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The Relationship between Sex Role, Mindfulness, Perceived Stress, Anxiety, and Flow in
Team Sport Female Athletes

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Submitted in partial fulfillment of the requirements
for the degree Doctor of Philosophy
Department of Professional Psychology and Family Therapy
Seton Hall University
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**SETON HALL UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN SERVICES
OFFICE OF GRADUATE STUDIES**

APPROVAL FOR SUCCESSFUL DEFENSE

Vanessa H. Chafos has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ph.D.** during this **Summer Semester 2021**

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Abstract

In recent years, studies have emerged that support the use of mindfulness interventions to enhance sport performance (Cathcart et al., 2014; Gardner & Moore, 2012; Jekauc et al., 2017; Kee & Wang, 2008; Moen et al., 2015). Nevertheless, a gap remains in the literature regarding sex role and mindfulness, perception of stress, and ability to reach a flow state. This study discusses current sport psychology literature and explores the relationship between sex role, mindfulness, perceived stress, anxiety, and flow among 185 team sport female athletes. Correlational analyses from this study indicated a positive and significant association between mindfulness and flow, which aligns with previous literature that higher mindfulness scores are more likely to be associated to higher levels of flow (Kee & Wang, 2008; Scott-Hamilton & Schutte, 2016). Results from multivariate and post hoc analyses suggest that team sport female athletes with a higher degree of both masculine and feminine traits (i.e., those with androgynous sex roles) have higher flow scores compared to females who may fit the more traditional sex role or those with a higher degree of masculine traits. The study provides a better understanding of the connection between sex role, mindfulness, and performance-related variables within the female team athlete subgroup and provides the preliminary groundwork for further studies of mindfulness in sport and its relationship to enhancing performance in female athletes. Overall findings suggest female team athletes at any experience level can benefit from incorporating mindfulness into their practice to assist with performance enhancement and serve as a buffer to stress and anxiety. The study concludes with discussion of study limitations, recommendations, and implications for future research.

Keywords: mindfulness, flow, sex role, female athletes, stress, and anxiety

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Chapter I

Introduction

Given its established benefits to psychological, cognitive, and physiological health, mindfulness is a frequent subject of study in the scientific literature (Baer, 2003; Cogan, 2019; Flaxman et al., 2012; Linehan, 1993; Mistretta et al., 2017; Samuelson et al., 2007; Worthen et al., 2016). Results of empirical studies suggest that benefits include increased attention, decreased anxiety, and better performance on everyday tasks (Cogan, 2019; Mistretta et al., 2017; Worthen & Luisell, 2016). Improved stress and coping mechanisms also appear to be common themes that emerge within the literature (Gustafsson et al., 2015; Moen et al., 2015).

Since the benefits of mindfulness in the general and clinical populations has grown and proven to be effective, researchers have begun to integrate the use of mindfulness methods with athletes at different performance levels (i.e., those who engage in exercise activity recreationally to elite performers) (Carraca et al., 2018; Cathcart et al., 2014; Cote et al., 2019; Gustafsson et al., 2015; Gardner & Moore, 2012; Kee & Wang, 2008). These scholars found that when engaging in an athletic activity or sport, athletes experienced challenges on and off the field, which may include intrinsic (i.e., negative self-talk, anxiety, low motivation) and extrinsic stressors (i.e., bad weather, loud crowd). To manage these stressors, athletes typically use a range of mental skills (i.e., management of anxiety and other emotions, self-motivation, positive self-talk, setting goals) (Birrer & Morgan, 2010; Cathcart et al., 2014; Gardner & Moore, 2012; Gustafsson et al., 2015; Kee & Wang, 2008). If an athlete does not attune to these stressors or engage in using healthy coping mechanisms, his or her physical performance can be negatively affected (Birrer & Morgan, 2010; Cote et al., 2019; Hussey et al., 2017; Rothlin et al., 2016; Vidic et al., 2017). This effect can range from reduced motivation to attend practice to subjective

and physiological anxiety states. Moreover, stress can undermine attention by compromising an athlete's ability to shift focus to the task at hand (Gustafsson et al., 2015). Thus, having a set of coping skills to manage stressors may mitigate some of the negative emotional, cognitive, and physiological processes commonly associated with stress.

Although there may be benefits to using these mental skills in sport to manage stressors, the existing literature does not address whether certain coping strategies may be better suited for certain athletes versus others in relation to the degree of masculine or feminine characteristics the athletes may have. Having awareness of this difference can aid in performance enhancement by identifying coping skills that work best based on sex role traits and receptivity to engage in their sport in a mindful way, specifically among team female athletes. This chapter will review the statement of the problem and background information as well as identify gaps or inconsistencies in the sport literature. These gaps include the use of mindfulness as an intervention in sport, the impact of stress on performance, flow in sport, differences between individual and group sports, the role of biological sex in sport, masculinity and femininity in sport, and sample selection. The last sections will highlight the significance of the study, definition of terms, hypotheses and research questions, and discuss the study's limitations in existing research.

Statement of the Problem

Coaches, sport psychologists, and athletes frequently seek ways to enhance performance, which entails learning coping strategies to counteract intrinsic and extrinsic stressors. Most commonly, they turn to Psychological Skills Training (PST). PST refers to regular and consistent use of mental skills with a goal to improve performance (Weinberg, 2015). Mental skills include mental imagery, thought stopping, goal-setting, and self-talk. However, conflicting literature has emerged over the past two decades suggesting PST may not be as effective as previously thought

(Gardner & Moore, 2004; 2012). This inconsistent effectiveness may be related to PST's emphasis on "control" of one's thoughts, emotions, and physiological states rather than a non-judgmental acceptance of the present moment. Attempting to control one's internal state through thought suppression or blocking may elicit a paradoxical effect (Gardner & Moore, 2004; 2012). Since mindfulness literature has shown promising benefits for the general population, it has emerged as a possible attractive alternative or an adjunct to PST (Gardner & Moore, 2004; 2012).

Despite this recent emergence of literature, several areas need to be further explored within mindfulness and sport psychology. Specifically, the current literature does not capture the cultural shift that has occurred over the past years on the view of women playing "men's sports" (i.e., football, soccer) and men playing sports characterized as "feminine" (i.e., gymnastics, cheerleading) (Chalabaev et al., 2013; Hively & El Alayli, 2014). The research appears to focus on gender identity (Chalabaev et al., 2013) as well as physiological differences (i.e., men may be more prone to more thigh injuries, women more likely to sustain a hip injury) (Ivkovic et al., 2007; Salis et al., 2001; Stracciolini et al., 2014), and gender stereotypes (Chalabaev et al., 2013; Hively & El Alayli, 2014).

Furthermore, research is almost nonexistent in capturing how an athlete's traditionally masculine (i.e., assertive, competitive, aggressive, leader; Bem, 1981) or traditionally feminine traits (i.e., gentle, sensitive to the needs of others, compassionate; Bem, 1981) play a role in his or her sport performance and its relationship to mindfulness. Since more masculine traits have been found to be associated with lower mindfulness (Rojiani et al., 2017), it is presumed that females with higher levels of masculine traits may have more difficulties with mindfulness (Rojiani et al., 2017). Research has not examined these components together, specifically the

relationships between masculinity, femininity, and mindfulness and how these variables may affect a competitive athlete's sports performance. Because both women and men show wide variability in gender role, masculinity and femininity may be more important to understand than just biological sex. This may be paramount to an improved understanding of how females internalize their intrinsic psychological and psychosocial processes in relation to the increasing emergence of female athlete engagement in more masculine sports and in sports in general because there is more of a trend toward women playing men's sports than men playing women's sports (Colley et al., 2005; Yi-Hsiu & Chen-Yueh, 2013).

According to Colley and colleagues (2005) and Chen-Yueh (2013), despite increased awareness and acceptance of females in sports that have traditionally been viewed as more masculine (i.e., hockey, soccer, basketball), inequalities are still rampant. When a female does choose a sport, they tend to choose an individual sport over a team sport due to the stigmatization of team sports having more masculine qualities (Colley et al., 2005). These qualities may include but are not limited to behaviors such as aggression, taking charge or leadership over a situation, or strength. Some factors that may play a role in the continued stigmatization of sport types include social media and television, in which male sports tend to be more popular and talked about (Colley et al., 2005; Yi-Hsiu & Chen-Yueh, 2013). Also, men's sports are more highly attended and command higher ticket prices (Yi-Hsiu & Chen-Yueh, 2013). This preference may also relate to higher salaries obtained by male athletes. Forbes Media (2019) published a statistical report that examined elite athletes' salaries throughout the world and published the top 100. Among these findings, Serena Williams, an elite tennis player, placed 67th and was the only female to rank in the top 100 for compensation (Forbes Media, 2019). In addition to these discrepancies, there is a pattern in the media that is portrayed of women who play sports as

appearing masculine or having “butch-like” features, which conflicts with the role of women appearing “lady-like” (Colley et al., 2005). A study conducted by Yi-Hsiu and Chen-Yueh (2013) with 237 young females and 278 young males revealed that when a female who was approximately 15-16 years old was asked to draw a sportsperson with the Draw the Sportsperson Test; they were more likely to draw a male sportsperson or celebrity rather than one of their own gender. Most of the males involved in the study drew a male sportsperson (Yi-Hsiu et al., 2013). This may speak to the influences that society has on sex roles.

With these influences that society has on sex roles, fear of how others may perceive them may incline women and girls towards playing a more feminine sport (Colley et al., 2005). Studies find that females may be more vulnerable to being judged negatively by their peer group for going against gender and societal norms (Colley et al., 2005). Specifically, a study with a sample of young girls revealed as girls become older, their perception of self in relation to their ability to perform competently in a sport decreases (Ridgers et al., 2007). Ridgers and colleagues (2007) suggested that this decline may be linked both to anxiety surrounding the fear of receiving a negative evaluation by their peer group and societal pressures. While these studies have emerged and society is becoming more receptive to female sport participation, these issues are still salient within women who play sports or want to play a sport. Nonetheless, according to the International Olympic Committee (IOC) (2018), it is projected that approximately 49% of athletes in the 2020 Olympic games will be female, although it is unclear what percentage of them will be participating in sports historically seen as a “man’s sport.” Regardless, this is a significant increase compared to 1924, when only 4.3% of females who wanted to play were allowed to participate (Women’s Sport Foundation, 2018).

Males, on the other hand, have not had as much of a substantial shift, although the mindset of “men can’t play female sports” has also been changing. This shift can be seen in cheerleading; however, it is important to note there are not many female-dominated sports. According to Ninemire (2019), approximately fifty percent of cheerleaders in high school are male. Professional cheerleading has also been increasing its male participation, and men now comprise 3-5% of all professional cheerleaders (Ninemire, 2019). Moreover, the 2019 Super Bowl was the first to have two males cheerleading, which segues into the possible change in the overall masculinization stereotype of sports. With this blending of gender among traditionally stereotyped sports comes a need to re-examine what it means to be masculine or feminine in the world of athletics. The shift appears to be most critical among female athletes due to the rapid changes in sport participation. This gender aspect is especially important because female athletes have also been studied much less in general (Allison et al., 2017), which also leaves gaps in the literature surrounding females, mindfulness, and sport performance. In sum, research has not been able to keep pace with these cultural shifts.

Background

Researchers in recent years (e.g., Carraca et al., 2018; Gardner & Moore, 2004, 2012; Glass et al., 2019; Hussey et al., 2020; Jekauc et al., 2017; Kaufman & Glass, 2009;) have begun investigating mindfulness methods that can potentially enhance performance. However, some of the studies have suffered from poor study design, limited sample size, statistical limitations, and inconsistent theoretical definitions of mindfulness in sport (Bernier et al., 2009; Bernier et al., 2014; Kaufman et al., 2009; Sappington & Longshore, 2015). Many of these studies have used measures that assess everyday mindfulness rather than mindfulness within a sport context. The former may not adequately assess mindfulness in sport, due to the difficulty sustaining

mindfulness amidst the high-stress demands that are placed on cognitive, attentional, and physiological processes of athletes (Aherne et al., 2011; Butryn et al., 2011; Cathcart et al., 2014; Kee & Wang, 2008).

There was no sport mindfulness measure in the literature until 2014 when Thienot and colleagues published the first preliminary measure, known as the Mindfulness Inventory for Sport (MIS; Thienot et al., 2014). Since its emergence, a few studies have utilized this measure (Gjerdingen, 2013; Hussey, 2015; Quinones-Paredes, 2014). Thienot and colleagues (2014) found that the awareness and refocusing subscales of the MIS had positive correlations with flow and concentration disruption in a sample of 178 male and 168 female athletes who competed at either the sub-elite or elite level in a wide range of sports. They connected this with literature from Kee and Wang (2008) and Aherne and colleagues (2011). Specifically, Aherne and colleagues (2011) found that a 6-week training program incorporating mindfulness meditation exercises resulted in a sample of 13 college-level athletes (unidentified gender) reporting an increase in mindfulness after completion. When Aherne and colleagues (2011) examined flow scores after program completion, they found a significant correlation between global flow on the FSS-2 (i.e., total score) and mindfulness (comparison between baseline and post-intervention). In addition, the nonjudgment and refocus components of mindfulness were negatively correlated with worry and rumination during competition. Thienot and colleagues (2014) postulated that this finding supported “the attention regulation component, in particular the ability to inhibit the elaborative process, described by Bishop and colleagues” (p. 78). These findings were salient because they began to highlight the underlying mechanisms of mindfulness in sport. In addition, the correlational findings suggest that mindfulness could assist in performance enhancement, health, and well-being of an athlete.

In the same study, Thienot and colleagues (2014) found that mindfulness in sport did not significantly correlate with the awareness construct of the Mindfulness Attention Awareness Scale (MAAS) or the Worry and Concentration Disruption subscales on the Sports Anxiety Scale (SAS-2), and instead found it to be positively correlated with perfectionism on the Multidimensional Perfectionist Scale (MPS; Thienot et al., 2014). The MAAS measures one's ability to bring attention to the present moment while simultaneously having an awareness and openness to one's experience (Brown & Ryan, 2003). The SAS-2 measures an athlete's heightened arousal state related to the anticipation of a threat before, during, or after participation in their sport.

In addition to these findings, there was a significant positive correlation between non-judgment and the MAAS (Thienot et al., 2014). The study by Thienot and colleagues (2014) also did not examine the role of perceived stress and its relationship to mindfulness. Since participation in sport and exercise constitutes management of internal processes, it seems necessary to further understand the correlation between mindfulness and stress and how they play a role in flow and anxiety. Thus, this study will conduct a quantitative examination of these specific variables.

Mindfulness

One potentially beneficial avenue in sport performance enhancement has been mindfulness, and, more broadly, acceptance-based strategies have been sources of interest to coaches and sport psychologists. Kabat-Zinn (2005) defined mindfulness as an "open-hearted, moment-to-moment nonjudgmental awareness" (p. 24). Similarly, according to Hays and Smith (2005), acceptance-based strategies foster a willingness to take in one's experience nonjudgmentally while concurrently promoting a specific behavior to elicit acceptance and

change. According to Hays and Smith (2005), this process is believed to make the goal or value more obtainable. Varied types of intervention strategies may encourage athletes to step back from their experience. They are likely to then recognize their limitations in controlling internal processes, thus allowing them to accept their thoughts and feelings (Hays & Smith, 2005). In turn, this practice may also change the relationship they have with their thoughts and feelings.

Research has emerged within the psychological literature suggesting it may not necessarily be direct change and control that is most effective for performance enhancement but rather interventions that promote acceptance of one's thoughts and emotions (Gardner & Moore, 2004). Gardner and Moore's (2012) extensive literature review on the effectiveness of PST found little support for improvement in performance beyond the novice level, which has led some researchers to mindfulness and acceptance-based strategies.

