness. Fogel (2009) described body awareness as beneficial when

paired with nonjudgmental acceptance and experiencing physical sensations in the present moment. The Brief Centering Exercise of the MAC Approach (Gardner & Moore, 2007) directs attention to sensations in the body and how they change, but that is not the sole focus on the exercise. Another exercise, the Mindfulness of the Breath, focuses attention on the breath as a re-centering tool when the mind begins to wander. The current study's intervention may not be optimal as a tool to develop interoceptive awareness in this population though further research in this area is needed.

One of the issues experienced during the study that might have impacted the results was timing of the study. The participants were in the middle of their off-season, which created some difficulties. Practices were cancelled, which limited the ability of the participants to consistently perform the sport-specific exercises called for by the protocol. This may have stunted some of the growth of skills compared to a situation where a predictable practice schedule was had that allowed for consistent application of skills. However, this may have influenced the reports from the participants about application of the skills learned in everyday life. The disruption of practice may have led to the participants using other events as context for their skill development. This potentially impacted the scores on the MIS as well. The MIS is designed to measure mindful behavior in sport; however, due to the disruption of practice the participants may have not had enough time to practice sport-specific mindfulness to meaningfully impact their scores. In this situation, an instrument designed to measure overall mindful behavior might have been more appropriate, especially considering that all of the participants reported to the skills learn translating well to everyday life.

Limitations

While case studies can provide information about the application of an intervention to a new population, the findings are not generalizable. Also, case studies do not make use of a control group, so it cannot be known whether changes resulted from the intervention or from other factors such as the therapeutic relationship between the researcher and the participants.

The timing of the intervention potentially limited the study as well. The intervention took place during the off-season, which limited the opportunities for the participants to practice sport-specific mindfulness. Additionally, it deprived the participants of an area of context to evaluate their experience. The off-season schedule was also less rigorous, resulting in a less continuous experience due to practice cancellations. Results may have been affected by these cancellations.

The sole use of self-report measures and subjective experience limited the scope of this study. This study did not make use of a measure to determine performance, which makes it difficult to establish if improvements in objective ratings of performance took place. The use of a coach's evaluation would have helped in this regard, as information about the athletes' performance ratings could supplement the other findings.

Another limitation to the study was the dropout rate, which limited the richness of data and information that could be reported. Three participants had to drop out of the study due to time conflicts. Two participants had injury concerns that limited their ability to participate in the study. With more participants, general trends on the questionnaires could have been considered and common themes from the qualitative data could have been presented as a group.

Future Research

The purpose of the study was to begin to look at a specific intervention with wheelchair rugby athletes. The study shows promise using the MAC Approach when working with this population. Future research should investigate the use of MAC Approach and other mindfulness-based programs with wheelchair rugby athletes as well as other adaptive athletes. Furthermore, measures of performance should be included in future studies to strengthen the findings. Studies investigating the use of such programs with different level athletes such as national-team athletes would help strengthen the current body of literature as well.

In general, more research is needed for best practices when working with not only rugby players, but other adaptive athletes as well as previously mentioned by other researchers (Porretta & Moore, 1996; Sherrill, 1999; Bawden, 2006; de Bressy de Gaust et al., 2013). Going forward, more studies should continue to investigate best practices and expand on applied knowledge for working with adaptive athletes.

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APPENDICES

APPENDIX A.

BARRY UNIVERSITY INFORMED CONSENT FORM

Barry University Informed Consent Form

Your participation in a research project is requested. The title of the study is “The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC) Approach with Wheelchair Rugby Athletes.” The research is being conducted by Andrew Corbett, a student in the College of Nursing and Health Sciences at Barry University, and is seeking information that will be useful in the field of Sport Psychology. The aims of the research are to better understand the MAC Approach with wheelchair rugby athletes. In accordance with these aims, the following procedures will be used: pre-post measures and use of the MAC Approach protocol. We anticipate the number of participants to be three.

If you decide to participate in this research, you will be asked to do the following: complete a pre-survey, participate in a MAC Approach protocol, post-survey, and an exit interview. The process should last eight sessions. I will audio record the interview and then transcribe it (i.e., type it out on paper) for further analysis. I will then let you look at your transcript to be sure it accurately portrays what you were trying to say in your interview. You may choose to omit, add, or modify any part of the interview in order to provide a more accurate description of your experience.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects to you. There are no known risks to you presented through involvement in the study.

As a research participant, information you provide will be held in confidence to the extent permitted by law. Your signed consent form will be kept separate from the data. You will select a pseudonym (fake name) for this study, which I will substitute for your real name whenever you make comments that might identify you. Any published results of the research will refer to you by your pseudonym; no real names will be used in the study. All interview transcripts will be stored on a password-protected computer and a hard copy will be locked in a filing cabinet in the primary researcher’s home, maintained for 5 years and then destroyed. After interviews are transcribed, audio recordings will be destroyed. Any other information that could potentially be used to identify you or other competitors will be changed or excluded from the transcripts. This is done to help preserve the confidentiality of your responses. I will only share your interview (not contact details or real name) with members of the research group assisting me in this study. Members of the research group will never have access to any materials, which might identify you.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Andrew Corbett, at (239) 770-7843, my supervisor, Dr. Kimberly Cologgi, at (305) 899-4890, or the Institutional Review Board point of contact, Barbara Cook, at (305) 899-3020. If you are satisfied with the information provided and

are willing to participate in this research, please signify your consent by signing this consent form.

Voluntary Consent

I acknowledge that I have been informed of the nature and purposes of this experiment by Andrew Corbett and that I have read and understand the information presented above, and that I have received a copy of this form for my records. I give my voluntary consent to participate in this experiment.

Signature of Participant

Date

Researcher

Date

Witness

Date

(Witness signature is required only if research involves pregnant women, children, other vulnerable populations, or if more than minimal risk is present.)

APPENDIX B.
CONTACT EMAIL

The following email will be sent to colleagues, coaches, managers, and affiliates whom may have access to athletes that fulfill inclusion criteria for the present study.

To Whom It May Concern:

My name is Andrew Corbett and I am a graduate student at Barry University in the Sport, Exercise, and Performance Psychology program and am interested in the experience of an athlete in a mindfulness program.

Due to family history, I have always been interested in adaptive sports. Unfortunately, there is little scholarly information that offers suggests for best practice for the player development for performance. The investigation requires the participants to engage in an mindfulness training program.

Criteria for participants' inclusion in the study is as follows: current wheelchair rugby player, willingness to participate in the training program, limited exposure to mindfulness, and is older than 18.

I understand that you are probably extremely busy, but I am hoping you might be able to assist with this project. Essentially your assistance is needed in forwarding this email to athletes you know that fit the criteria for inclusion. From that point anyone interested could simply contact me via email or telephone. We will also happily share our results upon request.

Again I know you are extremely busy, but if you would be willing to help I would greatly appreciate it. If you would like additional information about this project please feel free to email (andrew.corbett@mymail.barry.edu) or call me (239-770-7843). Thank you for your time and consideration.

Best regards,

Andrew Corbett

APPENDIX C.
SEMI-STRUCTURED INTERVIEW GUIDE

1. Describe your experience with the MAC Approach.
 - a. What do you think you have gained from this experience?
 - b. How do you think this will impact your performance?
2. How would you describe your current mindfulness behaviors?
 - a. How do these compare to your previous mindfulness behaviors?
 - b. How has your body awareness changed with the changes in your mindfulness?
3. How has your mindfulness in sport changed during the protocol?
 - a. Would you say how often you experience being in the zone has changed?
 - i. Describe how your experience of being in the zone has changed.

APPENDIX D.
DEMOGRAPHICS QUESTIONNAIRE

Gender (please circle):

Male

Female

Age: _____

Years of experience in wheelchair rugby: _____

Experience with mindfulness meditation(select option that most represents your situation):

None

Limited

Moderate

Experienced

Player Classification:

0.5

1.0

1.5

2.0

2.5

3.0

3.5

APPENDIX E.
DISPOSITIONAL FLOW SCALE-2

Please answer the following questions in relation to your experience in your chosen activity. These questions relate to the thoughts and feelings you may experience during participation in your activity. You may experience these characteristics some of the time, all of the time, or none of the time. There are no right or wrong answers. Think about how often you experience each characteristic during your activity and circle the number that best matches your experience.

Rating Scale

Never	Rarely	Sometimes	Frequently	Always
1	2	3	4	5

PLEASE CIRCLE ANSWER

1. I am challenged, but I believe my skills will allow me to meet the challenge.	1	2	3	4	5
2. I make the correct movements without thinking about trying to do so.	1	2	3	4	5
3. I know clearly what I want to do.	1	2	3	4	5
4. It is really clear to me how my performance is going.	1	2	3	4	5
5. My attention is focused entirely on what I am doing.	1	2	3	4	5

For use by Andrew Corbett only. Received from Mind Garden, Inc. on April 5, 2018



www.mindgarden.com

To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material in his/her research:

Flow Scales:

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Five sample items in total may be reproduced for inclusion in a proposal, thesis, or dissertation.

