

Performing Under Pressure: Physiological and Psychological Attributes of the Modern
Soccer Official

A thesis submitted in partial fulfillment of the requirements for the degree of
Master of Science in Sport and Recreation Studies at George Mason University

By

Sarah K. O'Reilly
Bachelor of Science
James Madison University, 2014

Chair: Dr. Christopher Atwater, Assistant Professor
School of Recreation, Health, and Tourism
College of Education and Human Development

Spring Semester 2017
George Mason University
Fairfax, VA

Copyright 2017 Sarah K. O'Reilly
All Rights Reserved

TABLE OF CONTENTS

	Page
List of Tables	v
List of Figures	vi
Abstract	vii
Chapter 1: Introduction	1
Background for the Study	1
Overview of the Study	3
Chapter 2: Literature Review	5
Physiological Requirements.....	5
Psychological Requirements.....	11
Synthesis of the Literature	17
Chapter 3: Methods.....	20
Rationale for the Study	20
Statement of the Problem.....	21
Research Questions.....	21
Variables and Definitions	22
Hypotheses.....	22
Population and Sampling.....	22
Research Design and Instrumentation	25
Research Setting.....	26
Data Collection and Analysis.....	27
Chapter 4: Findings.....	28
Introduction.....	28
Quantitative Findings.....	29
Quantitative Findings – Physiological Attributes	36
Quantitative Findings – Psychological Attributes	41
Qualitative Findings.....	44
Referee Matches.....	44
Training Regimen	47
Instruction and Education	49
The Referee Toolbox	51

External and Internal Factors	56
Demographic-Based Factors	58
Physiological or Psychological?	61
Chapter 5: Conclusions	65
Summary of the Purpose of the Study	65
Summary of Findings.....	65
Research Question # 1 – Findings and Discussion	66
Research Question # 2 – Findings and Discussion	67
Research Question # 3 – Findings and Discussion	69
Research Question # 4 – Findings and Discussion	70
Study Limitations.....	71
Recommendations for Further Studies.....	72
Conclusion	73
Appendices.....	76
Appendix A. Cover Letter.....	76
Appendix B. Survey Instrument	77
References.....	78

LIST OF TABLES

	Page
Table 1. Demographic Characteristics of Participants.....	31
Table 2. Effect of Physiological Factors on Refereeing	35
Table 3. The Fear of Injury Before or During Matches	36
Table 4. Following a Strict Regimen	38
Table 5. Aptitude Toward the Physiological Over the Psychological	39
Table 6. Effect of Psychological Factors on Refereeing.....	40
Table 7. Aptitude Toward the Psychological Over the Physiological	43

LIST OF FIGURES

Table	Page
Figure 1. Elements of Game Management	52

ABSTRACT

PERFORMING UNDER PRESSURE: THE PHYSIOLOGICAL AND PSYCHOLOGICAL ATTRIBUTES OF MODERN SOCCER OFFICIALS

Sarah K. O'Reilly, M.S.

George Mason University, 2017

Thesis Chair: Dr. Christopher Atwater, Assistant Professor

This thesis describes the physiological and psychological attributes that affect modern soccer officials and how they relate and affect referees both on and off the field. The study uses a sequential, mixed methods design that has two sections that have quantitative and qualitative components. Using statistical analysis, the results of the quantitative analysis will aim to reveal if one attribute, physical or psychological, weighs more heavily over the other for the referees. The second stage of the design contains questions that allow the participants to answer in a free-response setting identification of any subthemes that did not emerge throughout the literature review. These questions aim to investigate further the themes that were presented throughout the literature review and discover any additional subthemes that pertain to answering four research questions. Analysis of the data revealed that psychological attributes outweigh the physiological

attributes but that the population of Grade 6, 5, 4, and Emeritus referees hold both attributes to be of vital importance in order to be successful at the higher levels.

CHAPTER 1: INTRODUCTION

Background for the Study

A crowd of over seventy thousand fans combined with the largest television audience in sport history can produce intense pressures, anxieties, and stressors for the teams involved. However, what many do not realize is that this is especially the case for the referee crew. According to Federation Internationale de Football Association, or more commonly FIFA, such was the scene during the 2014 World Cup final between Germany and Argentina in Rio de Janeiro, Brazil. There is a myriad of physiological and psychological attributes that must exist in a referee's "toolbox" in order to avoid succumbing to the multitude of pressures and scrutiny that often coincide with officiating any sport. This is certainly the case with soccer officials in particular. Degrees of pressure found at the developmental and professional levels vary respective to the level of play. Every sport requires its own style of referee who must develop an individualized skillset or "toolbox." They then apply their knowledge to future situations that cannot often be taught in more controlled environments. Each referee's toolbox is assembled to help them perform under high stress situations during play.