Evidence on mindfulness and acceptance-based strategies has suggested marked improvements in both clinical and non-clinical populations targeting a vast number of constructs, such as stress, anxiety, pain, mood disorders, personality disorders, development disorders, and classroom management (Baer, 2003; Linehan, 1993; Samuelson et al., 2007). Worthen and Luiselli (2016) examined the internal experiences of 32 high school female volleyball and soccer players and noted that most of the athletes found incorporating mindfulness training to be helpful. The researchers found that athletes reported improved concentration, increased team mindfulness, and increased awareness of emotional responses (Worthen & Luiselli, 2016). A study by Mistretta and colleagues (2017) found qualitatively and quantitatively that 45 Division III athletes reportedly had a positive benefit among exploration of athlete personal experiences post engagement of a mindfulness intervention. Some of these benefits include stress reduction, improved anxiety management, and increased self-awareness (Mistretta et al., 2017). These

studies highlight the possible psychological benefit that an athlete may experience by integrating mindfulness as part of their training regime.

Implementation of Mindfulness Interventions and Sport

Professional sports teams have begun to incorporate mindfulness practice into their training programs. For example, the Seattle Seahawks have implemented daily mindfulness practice since 2011. Phil Jackson, who coached and won 11 championships with the Chicago Bulls and New York Knicks, is also known for using mindfulness interventions with elite basketball players. Due to his success, he is recognized by many as the “Zen Master of Sports” (Jackson & Delehanty, 2013). Some of these successes have drawn increased attention to the implementation of mindfulness-based strategies into the world of sports.

Beyond the popularity of mindfulness and acceptance-based strategies in the lay community, these approaches have also piqued the interest of researchers in sport psychology. Specifically, Gardner and Moore (2004; 2012) developed an approach that steered away from traditional Control Based PST approaches, known as the Mindfulness Acceptance Commitment Approach (MAC; Gardner & Moore, 2004). The MAC approach suggests that when athletes engage in a sport, their performance outcomes can be improved if they can accept their intrinsic and extrinsic experiences simultaneously and non-judgmentally and are able to maintain focus on the present moment regardless of any discomfort (Gardner & Moore, 2004; 2012). MAC’s theoretical rationale is grounded in two specific third wave CBT models: Mindfulness-Based Cognitive Therapy (Segal et al., 2002) and Acceptance and Commitment Therapy (ACT; Hayes & Smith, 2005). Because the MAC approach places emphasis on promoting psychological flexibility, increasing acceptance, and eliminating or reducing experiential avoidance, it is reasonable to assume that this approach may assist in reducing experiential avoidance and

promoting psychological flexibility, which may lead to performance enhancement and stress reduction (Goodman et al., 2014).

To date, few studies use the MAC approach in sport performance, which is partly related to its recent development. The research that has been published consists of case studies (Gardner & Moore, 2004; Schwanhausser, 2009) and a limited number of quantitative research (Hasker, 2010; Ivarsson et al., 2015). Participants in the case studies believed that mindfulness-based interventions improved their performance, but these studies did not include objective measures. In addition, while the MAC approach was in the process of publication by Gardner and Moore, Wolanin (2004) conducted a pilot investigation using the MAC approach for his doctoral dissertation under the mentorship of Gardner. This study lasted seven weeks and included 20 Division I female collegiate athletes that participated in volleyball (N=11) and field hockey (N=9); it found preliminary evidence that MAC is effective as an intervention for performance enhancement. Although these studies show preliminary support that this program can be effective, the protocol is in need of random control trials, studies with larger sample sizes, and more vigorous statistical analysis.

Similar to MAC, the Mindfulness Sport Performance Enhancement (MSPE) program was developed by Kaufman et al. (2009) as a method to assist in enhancing the performance of athletes. The MSPE focuses on teaching athletes mindfulness skills and ways to implement them in sports (Kaufman et al., 2009). Their theoretical rationale is grounded in frameworks of Mindfulness-Based Cognitive Therapy (Segal et al., 2002) and Mindfulness-Based Stress Reduction (Kabat-Zinn, 1990; 1994). The MPSE approach had been tested by Kaufman et al. (2009) in their 4-week study, and they found a positive relationship between mindfulness and flow in 23 male and nine female athletes who participated in recreational archery and golf.

Despite these findings, the researchers did not find any significant changes in the athletes' overall performance (Kaufman et al., 2009). Another study was run similarly by DePetrillo et al. (2009) among 25 recreational distance runners. Their initial findings also did not reveal any significant effect of improved performance (i.e., timed miles, number of times spent running per week, and average distance ran), although they did find increases in state and trait mindfulness scores (DePetrillo et al., 2009). The authors of both studies noted this result might be attributed to statistical limitations in examining overall performance (DePetrillo et al., 2009); Kaufman et al., 2009). Another concern regarding the protocol was that four weeks might be too short of an intervention to garner significant changes in performance (DePetrillo et al., 2009; Kaufman et al., 2009). A year later, Thompson et al. (2011) conducted a post-test utilizing some of the archers and golfers from Kaufman and colleagues' (2009) study and recreational runners from DePetrillo and colleagues' (2009) study; they found increased levels of mindfulness within each athlete group. The runners also showed significant improvements in their mile times (Thompson et al., 2011).

Notably, other studies have emerged in which mindfulness interventions have been related to increases in sport performance (i.e., peak performance state) as well as increases in mindfulness skills (Carraca et al., 2018; Cote et al., 2019; DePetrillo et al., 2009; Glass et al., 2019; Hussey et al., 2020; Kaufman et al., 2009; Noetel et al., 2019; Peter & Olsen, 2017). For example, a study by Scott-Hamilton and Schutte (2016) recruited 12 Australian athletes to participate in a mindfulness study that investigated levels of flow, sport-performance anxiety, and pessimism scores. The athletes (2 female; 10 male) consisted of "five mountain bikers, five cyclists, one swimmer, and one skier" (Scott-Hamilton & Schutte, 2016, p. 103). Their results revealed that higher mindfulness and flow scores were associated with less pessimism and

anxiety (Scott-Hamilton & Schutte, 2016). In addition, Jekauc et al. (2017), with 15 male and 31 female college students majoring in sports science, found that using a mindfulness intervention was more effective than a traditional psychological skills training program in increasing levels of mindfulness; however, they noted that they could not determine how the intervention may influence an athlete's ability to achieve flow.

Sappington and Longshore (2015) published a literature review of eight qualitative studies (six case studies, one non-peer-reviewed qualitative dissertation, and one interview) and 11 experimental control studies. Their review suggested that mindfulness-based interventions improve athletic performance (Sappington & Longshore, 2015). The authors cautioned that more research is needed to assess the effectiveness of mindfulness on athletic performance (Sappington & Longshore, 2015). Similar to Sappington and Longshore (2015), Noetel et al. (2019) found similar results in a more extensive review of the mindfulness and sports literature consisting of 66 studies (Noetel et al., 2019). Specifically, Noetel et al. (2019) stated many of the studies were “low grade” (p. 130) and contained “limited validity” (p. 130). In total, the literature suggests that mindfulness and acceptance-based interventions are promising in their application to sports psychology despite some of the noted limitations.

Stress and Performance

In addition to the effects of mindfulness on performance, it is important to consider the effects of such interventions on athletes' stress, given the amount of stress athletes undergo as part of their training and competition. Prior studies on mindfulness have highlighted positive relationships between stress management and improved attention (Samuelson et al., 2007). This finding is in line with research by Baer et al. (2012), who found that increased mindfulness scores are associated with a measurable reduction in perceived stress in the general population.

Specific to athletes, a study by Moen and colleagues (2015) of 382 young elite athletes (age range: 17-20, $M=18.5$) indicated that mindfulness might mitigate the effects of stress and serve as a resiliency factor. Sports included “cross country skiing, biathlon, Nordic combined, shooting, ice-hockey, ski jumping, alpine skiing, cycling, track and field, football, orienteering, handball and volleyball” (Moen et al., 2015, p. 3).

Gustafsson et al. (2015) looked at 233 young elite athletes ranging in age from 15 to 19 and found a relationship between dispositional mindfulness and perceived stress. The athletes were participating in five sports, including cross country skiing, track and field, biathlon, ski orienteering, and alpine skiing (Gustafsson et al., 2015). They found a significant negative correlation, which the authors suggested may further support mindfulness acting as a mediator between perceived stress and burnout. Similarly, Walker (2013) noted that higher mindfulness scores resulted in less burnout among young tennis athletes ranging in age from 14 to 19. Burnout is caused by prolonged stress, which exhausts mental and physiological processes (Moen et al., 2016).

In light of Walker’s study (2013) on mindfulness and burnout, athletic stress can carry into daily life. Therefore, a measurement of overall life stress may be an important consideration when working with athletes. Surujlal et al. (2013) used Cohen’s Perceived Stress Scale (PSS-10) with 500 college athletes and found that their perception of stress and the amount of increased negative stressors was associated with reduced life satisfaction. Participants were recruited from a range of sports and athletic ability at a university. This variety is an important consideration since an athlete’s stress can extend beyond the playing field and can include everyday stressors. This finding may also be related to some studies that found significant relationships among an athlete’s everyday dispositional mindfulness, life satisfaction, and coping styles (i.e., using

mental imagery, self-talk), despite it not necessarily tapping the underlying mechanism of mindfulness in sport. Taken together, these studies speak to the importance of further exploring general stress in sport, as it can carry over into the playing field.

A recent study by Haas and colleagues (2015) addressed the relationship between stress and the playing field. They noted that a seven-week mindfulness program increased seven BMX riders' ability to handle performance-related stress. Similar results were found in Haase and colleagues' (2014) study among United States Marines who were introduced to unpleasant stimuli and found mindfulness techniques allowed them to cope with general stress and performance-related stress that resulted from the stimuli exposure. These findings are pertinent because stress exposure is linked with increased anxiety (i.e., performance-related) and leads to a negative shift in attention. Although anxiety and eustress can serve as motivators, anxiety beyond a specific threshold can be detrimental to performance (Hussey et al., 2020; Smith et al., 2006). If athletes are able to enhance their mental skill set through mindfulness, they may achieve improved performance. Kee and Wang (2008) suggested that when athletes have both mental and physical training, they are more likely to experience flow, which generally happens when an athlete is performing at his or her best.

The Importance of Flow to Athletic Performance

Flow has been described by Nakamura and Csikszentmihalyi (2014) as a subjective state during which the individual is fully immersed in the present moment and engaging in the task at her or his full capacity or peak ability (Nakamura & Csikszentmihalyi, 2014). Thus, athletes, coaches, and sport coaches seek ways for athletes to achieve this state of heightened experience since it has been connected with an increased chance of winning during an event if in competition (Swann et al., 2012). Achieving this state is particularly salient with elite athletes

since they may have the most at stake when compared to other athlete levels. As such, elite athletes spend many hours practicing their particular sport; therefore, reaching a peak performance state may look different than that of a recreational athlete who may have much more room for improvement. For example, recreational athletes may be able to improve their performance more quickly because they are not starting at a very high baseline. Despite the recent interest in flow, the literature lacks studies regarding the underlying mechanisms of flow (Swann et al., 2012) and its relationship to mindfulness for athletes ranging from recreational to elite level.

Scott-Hamilton and Schutte's (2016) study, which included 12 club-level athletes, found those who had a larger increase in their mindfulness scores from baseline to post-intervention demonstrated greater perceived flow (Scott-Hamilton & Schutte, 2016). In their second study, consisting of 27 cyclists, they found similar results. Together, these studies show preliminary evidence that when individuals have higher states of mindfulness, they may be more likely to experience flow. However, the connection between mindfulness and flow states needs to be further explored with athletes that participate in a range of sports (i.e., recreational, elite, novice).

Individual Versus Group Sports

Most of the literature on the implementation of mindfulness interventions for sport performance has focused on individual athletes rather than athletes from group sports. Focusing on the impact of mindfulness on group sports may be just as important, particularly since there is potential for increased distraction and unpredictability with the involvement of many people participating at once (Hussey, 2015; Yu & Zellmer-Bruhn, 2018). According to mindfulness literature, team performance is not only dependent on the individual's ability to be mindful but also on the collective ability of the team (Blecharz et al., 2013). If athletes on a team share a

belief that the team is “not good enough” or if they do not believe in each other’s abilities, they may have a poor perception of the team (Blecharz et al., 2013). Team mindfulness is also important when it comes to teams’ ability to jump back from a bad play or for the team to come together to compensate for one of their own players becoming injured during the game (Blecharz et al., 2013). Disagreements can arise among the athletes and/or the coach, and mindfulness can help to mediate such occurrences. When these factors interrupt sport performance, they can also initiate a domino effect and counteract not only the individual athlete’s ability to achieve a flow state but also their teammates’ ability to achieve a flow state.

Kee and Wang’s (2008) correlational investigation of the relationship between mindfulness and flow included 182 college-enrolled competitive individual and team athletes from a range of sports. These sports were comprised of “taekwondo, soccer, Malay martial arts, rugby, tenpin bowling, and dragon boating, and archery” (Kee & Wang, 2008, p. 397). Their findings support that athletes with higher mindfulness scores are more likely to reach a flow state (Kee & Wang, 2008). Although this study included both individual and team sports, the results were not reported by sport or type of sport. The study also noted that because of low statistical power, the results should be interpreted with some caution (Kee & Wang, 2008).

The Role of Biological Sex in Sport

Recent mindfulness interventions to enhance sport performance (Cathcart et al., 2014; Gardner & Moore, 2012; Jekauc et al., 2017; Kee & Wang, 2008; Moen et al., 2015) found positive results. However, these studies have not looked at biological sex and mindfulness, perception of stress, and ability to reach a flow state. In addition, most of the already-limited team sport research has been done with men (Allison et al., 2017; Pine et al., 2009). Findings show that females are more receptive to mindfulness, as women are more open to emotional

experiences, thus they may benefit more from mindfulness practice (Rojiani et al., 2017).

Perhaps the emergence of mindfulness interventions for sport may be better suited or may have a higher likelihood of anxiety reduction, decreased perceived stress, and higher flow scores for females. Therefore, research is needed in this area specifically geared towards team sport female athletes, which may help to fill this gap in the literature.

Drawing on the work of Kee and Wang (2008), Cathcart et al. (2014) added to the mindfulness and sports performance literature with elite athletes by further examining their link to flow states. Cathcart and colleagues (2014) recognized the importance of examining the differences between an athlete's self-reported gender and participation in individual versus group sports. Results from their sample of 96 elite athletes with a mean age of 18 ($SD=2.6$) provided evidence that the non-judge construct of the FFMQ was higher in males compared to females. They concluded that their findings might suggest that males tend to be less critical of their internal and emotional cognitive processes. Furthermore, the observed construct was higher in individual athletic activities compared to team athletic activities, suggesting that athletes in team sports have to focus more on their external surroundings rather than their internal experiences. Moreover, age and number of years playing their sport also did not change their results. This was the only study found to examine these variables, and most studies appear to focus on mostly individual sports.

Further research is needed in examining mindfulness and flow among both biological sex and gender roles and with athletes participating in individual and group sports. Prior research has only addressed in a limited way the differences between team and individual sports. In addition, prior research has primarily focused on college students, with samples that are generally very

small (as few as 26). Finally, the above studies have considered only biological sex or gender, but they have not accounted for the range of gender roles, particularly among female athletes.

Masculinity and Femininity in Sport

Sex role (i.e., masculinity and femininity) is not the same as biological sex (see definition of terms section). According to Bem (1974), sex role can be defined as the degree to which individuals exhibit or report

internalized society's sex-typed standards of desirable behavior for men and women.

These personality characteristics are selected as masculine or feminine on the basis of sex-typed social desirability. That is, a characteristic is qualified as masculine if it is judged to be more desirable in American society for a man than for a woman, and it is qualified as feminine if it is judged to be more desirable for a woman than for a man. (p. 161)

For many years, all sports were considered “masculine” activities. However, females are increasingly accepted in all sports. In fact, there has been an increase by 545% of female participation for college athletics and 990% for high school athletics compared to approximately 45-50 years ago (Olmstead, 2016, p. 2). This growth may be attributed to the Passage of Title IX Education Amendments Act of 1972 (20 U.S.C. §1681-§1688; Olmstead, 2016). Unlike the male counterpart, a female is more likely to experience an internal dilemma with the societal expectation of maintaining certain characteristics that entertain the female ideology of femininity. According to Paloian (2012, p. 3), “western cultures continue to focus on the necessity of a flawless and delicate body to correspond with the weak and passive qualities associated with women.” Those who challenge this ideology are often seen as having “more masculine traits” (Paloian, 2012). This stereotype can specifically be applied to female athletes,

as research suggests that female athletes are still perceived to have more masculine traits despite the significant increases in females playing sports (Paloian, 2012).