Any or all of these entire instruments may not be included or reproduced at any time in any published material.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Most", with a long horizontal line extending to the right.

Robert Most
Mind Garden, Inc.
www.mindgarden.com

APPENDIX F.
MULTIDIMENSIONAL ASSESSMENT OF INTEROCEPTIVE AWARENESS

Although the MAIA survey is copyrighted, it is available without charge and no written permission is required for its use. This assumes agreement with the following as a consequence of using a MAIA survey:

- Please refer to the survey using its complete name- Multidimensional Assessment of Interoceptive Awareness- and provide the appropriate citation.
- Modifications may be made without our written permission. However, please clearly identify and modifications in any publications as having been made by the users. If you modify the survey, please let us know for our records.
- We recommend including entire subscales when selecting items from the MAIA to retain the psychometric features of these subscales (rather than selecting items from subscales).
- If you translate the MAIA into another language, please send us a copy for our records.
- If other investigators are interested in obtaining the survey, please refer them to the source document (PLoS-ONE 2012, and www.osher.ucsf.edu/maia/) to assure they obtain the most recent version and scoring instructions.

Scoring Instructions

Take the average of the items on each scale.

Note: Reverse-score items 5, 6, and 7 on Not-Distracting, and items 8 and 9 on Not-Worrying.

1. Noticing: Awareness of uncomfortable, comfortable, and neutral body sensations
 $Q1+Q2+Q3+Q4/4=$ _____
2. Not-Distracting: Tendency not to ignore or distract oneself from sensations of pain or discomfort
 $Q5(\text{reverse})+Q6(\text{reverse})+Q7(\text{reverse})/3=$ _____
3. Not-Worrying: Tendency not to worry or experience emotional distress with sensations of pain or discomfort
 $Q8(\text{reverse})+Q9(\text{reverse})+Q10/3=$ _____
4. Attention Regulation: Ability to sustain and control attention to body sensations
 $Q11+Q12+Q13+Q14+Q15+Q16+Q17/7=$ _____
5. Emotional Awareness: Awareness of the connection between body sensations and emotional states
 $Q18+Q19+Q20+Q21+Q22/5=$ _____
6. Self-Regulation: Ability to regulate distress by attention to body sensations
 $Q23+Q24+Q25+Q26/4=$ _____

7. Body Listening: Active listening to the body for insight

$$Q27+Q24+Q25+Q26/4=$$

8. Trusting: Experience of one's body as safe and trustworthy

$$Q30+Q31+Q32/3=$$

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life.

Rating Scale

Never					Always
0	1	2	3	4	5
1. When I am tense I notice where the tension is located in my body.					
0	1	2	3	4	5
2. I notice when I am uncomfortable in my body.					
0	1	2	3	4	5
3. I notice where in my body I am comfortable.					
0	1	2	3	4	5
4. I notice changes in my breathing such as whether it slows down or speeds up.					
0	1	2	3	4	5
5. I do not notice (I ignore) physical tension or discomfort until they become more severe.					
0	1	2	3	4	5
6. I distract myself from sensations of discomfort.					
0	1	2	3	4	5
7. When I feel pain or discomfort, I try to power through it.					
0	1	2	3	4	5
8. When I feel physical pain, I become upset.					
0	1	2	3	4	5
9. I start to worry that something is wrong if I feel any discomfort					
0	1	2	3	4	5
10. I can notice an unpleasant body sensation without worrying about it.					
0	1	2	3	4	5
11. I can pay attention to my breath without being distracted by things happening around me.					
0	1	2	3	4	5
12. I can maintain awareness of my inner bodily sensations even when there is a lot going on around me.					
0	1	2	3	4	5
13. When I am in conversation with someone, I can pay attention to my posture.					
0	1	2	3	4	5
14. I can return awareness to my body if I am distracted.					
0	1	2	3	4	5

15. I can refocus my attention from thinking to sensing my body.					
0	1	2	3	4	5
16. I can maintain awareness of my whole body even when a part of me is in pain or discomfort.					
0	1	2	3	4	5
17. I am able to consciously focus on my body as a whole.					
0	1	2	3	4	5
18. I notice how my body changes when I am angry.					
0	1	2	3	4	5
19. When something is wrong in my life I can feel it in my body.					
0	1	2	3	4	5
20. I notice that my body feels different after a peaceful experience.					
0	1	2	3	4	5
21. I notice that my breathing becomes free and easy when I feel comfortable.					
0	1	2	3	4	5
22. I notice how my body changes when I feel happy/joyful.					
0	1	2	3	4	5
23. When I feel overwhelmed I can find a calm place inside.					
0	1	2	3	4	5
24. When I bring awareness to my body I feel a sense of calm.					
0	1	2	3	4	5
25. I can use my breath to reduce tension.					
0	1	2	3	4	5
26. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.					
0	1	2	3	4	5
27. I listen for information from my body about my emotional state.					
0	1	2	3	4	5
28. When I am upset, I take time to explore how my body feels.					
0	1	2	3	4	5
29. I listen to my body to inform me about what to do.					
0	1	2	3	4	5
30. I am at home in my body.					
0	1	2	3	4	5
31. I feel my body is a safe place.					
0	1	2	3	4	5
32. I trust my body sensations.					
0	1	2	3	4	5

APPENDIX G.
MINDFULNESS INVENTORY FOR SPORT

The statements below describe a number of things that athletes may experience just before or during their sport performance. Please check the box that best indicates how much each statement is generally reflective of your recent experience from 1 (not at all) to 6 (very much).

There are no right or wrong answers.

	1	2	3	4	5	6
1. I am aware of the thoughts that are passing through my mind.						
2. I am able to notice the intensity of nervousness in my body.						
3. I am able to notice the sensations of excitement in my body.						
4. I am able to notice the location of physical discomfort when I experience it.						
5. I pay attention to the type of emotions I am feeling.						
6. When I become aware that I am thinking about a past performance, I criticize myself for not being focused on my current performance.						
7. When I become aware that I am angry at myself for making a mistake, I criticize myself for having this reaction.						
8. When I become aware that I am not focusing on my own performance, I blame myself for being distracted.						
9. When I become aware that I am thinking of the final result, I blame myself for not being focused on relevant cues for my performance.						
10. When I become aware that I am really upset I am losing, I criticize myself for reacting this way.						
11. When I become aware that some of my muscles are sore, I quickly refocus on what I have to do.						
12. When I become aware that I am thinking about how tired I am, I quickly bring my attention back to what I should focus on.						
13. When I become aware that I am really excited because I am winning, I stay focused on what I have to do.						
14. When I become aware that I am tense, I am able to quickly bring my attention back to what I should focus on.						
15. When I become aware that I am not focusing on my own performance, I am able to quickly refocus my attention on things that help me to perform well.						