There have been hundreds of studies involving physiological and psychological attributes separately as well as a smaller number of studies that investigate the interrelationships between the two. There are two distinct components associated with

being a successful official and they relate to the physical and psychological aspects of refereeing. The physical challenges include physical fitness and training and injuries and injury prevention. The psychological challenges include perfecting decision making skills and overcoming anxiety. The aim of this study is to discuss identified physiological and psychological challenges examined throughout the literature review with participants through a survey questionnaire. This will allow for better understanding of what pressures and stressors soccer officials often succumb to and which attribute is most important to the referee.

Several specialized physiological requirements of a soccer referee are due to factors such as field size and length of play. Two main physiological components of refereeing soccer include physical fitness and training and injury and injury prevention. D'Ottavio and Castagna (2001) concluded that the typical soccer referee spends most of the match running at medium to high intensity and that most of the physical exercise, both on and off the field, should relate to both short and long distance interval training. With these sudden, quick motions comes another physical attribute related to referee injury. Lower leg strains and injury are very common in soccer officials due to the directional change and rotational loads that are exerted on the body during these types of movements (Weston et al., 2011). These major physical attributes, or lack thereof, can either directly or indirectly lead to physical stresses that officials must address throughout the course of their career.

Psychological attributes are those that affect the cognitive abilities of the referee and can present from a variety of internal and external sources. These cannot be

overlooked when examining and understanding the pressures officials must overcome before, during, and after matches. Psychological pressures emerge from low confidence in decision making abilities as well as how the referee is able to cope with the anxieties associated with officiating. Lane, Nevill, Ahmad, and Balmer (2006) outline thirteen themes associated with stresses and pressures that referees experienced over the course of a typical match. Scoppa (2008) indicated that external factors exist and contribute to subconscious referee biases. Wolfson and Neave (2007) investigated a series of stressors and the psychological effects noticed by individual referees. Their study concluded that even though referees are highly scrutinized by several groups including players, coaches, fans, and parents, they are motivated to continue their work because of their love of the game.

Overview of the Study

This study aims to identify several physiological and psychological factors that challenge officials during typical and especially during atypical soccer matches. The literature review will investigate further the fitness and training, injury and injury prevention, decision making skills and biases, and finally the many stressors and anxieties that referees experience throughout their careers. There has been an evolution of the national and international governing bodies' standards throughout the past twenty years. The expectations of officials must also adapt with these increasing standards. It is important to identify and understand the most recent standards in order to identify any potentially new stressors and pressures that may fall upon officiating crews. The conclusion of the study aims to rank as well as break down any identified pressures by

their degree of importance according to a series of quantitative and qualitative-based questions answered by a number of referees. The target population of referees were identified by their certification level and then asked to participate in a survey developed from the core elements explored throughout the literature review. The results of this study will help to reveal areas that may be lacking in educational and training settings and help to identify means of eliminating certain pressures that negatively impact the referee both on and off the field of play.

CHAPTER 2: LITERATURE REVIEW

Review of the Literature

Over the last fifty-five years, soccer has both nationally and internationally seen an increase in the structure and quality of trainings that are offered and required for officials, especially at elite levels. Webb (2014) outlines the emergence of trainings and referee assessments in Association Football that began in 1960. By 1960, the sport had been codified for ninety-seven years and up until that time the advancement of officiating had not been afforded the opportunity to evolve with the sport of soccer. Officials and their governing bodies had to play catch up. The following sections will investigate a series of studies that have proven and scrutinized some physiological and psychological attributes of the modern soccer official as well as touch on how the sport of refereeing has progressed over the years.

Physiological Requirements

Physically, referees are often compared to the athletes they officiate over various levels of competition. Along with any professional or elite athlete comes a very intense and structured program that showcases that athlete's fitness and athleticism. With poor overall health, no athlete would be able to perform at their best ability. Physical fitness and training alongside injury incidence and prevention are two important physiological

attributes of any elite athlete. These attributes are no different for the referee and can be considered a vitally important characteristic of any elite soccer official.