With the increase in females playing sports, studies that have been conducted on sex role with athletes have found that individuals who are more masculine and androgynous are more likely to participate in sport (Andre & Holland, 1995; Chalabaev et al., 2013). Clement-Gullotin et al. (2012) found in a sample of 100 Caucasian college students (48 males, 52 females) from France, 90% of whom were engaged in some type of sport, that regardless of biological sex, there was a significant perception of sports being a “more masculine” domain. The authors noted a limitation to their study was their sample consisted solely of college students.

Past research on sex role in sport has suggested that females who choose to play sports tend to play sports that are perceived as more feminine (i.e., cheerleading, gymnastics). This coincides with Bem’s Gender Schema Theory (Bem, 1974), which postulates that society engrains certain prescriptions of what is acceptable or inappropriate based on biological sex (Bem, 1974; Starr & Zurbriggen, 2017). This mindset can be polarizing and limiting when it comes to sport choice (Starr & Zurbriggen, 2017). There is a plethora of research prior to the early 2000s that suggests that females that are higher in femininity may choose not to play sports to avoid being seen as “masculine” or to play sports that are viewed as feminine (Duquinn, 1988; Koivula, 1995; Miller & Levy, 1996; Royce et al., 2003). Since the emergence of this literature, as well as the passing of the Educational Amendments Act of 1972, which provides equal opportunity for individuals regardless of biological sex, there have been significant changes within the realm of sports (Royce et al., 2003). As such, female athletes have begun to revisit what it means to be both a female and an athlete and defy the traditional gender roles that have been ingrained in society for many years (DiCarlo, 2016; Paloian, 2012). This emerging paradox

has been transformed into increased fluidity between the constructs of masculinity and femininity, whereby a female can continue to embrace her feminine characteristics while also being able to have masculine characteristics that may assist a female athlete in her athletic performance (i.e., having speed, agility, and strength to out-compete her competitor) (Paloian, 2012).

This paradox can be related to the concept of androgyny. Martin et al. (2017) noted that within the sex role literature, “androgyny has never been fully and adequately tested; in particular, little attention has been paid to investigating whether flexibility in gender behavior leads to improved mental health” (Martin et al., 2017, p. 592). There is also sex role literature that suggests a link between androgyny and cognitive flexibility, which can potentially serve as a protective function against psychological stress (Bem, 1974; Bem & Lenney, 1976; DiDonato et al., 2012; Gillis & Connell, 1989; Martin et al., 2017; Paulhus & Martin, 1988). There is a lack of research that explores these hypothesized changes and their potential impact on female sport performance. It seems important to take a closer look at sex role, specifically, the concept of androgyny, and whether this has a positive impact on the female athlete.

Sample Selection in Existing Research

Beyond the issues addressed above, most of the studies focused on athletes have included samples of only college students (Goodman et al., 2014). This selection bias is a limitation to sport psychology literature, as not all athletes are college students, and these samples represent only part of the athletic population. The present study will include college, recreational, and semi-elite athletes. In addition, due to limited research with women, particularly those who play team sports, the study will include only females from team sports. According to the literature, there is less female involvement in group sports compared to individual sports (Colley et al.,

2005). Research with the female athlete population will assist in getting a better understanding of sex role variation among women within a team context, in particular, those team sports that are perceived to be “more masculine” (i.e., basketball, soccer, hockey).

Significance of Study

Since the passage of Title IX, the Education Amendments Act of 1972 (20 U.S.C. §1681-§1688) that provides equal opportunity for individuals regardless of biological sex (i.e., male, female), there have been significant changes within the realm of sports (Royce et al., 2003). These changes include the increased acceptance of females playing sports. Female participation in college athletics has increased by 545% and 990% in high school athletics compared to approximately 45-50 years ago, and this participation rate is continually growing (Olmstead, 2016).

Within the sports and mindfulness literature, the understanding of gender and type of athletic activity is lacking. Specifically, understanding how an athlete’s masculinity or femininity characteristics play a role in one’s sports performance in conjunction with investigating mindfulness, flow, and anxiety together is almost nonexistent. This gap is particularly notable in team sports. Female athletes who participate in group team sports may have “more masculine” traits due to the type of sports that make up team sports (i.e., basketball, soccer, softball) and may require the female to be more aggressive, assertive, or take on leadership characteristics that do not comprise the traditional “feminine role.” There is speculation based on prior findings that men score lower on mindfulness; however, no study has yet addressed this connection (Rojiani et al., 2017). If female athletes are shown to endorse higher levels of masculine traits, it would be important to explore the relationship of sex role to mindfulness scores, specifically within a

sports context. Including college, recreational, and semi-elite athletes may help to capture a wider pool of athletes, which may include females with more feminine traits.

The present study seeks to examine these gaps in the literature and build upon the initial work of Cathcart et al. (2014), who found that there are differences between an athlete's self-reported gender and participation in individual versus group sports. If there is a better understanding of the connection between sex role, mindfulness, and performance-related variables within the female team athlete subgroup, it may provide the groundwork for further studies of mindfulness in sport and its relationship to enhancing performance.

Definition of Terms

The following terms will be used throughout this study. Some of the terms listed (i.e., stress, mindfulness) can be used in both a general and sport context; however, for the purposes of the study, they will be applied within the context of sport.

Stress is defined as an outcome due to contextual factors interconnecting individual and environmental demands (Lazarus & Folkman, 1987). For the purpose of this study, stress will be operationally defined as scores on Cohen's Perceived Stress Scale (Cohen & Williamson, 1988).

Flow is defined as a subjective state in which the individual is fully immersed in the present moment and engaging in the task at their full capacity or peak ability (Nakamura & Csikszentmihalyi, 2014). For the purposes of this study, flow will be operationally defined by scores on the Short Disposition Flow Scale (DFS-2; Jackson & Eklund, 2002).

Mindfulness is defined as bringing ones' attention to the present moment while simultaneously having an awareness and openness to ones' experience (Brown & Ryan, 2003). For the purposes of this study, mindfulness will be operationally defined by scores on the Mindfulness Attention Awareness Scale (Brown & Ryan, 2003).

Anxiety is defined as a heightened arousal state related to the anticipation of a threat. Common symptoms may include nervousness, worry, apprehension, somatic complaints (i.e., headaches, stomachaches), difficulty concentrating, or feelings of uneasiness (Smith et al., 2006). For the purposes of this study, anxiety will be operationally defined by scores on the Sport Anxiety Scale (SAS; Smith et al., 2006).

Biological Sex is defined as the categorization and assignment of an individual's status as male, female, or intersex based on physiological (i.e., appearance) and biological makeup (i.e., genitalia, reproductive system) (VandenBos, 2018).

Sex Role is defined as “the degree to which individuals exhibit or report internalized society's sex-typed standards of desirable behavior for men and women” (Bem, 1974, p.161). For the purposes of this study, sex role, and more specifically, masculine, feminine, androgynous, and undifferentiated, will be operationally defined by scores on the Bem Sex Role Inventory (BSRI; Bem, 1974). The categorical sex roles are determined by the pattern of scores on two continuous variables, masculinity and femininity.

- **Masculinity** is defined as a set of characteristics (behaviors, attributes, and roles) that have been judged by society to comprise that of a “stereotypical male.” Individuals with higher scores of masculinity on the BSRI have been connected with having higher levels of instrumental traits, such as assertiveness, aggressiveness, dominance, the desire to work independently, and task orientation (Bem, 1974).
- **Femininity** is defined as a set of characteristics (behaviors, attributes, and roles) that have been judged by society to comprise that of a “stereotypical female.” Higher scores of femininity on the BSRI have been connected with having higher levels of expressive traits, such as warmth, empathy, altruism, and gentleness (Bem, 1974).

- **Feminine sex role** is defined as endorsing higher traits of femininity and lower traits of masculinity on the BSRI (Bem, 1974).
- **Masculine sex role** is defined as endorsing higher traits of masculinity and lower traits of femininity on the BSRI (Bem, 1974).
- **Androgynous sex role** is defined as endorsing higher traits of both masculinity and femininity on the BSRI (Bem, 1974).
- **Undifferentiated sex role** is defined as endorsing lower traits of both femininity and masculinity on the BSRI (Bem, 1974).

Hypotheses and Research Questions

Research Question 1: What is the relationship between mindfulness and flow in female athletes?

Hypothesis 1: Female athletes who score higher on mindfulness will also score higher on flow.

Research Question 2: Is there a relationship between sex role and how team sport female athletes experience flow, mindfulness, perceived stress, and anxiety?

Hypothesis 2: Team sport female athletes with an androgynous sex role will have higher mean scores on mindfulness and flow and report that they experience lower perceived stress and anxiety than masculine, feminine, and undifferentiated female athletes.

Limitations

While this study plans to address gaps in the sport psychology literature, it is important to note there are limitations to the study. First, an ideal sample would be recruited from various competitive teams throughout the United States, which would ensure that the participants are actually engaged in competitive sport, rather than through online where individuals are paid to take surveys. Also, this study is dispositional in nature, and participants are not asked to

participate in the study immediately right before, during, or after participation in their sport.

Rather, participants are asked to take the study at their own convenience.

Another limitation is the self-report nature of the instrument. The study also has a mono-method bias since there is only a single type of measure that is used. Because the study will employ a correlational design, causation cannot be inferred. Lastly, this study will consist of only women, which limits the ability to generalize to men. It will not be possible to address these issues during this study; however, perhaps this is an area for further research in the future beyond acquiring the results from this project.

Chapter II

Literature Review

This literature review focuses on the relationship between masculinity, femininity, mindfulness, perceived stress, anxiety, and flow in female athletes. The chapter begins with a literature review on stress, mindfulness, and performance and highlights relevant variables as well as theoretical underpinnings, including the Transactional Theory of Stress. Anxiety and its impact on attention will then be explored, as well as the relationship between anxiety and flow in an athlete's sport performance. The next section covers current literature on Mindfulness in Sport Psychology.

The last section will discuss the history of women in sport and Sandra Bem's Gender Schema Theory while also touching upon other relevant theories of sex role behavior. This chapter also addresses research on the impact of sex role on athlete performance and overall well-being in female athletes. The relationship between sex role, mindfulness, and team sports will be discussed.

Stress, Mindfulness, and Performance

Stress has been found to have both positive and negative impacts on both psychological and physiological functioning. Evidence suggested that when athletes experience an optimum level of arousal, a balanced combination of their internal state and motivation in the moment can assist them in achieving a flow state (Aherne et al., 2011). McGrath (1970) described athletic stress as occurring in situations in which an athlete's performance has repercussions (i.e., the consequences of missing the ball can cost the game or result in hindered performance) and, therefore, can create a "substantial imbalance between demand (physical and/or psychological) and response capability" (p. 80). Staal (2004) postulated that McGrath's definition holds significance because it encompasses three components: "perceived demand, perceived ability to

cope, and the perception of the importance of being able to cope with the demand” (p. 2).

Together, these components seem to resemble what an athlete may experience when engaging in a sport or athletic activity.

There is evidence that the internal perception of an athlete’s abilities and resources to complete the task can induce levels of anxiety that can either impair or enhance their performance (Weinberg, 2015). This perception activates the sympathetic nervous system (SNS). The SNS response elicits a state of nervousness, fear, apprehension, racing thoughts, rapid heartbeat, sweating, or worry and can negatively affect performance. For example, some writers have proposed that the stress response in sport performance affected the 51st Super Bowl when kicker Stephen Gostowski from the New England Patriots had the physical skill set to perform, but the level of stress in a high stakes situation caused him to fumble the ball and miss a field goal (Waldron, 2017).

In the same Super Bowl game, Tom Brady, the Patriots quarterback, did not seem to stumble and appeared mentally and physically tough throughout the game. In fact, his performance not only led the New England Patriots to win the Super Bowl, but he also was selected Most Valuable Player in the Super Bowl for the fourth time in his career. Although other unknown mechanisms may have also been at work, these performances speak to the importance of better understanding variables that affect an athlete’s internal perception in highly competitive situations.

A number of studies on stress, mindfulness, and sport performance have been published in recent years (Gustafsson et al., 2015; Moen et al., 2016; Mistretta et al., 2017; Surujlal et al., 2013; Walker, 2013). For example, Gustafsson et al. (2015) conducted a study on 233 young elite athletes ranging in age from 15-19 and found a relationship between dispositional

mindfulness and perceived stress. The athletes were participating in five sports, including cross country skiing, track and field, biathlon, ski orienteering, and alpine skiing (Gustafsson et al., 2015). They found a significant negative correlation, which the authors suggested may further support mindfulness acting as a mediator between perceived stress and burnout. Burnout is caused by prolonged stress, which exhausts mental and physiological processes (Moen et al., 2016). Similarly, Walker (2013, p. 105) noted that higher mindfulness scores resulted in less burnout among 104 young tennis athletes in his study.

In a sample of 500 college athletes, Surujlal et al. (2013) found that perception of stress and the amount of increased negative stressors was associated with reduced life satisfaction. Participants were recruited from a range of sports and athletic ability at a university. This is an important consideration since an athlete's stress can extend beyond the playing field and can include everyday stressors. Taken together, these studies implicate the importance of developing and utilizing strategies to manage stress (Gustafsson et al., 2015; Moen et al., 2016; Surujlal et al., 2013; Walker, 2013).

Four Stage Stress Process

McGrath's theoretical rationale for stress in sports occurs in four stages: 1) the presence of an environmental demand, 2) perception of the demand, 3) the stress response, and 4) the behavioral consequences. The process begins with a task that the athlete may need to complete, such as obtaining possession of the soccer ball close enough to the goal and hearing teammates and coaches shout, "shoot the ball." It can also include testing a new skill learned at practice during a game, which had only been behaviorally rehearsed at practice (Weinberg, 2015). In either circumstance, the athlete's interpretation of the task's relative challenge is assessed through the lens of their perceived capabilities to accomplish the task (Weinberg, 2015).

Whether athletes perceive the demands of a task in threatening or non-threatening terms may be related to the degree of their trait or state anxiety (Weinberg, 2015). Trait anxiety is defined as the propensity for an athlete to feel anxious across a majority of environmental experiences (Cox, 2007). State anxiety is described as the anxiety experienced in a specific setting (Cox, 2007). The athletes' perception of the task may result in state-specific anxiety, which can produce increased nervousness and worry (Weinberg, 2015). The state anxiety may result in physiological changes and altered focus (i.e., body tightness) (Weinberg, 2015). The outcome may precipitate poor performance. However, the athlete may tolerate or adapt to the anxiety response in a manner that allows her to perform without impairment of functioning. (Mellalieu et al., 2009; Weinberg, 2015).