APPENDIX H.
TABLES AND FIGURES

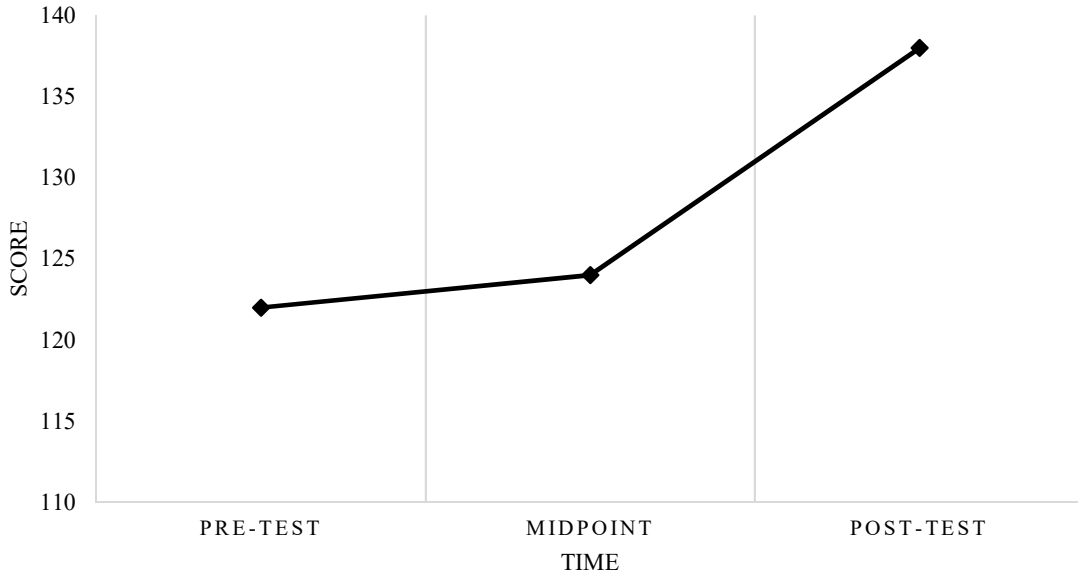


Figure 13. Mike DFS-2 Global Scores

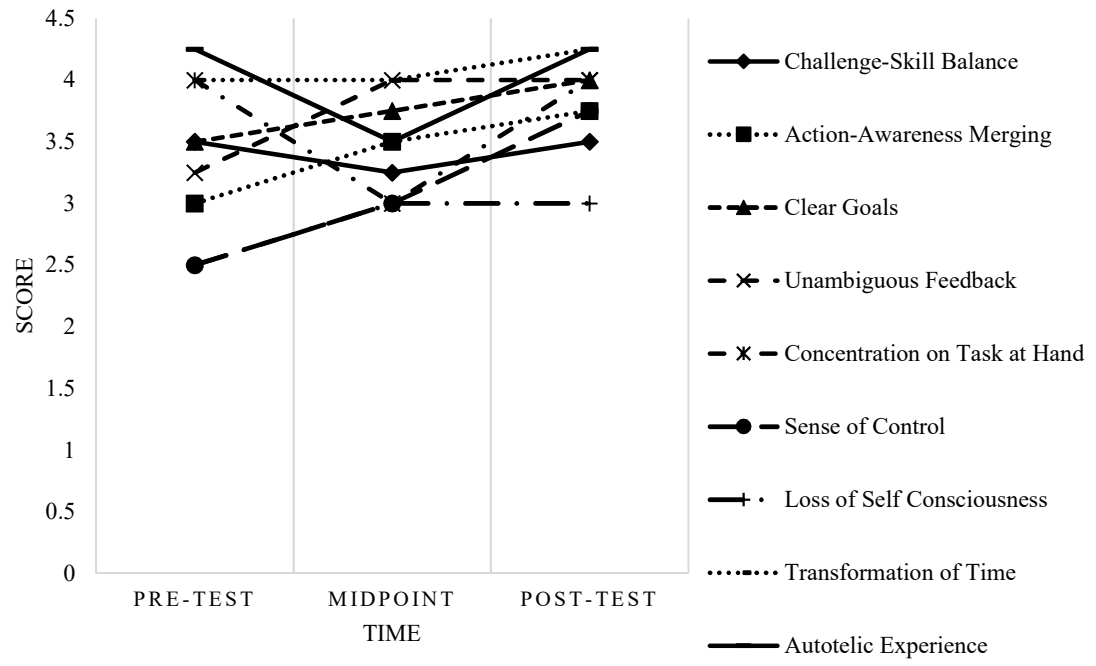


Figure 14. Mike DFS-2 Subscale Scores

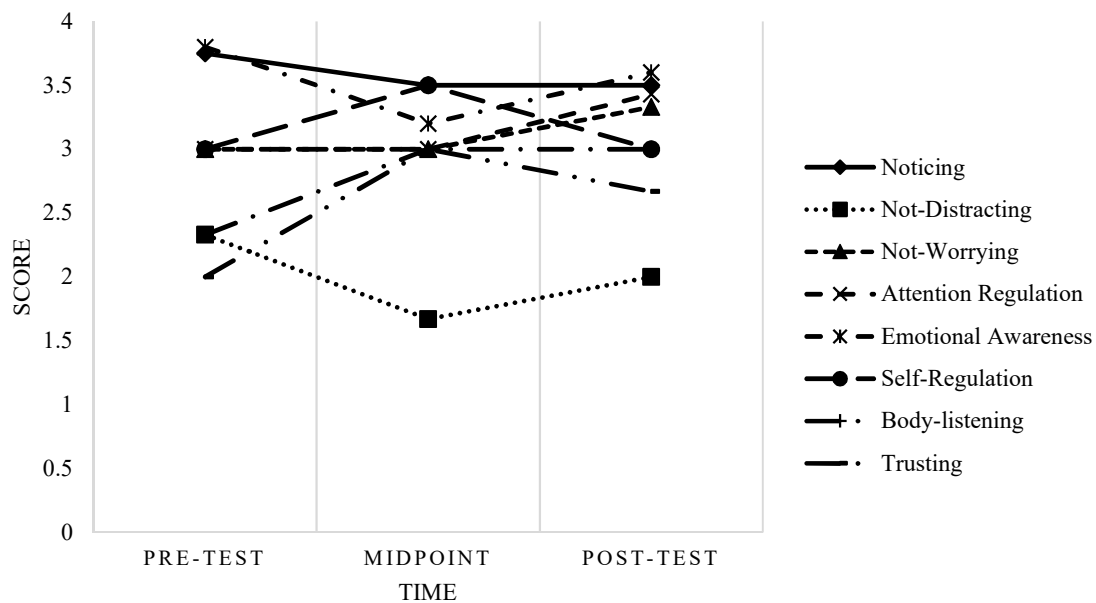


Figure 15. Mike MAIA Subscale Scores

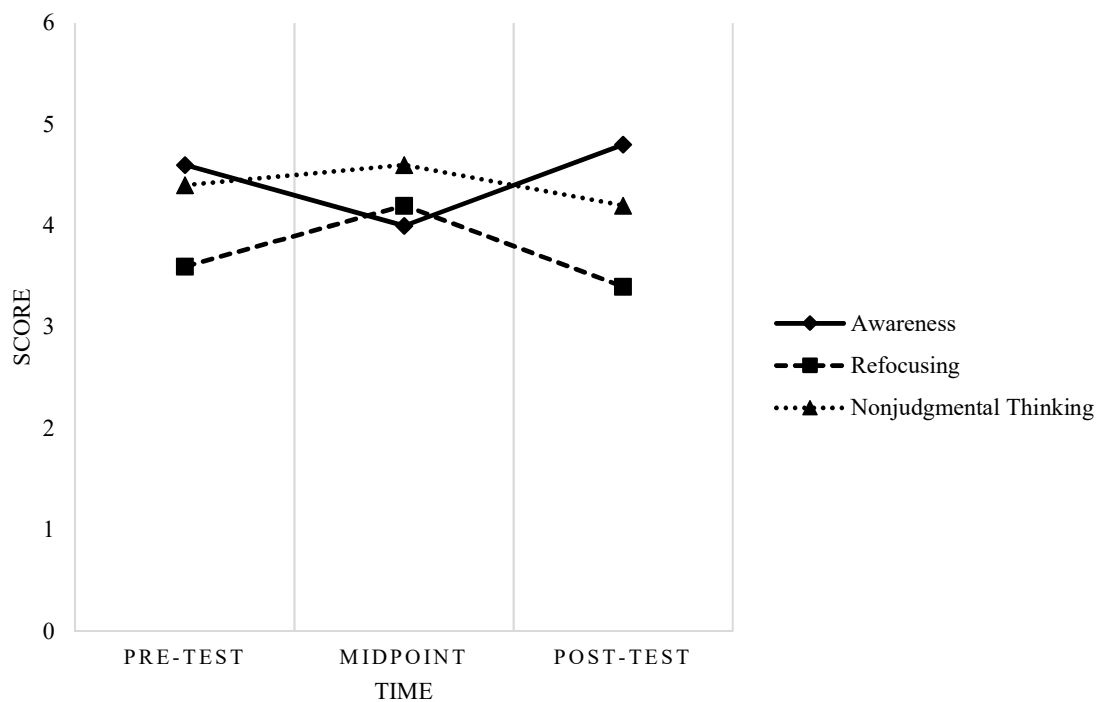


Figure 16. Mike MIS Subscale Scores

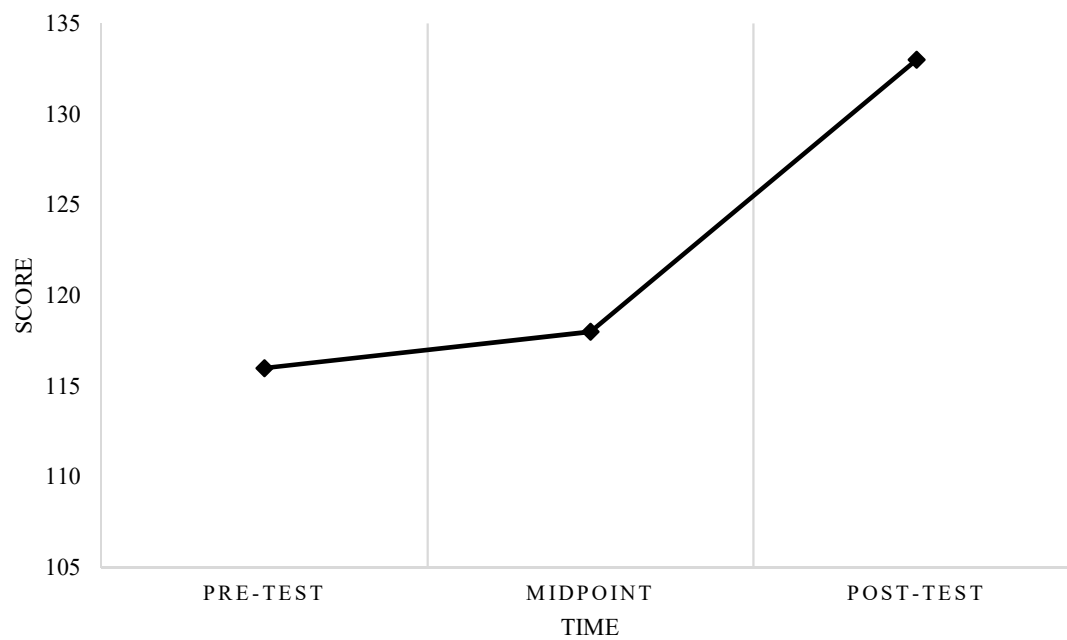


Figure 17. Frank DFS-2 Global Scores

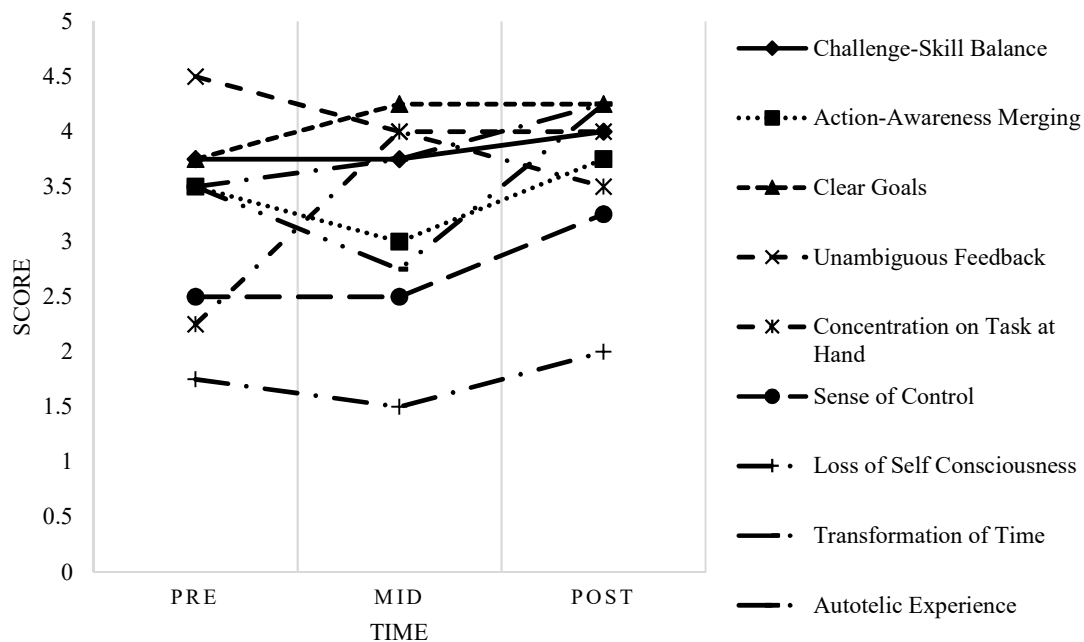