As professional athletes continue to break physical barriers in many aspects including strength, speed, and stamina, officials must also continue to progress to meet these demands. Studies, including one performed by Mallo, Navarro, Aranda, and Helsen (2009), have shown that referee fitness is interrelated with player fitness. The authors attributed a team's style of play to directly impact the activity profile of the referee. A style of play for a team that employs success by possessing the ball and using methodical plans of attack will have a different demand on the referee's overall match activity than a team who uses a "long ball" approach. The former style requires less high intensity intervals compared to the latter, which requires a higher volume of long range, high intensity intervals throughout the duration of the match (Reilly, 1997).

Such demands of the game relate to how an official has trained and will continue to train throughout their career. A study of the evolution of a holistic fitness profile was published in 2011 and followed an English Premier League referee's physical training regimen over an eight-year period. Over the course of the study, an increase in strength training and speed development was accompanied by a decrease of high intensity aerobic and speed endurance training. The decrease in high intensity aerobic training occurred because a peak level of this exercise had been achieved and maintained. Strength training and speed development then became a focus for the particular subject as he felt these were areas that could be improved upon (Weston et al., 2011). D'Ottavio and Castagna (2001) attribute 41.7% of all match activity to high intensity exercises as well

as a constant cardiovascular strain at 89.1% of the maximum heart rate. The average total distance covered by the eighteen professional Italian referees who participated in the study was approximately 11.4 kilometers. Weston et al. (2012) detailed similar findings with the average total distance covered by match officials equaling 11.8 kilometers with a much larger sample size of 1,269 matches. A 2001 study by Krustup and Bangsbo reported a shorter total distance of 10.07 kilometers and attributed only 6.6% of total match activity to being high intensity running, 30.2% to low intensity running, and the remaining 63.2% to periods of standing and walking. The authors also reported a mean heart rate of 165 bpm and a maximum heart rate of 85%, similar to the findings previously reported by Weston et al. (2012).

Fitness testing, knowledge based testing on the Laws of the Game, and match assessments are three criteria that must be met in order to become an elite referee. Of the three requirements, fitness testing has been the most criticized for its lack of validity in relating to the actual match activity exhibited by officials. Weston et al. (2012) concluded that the validity of the standardized FIFA sprint and interval testing (at that time) does not adequately reflect the actual match activity of the officials. A 2007 study discusses proposed alternative physical fitness tests that would be better indicators of a referee's match fitness level (Castagna, Abt, & D'Ottavio, 2007). FIFA has recently adopted a variation of the proposed tests by updating its physical fitness requirements and moving away from a twelve-minute run, an aerobic indicator, toward a high-intensity interval test that better reflects a referee's match activity. The test involves a series of walking and running intervals that is a better indicator of a referee's typical match

activity. It is important for a referee to be at a peak level of fitness for an optimum position or angle to decide how to handle a situation. Every decision is important to both teams and selling the call is easier when the referee is within 10-15 yards of play at all times. Having that presence around the players is an essential tool in overall game management which is why training and physical development is so important for match officials. Mallo et al. (2009) estimate that 61% of the referees focus on bettering the “sport” of officiating or dedicating time to self-evaluation and improvement. Although most people have full time jobs or careers outside of officiating, even for those FIFA referees who are considered to be the most elite in the world, there are countless hours put into individual physical development.

As with any professional or recreational athlete, there is a wide variety of potential injuries that can affect and limit a referee. Injuries and their prevention have proven to be a major concern throughout a soccer referee’s career. Muscle strains continue to be the most commonly reported injury by soccer officials. Weston et al. (2012) attribute rotational and eccentric loads as well as directional changes as the reason for the many lower leg injuries that referees experience during training and matches. Their study reported an 18:1000 injury to match hour ratio. Bizzini, Junge, Bahr, and Dvorak (2008) note that over 50% of all reported injuries were lower leg injuries relating to musculoskeletal problems. The numbers suggest that among both men and women, leg injuries are most common. However, women reported injury 38.9% of the time during the 2007 Women’s World Cup, whereas only 22.2% of the men reported injuries from the 2006 World Cup. The injury to match hour ratio reported for the women was

34.7:1000, which is almost double that of the previous data for a male only group reported by Bizzini and others (2008).