Transactional Theory of Stress and Coping

The Transactional Theory of Stress and Coping describes stress as a consequence of contextual factors interconnecting the individual's adaptation and the environmental demands (Lazarus & Folkman, 1987). The individual's reaction to the situation depends upon their resiliency as a function of their coping strengths (Lazarus & Folkman, 1987). The individual's coping capabilities leads to how they appraise the situation and the emotions produced (i.e., anger, frustration, anxiety, excitement) (Smith & Lazarus, 1993). The theory separates this response into two stages: the primary appraisal process and the secondary appraisal process. In the primary appraisal process, the individual determines whether the event is a threat (Lazarus, 1987; Smith & Lazarus, 1993). A person may ask questions about the effect of the event and try to understand any consequences or attempt to appraise the meaning behind it. One of three outcomes can occur: the event can be deemed irrelevant, or it may be seen as positive or negative to one's well-being (Lazarus, 1987; Smith & Lazarus, 1993). This appraisal is considered

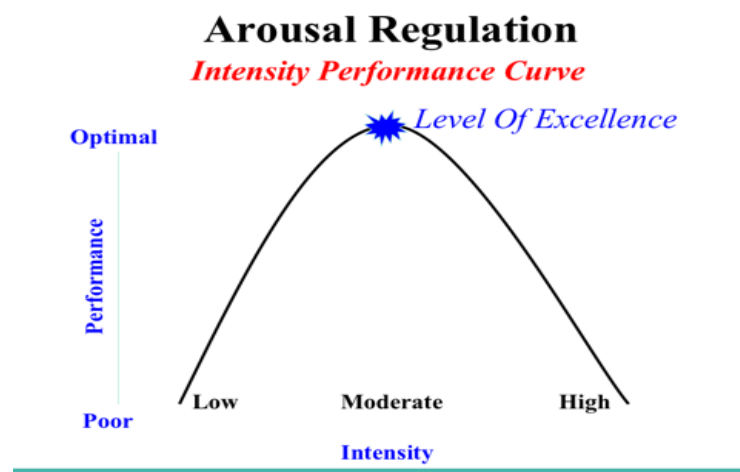
primary because it is focused on the event itself, rather than the feelings being experienced in the moment (Lazarus, 1987; Smith & Lazarus, 1993). In secondary appraisal processes, the individual assesses her or his coping resources (i.e., social, environmental resources) (Lazarus, 1987; Smith & Lazarus, 1993). Lazarus (1987) defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p.141). In general, coping methods represent an attempt to manage the current stressor regardless of the severity. Because this theory is one of the most common models in stress research, it will be used as part of the theoretical rationale for further understanding the relationship between stress, mindfulness, and sport.

Anxiety in Sport Research

Anxiety in sport has been one of the most researched areas (Mellalieu et al., 2009; Ponseti et al., 2019). It is often associated with studies on stress, specifically in relation to athletes’ anxiety prior to their performance (Carraca et al., 2018; Mellalieu et al., 2009). Anxiety occurs when there is a heightened arousal state related to the anticipation of a threat. Common symptoms may include nervousness, worry, apprehension, somatic complaints (i.e., headaches, stomachache), difficulty concentrating, or feelings of uneasiness (Smith et al., 2006). Anxiety/physiological arousal produced by perceived stress can serve as a motivator. However, anxiety beyond a specific threshold can be detrimental to performance (Hussey et al., 2020; Smith et al., 2006). Whitely (2013) postulated that anxiety in competitive sport could have a negative impact on an athlete’s performance. Mellalieu and colleagues (2009), as well as Whitely (2013), pointed out that there are no new variables that hinder performance, but there are situational factors that contribute to anxiety-decreasing performance effectiveness. These factors include situations involving tripping, performing when injured, missing the ball, and other adversities that can

instigate higher levels of state anxiety (Mellalieu et al., 2009). All of these are also considered stressors, which play a role in the nature of sport.

Furthermore, the Yerkes/Dodson Inverted-U theory hypothesizes that when athletes engage in a performance-related activity, an individual experiences an increase in arousal both mentally and physiologically (Yerkes & Dodson, 1908). The during-task performance is to reach one's "threshold of optimal arousal." However, the theory notes that arousal beyond the threshold can impair an athlete's abilities to perform optimally (Fontana et al., 2009; Yerkes & Dodson, 1908). When these increased arousal states occur, it creates a shape that looks like an inverted-U on a graph.



Adapted with permission from "Optimizing Athlete Mental Health and Performance," by M. Mintz, 2015, *Sports Medicine Department Atlantic Health System Presentation*.

Sport science research has indicated that when athletes reported lower scores on mindfulness measures, they also had higher levels of anxiety and perceived stress (De Petrillo et al., 2009; Hussey et al., 2020; Scott-Hamilton & Brown, 2016; Scott-Hamilton & Schutte, 2016). Scott-Hamilton and Schutte (2016) studied 12 club-level athletes and found those who had a larger increase in their mindfulness scores from baseline to post-intervention had a decrease in anxiety and increased flow (Scott-Hamilton & Schutte, 2016). In a second study, consisting of 27

cyclists, they found similar results. This finding supports the need to explore the correlation between stress, mindfulness, anxiety, and performance.

Attention and Mindfulness in Sport

The concept of concentration in sport is defined as focusing one's attention on the goal the athlete has set out to accomplish during an athletic event (Moran et al., 2016). Weinberg and Gould conceptualized concentration into four components: "focusing on the relevant cues in the environment (selective attention), maintaining that attentional focus over time, having awareness of the situation and performance error, and shifting attentional focus when necessary" (Weinberg & Gould, 2015, p. 372). When frequently exposed to a complexity of competing internal and external stimuli, an athletes' attention can be challenged or disrupted. When this happens, the athletes have to work harder on refocusing on the task at hand, which also can be interpreted as additional stress. For example, athletes can interpret an environmental stimulus as a threat, which then can cause their attentional focus to become more restrictive, possibly resulting in "tunnel vision" (Staal, 2004). This so-called tunnel vision can impair performance, or it can lead to improved performance. Similar effects have been found in arousal states, such as anxiety and fear (Staal, 2004). Thus, various studies have emerged examining the association between arousal, attention, and performance, and more recently, studies have included mindfulness (Carraca et al., 2018; Cote et al., 2019; Glass et al., 2019; Gross et al., 2018; Hussey et al., 2020).

A study by Moen et al. (2015) indicated that mindfulness might mitigate the effects of stress and serve as a resiliency factor. The authors administered a questionnaire to 382 young elite athletes (age range: 17-20, $M=18.5$) in the following sports, "cross country skiing, biathlon, Nordic combined, shooting, ice-hockey, ski jumping, alpine skiing, cycling, track and field, football, orienteering, handball and volleyball" (Moen et al., 2015 p. 3). Another study by Moen,

Firing, and Wells (2016) that implemented a 12-week Attention Training Program (ATT) with 58 elite athletes ($M=18.5$ years old) examined athletes' attentional awareness at baseline and post-intervention. Athletes included those that participated in "alpine skiing, cross-country skiing, handball, biathlon, ski-jumping and Nordic" competing at an elite level, that is, athletes that are the top performers of their sport (Moen et al., 2016, p. 217). Their findings suggested that when athletes have increased attentional awareness, there was an improvement in their outlook on their performance and a decrease in their perception of stress (Moen et al., 2016). Although this study did not focus on mindfulness, it speaks to the importance of attentional awareness in sport. The authors report that as athletes are undergoing ATT, they may enter a state of detached mindfulness; that is, seeing thoughts as just thoughts and feelings as just feelings (Moen et al., 2016). This stance allows the athletes to have awareness of their internal and external processes without trying to use methods that emphasize control, suppression, or avoidance (Moen et al., 2016). Mardon et al. (2016) examined the effect of an 8-week mindfulness program on the attention and athletic performance of six 20-year-old swimmers (Mardon et al., 2016). Their findings added further support to the hypothesis in mindfulness and sport literature, in which the construct of attention serves as a mechanism that can lead to enhancement in athletic performance (Mardon et al., 2016). However, it is important to note a major limitation to their study was its small sample size. Ivarsson et al. (2015) found in their mindfulness intervention study consisting of 41 young elite soccer players that attention is also an important component in decreasing the rates of sport injury with soccer players. This effect is because athletes may reduce their vulnerability to injury or re-injury if they are more attentive to caring for their injury or injury potential. This acknowledgement of attention and recognition of their limits may quicken recovery time.

Flow and Mindfulness

Numerous authors have pointed out a possible connection between dispositional mindfulness and flow states (Bernier et al., 2009; Carraca et al., 2018; Glass et al., 2019; Gooding & Gardner, 2009). For example, Bernier and colleagues (2009, p. 322) conducted research on the relationship between mindfulness and flow states on ten young adult elite swimmers using a qualitative design and found that the swimmers consistently described the experience of flow in line with nine dimensions developed by Jackson and Csikszentmihalyi (1999). Bernier et al. (2009) reported finding an “awareness and acceptance of bodily sensations” (p. 324) prior to each swimmer’s performance. Taken together, the researchers implicated there is a positive relationship between flow and the dispositional mindfulness characteristics described by Baer (2003).

Kee and Wang’s (2008) study of 182 university athletes from 23 different sports indicated that those who reported higher levels of mindfulness also had higher scores for dispositional flow and were more likely to report using PST. Measures were the Mindfulness/Mindlessness Scale, the Dispositional Flow Scale-2, and the Test of Performance Strategies (Kee & Wang, 2008). Moreover, in a study consisting of a combination of 13 nationally and internationally competing college athletes from various sports (*M* age = 21 years old), Aherne and colleagues (2011, p. 180) found that a 6-week training program incorporating mindfulness meditation exercises resulted in participants reporting an increase in mindfulness after completion. When they examined flow scores after the program completion, they found a significant correlation in global flow on the FSS-2 (i.e., total score). Despite this outcome, it is also important to note their findings suggested only partial support for a relationship between flow states after examining the nine subscales of the FSS-2. According to Marsh and Jackson

(1996), these subscales are as follows: (1) Clear Goals (the creation of a clear, understandable, and realistic goal that the athlete has set out to achieve), (2) Sense of Control (the experience and/or perception of having control in the situation or task), (3) Challenge Skill-Balance (a balance that occurs related to the athlete's acquired skill level and the current challenge the athlete is facing), (4) Action-Awareness Merging (awareness and responses to the action become "one" due to immersion in the situation), (5) Unambiguous Feedback (feedback the athlete receives immediately from the activity itself, which can then allow the athlete to learn or self-correct in the moment), (6) Concentration on Task (full attention and focus merged in the task), (7) Loss of Self-Consciousness (no longer thinking about self-judgements along with a loss of a sense of self, which allows the athlete to perform naturally), (8) Time Transformation (time feels altered, in which things feel they are going by fast, slow, or just not thought about during the task), and (9) Autotelic experience ("intrinsically rewarding experience/ the end result of being in flow") (p. 20). Only "Clear Goals" and "Sense of Control" were found to significantly affect flow (Aherne et al., 2011).

Aherne and colleagues (2011) related these findings to their small sample size and methodical limitations. Unlike Kee and Wang (2008), they used a situation-specific mindfulness measure, as opposed to a dispositional one. Aherne and colleagues pointed out that although the measures that were used were similar in that they assess mindfulness experiences, conceptually, they may capture subjectively the experience of flow differently.

Cathcart et al. (2014) found a correlation between mindfulness and flow states in a sample of 92 elite level athletes (56 males, 36 females) with an average age of 18. Sports included were "baseball, water polo, swimming, cycling, athletics, netball, men's football, soccer, kayaking, rowing, hockey, basketball, and rifle shooting" (Cathcart et al., 2014, p. 122).

Their findings showed a stronger relationship among what they described as individual and pacing sports (i.e., swimming, rowing) versus team and non-pacing sports (i.e., football, hockey). Scott-Hamilton and Schutte (2016) implemented an eight-week mindfulness program with 12 club-level athletes (M age=33.57) using measures to assess mindfulness and flow at baseline and post-intervention. Results suggested that athletes who had a larger increase in their mindfulness scores from baseline to post-intervention also demonstrated greater perceived flow (Scott-Hamilton & Schutte, 2016).

Scott-Hamilton, Schutte, and Brown (2016) found similar results in a sample of 27 cyclists. Cumulatively, the above studies provide evidence that when individuals have higher states of mindfulness, they may be more likely to experience flow. However, as this area of research is still in its infancy, the connection between mindfulness and flow states needs to be further explored with athletes that participate in a range of sports (e.g., soccer, basketball, hockey).

History of Mindfulness in Sport Theory

The origins of the concept of mindfulness date back 2500 years, predominately stemming from Buddhist traditions and Eastern religions and philosophy (Kabat-Zinn, 1990). The historical common goal of mindfulness has been to free oneself from the nature and causes of suffering (Kabat-Zinn, 1990; Xiao et al., 2017, p. 2).

In the 1970s, Kabat-Zinn brought mindfulness into the Western culture by introducing mindfulness meditation and developing the Mindfulness-Based Stress Reduction program (MBSR) (Kabat-Zinn, 1990; 1994). MBSR is a program intended to enhance an individual's overall health and well-being (Kabat-Zinn, 1990; 1994). MBSR has been found to benefit clinical and non-clinical populations (Baer, 2003; Linehan, 1993; Samuelson et al., 2007).

Kabat-Zinn trained Olympic rowers with his Mindfulness Stress Reduction Training Program in 1984, although the study remains unpublished (Baltzell & Akhtar, 2014; Kabat-Zinn, 1990). The rowers practiced mindfulness meditation independently (timeframe varied widely between two and seven weeks) utilizing tapes one to two times per day for approximately 15 minutes (Baltzell & Akhtar, 2014; Kabat-Zinn, 1994; Kabat-Zinn et al., 1985). After the Olympic competition, the rowers self-reported mindfulness meditation as having had a positive impact on their performance (Kabat-Zinn, 1994; Kabat-Zinn et al., 1985). Furthermore, one athlete, John Biglow, was part of the rowing team that implemented mindfulness practice (Kabat-Zinn, 1990). He had developed difficulties with chronic back pain due to a herniated disk in 1979 (Kabat-Zinn, 1990). Using mindfulness practice, he was able to manage the effect of his injury and become “the single sculler on the 1984 U.S. Olympic rowing team and voted the best male American sculler of the year” (Kabat-Zinn, 1990, p. 309). Additional rowers who participated in his mindfulness training were awarded medals at the games (Kabat-Zinn, 1990; 1994).

Mindfulness Training and MBSR may not have blossomed in sport psychology until recently because PST is the preferred method for performance enhancement. This preference has started to change, as 30 years of effort has failed to reliably support a PST performance enhancement effect among athletes (Gardner & Moore, 2007; Moore, 2003). Subsequently, mindfulness has become an area of sport science study. However, questions have arisen regarding the conceptualization of mindfulness and how to assess the effectiveness of a mindfulness sport intervention. In fact, mindfulness had been discussed in the literature by many scholars over the years (Kabat-Zinn, 1990; Segal et al., 2002, Shapiro & Swartz, 2000); however, according to Bishop (2002; 2004), no agreed-upon operationalized definition of mindfulness existed, and there were only descriptions of the term generated in the literature.

At the most basic level, the foundation of a sound, reliable, and valid measure is one with a strong working operational definition. Bishop (2004) noted meaningful results could not be achieved when there are questions related to construct validity and operationally defining variables. Out of this concern, he developed a model with two elements. The first element involves an awareness of emotional and cognitive processes to emotionally regulate one's mental experiences in the immediate present (Bishop, 2004). The second element involves acceptance of what is happening in the present moment and maintaining an open stance to the experience while also having a curiosity towards it (Bishop, 2004). He noted the operational definition of mindfulness fits well with prior descriptions that have been developed, such as by Kabat-Zinn (1990), Segal et al. (2002), and Shapiro and Swartz (2000).

More recently, Gardner and Moore (2012) utilized Bishop's model but added three components: nonjudging, attentional focus, and commitment (Gardner & Moore, 2012). Nonjudging can be described as not putting a label on one's internal processes, being aware of them in the moment, and just accepting them as they are (Gardner & Moore, 2012). Attentional focus can be described as focusing specifically on the task at hand, rather than thoughts, cognitions, or physiological sensations that may arise (Gardner & Moore, 2012). Lastly, commitment entails making a decision that assists in driving the athlete to strive to maintain his or her values and achieve his or her goals (Gardner & Moore, 2012). Since this theory has recently emerged in the sports literature, its underlying mechanisms may still need to be further explored.

History of Women in Sport

Historically, women in sport have faced challenges with gender stereotypes (Howarth, 1994; Park & Halt, 1993; Vertinsky, 1990). An article by Park and Halt (1993) highlights these

challenges by describing the nineteenth century as a period when it was frowned upon for a woman to engage in either a physically vigorous task or an activity that required intellectual stimulation because it would be too much of an energy drain. In fact, medical experts during this era believed that if a woman engaged in both, it could be potentially detrimental to her health (Vertinsky, 1990). Medical doctors were especially worried about a women's reproductive system and believed too much physical exertion could result in infertility. When a woman had her monthly menstrual cycle, she was considered weakened and increasingly fragile (Howarth, 1994).