Figure 18. Frank DFS-2 Subscale Scores

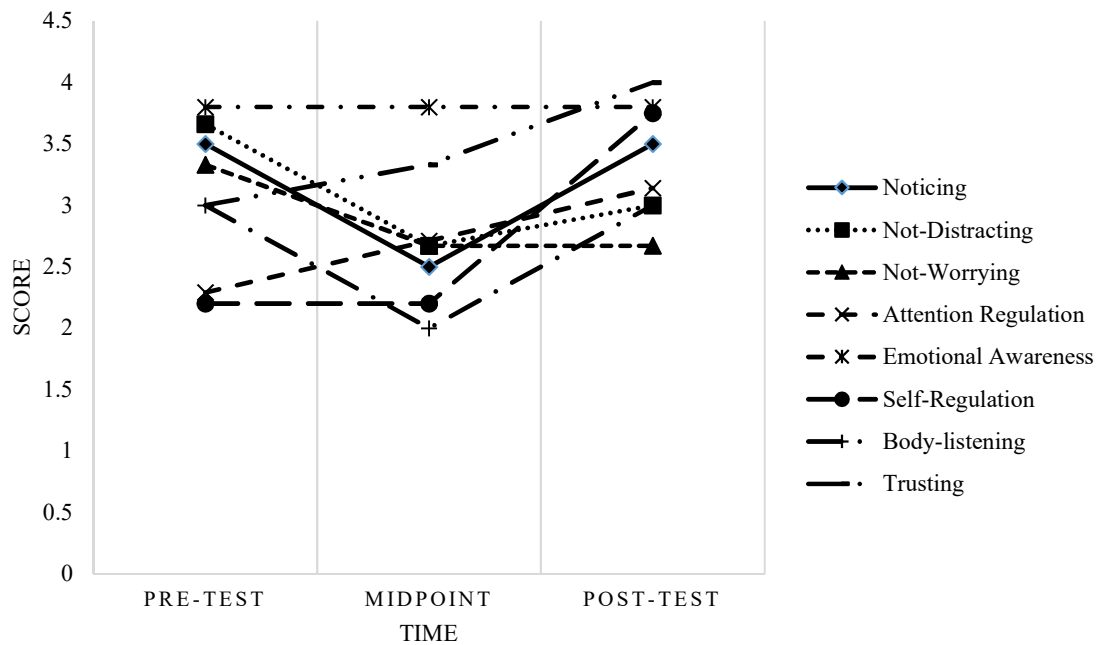


Figure 19. Frank MAIA Subscale Scores

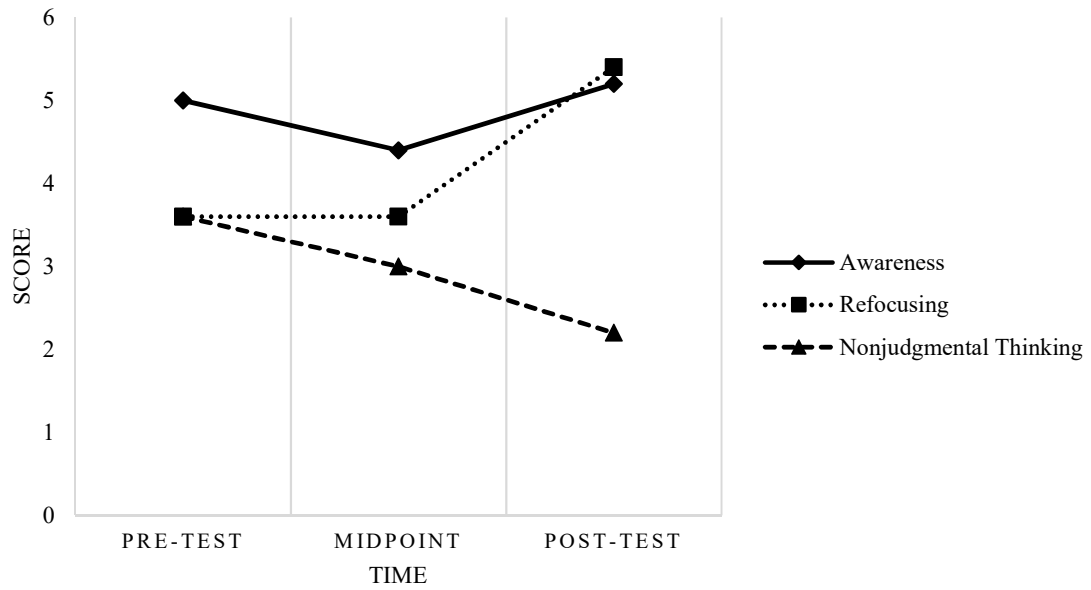


Figure 20. Frank MIS Subscale Scores

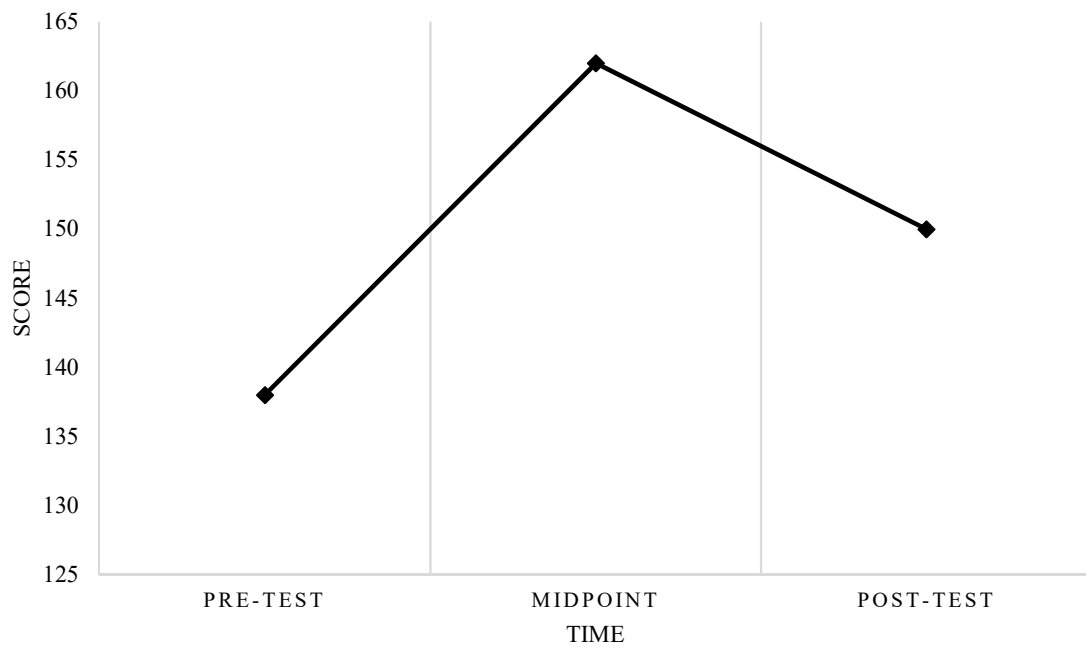


Figure 21. Anne DFS-2 Global Scores

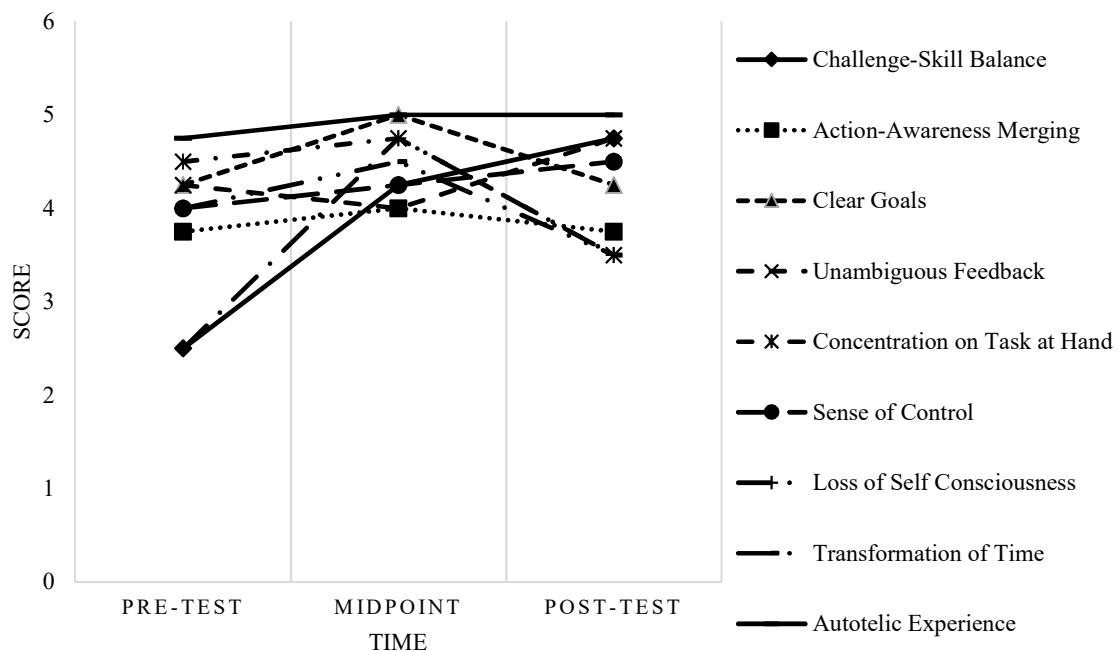


Figure 22. Anne DFS-2 Subscale Scores

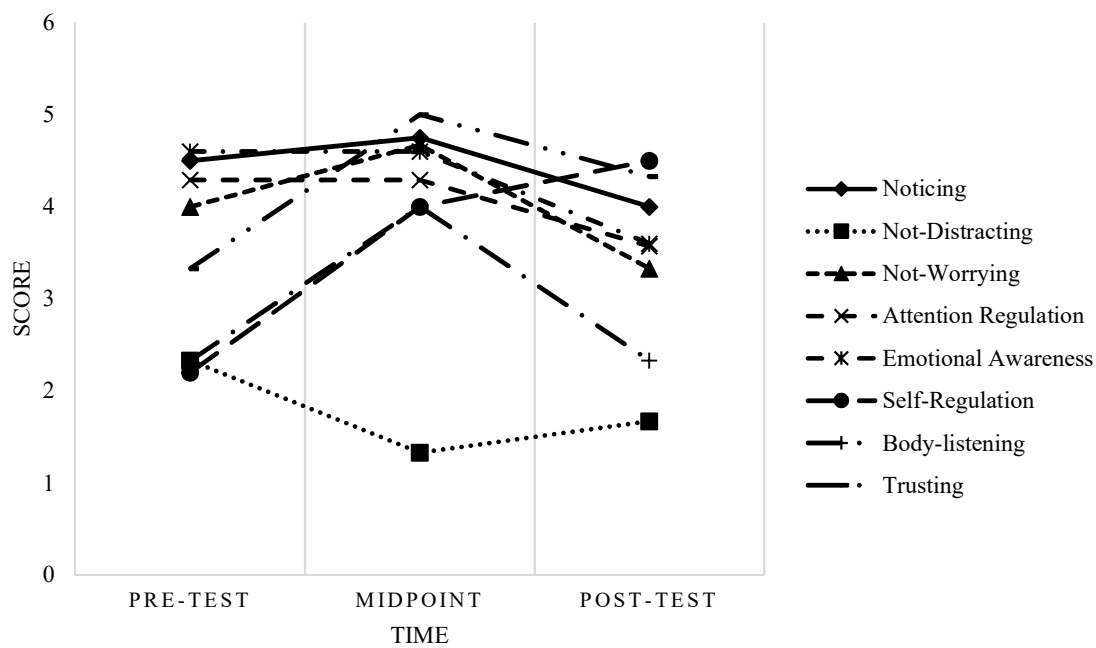


Figure 23. Anne MAIA Subscale Scores