A 2013 study by Kordi, Chitsaz, Rostami, Mostafar, and Ghadimi (2013) followed seventy-four elite Iranian officials over the course of ten months and documented the injuries they suffered throughout league play. It was found that more injuries existed for the assistant referees compared to the center referees and that muscular and tendon injuries in the leg dominated the overall list of ailments. The authors also obtained the injury to total match hour ratio to be 5.7:1000. It is hard to pinpoint why there is such a wide range of results regarding the injury to match hour ratio—all three studies included subject groups consisting of elite referees from three separate countries. A possible hypothesis is that this wide range of results may be attributed to differences in training regimens and playing styles for each of the leagues.

Injury prevention is just as important to referees as it is to any athlete. Injuries of any nature, acute or chronic, can lead to indefinite sidelining or perhaps early retirement for referees. Verhagen, Van Stralen, and Van Mechelen (2010) suggest that behavior is the key to injury prevention. They call for a broader focus on the athlete, or official in this case, as a whole, rather than a particular isolated injury. Behavior and attitude can certainly play a key role in injury prevention for referees, especially when considering the importance of elite matches. Refereeing is not a contact sport; therefore, injuries are most likely attributed to overuse as well as lack of proper warm up techniques (Weston et al., 2012). It is common to see more injuries at the lower levels of youth refereeing as the

officials tend to be less experienced and therefore less knowledgeable about simple precautions that can be taken to properly warm up and prevent these potential injuries.

A study of athletes of the 2011 Pan American Games showed that the main strategies utilized in injury prevention were muscle strengthening exercises, nutritional counseling, and informational seminars. Although most of the athletes during the Games participate in contact sports, the prevention methods can also all be applied to the sport of refereeing. As discussed, the most common injury faced by soccer referees is musculoskeletal strains in the legs. A study by Saragiotto, Di Pierro, and Lopes (2014) suggests that a proper muscle strengthening program could possibly prevent these injuries. However, current literature is lacking to prove this hypothesis's validity.

Differences in the style of play between men and women soccer players can vary exponentially and will likely continue to evolve and adapt as the sport progresses. Since female referees have shown more injury prevalence than men, there should also be development of gender specific prevention programs and methods (Bizzini et al., 2008). Prevention methods should look to focus on short term aspects, including nutrition and warm up activities, whereas prevention programs should focus on long term strengthening and fitness training. Injuries most often result in a rest and recovery period of varying length in accordance with the recovery period. By the time the injury has healed and the referee is ready to step back onto the field of the play, individual fitness level may have been affected and this will ultimately have an effect on how the officials call the game.

Psychological Requirements

Mental stability and performance is a second, important attribute of any sport referee. It is very important that the referee is able to overcome and master several demands of the game by honing their decision-making skills and overcoming anxieties. Officiating sports like soccer, basketball, and American football is highly subjective in nature and the result is ultimately can be influenced by the opinions of the referee crew. A referee needs to know the psychological demands of each match and develop a set of strategies to help them meet these demands, continuing to learn and adapt throughout their career.

It is estimated that 200-250 decisions of foul or no foul, in and out of play, offside, and other less common instances are made by the referee crew during an elite match. There have been few studies that have been able to quantify decision making abilities of referees; however, Plessner, Schweizer, Brand, and O'Hare (2009) applied the multiple cue probability learning (MCPL) approach, a system that provides feedback for learning, to sport. The study investigated the theory that immediate feedback for soccer referees can help develop better decision-making skills during match play. In a 2011 study by Ghasemi, Momeni, Jafarzadehpur, Rezaee, and Taheri, five visual memory tests including accommodation facility, saccadic eye movement, recognition speed, visual memory, and peripheral vision were used to determine traits of referees with successful decision making abilities. It was concluded that training and practicing of visual ability tests can help hone the decision-making skills of soccer referees.

Film review is often utilized during classroom-style training, which allows referees to gain valuable knowledge and experience to add to their toolbox. Often during classroom training, there is time for discussion where the film can be slowed down and replayed to dissect the play from beginning to end. During this time, there is an opportunity for further discussion about the play between referees and instructors. This is not the case during match play as decisions must be made within just a few seconds; otherwise play continues at the possible dismay of many players, coaches, and fans which causes the match temperature to rise. Credibility toward the referee crew tends to be lost when players recognize that a referee has missed a call during a match; therefore, it is imperative that the best decision in the opinion of the referee be made at every opportunity. Alternatively, MacMahon, Helsen, Starkes, and Wetson, (2007) suggest that elite referees have early specialization in officiating and therefore tend to focus on skills and training to master their decision-making abilities. Although improving these skills is very important, the study concluded that situational learning during match play is more beneficial than any classroom experience.