Women were portrayed as delicate, non-aggressive, and docile. Therefore, participation in an athletic activity, especially activities deemed competitive, was limited due to society's opposition (Vertinsky, 1990). If a woman participated in a sport, it was one that was recreational in nature, and it was not considered competitive; it merely allowed women to get some exercise (Vertinsky, 1990). There were some clubs for women; however, the purpose of these clubs was to allow women to engage in physical activity and not to compete against one another (Park & Halt, 1993; Vertinsky, 1990). Those who did participate in competitive sports were few, and they participated in sports such as equitation, golf, swimming, and tennis (Park & Halt, 1993). Society in the early 1900s continued with such beliefs, and it was not until the 1940s that there was a shift in the thought process regarding women's abilities and energy levels.

World War II (1939-1945) can be postulated as the motivator for such change. When many men had left to serve their country during the war, women started to increasingly enter the world of work (Bell, 2008; Vertinsky, 1990). Some of the tasks required not only their cognitive abilities but physical strength as well (Bell, 2008). Contrary to prior assumptions, the women appeared to be able to handle these tasks. In addition, in 1943, after the cancellation of Major

League baseball because the men were at war, women worked to create the first professional female baseball league (Bell, 2008). These efforts later segued into the increased participation of women in sport, particularly in educational settings (Bell, 2008).

In the 1970s, there were several noteworthy changes for women and girls and athletics. The most significant change was the passage of Title IX of the Education Amendments of 1972 (20 U.S.C. §1681-§1688). According to the United States Department of Justice, Civil Rights Division (2015), this law states, “No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving Federal financial assistance” (p. 1). Since the passage of Title IX of the Education Amendments of 1972, there have been significant changes within the realm of sports (Royce et al., 2003). These changes include increased acceptance of females playing sports. The Women’s Sports Foundation (2016) was developed by Billie Jean King (a well-known female tennis competitor) in 1974 to promote social change, serve as an advocate, and fund research that promotes participation in athletics for females. Moreover, other strides have been made for female inclusion since this time, including a significant increase in female college athletics and high school athletics compared to 45-50 years ago (Olmstead, 2016).

Gender Schema Theory

As mentioned in Chapter I, the present study explored sex role based on traits of masculinity and femininity, and it is important to distinguish that sex role is not the same as biological sex. Biological sex is determined by the anatomical makeup of an individual, which may include reproductive organs and physical appearance (Bem, 1981). The literature has described sex role as a concept that is more fluid (Bem 1974; 1981; Starr & Zurbriggen, 2016). Sandra Bem (1974; 1981) described sex role as the degree to which individuals identify with that

of what they “judge to be more socially desirable” (p. 161) in relation to masculine and feminine characteristics.

Gender Schema Theory describes a phenomenon in which an individual processes information based upon life experiences that have been sex-typed by society (Bem, 1981). That is, how an individual identifies is based on culture’s prescribed definition of what it means to be a male or female (Bem, 1981). A schema can be defined as a “cognitive structure, or a network of associations that organizes and guides an individual’s perception” (Bem, 1981, p. 355).

Over the past several years, there have been challenges to sex-typing. Eagly et al. (2020) found in their meta-analytic study consisting of 16 public opinion surveys from the United States (distributed between 1946 and 2018) that women perceive themselves to be more competitive compared to decades ago. Their findings also found certain traditional traits, such as compassion, warmth, and sensitivity, tend to continue to be salient with the traditional female sex role (Eagly et al., 2020). Conversely, Eagly et al. (2020) found traits that are related to agency (i.e., aggression, dominance) are more associated with a male sex role. This contrast may be related to increased numbers of women entering the workforce and also achieving higher levels of education, which may underlie women’s feelings of an increased sense of competence (Eagly et al., 2020).

Donnelly and Twenge (2017) examined 34 samples that included 8,027 university students meta-analytically from studies between 1993 and 2012. Findings revealed there was a significant decrease in feminine sex role scores for females (Donnelly & Twenge, 2017). However, significant differences with males over this period were not found (Donnelly & Twenge, 2017). Donnelly and Twenge (2018) also conducted an expanded meta-analysis with 94 samples that included 24,801 university students and dated back to 1974. In this analysis, they

found a significant increase in androgyny in women but not in men (Donnelly & Twenge, 2017). These findings may have been a result of the changes in lifestyle today compared to the traditional feminine female in 1974 (Donnelly & Twenge, 2017). Despite these findings, the study does not examine cross-cultural differences, which may be an important consideration in future studies (Donnelly & Twenge, 2017). The Latinx community has a strong emphasis on family, which includes traditional sex roles such that they may be more likely to adhere to certain scripts or schema (i.e., machismo, marianismo) (Miville et al., 2017). Wade and Rochlen (2013) highlight in their literature review that African American males tend to adhere to the traditional masculinity characteristics more than Caucasian American males. To date, there are minimal studies that focus on marginalized populations or those of color (Starr & Zurbriggen, 2016).

In a related study including an Italian sample of lesbian, gay, and bisexual individuals, Ciliberto and Ferrari (2009) reported a higher prevalence of androgyny in participants who had reported lower levels of internalized homophobia. Miville et al. (2017) found no studies of sex-typing among queer individuals, which may be a population of interest due to their known culture of resistance towards prescriptive gender norms within society.

Gender Schema Theory encompasses aspects of developmental theories and how one assimilates sex role by various methods of learning, for example, Social Learning Theory developed by Albert Bandura and Kohlberg's Cognitive Developmental Theory of Gender (Bem, 1981). According to Social Learning Theory, learning occurs by observing others and attempting to imitate that which they perceive as the acceptable gender role or behavior they are supposed to conform to (Bandura, 1971; Bem, 1981). The theory suggests individuals are often rewarded by compliments and praise when they adhere to the norms of their gender role, while going against

the gender norm may result in being taunted, ridiculed, or punished (Bandura, 1971; Bem, 1981). Kohlberg's cognitive developmental theory of gender stated that during the first couple of years of a child's life, children differentiate themselves as either male or female (Bem, 1981; Kohlberg, 1966; Ruble et al., 2007). Sequentially, as the child continues to get older, gender identity becomes more stable, and it is recognized that gender is fixed (Halim, 2016; Kohlberg, 1966; Ruble et al., 2007). At approximately five to seven years of age, the child recognizes that wearing different outfits, putting on makeup, or engaging in certain behaviors will not alter gender (Halim, 2016; Kohlberg, 1966; Ruble et al., 2007). Since these experiences are learned at such a young age, it becomes an internal dilemma to go against what is perceived as normal or what was taught starting at a very young age. This social learning can specifically be applied to female athletes, who may attempt to maintain societal expectations of certain characteristics that entertain the traditional female ideology of femininity (Paloian, 2012). When they challenge this ideology, they are often seen as having "more masculine traits" (Paloian, 2012).

The Female Athlete and the Impact of Sex Role

With the significant increase in women playing sports and challenging the traditional female role behavior, there has been an increased acceptance of their participation. This increased participation has led to a gap in the literature, as research has been unable to keep up with all of the changes. Studies that have been conducted on sex roles with athletes have found that individuals who are more masculine and androgynous are more likely to participate in sport (Andre & Holland, 1995; Chalabaev et al., 2013). Clement-Gullotin et al. (2012) found that regardless of biological sex, there was a significant perception of sports being a "more masculine" domain in a sample of 100 Caucasian college students (48 males, 52 females) from France, 90% of whom were engaged in some type of sport. Hardin and Greer (2009) found in

their study with 340 college-age students that they still identified sports as mostly masculine, despite the rapid growth in female participation. This finding is surprising since today females can be seen playing most sports, including football (Hardin & Greer, 2009).

According to Hardin and Greer (2009) and Messner (2002), this mindset may be attributed to the popularity of male sports being watched for entertainment purposes as well as more frequently talked about in society. This preference also speaks to developmental learning theories, such as Gender Schema Theory and Social Learning Theory, because society has taught individuals at a young age what is sex-appropriate (Hardin & Greer, 2009). As this is happening, females are forced to be creative and redefine what it means to be both a female and an athlete (Markula, 1995; Ross & Shinew, 2008).

A study by Ross and Shinew (2008) found that among 14 Division one athletes (seven participated in softball, seven participated in gymnastics)

strategies to resolve the female/athlete paradox include choosing when they want to portray a feminine ideal, and supporting one another in these decisions. Playing like a (powerful) ‘girl,’ and occasionally looking like one too (in a traditional sense), may define what it means to be a sportswoman at the present time. (p. 54)

With this integration, sex role can be redefined as a phenomenon that is not static; however, it is a delicate balance of a female maintaining her female image while also being an athlete. When a female falls outside this equilibrium, she becomes at risk for discrimination and ostracized by society because she is not behaving within the “norm” (Chalabaev et al., 2013; Hermann & Vollmeyer, 2016; Krane, 2001). Taken together, most of these studies are over a decade old, which speaks to the limitations in this area to be able to fully understand what is happening presently and how much society’s worldview may or may not have changed and its

impact on the female athlete. The study by Ross and Shinenew (2008) is also important in highlighting the perception of a female's view of what is considered a masculine sport versus a feminine sport in their qualitative study. The athletes identified most of the sports that involved competition and teamwork as more masculine (i.e., football, softball, rugby) and sports that had a more graceful and ladylike appeal as more feminine (i.e., gymnastics, cheerleading, figure skating) (Paloian, 2012; Ross & Shinenew, 2008). Interestingly, the researchers also note that despite the passage of Title IX and more awareness of stereotypes, there seemed to be little change in how females categorized sports (Ross & Shinenew, 2008).

Sex Role, Mindfulness, and Team Sports

Of significance, mindfulness is emerging as a popular intervention to enhance one's performance in sport across gender; however, studies have not examined how masculine and feminine traits play a role in its implementation, especially among team sports. The type of sport may be important since team sports have been identified as "more masculine" (DiCarlo, 2016; Ross & Shinenew, 2008). Most of the literature on the implementation of mindfulness interventions for sport performance has focused on individual athletes rather than athletes from group sports. Focusing on the impact of mindfulness on group sports may be just as important, particularly since there is potential for increased distraction and unpredictability with the involvement of many people participating at once (Hussey, 2015; Yu & Zellmer-Bruhn, 2018). According to mindfulness literature, team performance relies not only on the individual's ability to be mindful but also on the collective ability of the team (Blecharz et al., 2014).

Deaner and colleagues (2012) found that among female athletes who participated in an American Time Use Survey, females were significantly more likely to choose an individual sport over a team sport. The researchers also examined data from 34 college and university

recreational sport registries and found similar results (Deaner et al., 2012). According to Colley et al. (2005), when a female chooses a sport, they tend to choose an individual sport over a team sport, which the researchers related to the stigmatization of team sports having more masculine qualities (Colley et al., 2005). These qualities may include but are not limited to behaviors such as aggression, taking charge or leadership over a situation, or strength.

With this in mind, studies also show females are more receptive to mindfulness due to being more open to emotional experiences compared to males (Rojiani et al., 2017). If this is the case, mindfulness interventions may be less effective with females who have higher traits of masculinity and who play team sports, since more masculine traits have been found to be associated with lower mindfulness (Rojiani et al., 2017). However, research is almost nonexistent in capturing how an athlete's masculine or feminine traits play a role in his or her sport performance and its relationship to mindfulness. This area needs further exploration.

Summary and Conclusion

This chapter began by providing a review of literature on stress, mindfulness, and performance and discussed relevant variables as well as theoretical underpinnings. The Transactional Theory of Stress was integrated as part of the discussion, which describes stress as an outcome due to contextual factors interconnecting individual and environmental demands (Lazarus & Folkman, 1987). The reaction to these demands may depend upon the individual's resiliencies, strengths, and ways of coping, which can play a role in the stressor's impact on the individual; thus, the situation that unfolds may depend on a complexity of factors (Lazarus & Folkman, 1987). The way individuals appraise the situation impacts the way they feel about it (i.e., anger, frustration, anxiety, excitement) (Smith & Lazarus, 1993).

In 2012, Gardner and Moore proposed that mindfulness in sport has three components: nonjudging, attentional focus, and commitment. Nonjudging can be described as not putting a label on one's internal processes, being aware of them in the moment, and just accepting them as they are (Gardner & Moore, 2012). Within the context of sports, when athletes have reported lower scores on mindfulness measures, the athletes also had higher levels of anxiety and perceived stress (Scott-Hamilton & Brown, 2016; Scott-Hamilton & Schutte, 2016). Recent studies have also shown preliminary evidence that when individuals have higher states of mindfulness, they may be more likely to experience flow (Aherne et al., 2011; Bernier et al., 2009; Cathcart et al., 2014; Cote et al., 2019; Gooding & Gardner, 2009; Kee & Wang, 2008; Scott-Hamilton & Schutte, 2014). As this area of research is still in its infancy stages, the connection between mindfulness and flow states needs to be further explored with athletes that participate in a range of sports (i.e., recreational, elite, novice). Mindfulness is emerging as a popular intervention to use to enhance one's performance in sport across gender; however, studies have not examined how masculine and feminine sex role traits play a role in its implementation, especially among team sports. This factor may be important since team sports have been identified as "more masculine" (Ross & Shinew, 2008).

The second section of the chapter discussed the history of women in sport and provided an overview of sex role and its impact on female athletes. The section discussed the significant increase in women playing sports and how females are challenging the traditional female role behavior, with some increased acceptance towards their participation. Despite this increased participation, the literature has not been able to keep up with all of the changes. Interestingly, of the emerged literature, researchers note that despite the passage of Title IX and a greater awareness of stereotypes, there seems to be little change in how females categorize sports in line

with sex role behavior (Ross & Shiner, 2008). Another finding was that many of these studies are over a decade old. Lastly, the chapter noted that research is nonexistent in capturing how a female athlete's masculine or feminine traits play a role in her sport performance and its relationship to mindfulness.

Chapter III

Methodology

This chapter will provide a description of the methodology used for this study. The research design, setting, participant selection, conduct of the study, and research procedures will be discussed. Furthermore, descriptions of the measurement tools and their reliability and validity are provided. Lastly, the research questions and hypotheses are outlined.

Research Design

The study explored the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in female athletes employing multivariate and correlational analyses. Participants completed information about demographics and five self-report measures. The self-report measures were counterbalanced through a method called Randomization in Qualtrics. Counterbalancing can assist in preventing potential and unintentional bias that can happen when subjects favor one condition better than another, simply because it was experienced in a particular order (i.e., first, second, last) (Witte & Witte, 2013). Therefore, the self-report questionnaires were provided to the participants in random order.

Setting

The study was conducted online through the use of Qualtrics online survey software. Participants completed the study instruments at their convenience at a location of their choice on any device connected to the internet.

Participants

The sample consisted of female recreational, collegiate, and semi-elite athletes who were 18 years of age or older. Participants included in this study reported residing in the United States. In addition, athletes reported engaging in at least one of the team sports that is recognized by the International Olympic Committee (IOC). Lastly, rather than focusing exclusively on either

recreational or elite athletes, Kline (2015) noted it is preferable to use a heterogeneous population, as a homogeneous population can result in lower construct loadings and variance.

Procedures

IRB approval was obtained, and data was collected using a secure Qualtrics Platform. The study recruited participants through Amazon Mechanical Turk (M-Turk; Berinsky et al., 2012). This resource is an application that provides outsourcing services by using an advanced technological interface that generates participants (i.e., workers) from a large selection of individuals throughout the world to complete hits (i.e., tasks) in exchange for payment that is determined by the requester (i.e., the researcher) (Berinsky et al., 2012). The application has settings to help decide and specify the type of participants that are appropriate for the study (Berinsky et al., 2012). These features ensured participants met these requirements to obtain high-quality results (Berinsky et al., 2012). For the purposes of this study, only Master Mturk users were eligible to participate, that is, workers who statistically have met criteria that consistently demonstrate that they engage in high work performance (Berinsky et al., 2012).