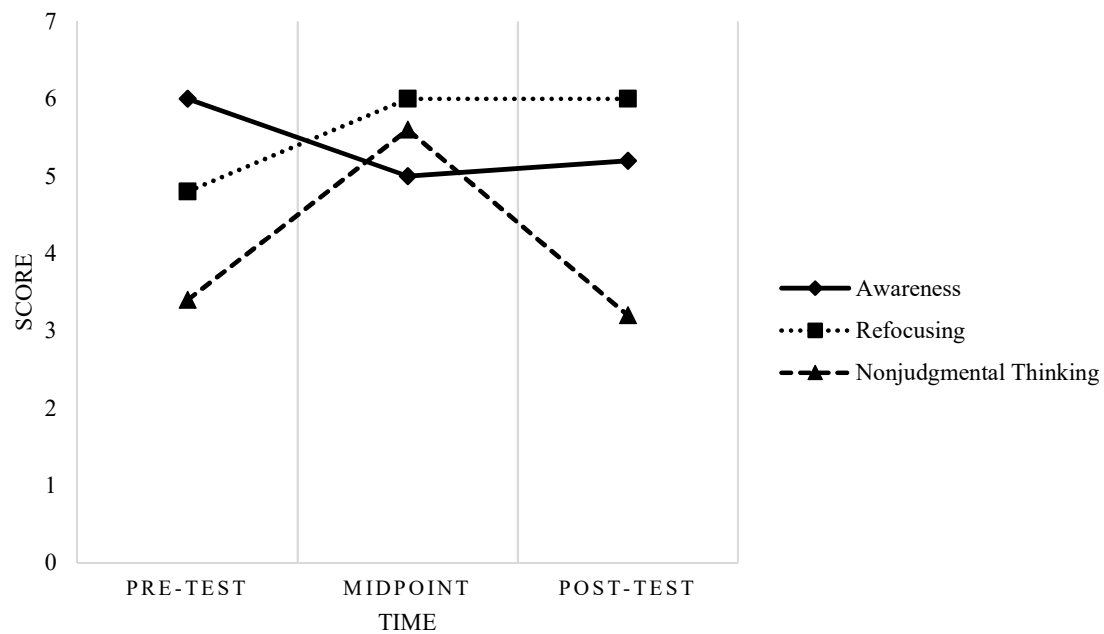


Figure 24. Anne MIS Subscale Scores

APPENDIX I
Barry University
Research with Human Participants
Protocol Form

PROJECT INFORMATION

1. The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC) Approach with Wheelchair Rugby Athletes

2. Principal Investigator (please type or print)

Student Number or Faculty Number: 3243006

Name: Andrew Corbett

School – Department: College of Nursing and Health Sciences – Sport and Exercise Sciences