Any decision has several external biases that may or may not have an effect on the final outcome of an event. Lane, Nevill, Ahmad, and Balmer (2006) identified a list of thirteen associated factors that could affect a decision made by a referee. Some of the major themes identified throughout the study include the following: crowd noise, accuracy/error, experience, regulations, opinion, and concentration/avoidance. The authors concluded that many of the thirteen themes are interrelated and have the ability to persuade or influence decision-making during a match. Scoppa (2008) investigates

crowd noise further and suggests that a home team advantage exists in Serie A, a professional Italian league, and that referees subconsciously favor home teams when determining injury time in matches. The results indicate that the outcomes of approximately ten matches were altered by favoring of the home teams, who were down by a goal, by an additional thirty seconds of match play.

Chu, Nadarajah, Afuecheta, Chan, and Xu (2014) investigated another statistical form of discrimination and referee bias during the 2011-2012 English Premier League season. The authors concluded that there is evidence of racism against non-European, non-white, and black players. In terms of the-referees' role and responsibility in the matter, the study suggests that the Premier League referees award more fouls and show more cards to minority and non-white players. The psychological pressures are great when officiating any sport; every call or decision that is made will most likely upset one team or the other and some players often feel that they are targeted by the referee crew. A high degree of psychological security and confidence must exist in order to be successful in overcoming the many criticisms referees will continue to face.

Any referee will likely experience a certain amount of anxiety associated with the criticism and degree of difficulty before, during, and perhaps after a match. These anxieties can be brought on by a variety of factors. The types of anxieties experienced by these officials will vary across the many different grades, or levels of the official. For example, the anxieties that new referees experience officiating youth or amateur adult leagues are vastly different than the anxieties experienced by a referee who may be stepping onto the pitch to officiate a World Cup match. Dell, Ghervis, and Rhind (2014)

investigated the factors that can lead to officials quitting or leaving the sport of refereeing. The major contributors to a referee's anxiety emerged in three themes: (1) organizational factors, (2) personal factors, and (3) match factors. Referees of varying levels blamed lack of support in trainings as well as intimidation from various sources as major components of their intentions of quitting.

There is likely a trend in the degree and type of anxieties that referees face as they move up to higher levels of competition; however, there is currently no literature in this subject matter. A study on elite Norwegian soccer referees by Johansen and Hagen (2013) revealed that by the time referees reach higher levels of competition, they have already developed coping mechanisms for addressing anxieties brought on by aggressive behaviors from players during a match. A 2002 study by Folkesson, Nyberg, Atcher, and Norlander (2002) investigates threat and aggression toward soccer referees and found that 72.9% of the sample population experienced some form of aggression, either verbally or physically, while officiating. Younger referees experience more aggression due to a certain vulnerability and lack of experience. The older, yet new referees, are able to pull from their life experiences to help them cope with and handle certain actions of aggression without the same officiating experience as a younger referee. The verbal, and less often, physical aggression that referees will experience throughout their careers may be a major cause of anxiety and could potentially be career ending for those who cannot find successful individualized coping mechanisms.

Other common stressors were identified by Wolfson and Neave (2007) as well as some of the associated referee reactions to the identified stressors. The most commonly

reported stress/anxiety themes that emerged were: having a bad game, coaches and fans' lack of knowledge of the Laws of the Game, referee biases toward one team over another, and reactions from players/coaches/fans during the heat of the moment. As far as referee reactions to these stressors, 100% of the group agreed that learning from a mistake made during a match is an appropriate reaction these stressors. Other reactions, agreed upon by the majority, include analyzing the event, replaying the event in their head, and discussing the problem with other referees to gain a second opinion. Overall, referees want to learn from their experiences and mistakes to better themselves as officials. The authors go on to say that those who officiate tend to have a passion and attribute that passion to the "love of the game." The study concluded that those who officiate soccer and are successful have a high level of self-esteem and the ability to utilize individual coping mechanisms when necessary.

Having a proper mental state prior to and during the game is a useful tool for coping with some of the anxieties that officials experience (Zeman, Vobornu, Kralík, & Blahutkova, 2013). The proper mental state of mind is just as essential for officials as it is for athletes. Hepler (2015) concluded that the presence of mental stressors led to slower decision making speeds for the referees included in their study. Slower decisions can lead to loss of control throughout the game. This leads to increased frustrations of coaches and players and ultimately loss of overall game management. Understanding that referees are constantly put into situations where decisions must be made, it is important to limit potential mental stressors that could negatively influence the speed and overall quality of these decisions in the match. Limiting anxieties starts with the

individual in terms of their confidence and available coping mechanisms; however, the level of play and the confidence the center referee has in his or her crew also play a critical role in reducing those anxieties.