MTurk allows a researcher to pay a nominal advertising fee in exchange for recruiting participants for surveys. The fees help cover small monetary payments (i.e., approximately \$1.20 for a survey lasting 25 minutes, depending on the complexity of the study design) that Amazon.com provides individuals for participating in the study through their Mechanical Turk website. The participants were able to receive these small payments while retaining their anonymity to the research study. Once Mechanical Turk participants clicked on the study financial incentives via Mechanical Turk were explained. The validity of using Mechanical Turk to recruit participants can be found in an article by Berinsky et al. (2012). The authors noted that recruiting participants through M-Turk has been found to be better than using convenience

sampling methods due to its ability to generalize to a wider sample, therefore creating a better representation of the intended recruitment of the population within the United States (Berinsky et al., 2012).

I explained the research study in written form (via a letter of solicitation) to participants, which included the purpose, the approximate amount of time (25 minutes) to complete the questions, and the voluntary nature of the study. Participants were informed in the letter of solicitation that they could drop out of the study at any time. Furthermore, a participant was not able to access the study unless they certified that they were 18 years old or older and had read about what the study encompassed. They were asked to complete a demographic questionnaire (APPENDIX C), Cohen's Perceived Stress Scale (CPSS; Cohen & Williamson, 1988), Bem Sex Role-Short Form (BSRI-short form; Bem, 1981), Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003), Sport and Anxiety Scale (SAS-2; Smith et al., 2006), and the Short Disposition Flow Scale (DFS-2; Jackson & Eklund, 2002). The study took approximately 25 minutes to complete. Time to completion was determined based on five preliminary trials that were conducted with five female volunteers who were not part of the study. Once all responses and data were collected, they were analyzed and checked for accuracy using IBM SPSS Statistics, Version 24. First, the data were screened for any outliers or missing data. Data were evaluated for assumptions of linearity and homoscedasticity. Third, the data were inspected for any skewness and kurtosis. According to Field (2013), any value in the SPSS skewness data over 1.00 is considered skewed. The next step was to look for any multicollinearity and singularity in the data. Lastly, the hypotheses and research questions were examined through the use of multivariate and correlational analyses.

Measurement Tools

As noted above, the instruments used in this study are a demographic form (Appendix C, and the following instruments, for which the authors had all given permission to use: Cohen's Perceived Stress Scale (CPSS; Cohen & Williamson, 1988), Bem Sex Role-Short Form (BSRI-short form; Bem, 1981), Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003), Sport and Anxiety Scale (SAS-2; Smith et al., 2006), and the Short Disposition Flow Scale (DFS-2; Jackson & Eklund, 2002).

Perceived Stress Scale

Cohen's Perceived Stress Scale is a widely used instrument that consists of one construct. The scale has been applied in many different populations and assesses a person's perception of stress in relation to their environment, such as stressful situations. Measuring stress in general helps to encapsulate stressors both on and off the field, which may all play a role in an athlete's overall performance. There are ten questions that are asked on a 5-point Likert Scale (i.e., 0=Never, 5=Very Often). Sample items include, "In the last month, how often have you been upset because of something that happened unexpectedly," "In the last month, how often have you felt that you were unable to control the important things in your life," and "In the last month, how often have you felt that you were on top of things?" Cohen and Williamson (1988) posited that the questions are geared to be general in nature rather than specific, so the questionnaire can be used with a range of populations. The Scale was originally found to have sound psychometric properties in both factorial validity and internal consistency ($\alpha=.78$) (Cohen & Williamson, 1988), and since its publication, numerous other studies have also been conducted offering evidence to its reliability. Lee (2012) conducted a systematic review of 19 studies that examined the reliability and validity of Cohen's Perceived Stress Scale. Her findings supported that it is an

acceptable measure and noted that it was superior to the original 14-item scale and fared much better than the 4-item questionnaire (Lee, 2012). Each of the 12 articles she found that used PSS-10 to assess perceived stress had internal consistency above .70 (Lee, 2012). Moreover, Chiu et al. (2016) examined the PSS-10 among a sample of 359 university athletes and 242 non-athletes. They found internal consistency for the scale's two factors: perceived stress ($\alpha=.81$) and counter stress ($\alpha=.71$). They concluded that the measure could be useful in both sport and non-sport contexts (Chiu et al., 2016).

Bem Sex Role Inventory-short form (BSRI-short form)

The BSRI-short form provides a brief measure of sex role characteristics. The scale includes 30 questions that are asked on a 7-point Likert Scale (i.e., 1=Never or Almost Never True – 7=Always or Almost Always True). The measure is derived of ten stereotypically feminine traits (i.e., compassionate, gentle), ten stereotypically masculine traits (i.e., aggressive, dominant), and ten filler or neutral items (i.e., reliable, truthful) (Bem, 1981a). The content of the BSRI-short form was taken from the original BSRI, which contained 60 items. According to Bem (1981a), items were removed to increase internal consistency and to create a more psychometrically sound measure. Her validation study of the BSRI-short inventory revealed higher internal consistency compared to the original measure (ranged from $\alpha=.75$ to $\alpha=.90$). The BSRI-short form has been validated on a range of samples since its development (Campbell et al., 1997; Choi et al., 2009; Holt & Ellis, 1998). Moreover, Fantayne et al. (2000) found internal consistency (masculinity: $\alpha=.80$, femininity: $\alpha=.88$) in their validity study of the French BSRI-short form with 458 adolescents that identified with either sport participation or non-sports participation. Their study suggested sports participation was associated with higher masculine scores. Clement-Guilliton and Fontayne (2011) also found in their study of 64 French university

students that participants who played sports competitively scored higher on masculine characteristics of the BSRI-short form.

In addition to scale scores, individuals can be categorized into four categories based on computed raw scores for masculinity and femininity that were determined by Bem's median split method (Bem, 1981a). The categories include (1) Androgynous (masculinity is equal to or greater than 4.9 and femininity is equal to or greater than 4.9), (2) Undifferentiated (masculinity is equal to or below 4.8 and femininity is equal or below 4.8), (3) Masculine (masculinity is equal to or greater than 4.9 and femininity is equal to or less than 4.8), and (4) Feminine (masculinity is equal to or less than 4.8, and femininity is equal to or greater than 4.9).

Mindfulness Attention Awareness Scale (MAAS)

The MAAS provides a brief measure of dispositional mindfulness, that is, the extent to which individuals experience "open and receptive awareness of and attention to what is happening in the present" (Brown & Ryan, 2003, p. 824). The scale includes 15 questions that are asked on a 6-point Likert Scale (i.e., 1=Almost Always – 6= Almost Never). Sample items of the MAAS include "I find it difficult to stay focused on what's happening in the present," "It seems I am running on 'automatic,' without much awareness of what I am doing," and "I find myself pre-occupied with the future or the past." Brown and Ryan (2003) developed the MAAS and found it to have good psychometric properties (ranged from $\alpha=.80$ to $\alpha=.90$). Using 711 college students, Mackillop and Anderson (2007) conducted a confirmatory factor analysis on the MAAS to assess its psychometric properties further and found the measure to support individuals with novice-level meditation experience " $(\alpha=0.89$; RMR=0.082; CFI=0.914; RMSEA=0.071; CI= 0.065–0.079)" (p. 291). Some of the sports studies that have used the MAAS include Gross (2016; "22 NCAA Division III female basketball players," p. 2), Goodman et al. (2014; "26

NCAA Division 1 male varsity college athletes,” p. 342), Moen and colleagues (2016; 382 “elite junior athletes” from a range of sports, p. 8), and JeKauc et al. (2017; 46 college students majoring in sport science), and Quinones-Paredes (2014; “13 college soccer players,” p. 23. Moreover, Thienot and colleagues (2014) used this measure in their development of the first Mindfulness Inventory for Sport.

Short Disposition Flow Scale (DFS-2)

The DFS-2 provides a brief measure of flow consisting of nine items that were extracted from the longer version of the DFS-2 (Jackson & Eklund, 2002). The measure utilizes a dimensional perspective (i.e., an individual’s tendency to experience flow states while performing a sport) and assesses flow on a 5-point Likert scale (1=never; 2=always). Sample items include “I have a strong sense of what I want to do,” “I do things spontaneously and automatically without having to think,” and “I have a feeling of total control over what I am doing.” Jackson and Elkund (2002) had conducted preliminary analyses and found the DFS-2 to have internal consistency ($\alpha = .81$ and $\alpha = .74$) and factorial validity. Their 2008 study also supports the measured psychometric properties (Jackson et al., 2008). The following are the results of their study: “for the item-identification sample (embedded $\chi^2 = 66.89$, $df = 27$; CFI = .99; NNFI = .98; RMSEA = .05; SRMR = .03) and the cross-validation sample (embedded $\chi^2 = 127.87$, $df = 27$; CFI = .96; NNFI = .95; RMSEA = .07; SRMR = .04) demonstrated a good fit of the hypothesized models to the data” (Jackson et al., 2008, p. 568). Correlation with the Long Dispositional flow scale was found to be “(range $r = .66-.83$; mean $r = .76$)” (Jackson et al., 2008, p. 573).

Sport Anxiety Scale (SAS-2)

A total score was derived from three constructs (the worry, somatic anxiety, and concentration subscales) of the SAS-2 to assess an athlete's overall anxiety prior to engaging in their sport and during competition (Smith et al., 2006). Each construct consisted of five items, rated from 1 (*not at all*) to 4 (*very much*). Sample items from the worry subscale include "I worry that I won't play well" and "I worry that I will let others down." Sample items from the concentration subscale include "I lose focus on the game" and "I cannot think clearly during the game." Sample items from the somatic anxiety subscale include "My body feels tense" and "My muscles feel shaky." Smith and colleagues (2006) assessed the SAS-2's effectiveness with college students and found strong factorial validity " $\chi^2 = 315.15$, $df = 89$; CFI = .95; NNFI = .94; RMSEA = .066" (p. 498). and good internal consistency for each of the constructs (.91 for worry, .84 for Concentration Disruption, .89 for somatic anxiety, and .91 for the total score) (Smith et al., 2006).

Statistical Power

An *a priori* power analysis was conducted for each analysis using G*Power 3.1 software. This statistical software is used to determine an adequate sample size and assist in reducing the chance of Type II error, which is failure to detect an effect when it is present. Another way of describing a Type II error is retaining the null hypothesis when it should be rejected. This error can occur if the sample size is too small. Detailed information on each planned statistical analysis with each research question and hypothesis can be found below.

Hypotheses and Research Questions

The following are the research questions, hypotheses, and statistical analysis for each:

Research Question 1: What is the relationship between mindfulness and flow in female athletes?

Hypothesis 1: Female athletes who score higher on mindfulness will also score higher on flow.

Power Analysis for a linear regression was conducted in G-Power to determine sample size using an alpha of 0.05, a power of .80, and a medium effect size of 0.15. Based on the aforementioned assumptions, the desired sample is 55.

Criterion (dependent) variable: flow.

Predictor (independent) variable: mindfulness.

Research Question 2: Is there a relationship between sex role and how team sport female athletes experience flow, mindfulness, perceived stress, and anxiety?

Hypothesis 2: Team sport female athletes with an androgynous sex role will have higher mean scores on mindfulness and flow and report that they experience lower perceived stress and anxiety than will masculine, feminine, and undifferentiated female athletes.

A Power Analysis for a MANOVA with four groups and four response variables was conducted in G-Power to determine the sample size using an alpha of 0.05, a power of .80, and a medium effect size of 0.25. Cohen's f^2 was the criteria used for determining the effect size (Cohen, 1988). Based on the aforementioned assumptions, the desired sample is 28. If the MANOVA yields significant results, univariate ANOVAs will be conducted independently for each dependent variable. Power Analysis for the univariate ANOVAs with four groups was conducted in G-Power to determine the sample size using an alpha of 0.05, a power of .80, and a medium effect size of 0.25. Based on the assumptions, the desired sample is 180.

Criterion (dependent) variables: flow, mindfulness, perceived stress, and anxiety.

Predictor (independent) variables: sex role (masculine, feminine, androgynous, undifferentiated).

Summary

The study explored the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in team sport female athletes. This chapter provided information regarding the methodology used. The research design, setting, participant selection, conduct of the study, and research procedures were discussed. Furthermore, descriptions of the measurement tools and their reliability and validity were provided. Lastly, the research questions and hypotheses were outlined along with the corresponding power analysis and statistical plan.

Chapter IV

Results

The purpose of this study was to explore the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in team sport female athletes. This chapter will outline the statistical procedures and results. Data exploration and evaluation, preliminary analyses, a demographic summary of the sample, and primary analyses related to each research question will be discussed.

A total of 317 participants started the survey through Amazon's Mechanical Turk (Mturk), but 132 were immediately excluded due to not meeting the criteria for the study (i.e., gender, participation in a team sport, residing in the United States). One hundred and eighty-five participants were included in the final analyses. All analyses used SPSS Version 27. Significance was determined by the $p < .05$ criterion.

Preliminary Analyses

Prior to conducting the main analyses, data were screened to ensure no data was missing. No missing data was found. Next, all variables in the analysis were evaluated to ensure that the data met statistical assumptions (e.g., normality). The screening included examining continuous variable items through the mean to standard deviation ratio as well as an examination of standardized skewness and kurtosis values. Kline (2010) indicates that skewness and kurtosis values should fall between -2 and +2 to support approximately normal distributions. All the variables of interest fell in this threshold, indicating that the assumption of normality was met for the sample.

Sample Description

Participants in the final sample were between 18 and 65 years old ($M = 33.49$, $SD = 8.75$). One hundred percent identified as female ($n = 185$) and lived within the United States as per the inclusion criteria. The majority of respondents identified as White/Caucasian (58.4%), followed by Black/African American (20%), Asian or Pacific Islander (17.3%), Hispanic/Latino (5.4%), Biracial/Multiracial (2.2%), and Native American (4.3%).

Thirty-nine and a half percent reported that they participate in Division I athletics ($n=73$), 30.8% percent in Division II athletics ($n=57$), 13.5% in Division III athletics ($n=25$), 8.6% in a club or organization ($n=16$), and 7.6% ($n=14$) in other. The distribution of sports was 38.9% basketball ($n=72$), 48.1% soccer ($n=89$), 14.1% hockey ($n=26$), 2.7% rowing ($n=5$), 16.2% football ($n= 30$), 25.4% volleyball ($n= 47$), 1.6% hockey ($n=3$), 7% softball ($n=13$), and 8.6% track and field ($n= 16$). Participants were able to select more than one sport if it applied to them.

Participants reported using the following techniques when playing their sport: 49.2% mindfulness ($n=91$), 44.9% Mindfulness, Acceptance, and Commitment (MAC) ($n= 83$), 33% self-talk ($n= 61$), 24.9% Mental Rehearsal ($n= 46$), 48.1% goal-setting ($n= 89$), 13% thought-stopping ($n= 24$), 4.9% do not use any ($n= 9$) and .5% used other ($n=1$). Participants, on average, used these techniques $M= 5.37$ days per week and for $M=9.23$ years. Sixty-nine percent of participants reported that they apply these techniques in other areas of their life ($n= 129$), 12.4% reported they did not ($n= 23$), and 17.8% reported sometimes ($n= 33$).

Reliability

Measures were checked for reliability using Cronbach's alpha, which is a measure that checks for internal consistency. All of the measures used in this study had computed Cronbach's alphas greater than .76, with the exception of the Perceived Stress Scale. The Perceived Stress

Scale's reliability was $\alpha = .67$. Therefore, the statistical findings of the Perceived Stress Scale must be interpreted with a level of caution. All other measures were found to be sufficiently reliable. See Table 1 below.