Mailing Address: 6815 Biscayne Blvd. Suite 103-328, Miami, FL 33138

Telephone Number: 239-770-7843

E-Mail Address: andrew.corbett@mymail.barry.edu

*NOTE: You **WILL NOT** receive any notification regarding the status of your proposal unless accurate and complete contact information is provided at the time the proposal is submitted.*

3. Faculty Sponsor (If Applicable)

Name: Kimberly Cologgi

School – Department: College of Nursing and Health Sciences – Sport and Exercise Sciences

Mailing Address:

Telephone Number: 305-899-4890

E-Mail Address: kcologgi@barry.edu

Faculty Sponsor Signature: _____ Date: _____

4. Is an IRB Member on your Dissertation Committee? Yes _____ No: _____
 X

5. Funding Agency or Research Sponsor

None

6. Proposed Project Dates

Start 03/01/2018

End 08/29/2018

Note: It is appropriate to begin your research project (i.e., the data collection process)

only *after* you have been granted approval by this board. Proposals that list starting dates occurring before the date of submission will be returned without review. Please allow time for approval when determining your start date. It is best if the end date you choose is one year after the start date.

Please Provide the Information Requested Below

A. Project activity STATUS is: (Check one of the following three as appropriate.)

NEW PROJECT

PERIODIC REVIEW ON CONTINUING PROJECT

PROCEDURAL REVISION TO PREVIOUSLY APPROVED PROJECT

(Please indicate in the **PROTOCOL** section the way in which the project has been revised.)

B. This project involves the use of an **INVESTIGATIONAL NEW DRUG (IND) OR AN APPROVED DRUG FOR AN UNAPPROVED USE** in or on human participants.

YES NO

Drug name, IND number and company:

C. This project involves the use of an **INVESTIGATIONAL MEDICAL DEVICE (IMD)** or an **APPROVED MEDICAL DEVICE FOR AN UNAPPROVED USE**.

YES NO

D. This project involves the use of **RADIATION** or **RADIOISOTOPES** in or on human participants.

YES NO

E. This project involves the use of Barry University students as participants. (If any students are minors, please indicate this as well.)

YES Barry Students will be participants (Will minors be included? YES NO)

NO Barry Students will participate

F. **HUMAN PARTICIPANTS** from the following population(s) would be involved in this study:

Minors (under age 18)

Abortuses

Prisoners

Mentally Disabled

Other institutionalized persons (specify)

Other (specify) Physically Disabled

Fetuses

Pregnant Women

Mentally Retarded

G. Total Number of Participants to be Studied: 20

Description of Project

1. **Abstract** (200 words or less)

The study will investigate the efficacy and perceptions of the Mindfulness-Acceptance-Commitment Approach in regards to athletic performance and overall wellbeing with wheelchair rugby athletes. A case study using quantitative and qualitative measures will be utilized. The participants will partake in seven sessions, with each session lasting an hour. Self-report measures will be used to evaluate trends regarding levels of mindfulness in sport, interoceptive awareness, and experiences of flow during the intervention and after the intervention a semi-structured interview will be used to gather information regarding the participants' experiences of the intervention. The MAC approach has been shown to be efficacious with other population and research supports the use of case study to investigate a specialized population. Mindfulness-based interventions have been found to increase athletic performance and overall wellbeing. The present study is meaningful as adaptive athletes and wheelchair athletes are an underrepresented population and would add to the body of research regarding wheelchair athletes.

2. **Recruitment Procedures**

Describe the selection of participants and methods of recruitment, including recruitment letter if applicable. (**NOTE:** If the investigator has access to participants by virtue of his or her position within the study setting, please provide a brief description of such access.)

The researcher will recruit members of the Fort Worth Rattlers wheelchair rugby team with whom the researcher currently volunteers with. During a meeting with the team the researcher will describe the purpose of the study, the methods, and what it entails for the participants. After answering questions regarding the study, the researcher will ask for voluntary participation in the study. If additional participants are needed the researcher will recruit current wheelchair rugby athletes via email with the following recruitment letter:

The following email will be sent to colleagues, coaches, managers, and affiliates whom may have access to athletes that fulfill inclusion criteria for the present study.

To Whom It May Concern:

My name is Andrew Corbett and I am a graduate student at Barry University in the Sport, Exercise, and Performance Psychology program and am interested in the experience of an athlete in a mindfulness program.

Due to family history, I have always been interested in adaptive sports. Unfortunately, there is little scholarly information that offers suggests for best practice for the player development for performance. The investigation requires the participants to engage in a mindfulness training program.

Criteria for participants' inclusion in the study is as follows: current wheelchair rugby player, willingness to participate in the training program, limited exposure to mindfulness, and is older than 18.

I understand that you are probably extremely busy, but I am hoping you might be able to assist with this project. Essentially your assistance is needed in forwarding this email to athletes you know that fit the criteria for inclusion. From that point anyone interested could simply contact me via email or telephone. We will also happily share our results upon request.

Again, I know you are extremely busy, but if you would be willing to help I would greatly appreciate it. If you would like additional information about this project please feel free to email (andrew.corbett@mymail.barry.edu) or call me (239-770-7843). Thank you for your time and consideration.

Best regards,

Andrew Corbett

3. **Methods**

Describe procedures to which humans will be subjected. Include a description of deceptive techniques, if used, and debriefing procedures to be used on completion of the study. Use additional pages, if necessary.

No deceptive techniques will be used in the study and the participants will be informed of the length of the study and what participation entails.

Purposeful sampling will be used to ensure that the participants meet the inclusion criteria. The study will employ a mixed-method design. Prior to giving consent, the participant will be informed about the purpose of the study. After giving consent a pseudonym will be given to ensure confidentiality. Demographic information (see Appendix C) about the participants will be collected. The intervention will consist of seven one hour sessions delivered by the researcher, previously demonstrated to be effective by Gardner and Moore (2007) followed by a session to administer the semi-structured interview. The sessions will be completed in the following order, with at least 5 days between each session, per the protocol (see Appendix A): (1) psychoeducation, (2) introducing mindfulness and cognitive diffusion, (3) introducing values and values-driven behavior, (4) introducing acceptance, (5) enhancing commitment, (6) skill consolidation and poise, and (7) maintaining and enhancing mindfulness, acceptance, and commitment. To evaluate the efficacy of the MAC Approach and establish trends, three questionnaires will be administered prior to the start of the protocol, after the third session, and at the end of the seven sessions. The Multidimensional Assessment of Interoceptive Awareness (MAIA) (Appendix E) will be used to evaluate interoceptive awareness. The Mindfulness Inventory for Sport (MIS) (Appendix F) will be used to measure mindfulness behaviors in the participants' sport. The Dispositional Flow Scale-2 (DFS-2) (Appendix D) will be used to measure changes in participants' propensity to experience flow. It is estimated

that the questionnaires will require thirty minutes to complete. At the end of the protocol, a semi-structured interview (see Appendix B) will be used to study and report the participants' experience with the MAC Approach. The researcher will transcribe the interviews and the participants will be shown a copy to ensure that their responses reflect their experience. Prior to recruitment of participants, a former wheelchair rugby player will pilot the questionnaire and the researcher will undergo a bracketing interview to reveal any biases.

Individual sessions will take place at the Lake Worth Adaptive Sport Complex on Thursdays and Sundays before and after team practices. If additional participants are recruited from other teams, sessions will be conducted via Skype. The sessions will last one hour.

To analyze the data, the researcher will plot data points from the questionnaires to determine general trends and will use interviews and observations to create a description of the cases. The researcher will analyze themes found in the case and present the key emergent themes and report on the meaning of the cases.

4. Alternative Procedures

Describe alternatives available to participants. One alternative may be for the individual to withhold participation.

The participants will be able to withhold participation and cease participation from the study without any consequences. Participants can ask questions at any time and will have the researcher's contact information if further questions arise.

5. Benefits

Describe benefits to the individual and/or society.