Table 1
Reliability Check using Cronbach's Alpha for Study Scales

<u>Scale</u>	<u>Number of Items</u>	<u>Cronbach's Alpha</u>
MAAS	15	.96
DFS-2	36	.95
SAS	15	.96
BSRI: Masculine	10	.86
BSRI: Feminine	10	.88
PSS	10	.67

Table 2
Descriptive Statistics and Correlations for Study Variables

<u>Variable</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
1. Perceived Stress	185	1.80	0.61	—					
2. Mindfulness	185	3.90	1.18	-0.29**	—				
3. Flow	185	3.73	0.59	-0.04	0.35**	—			
4. Anxiety	185	2.64	0.85	0.59**	-0.19*	0.14	—		
5. Masculinity	185	5.13	0.97	0.08	0.19**	0.59**	0.39**	—	
6. Femininity	185	5.40	0.93	-0.16**	0.27**	0.61**	0.14	0.68**	—

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Primary Analyses

The first research question asked, “what is the relationship between mindfulness and flow in female athletes?” It was hypothesized that female athletes who score higher on mindfulness would also score higher on flow. This hypothesis was tested with a bivariate linear regression. In

the analysis, mindfulness served as the predictor (independent variable), and flow was the dependent variable. The linear regression showed a positive and significant association between mindfulness and flow ($r(183) = .35, p < .001$). These findings suggest athletes with a greater degree of mindfulness may experience a higher degree of flow.

The second research question asked, “Is there a relationship between sex role and how team sport female athletes experience flow, mindfulness, perceived stress, and anxiety?” It was hypothesized that team sport female athletes with an androgynous sex role would have higher mean scores on mindfulness and flow and report that they experience lower perceived stress and anxiety than masculine, feminine, and undifferentiated female athletes. This hypothesis was tested using a MANOVA, with sex role (masculine, feminine, androgynous, undifferentiated) as the predictor (independent variable) and flow, mindfulness, perceived stress, and anxiety as the criterion (dependent) variables. The findings of the overall MANOVA were statistically significant, indicating that there were collective differences between the sex role groups: Wilks’s Lambda = .027, $F(4, 178) = 8.50, p < .001, \eta^2 = .97$. Analyses of variance (ANOVA) on each dependent variable were conducted as follow-up tests to the MANOVA. There was a significant difference in scores by sex role for flow, $F(3, 185) = 25.07, p < .001, \eta^2 = .29$; perceived stress, $F(3, 185) = 4.28, p < .001, \eta^2 = .066$; and anxiety, $F(3, 185) = 7.19, p < .001, \eta^2 = .106$. There was not a significant difference in mindfulness by sex role, $F(3, 185) = 2.94, p = .096, \eta^2 = .034$. This finding was contrary to the hypothesis.

Using Tukey HSD, each ANOVA was tested at the .05 level. Post Hoc Analyses were conducted for each significant ANOVA (flow, perceived stress, and anxiety) using Multiple Comparisons. Post-hoc analyses for flow showed significantly higher scores for those with an androgynous sex role compared to an undifferentiated sex role (M difference = .78, $p < .001$).

Flow scores for androgynous sex role were also significantly higher compared to feminine sex role groups (M difference= .35, $p < .001$). The undifferentiated sex role group scores were significantly lower than androgynous, masculine, and feminine sex role for flow. Perceived stress scores were significantly higher for those with an androgynous sex role compared to those with a feminine sex role (M difference= .42, $p < .001$). Perceived stress scores were higher for those with an undifferentiated sex role compared to feminine sex role (M difference= .53, $p < .001$). The univariate ANOVA for anxiety was significantly higher for androgynous sex role compared to undifferentiated sex role (M difference= .51, $p < .001$). Anxiety was also significantly higher for androgynous sex role compared to feminine sex role (M difference= .70, $p < .001$). Those with a feminine sex role had significantly lower scores on perceived stress in comparison to the androgynous and undifferentiated groups. Androgynous sex role tended to have the highest scores for flow, perceived stress, and anxiety. The results also suggest team sport female athletes with an androgynous sex role have higher flow scores compared to those with masculine, feminine, and undifferentiated sex roles. Table 3 presents the means, standard deviations, and one-way analyses of variance in sex role and flow, anxiety, and perceived stress. Table 4 shows the Post-Hoc comparison results.

Table 3
Means, Standard Deviations, and One-Way Analyses of Variance in Sex Role and Flow, Anxiety, and Perceived Stress

Measure	Sex Role		$F(3, 185)$	η^2
	M	SD		
Flow	3.74	0.59	25.07	0.29
Anxiety	2.64	0.85	7.19	0.11
Perceived Stress	1.80	0.61	4.28	0.01

*** $p < .001$.

Table 4*Post Hoc Tests: Multiple Comparisons Following Significant ANOVAs by Sex Role*

Tukey HSD

Dependent Variable	BSRI Sex Role	BSRI Sex Role	Mean Difference	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Flow Total	Androgynous	Undifferentiated	.78*	.09	.000	.55	1.02
		Masculine	.28	.16	.291	-.13	.69
		Feminine	.35*	.12	.015	.05	.65
	Undifferentiated	Masculine	-.50*	.17	.019	-.94	-.06
		Feminine	-.44*	.13	.005	-.77	-.10
	Masculine	Feminine	.07	.18	.984	-.41	.54
Perceived Stress Total	Androgynous	Undifferentiated	-.11	.11	.731	-.39	.17
		Masculine	-.09	.19	.967	-.57	.40
		Feminine	.42*	.14	.013	.06	.77
	Undifferentiated	Masculine	.02	.20	.999	-.50	.55
		Feminine	.53*	.15	.004	.13	.93
	Masculine	Feminine	.50	.22	.098	-.06	1.07
Anxiety Total	Androgynous	Undifferentiated	.51*	.15	.004	.13	.90
		Masculine	.25	.26	.757	-.41	.92
		Feminine	.70*	.19	.001	.22	1.19
	Undifferentiated	Masculine	-.26	.27	.786	-.97	.46
		Feminine	.19	.21	.796	-.35	.74
	Masculine	Feminine	.45	.30	.432	-.32	1.22

Based on observed means.

The error term is Mean Square(Error) = .66.

*. The mean difference is significant at the .05 level.

CHAPTER V

Discussion

The purpose of this study was to explore the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in team sport female athletes. The study addressed the gaps in sport and mindfulness literature in understanding the relationship between sex role and type of athletic activity (i.e., team sports). Specifically, the study was designed to improve understanding how traits of masculinity or femininity play a role in sport performance, mindfulness, flow, and anxiety among female team athletes. Analysis of the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in female athletes involved multivariate and correlational analyses. This chapter includes an interpretation of the findings in relation to the findings of previous literature. The chapter also includes a discussion of study limitations, clinical implications, and directions for future research.

Summary of Results and Interpretation of Findings

Since the passage of Title IX, the Education Amendments Act of 1972, which provides equal opportunity for individuals regardless of biological sex, there have been significant changes within the realm of sports (Royce et al., 2003). Researchers had not fully examined and understood the cultural shift over the past 45-50 years associated with women playing “men’s sports” (i.e., football, soccer) and men playing sports characterized as “feminine” (i.e., gymnastics, cheerleading) (Chalabaev et al., 2013; Hively & El Alayli, 2014; Olmstead, 2016). Research has been almost nonexistent on how athletes’ traditionally masculine traits (i.e., assertiveness, competitiveness, aggressiveness; Bem, 1981) or traditionally feminine traits (i.e., gentleness, sensitivity, compassion; Bem, 1981) play a role in their sport performance and its relationship to mindfulness. Since more masculine traits have been found to be associated with lower mindfulness (Rojiani et al., 2017), it has been presumed that females with higher levels of

masculine traits will have more difficulties with mindfulness (Rojiani et al., 2017). The present study was designed to better understand the relationship between masculinity, femininity, mindfulness, perceived stress, anxiety, and flow in female athletes to contribute to an understanding of the topic.

The first research question was, “what is the relationship between mindfulness and flow in female athletes?” It was hypothesized that female athletes who score higher on mindfulness would also score higher on flow. Analysis revealed a positive and significant association between mindfulness and flow, indicating athletes with a greater degree of mindfulness may experience a higher degree of flow. The results from the study show a positive and significant association between mindfulness and flow, which aligns with previous literature that higher mindfulness scores are more likely associated with higher levels of flow (Kee & Wang, 2008; Scott-Hamilton and Schutte, 2016). For example, mindfulness and flow literature, such as the studies of Scott-Hamilton and Schutte (2016), Kee and Wang (2008), and Bernier and colleagues (2000), report similar findings. Overall, these results of the present study confirm the connection between mindfulness and flow revealed in previous studies. Additionally, the results contribute to the literature by adding knowledge that mindfulness and flow are positively and significantly related in female team athletes who participate in a range of sports (i.e., recreational, elite, novice). It is important to note that the results do not suggest that there is a causal connection between the two phenomena; that is, despite the findings indicating that mindfulness improves performance, it is not clear that a flow state results from a mindfulness induction or has the same impact on performance.

The second research question asked, “is there a relationship between sex role and how team sport female athletes experience flow, mindfulness, perceived stress, and anxiety?” The

findings of the overall MANOVA were statistically significant, indicating that there were collective differences between the sex role groups and their relationship to flow, perceived stress, and anxiety. Contrary to the hypothesis, there was no significant relationship between sex role and mindfulness.

According to Martin (2017), “androgyny has never been fully and adequately tested; in particular, little attention has been paid to investigating whether flexibility in gender behavior leads to improved mental health” (Martin et al., 2017, p. 592). There was a lack of research that explored these hypothesized changes and their potential connection to female sport performance. The present study was designed to address these gaps and specifically examine the relationship between androgynous sex role and performance-related variables. This focus is important to know because over the past years there have been challenges to sex-typing, which was highlighted in Eagly and colleagues (2020) and Donnelly and Twenge’s (2017) studies. These challenges to sex-typing made it necessary to include sex role. The present study adds to the literature in the finding that team sport female athletes with a higher degree of both masculine and feminine traits (i.e., those with androgynous sex roles) have higher flow scores compared to females who may fit the more traditional sex role or those with a higher degree of masculine traits. It also suggests that female team athletes with an androgynous sex role may experience a higher degree of flow than those with a masculine, feminine, or undifferentiated sex role.

An unexpected finding was that female team athletes with an androgynous sex role appeared to have higher levels of anxiety and perceived stress compared to those with a feminine or undifferentiated sex role. This finding does not align with prior findings that having an androgynous sex role can serve as a protective factor for psychological stress (Bem, 1974; Bem & Lenney, 1976; DiDonato et al., 2012; Gillis & Connell, 1989; Martin et al., 2017; Paulhus &

Martin, 1988). The results did not provide preliminary evidence that having more androgynous traits has a positive relationship for the female athlete aside from the association of higher flow scores. Overall, the results reveal female team athletes with an androgynous sex role may experience a higher degree of flow than those with a masculine, feminine, or undifferentiated sex role.

When it comes to sports in general, there can be many variables at play. In particular, the reaction to stressors (i.e., heightening or lessening anxiety) can involve a combination of the athletes' personality characteristics combined with resiliencies, strengths, and ways of coping, which can all play a role in an athlete's anxiety or perceived stress (Lazarus & Folkman, 1987). This explanation is consistent with the Transactional Theory of Stress, which holds that an individual's reaction to the situation depends upon their resiliency as a function of their coping strengths (Lazarus & Folkman, 1987). The Yerkes Dodson Inverted-U theory also suggests that it is a goal for an athlete to achieve an ideal threshold of optimal arousal, even in the form of anxiety, for the athlete to play their best. That is, an athlete may benefit from experiencing a certain level of anxiety or perceived stress. Mellalieu and colleagues (2009) noted a level of anxiety up to a certain point could serve as a motivator for performance.

Despite this explanation, the higher scores of anxiety and perceived stress for those with an androgynous sex role should be interpreted with caution when looking at the relationship between flow and mindfulness for performance enhancement. This warning is because the findings of past studies, including those of Gustafsson and colleagues (2015) and Surujlal and colleagues (2013), revealed that mindfulness serves as a moderator to stress and anxiety, which in turn was helpful to the athletes playing their sport. However, of importance and significant to adding to the literature is that the overall findings of the present study suggest that female team

athletes in general can benefit from using mindfulness due to its significant positive association with flow. Flow has been frequently linked in prior research with enhanced performance and as an effective coping strategy in mitigating stress, anxiety, and other negative psychological factors that have been known to hinder performance if severe. This is also an important finding because there has been an increase in women playing sports. Prior studies of sex role traits in athletes have suggested that individuals who are more masculine and androgynous are more likely to participate in sport (Andre & Holland, 1995; Chalabaev et al., 2013). The present study shows that there is an association between higher degrees of both masculine and feminine traits (i.e., androgyny) and higher flow scores, which may positively affect sport performance.

Clinical Implications

This study provides a better understanding of the connection between sex role, mindfulness, and performance-related variables within the female team athlete subgroup and provides the preliminary groundwork for further studies of mindfulness in sport and its relationship to enhancing performance in female athletes. Findings support prior suggestions that incorporating mindfulness interventions can potentially serve as a protective factor for psychological stress (Bem, 1974; Bem & Lenney, 1976; DiDonato et al., 2012; Gillis & Connell, 1989; Martin et al., 2017; Paulhus & Martin, 1988). Naturally, when there are more manageable levels of anxiety and perceived stress, an athlete is less susceptible to factors that can hinder performance (i.e., external everyday stressors). This effect can contribute to the athlete cultivating a greater sense of focus on their sport, acquiring a competitive edge, building self-confidence, increasing enjoyment, and building mental toughness (Biegal et al., 2018; Saltzman, 2018). The overall findings suggested that female team athletes at any experience level can

benefit from incorporating mindfulness into their practice to assist with performance enhancement and serve as a buffer to stress and anxiety.

Limitations

While the study was designed to address gaps in the sport psychology literature, it is important to note there are limitations to the study. First, an ideal sample would be recruited directly from various competitive teams throughout the United States, which would ensure that the participants are actually engaged in competitive sport, rather than through online means where individuals are paid to take surveys. The study is also unable to distinguish between athletes at different levels of performance. Due to these limitations, there was no way to confirm participants' enrollment in their selected sport and/or level of participation.

Additionally, this study was retrospective in nature; that is, answering questions about psychological and performance-related experiences using a Likert scale format. Having several Likert scale measures could have had an impact on a participant's motivation with answering questions despite the results passing data screening and statistical assumptions (i.e., normality). Participants were also not asked to participate in the study immediately right before, during, or after participation in their sport. Rather, participants were asked to take the study at their own convenience. These factors could have played a role in the low Cronbach's alpha value for the Perceived Stress Scale, which may have resulted in this study's findings that were inconsistent with prior research. Another consideration is that the Perceived Stress Scale was designed to address a person's perception of stress in relation to their environment rather than their specific sport. The COVID-19 pandemic could have been a confounding variable in the results as a potential stressor. Another limitation involved the self-report nature of the instrument. Although Berinsky et al. (2012) found using Mechanical Turk to recruit participants was a reliable way and

better than using convenience sampling methods due to its ability to generalize to a wider sample, it is not possible to know for sure who is taking the surveys, or whether they are answering honestly and putting forth their best effort. Since the participants were paid to take the surveys, participants may have been motivated to complete studies quickly to make the most of their time. It is unclear whether this is an actual limitation; however, it is something to consider when interpreting these results. The study is also limited by a mono-method bias since there is only a single type of measure that is used. Because the study employed a correlational design, causation cannot be inferred. Lastly, the study consisted of women of a wide range of ages; having a more narrow age selection may produce different results.

Directions for Future Research

Future studies may incorporate a mixed-methods approach that would incorporate a qualitative portion, which can help explain the quantitative results. A mixed-methods approach could yield a more comprehensive understanding of the relationship between sex role, mindfulness, and flow in female team athletes. Qualitative studies may assist with understanding this relationship in more depth, based on participants' own interpretation of their experiences, which may help explain the relationships between androgynous sex role and psychological factors (i.e., anxiety and perceived stress). Similar studies involving men within a sport context may also be beneficial since including sex role as a variable is an area that has not been explored with male athletes. Research on sex role and mindfulness specifically is also recommended because this relationship was not significant in the present study, which was an unexpected finding. The rationale for further exploration is related to this study having a larger pool of those with an androgynous sex role compared to other sex roles. Those with a masculine sex role, in particular, had the smallest sample size, although, collectively, there were significant differences

between sex role and the other variables. Taken together, a larger overall sample could potentially balance any possible confounding variables that were not part of the study.