Individuals participating in the study will participate in an evidence-based program designed for the development of mindfulness-related skills in the pursuit of optimized athletic performance. Based on previous studies, use of the intervention should be of benefit to the individual's performance in their sport as well as evidenced by previous studies regarding mindfulness-based interventions (Should I include findings and cite other studies here?) and the ancillary benefits associated with these interventions. Outside of general findings regarding mindfulness and acceptance based interventions; specific studies have shown benefits of such programs for individuals with physical disabilities and individuals who use wheelchairs.

For society, the present study would increase and improve the body of research for an underrepresented population. Currently, few studies have investigated the use of a mindfulness-based intervention with wheelchair rugby athletes and described the experiences of the participants in the studies. This study would provide in-depth knowledge to future researchers, opening potential new avenues for designing studies to investigate this population. Outside of research, it would provide practitioners in applied settings more knowledge to draw from when working with individuals from this population and better inform best practices.

6. Risks

Describe risks to the participant and precautions that will be taken to minimize them. Include physical, psychological, and social risks.

The use of a pre-designed and empirically supported program reduces the risk that the participants would experience in a newly designed program. Additionally, in this population physical considerations represent the greatest risk as the individuals in this population have physical disabilities and not intellectual disabilities. The current program does not require the research to manipulate or control for physical considerations, which minimizes the risk for the participants.

7. Anonymity/Confidentiality

Describe methods to be used to ensure the confidentiality of data obtained.

A pseudonym will be given to all participants. Forms and sessions notes will be devoid of identifying information. All files will be kept in a password protected folder on a laptop.

To ensure confidentiality during sessions, the researcher and participants will meet in a private location at the complex.

8. Consent

Attach a copy of the consent form(s) to be signed by the participant and/or any statements to be read to the participant or informational letter to be directed to the participant. **(A copy of the consent form should be offered to each participant.)** If this is an anonymous study, attach a cover letter in place of a consent form.

Barry University Informed Consent Form

Your participation in a research project is requested. The title of the study is “The Efficacy and Perceptions of the Mindfulness-Acceptance-Commitment (MAC) Approach with Wheelchair Rugby Athletes.” The research is being conducted by Andrew Corbett, a student in the College of Nursing and Health Sciences at Barry University, and is seeking information that will be useful in the field of Sport Psychology. The aims of the research are to better understand the MAC Approach in regards to perceptions athletic performance and overall wellbeing with wheelchair rugby athletes. The MAC Approach is designed to increase levels of mindfulness in sport and attention to relevant performance cues. In accordance with these aims, the following procedures will be used: self-report questionnaires before the start of the protocol, at the midpoint of the protocol, at the end of the protocol, a semi-structured interview at the conclusion of the protocol, and individual sessions following the MAC Approach protocol. The self-report measures include a demographics form, the Dispositional Flow Scale-2 to measure experiences of flow, the Multidimensional Assessment of Interoceptive Awareness to measure body awareness, and the Mindfulness Inventory for Sport to measure levels of mindfulness in sport. We estimate that it will take thirty minutes to complete the self-report questionnaires. We anticipate the number of participants to be twenty.

If you decide to participate in this research, you will be asked to do the following: complete a pre-survey, a midpoint survey, participate in a MAC Approach protocol, post-survey, and an exit interview. The study includes seven intervention sessions, three questionnaire sessions, one interview session, and a meeting to check for accuracy of my reporting of your experiences. I will audio record the interview and then transcribe it (i.e., type it out on paper) for further analysis. I will then let you look at your transcript to be sure it accurately portrays what you were trying to say in your interview. You may choose to omit, add, or modify any part of the interview in order to provide a more accurate description of your experience.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects to you. There are no known risks to you presented through involvement in the study. The potential benefits to your participation are increased levels of mindful behaviors and improved ability to tend to relevant performance cues.

As a research participant, information you provide will be held in confidence to the extent permitted by law. Your signed consent form will be kept separate from the data. You will select a pseudonym (fake name) for this study, which I will substitute for your real name whenever you make comments that might identify you. Any published results of the research will refer to you by your pseudonym; no real names will be used in the study. All interview transcripts will be stored on a password-protected computer and a hard copy will be locked in a filing cabinet in the primary researcher's home, maintained for 5 years following completion of the study and then destroyed. After interviews are transcribed, audio recordings will be destroyed. Any other information that could potentially be used to identify you or other competitors will be changed or excluded from the transcripts. This is done to help preserve the confidentiality of your responses. I will only share your interview (not contact details or real name) with members of the research group assisting me in this study. Members of the research group will never have access to any materials, which might identify you.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Andrew Corbett, at (239) 770-7843, my supervisor, Dr. Kimberly Cologgi, at (305) 899-4890, or the Institutional Review Board point of contact, Jasmine Trana, at jtrana@barry.edu. If you are satisfied with the information provided and are willing to participate in this research, please signify your consent by signing this consent form.

Voluntary Consent

I acknowledge that I have been informed of the nature and purposes of this experiment by Andrew Corbett and that I have read and understand the information presented above, and that I have received a copy of this form for my records. I give my voluntary consent to participate in this experiment.

Signature of Participant

Date

Researcher

Date

9. Certification

I certify that the protocol and method of obtaining informed consent as approved by the Institutional Review Board (IRB) will be followed during the period covered by this research project. Any future changes will be submitted to IRB review and approval prior to implementation. I will prepare a summary of the project results annually, to include identification of adverse effects occurring to human participants in this study. I have consulted with faculty/administrators of any department or program which is to be the subject of research.

Andrew Jonathan Corbett

2.2.2018

Principal Investigator

Date

Reminder: Be sure to submit sixteen (16) individually collated and bound (i.e. stapled or paper clipped) copies of this form with your application.

*NOTE: Your proposal **WILL NOT** be reviewed until the completed packet is received in its entirety.*

APPENDIX A. MAC APPROACH CURRICULUM

Session 1: Psychoeducation

1. Introduction
2. Present the Theoretical Rationale for the MAC Program
3. Connect the Rationale to the Client's Personal Performance Experience
4. Explain Automated Self-Regulation of Elite Performance
5. Define Specific Goals of the MAC Training Program
6. Introduce the Brief Centering Exercise

Session 2: Introducing Mindfulness and Cognitive Diffusion

1. Brief Centering Exercise
2. Discussion of What I Have Learned
3. Check for and Respond to Questions or Uncertainties Regarding the Previous Session
4. Rationale and Importance of Mindfulness
5. Discussion of Between-Session Exercises: What I Have Learned, Brief Centering Exercise, and Washing a Dish Mindfulness Exercise
6. Review Session
7. Brief Centering Exercise

Session 3: Introducing Values and Values-Driven Behavior

1. Brief Centering Exercise
2. Discussion of What I have Learned
3. Check for and Respond to Questions or Uncertainties Regarding the Previous Session
4. Discussion and Exploration of Values and Values-Driven Versus Emotion-Driven Behavior
5. Additional Home Mindfulness Exercise
6. Discussion of Between-Session Exercises: What I Have Learned, Performance Values, Given Up for Emotions, and Mindfulness Exercises
7. Introduction to the Mindfulness of the Breath Exercise

Session 4: Introducing Acceptance

1. In-Session Mindfulness Practice
2. Discuss What I Have Learned, Check for and Respond to Questions or Uncertainties Regarding the Previous Session, and Discuss Reactions to the Mindful Activity Exercise
3. Review the Performance Values and Given Up for Emotions and Pursue Discussion of Obvious and Subtle Avoidance Strategies

4. Experiential Acceptance as an Alternative to Avoidance and the Connection Between Willingness and Values-Driven Committed Behavior
5. Extending the Mindful Activity Exercise
6. Brief Centering Exercise

Session 5: Enhancing Commitment

1. In-Session Mindfulness Practice
2. Review of Previous Session
3. Enhancing Commitment: Connecting Values, Goals, and Behaviors
4. Review and Assign Performance-Relevant Mindfulness Homework
5. Session Review and Brief Centering Exercise

Session 6: Skill Consolidation and Poise

1. In-Session Mindfulness Exercises
2. Review of Previous Session
3. Putting It All Together: Enhancing Poise Through Exposure-Based Activities
4. Review and Assign Performance-Relevant Mindfulness and Task-Focused Attention Exercise
5. Brief Centering Exercise and Review of Between-Session Exercises

Session 7: Maintaining and Enhancing Mindfulness, Acceptance, and Commitment

1. Review Previous Session and Overall MAC Program
2. Brief Centering Exercise
3. Task-Focused Attention Exercise
4. Review of Current Level of Experiential Acceptance, Willingness, and Commitment to Values
5. Plan for Future Practice: Self-Reflection and Self-Correction

APPENDIX B.
SEMI-STRUCTURED INTERVIEW GUIDE

4. Describe your experience with the MAC Approach.
 - a. What do you think you have gained from this experience?
 - b. How do you think this will impact your performance?
5. How would you describe your current mindfulness behaviors?
 - a. How do these compare to your previous mindfulness behaviors?
 - b. How has your body awareness changed with the changes in your mindfulness?
6. How has your mindfulness in sport changed during the protocol?
 - a. Would you say how often you experience being in the zone has changed?
 - i. Describe how your experience of being in the zone has changed.

APPENDIX C.
DEMOGRAPHICS QUESTIONNAIRE

Gender (please circle):

Male

Female

Age: _____

Years of experience in wheelchair rugby: _____

Player Classification (please circle):

0.5

1.0

1.5

2.0

2.5

3.0

3.5

Experience with mindfulness meditation(select option that most represents your situation):

None

Limited

Moderate

Experienced

APPENDIX D.

DISPOSITIONAL FLOW SCALE-2

Please answer the following questions in relation to your experience in your chosen activity. These questions relate to the thoughts and feelings you may experience during participation in your activity. You may experience these characteristics some of the time, all of the time, or none of the time. There are no right or wrong answers. Think about how often you experience each characteristic during your activity and circle the number that best matches your experience.

Rating Scale

Never	Rarely	Sometimes	Frequently	Always
1	2	3	4	5

PLEASE CIRCLE ANSWER

1. I am challenged, but I believe my skills will allow me to meet the challenge.	1	2	3	4	5
2. I make the correct movements without thinking about trying to do so.	1	2	3	4	5
3. I know clearly what I want to do.	1	2	3	4	5
4. It is really clear to me how my performance is going.	1	2	3	4	5
5. My attention is focused entirely on what I am doing.	1	2	3	4	5

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Sincerely,

Robert Most
Mind Garden, Inc.
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APPENDIX E.

MULTIDIMENSIONAL ASSESSMENT OF INTEROCEPTIVE AWARENESS

Although the MAIA survey is copyrighted, it is available without charge and no written permission is required for its use. This assumes agreement with the following as a consequence of using a MAIA survey:

- Please refer to the survey using its complete name- Multidimensional Assessment of Interoceptive Awareness- and provide the appropriate citation.
- Modifications may be made without our written permission. However, please clearly identify and modifications in any publications as having been made by the users. If you modify the survey, please let us know for our records.
- We recommend including entire subscales when selecting items from the MAIA to retain the psychometric features of these subscales (rather than selecting items from subscales).
- If you translate the MAIA into another language, please send us a copy for our records.
- If other investigators are interested in obtaining the survey, please refer them to the source document (PLoS-ONE 2012, and www.osher.ucsf.edu/maia/) to assure they obtain the most recent version and scoring instructions.

Scoring Instructions

Take the average of the items on each scale.

Note: Reverse-score items 5, 6, and 7 on Not-Distracting, and items 8 and 9 on Not-Worrying.

1. Noticing: Awareness of uncomfortable, comfortable, and neutral body sensations
 $Q1+Q2+Q3+Q4/4=$ _____
2. Not-Distracting: Tendency not to ignore or distract oneself from sensations of pain or discomfort
 $Q5(\text{reverse})+Q6(\text{reverse})+Q7(\text{reverse})/3=$ _____
3. Not-Worrying: Tendency not to worry or experience emotional distress with sensations of pain or discomfort
 $Q8(\text{reverse})+Q9(\text{reverse})+Q10/3=$ _____
4. Attention Regulation: Ability to sustain and control attention to body sensations
 $Q11+Q12+Q13+Q14+Q15+Q16+Q17/7=$ _____
5. Emotional Awareness: Awareness of the connection between body sensations and emotional states
 $Q18+Q19+Q20+Q21+Q22/5=$ _____
6. Self-Regulation: Ability to regulate distress by attention to body sensations
 $Q23+Q24+Q25+Q26/4=$ _____

7. Body Listening: Active listening to the body for insight

$$Q27+Q24+Q25+Q26/4= \underline{\hspace{2cm}}$$

8. Trusting: Experience of one's body as safe and trustworthy

$$Q30+Q31+Q32/3= \underline{\hspace{2cm}}$$

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life.

Rating Scale

Never					Always
0	1	2	3	4	5

1. When I am tense I notice where the tension is located in my body.

0	1	2	3	4	5
---	---	---	---	---	---

2. I notice when I am uncomfortable in my body.

0	1	2	3	4	5
---	---	---	---	---	---

3. I notice where in my body I am comfortable.

0	1	2	3	4	5
---	---	---	---	---	---

4. I notice changes in my breathing such as whether it slows down or speeds up.

0	1	2	3	4	5
---	---	---	---	---	---

5. I do not notice (I ignore) physical tension or discomfort until they become more severe.

0	1	2	3	4	5
---	---	---	---	---	---

6. I distract myself from sensations of discomfort.

0	1	2	3	4	5
---	---	---	---	---	---

7. When I feel pain or discomfort, I try to power through it.

0	1	2	3	4	5
---	---	---	---	---	---

8. When I feel physical pain, I become upset.

0	1	2	3	4	5
---	---	---	---	---	---

9. I start to worry that something is wrong if I feel any discomfort

0	1	2	3	4	5
---	---	---	---	---	---

10. I can notice an unpleasant body sensation without worrying about it.

0	1	2	3	4	5
---	---	---	---	---	---

11. I can pay attention to my breath without being distracted by things happening around me.

0	1	2	3	4	5
---	---	---	---	---	---

12. I can maintain awareness of my inner bodily sensations even when there is a lot going on around me.

0	1	2	3	4	5
---	---	---	---	---	---

13. When I am in conversation with someone, I can pay attention to my posture.

0	1	2	3	4	5
---	---	---	---	---	---

14. I can return awareness to my body if I am distracted.

0	1	2	3	4	5
---	---	---	---	---	---

15. I can refocus my attention from thinking to sensing my body.					
0	1	2	3	4	5
16. I can maintain awareness of my whole body even when a part of me is in pain or discomfort.					
0	1	2	3	4	5
17. I am able to consciously focus on my body as a whole.					
0	1	2	3	4	5
18. I notice how my body changes when I am angry.					
0	1	2	3	4	5
19. When something is wrong in my life I can feel it in my body.					
0	1	2	3	4	5
20. I notice that my body feels different after a peaceful experience.					
0	1	2	3	4	5
21. I notice that my breathing becomes free and easy when I feel comfortable.					
0	1	2	3	4	5
22. I notice how my body changes when I feel happy/joyful.					
0	1	2	3	4	5
23. When I feel overwhelmed I can find a calm place inside.					
0	1	2	3	4	5
24. When I bring awareness to my body I feel a sense of calm.					
0	1	2	3	4	5
25. I can use my breath to reduce tension.					
0	1	2	3	4	5
26. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.					
0	1	2	3	4	5
27. I listen for information from my body about my emotional state.					
0	1	2	3	4	5
28. When I am upset, I take time to explore how my body feels.					
0	1	2	3	4	5
29. I listen to my body to inform me about what to do.					
0	1	2	3	4	5
30. I am at home in my body.					
0	1	2	3	4	5
31. I feel my body is a safe place.					
0	1	2	3	4	5
32. I trust my body sensations.					
0	1	2	3	4	5

APPENDIX F.
MINDFULNESS INVENTORY FOR SPORT

The statements below describe a number of things that athletes may experience just before or during their sport performance. Please check the box that best indicates how much each statement is generally reflective of your recent experience from 1 (not at all) to 6 (very much). There are no right or wrong answers.

	1	2	3	4	5	6
1. I am aware of the thoughts that are passing through my mind.						
2. I am able to notice the intensity of nervousness in my body.						
3. I am able to notice the sensations of excitement in my body.						
4. I am able to notice the location of physical discomfort when I experience it.						
5. I pay attention to the type of emotions I am feeling.						
6. When I become aware that I am thinking about a past performance, I criticize myself for not being focused on my current performance.						
7. When I become aware that I am angry at myself for making a mistake, I criticize myself for having this reaction.						
8. When I become aware that I am not focusing on my own performance, I blame myself for being distracted.						
9. When I become aware that I am thinking of the final result, I blame myself for not being focused on relevant cues for my performance.						
10. When I become aware that I am really upset I am losing, I criticize myself for reacting this way.						
11. When I become aware that some of my muscles are sore, I quickly refocus on what I have to do.						
12. When I become aware that I am thinking about how tired I am, I quickly bring my attention back to what I should focus on.						
13. When I become aware that I am really excited because I am winning, I stay focused on what I have to do.						
14. When I become aware that I am tense, I am able to quickly bring my attention back to what I should focus on.						
15. When I become aware that I am not focusing on my own performance, I am able to quickly refocus my attention on things that help me to perform well.						