Confounding variables could include but are not limited to the COVID-19 pandemic, the time at which the participants decided to respond to the study, situational stress of the participant(s) at that time, and variables that may have been unknown to the researcher. Any of these variables also may have led to this unexpected result with mindfulness.

Although this study was designed to address the gap on the connections between sex role, mindfulness, flow, anxiety, stress, and sport performance, literature on these connections and type of athletic activity is still lacking. This gap is because past literature had suggested that athletes tended to identify most sports that involved competition and teamwork as more masculine (i.e., football, softball, soccer, and rugby) and sports that had a more graceful and ladylike appeal as more feminine (i.e., gymnastics, cheerleading, and figure skating) (Paloian, 2012; Ross & Shinew, 2008). However, this perception has changed with the increased acceptance of females playing sports and the cultural shift of having a more positive view of women playing sport. This study was a mix of various sports, so there may have been interaction effects that were unseen because the athletes studied could have had a mix of sex role traits that were dependent on their sport. Therefore, more research is recommended on these connections, specifically looking at sex role in different sports and types of athletic activities. A study that focuses on specific sports, as opposed to several sports, as in the present study, may provide a different outcome when examining sex role by type of sport.

Another consideration for future research is expanding research to wider pools of athletes. Most studies have included only college athletes, and that sub-group only makes up a small part of the athlete population (Goodman, 2014). The research would be more

comprehensive if researchers were to include athletes from sports at recreational, semi-elite, and elite levels. Specifically, future studies should include comparisons by age or generational cohort. Androgyny, for example, is much more accepted in younger women and even men than it was in earlier generations. Future studies should also consider that Division 1 athletes or those closer to professional performance may have more support and attend directly to self-care, which can play a role in an athletes' cognitive and physiological processes. Prior literature has suggested that elite athletes may not benefit as much from distraction techniques for pain, which also supports the idea that there are differences based on skill level (Kress et al., 2007). Therefore, a consideration to explore is the different attentional and cognitive strategies the athlete is using to manage psychological and physiological elements. Overall, additional research on the connections between sex role, mindfulness, and performance-related variables within various female team athlete subgroups may provide a better understanding of mindfulness in sport and its relationship to enhancing performance.

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Appendix A: Approval Letter from Institutional Review Board



June 26, 2020

Vanessa
Chafos
Seton Hall
University

Re: Study ID# 2020-103

Dear Ms. Chafos,

At its June 24, 2020 meeting, the Research Ethics Committee of the Seton Hall University Institutional Review Board reviewed and approved your research proposal entitled “The Relationship between Sex Role, Mindfulness, Perceived Stress, Anxiety, and Flow in Team Sport Female Athletes” as submitted. This memo serves as official notice of the aforementioned study’s approval. Enclosed for your records are the stamped original Consent Form and recruitment flyer. You can make copies of these forms for your use.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol, informed consent form or study team must be reviewed and approved by the IRB prior to their implementation.

You will receive a communication from the Institutional Review Board at least 1 month prior to your expiration date requesting that you submit an Annual Progress Report to keep the study active, or a Final Review of Human Subjects Research form to close the study. In all future correspondence with the Institutional Review Board, please reference the ID# listed above.

Thank you for your cooperation.

Sincerely,

A handwritten signature in black ink that reads 'Mara Podvey'.

Mara C. Podvey, PhD, OTR
Associate Professor
Co-Chair, Institutional Review Board

Office of the Institutional Review Board

Presidents Hall · 400 South Orange Avenue · South Orange, New Jersey 07079 · Tel: 973.275.4654 · Fax
973.275.2978 ·
www.shu.edu

W H A T G R E A T M I N D S C A N D O

Appendix B: Letter of Solicitation

Seton Hall University
Institutional Review Board

JUN 29 2020

Approval Date

Expiration Date

JUN 29 2021



Letter of Solicitation

Dear Potential Participant,

Thank you for your interest in this survey. My name is Vanessa Chafos, and I am a student in the Counseling Psychology program at Seton Hall University. I am completing a study to learn about the relationship between sex role, mindfulness, perceived stress, anxiety, and flow in team sport female athletes.

Duration:

If you choose to participate, completing the study will take approximately 25 minutes.

Procedures:

The study will begin with a background survey and then proceed with five questionnaires:

- (1) **Perceived Stress Scale**-This will ask about your perception of stress in relation to your environment.
- (2) **Bem Sex Role Inventory-short form (BSRI-short form)**- This will ask about your sex role traits (i.e., masculinity, femininity).
- (3) **Mindfulness Attention Awareness Scale (MAAS)**- This will ask you questions about your every day present moment experience.
- (4) **Short Disposition Flow Scale (DFS-2)**- This will ask you questions about experiences you have while performing your sport and when you feel like you are playing your best.
- (5) **Sport Anxiety Scale (SAS-2)**- This scale will ask you about your overall anxiety prior to engaging in their sport and during competition.

Participation:

Participants will receive \$1.20 via Amazon.com's Mechanical Turk for completing the survey.

Department of Professional Psychology and Family Therapy
400 South Orange Avenue • South Orange, New Jersey 07079-2685 • Tel: 973.761.9451

A H O M E F O R T H E M I N D , T H E H E A R T A N D T H E S P I R I T

Participation in the study is completely voluntary. Participants are free to withdraw their participation at any time without penalty.

Confidentiality: Who will see your answers?

Your answers that will be kept private. We will be able to see your worker ID number, however this is not shared with anyone and is only used in order to compensate you for taking the study. *Please note any work performed on MTurk can be linked to the user's Amazon public profile page depending to the settings you have on your Amazon profile. For more information, go to <https://www.MTurk.com/MTurk/privacynotice>.

I will keep all data in a password-protected, encrypted USB memory key in a locked cabinet. Only I or my research mentor, Dr. Foley, may access the data. The results of the study will be used for scholarly purposes only.

Anticipated Risks and Discomfort

I do not anticipate any risks to participants. However, due to the nature of using the internet as a data collection platform, it is important to highlight unforeseen breaches as always a potential when completing anything through means of the internet.

You are not required to answer every question. If you feel discomfort after taking this survey and wish to speak with a professional, the American Psychological Association offers a free location based referral service at <http://locator.apa.org/>. You can also call the National Crisis Hotline at 1-800-273-8255. All participants must be 18 years of age or older. This study does not involve video or audio taping.

Anticipated Benefits

- There is no direct benefit from participation in the study, aside from compensation for your participation.
- Your participation will help researchers better understand the connection between sex role, mindfulness, and performance-related variables with female team athletes.

Contact Information

If you have any questions about this study, please contact me, Vanessa Chafos by email at vanessa.chafos@student.shu.edu, or my research advisor at Seton Hall University, Dr. Pamela Foley at (973) 761-9451 or email at pamela.foley@shu.edu. If you have questions about your rights as a research participant, you may also contact the Chairperson of the IRB, Michael LaFountaine, Ed.D, at 973-313-6314 or email at irb@shu.edu.

By clicking on the [link/start button/ etc] you acknowledge that you have read this information and agree to participate in this research.

Appendix C: Demographic Questionnaire

1. How old are you? (Have them enter in an age; they must enter 18 or older to proceed)
2. Do you identify as female? (If “no” is selected will not be able to proceed further in the survey)
 - a. Yes
 - b. No
3. Do you live in the United States? (If “no” is selected will not be able to proceed further in the survey)
 - a. Yes
 - b. No
4. What is your ethnicity?
5. What is your race?
6. What is your participation level with your sport?
 - a. Division I athletics
 - b. Division II athletics
 - c. Division III athletics
 - d. Club or organization (enter organization)
 - e. Other: (enter other)
7. Do you participate in a team sport? (Participants that select no will not be able to proceed further in the survey)
 - a. Yes
 - b. No
8. Do you participate in any of the following team sports? basketball, football, hockey, rowing, rugby, soccer, volleyball, ice hockey, softball, track and field: (have them check mark the sport)
(For each sport the participant selects, questions 9-11 will be asked)
9. How long have you participated in the sport? (enter number; they will be able to specify days, months, years)
10. How many days of the week do you participate in the sport on average? (enter number of days)
11. How long are you engaged in the activity on average? (enter in minutes)

12. Which of the following psychological skills training techniques do you use while performing your sport(s) (check all that apply)?
- a. Mindfulness (*present moment awareness; paying attention in a particular way: on purpose, in the present and nonjudgmentally* (Kabat-Zinn, 1994, p. 4))
 - b. Mindfulness Acceptance Commitment Sports Enhancement (*mindful, nonjudging, present-moment attention, acceptance of internal states as natural human experiences, and a willingness to remain in contact with internal states regardless of intensity and nature; while focus of attention is on performance or task-relevant cues* (Gardner & Moore, 2004))
 - c. Self-talk (*replacing negative inner dialogue with positive inner dialogue*)
 - d. Mental rehearsal involving visualizing and practicing a certain athletic task without muscular movement
 - e. Goal setting (*focusing attention on short term or long-term goals*)
 - f. Thought stopping (*Thought suppression/blocking thoughts*)
 - g. I do not use any psychological skills training techniques
 - h. Other (enter other)
13. How often do you use mindfulness and/or psychological skills training techniques on average? (enter in days per week)
14. How long have you been using these techniques? (enter in days, years, months)
15. Do you apply these techniques in other areas of your life?
- a. Yes
 - b. No
 - c. Sometimes

Appendix D: Permission to Use PSS

Page 1 of 3

Perceived Stress Scale (PSS)

Author:	Sheldon Cohen
Date:	(Originally published) 1983
Constructs:	Child and Family Health, Family Relationships
Standardized:	Not specified
Instrument Type(s):	4-item self-report instrument with a five-point scale: (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often). The PSS is also available in a 10 and 14 item self-report instrument with the same five-point scale.
Uses of Information:	<p>The 4-item version is appropriate for use in situations requiring a very brief measure of stress perceptions. It was previously employed when collecting perceived stress levels over the phone during follow-up interviews.</p> <p>It is not a diagnostic instrument, but intended to make comparisons of subjects' perceived stress related to current, objective events. The higher the degree and longer the duration of self-perceived stress, indicated by a higher score, is considered a risk factor for a clinical psychiatric disorder.</p>
Environment:	Not specified, but flexible
Description:	<p>The short version, PSS-4, is an economical and simple psychological instrument to administer, comprehend, and score. It measures the degree to which situations in one's life over the past month are appraised as stressful. Items were designed to detect how unpredictable, uncontrollable, and overloaded respondents find their lives. The PSS-4 poses general queries about relatively current levels of stress experienced. All items begin with the same phrase: In the past month, how often have you felt...? Since the questions are of a general nature and are not directed at any particular sub-population group, using this abbreviated version (or any version) with a diverse population is predicted to yield equally reliable results.</p>
References:	<p>(1.) Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. <i>Journal of Health and Social Behavior</i>, 24, 385-396.</p> <p>(2.) Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the U.S. In S. Spacapan & S. Oskamp (Eds.), <i>The social psychology of health: Claremont Symposium on Applied Social Psychology</i>. Newbury Park, CA: Sage.</p>
Cost:	<p>Permission for use of the scale is not necessary when use is for academic research or educational purposes.</p> <p>Use of the PSS in profit making ventures requires special permission and a nominal charge. Inclusion of the scale within a larger scale that will be copyrighted also requires specific permission. For permission, send a request letter to the contact person with a self-addressed and stamped envelope enclosed.</p>
Availability of Test Manual	N/A

FRIENDS National Resource Center

February 2006

Appendix E: Permission to Use BEM

5/19/2020

Remote Online Survey License - Bem Sex Role Inventory



Bem Sex Role Inventory



Remote Online Survey License

Allows you to administer the BEM as an online survey via a non-Mind Garden survey system. The downloadable PDF file includes one copy of the BEM (all forms), scoring keys, and permission to administer the BEM for up to the quantity purchased. The PDF is non-refundable.

Price: \$125.00

Translation :
English (default)

This product is not sold individually. You must select at least **50** quantity for this product.

Bem Sex Role Inventory : Original Form and Short Form (BEM)

Remote Online Survey License

Purchase BEM Remote Online Survey License if you plan to administer the BEM as an online survey via a non-Mind Garden survey system. You will be required to agree to **Mind Garden's Online Use Policy** by completing the Remote Online Use Application Form that you will receive with your license purchase. Upon Mind Garden's review/approval of your Remote Online Use Application, you will be provided permission to administer the BEM. You re-type, re-format, administer, and score the BEM via the non-Mind Garden survey system.

Terms of Use for Remote Online Survey License

The Remote Online Survey License is a data license for **research purposes only**. This license grants you permission to collect and disclose (a) item scores and scale scores, (b) statistical

<https://www.mindgarden.com/bem-sex-role-inventory/101-bsri-remote-online-survey-license.html>

1/5

Appendix F: Permission to Use SAS-2

Re: Request for permission to use the SAS-2 for my research

smoll@uw.edu <smoll@uw.edu>

Thu 9/21/2017 2:51 PM

To: Vanessa H Chafos <vanessa.chafos@student.shu.edu>

Hi Vanessa,

The SAS-2 was published in a scientific journal, so it's in the public domain. Consequently, permission to use the scale in research projects isn't necessary.

Best wishes for successful completion of your research/dissertation.

Frank Smoll

~~~~~  
Frank L. Smoll, Ph.D.

Professor

Department of Psychology

Box 351525

University of Washington

Seattle, WA 98195-1525  
~~~~~

Appendix G: Permission to Use MAAS

Monroe Campus

Virginia Commonwealth University

Department of Psychology

White House
806 West Franklin Street
P.O. Box 842018
Richmond, Virginia 23284-2018

804 828-6754
Fax: 804 828-2237
TDD: 1-800-828-1120

Dear Colleague,

The trait Mindful Attention Awareness Scale (MAAS) is in the public domain and special permission is not required to use it for research or clinical purposes. The trait MAAS has been validated for use with college student and community adults (Brown & Ryan, 2003), and for individuals with cancer (Carison & Brown, 2005). A detailed description of the trait MAAS, along with normative score information, is found below, as is the scale and its scoring. A validated state version of the MAAS is also available in Brown and Ryan (2003) or upon request.

Feel free to e-mail me with any questions about the use or interpretation of the MAAS. I would appreciate hearing about any clinical or research results you obtain using the scale.

Yours,

Kirk Warren Brown, PhD
Department of Psychology
Virginia Commonwealth University
806 West Franklin St.
Richmond, VA 23284-2018
e-mail kwbrown@vcu.edu

Mindful Attention Awareness Scale (MAAS), trait version

Characteristics of the scale:

The trait MAAS is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place. This is in contrast to the conceptually driven mode of processing, in which events and experiences are filtered through cognitive appraisals, evaluations, memories, beliefs, and other forms of cognitive manipulation. Across many studies conducted since 2003, the trait MAAS has shown excellent psychometric properties. Factor analyses with undergraduate, community and nationally sampled adult, and adult cancer populations have confirmed a single factor scale structure (Brown & Ryan, 2003; Carlson & Brown, 2005). Internal consistency levels (Cronbach's alphas) generally range from .80 to .90. The MAAS has demonstrated high test-retest reliability, discriminant and convergent validity, known-groups validity, and criterion validity. Correlational, quasi-experimental, and experimental studies have shown that the trait MAAS taps a unique quality of consciousness that is related to, and predictive of, a variety of emotion regulation, behavior regulation, interpersonal, and well-being phenomena. The measure takes 5 minutes or less to complete. A validated, 5-item state version of the MAAS is also available in Brown and Ryan (2003) or upon request.

MAAS norms to date:

Normative information on the trait MAAS is available for both community adults and college students, as follows:

Community adults (4 independent samples): $N = 436$; MAAS $M = 4.20$, $SD = .69$.

College students (14 independent samples): $N = 2277$; MAAS $M = 3.83$, $SD = .70$.

Appropriate validity references for the trait MAAS:

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.

Carlson, L.E. & Brown, K.W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research*, 58, 29-33.