Having to make decisions that will ultimately impact one team over the other is just one component of the game—being confident that it is the correct decision is another. Wolfson and Neave (2007) concluded that referees show resilience and confidence in their match performances and that “they are unlikely to ignore their errors, feel embarrassed by them, or worry about their recurrence and implications. Instead, they try to analyze their mistakes and remind themselves that they tried their best, that their errors are rare, and that getting every decision right would be impossible.”

There is limited literature available on referee efficacy; however, Guillen and Feltz (2011) proposed a “refficacy” model that sets a framework for officials’ sources of efficacy. The authors define refficacy as “the extent to which referees believe they have the capacity to perform successfully in their job.” Sources of efficacy for their model include mastery experience, significant other’s involvement (assessors and referee crew), physical and mental preparation, and the referee crew’s qualifications. Refficacy changes for the officials as does the level of play. With lower level games, it is likely that the referees are confident in their ability to perform at a high level. The opposite could be true for referees who have higher level games where there are bigger impacts and implications for the final results, such as World Cup matches or even MLS league playoffs.

Causal attribution is something that is often investigated in sport psychology because of its relevance in understanding how these attributions can lead to an effective behavior program, improvement in decision making, and higher expectations in future performances (Allen, 2010). Causal attribution in application to the sport of officiating relates to whether the referee believes that they control or determine the outcome of the match. There is very limited research currently available directly relating and discussing causal attributions in sport officials.

Just as physiological and psychological pressures can be identified; it is equally important to understand that some of the attributes of the modern soccer official will interrelate in nature dependent upon the demands of the game.

Synthesis of Literature

Soccer referees have many physiological and psychological attributes that exist in their toolbox when officiating matches of any level. Every referee must develop different means of training as well as different methods of coping to adapt to the many demands of a typical match. Physiologically, every referee must be at a fitness level that meets and sometimes even exceeds that of the players. With different methods of training and fitness testing, elite referees are expected to be at their peak fitness level by incorporating high intensity interval training and appropriate fitness regimens in order to be successful in keeping up with play.

The incidence of injury as well as injury prevention is another major physiological component of being a referee. As with any athlete, referee injuries can lead to time off or even early retirement. With musculoskeletal injuries in the lower

extremities being the most common among soccer referees, it is important for a referee to understand and apply injury prevention methods. Refereeing can be considered its own sport, with physical demands comparable to the athletes they are officiating. It should be understood that maintaining the physiological components of fitness required of referees alone can cause major stressors on the body. Without proper physical maintenance, it is difficult to become a successful, elite referee, let alone maintain a career.

Separate from the physical demands of officiating, the psychological demands of the refereeing any sport are also of great importance. The two major psychological aspects of officiating include the referee's ability to make timely and accurate decisions on the field and the effect of internal and external factors on those decisions. The literature review examined the mastery of decision making skills as well the associated biases that may be present with every decision made. Although classroom experience and trainings may help to identify the traits of good decision makers, ultimately on-field experience provided the best training of this skill. Many decisions made throughout a match will most likely have some associated biases, albeit these may be subconscious, they still exist. It is important for a referee to use impartial judgment and a high level of concentration and confidence for every decision made. Although this seems obvious, with over two hundred decisions made per match, every decision can have a substantial impact on the outcome of the match.

The second major psychological aspect deals with many associated anxieties and pressures experienced by internal and external factors that referees must deal with while officiating. Anxieties when refereeing tend to exist based upon a degree of self-

confidence as well as on-field officiating experiences. Newer, younger referees tend to show higher anxieties toward different forms of aggression, whereas older referees, new to the sport of officiating, are able to pull from off-field life experiences to deal with those same anxieties. Stress and pressures are more easily alleviated by elite referees due to their mastery of utilizing individual coping mechanisms (Wolfson & Neave, 2007). Referees are resilient in their sport by learning from previous mistakes and turning to fellow colleagues for support and guidance. Their love for the game of soccer is so great, they choose to overcome difficult situations and still perform under a tremendous degree of stress and pressure rather than succumbing to these pressures.

This study ties together several significant components of refereeing that have been previously identified in the literature by various authors. The physiological and psychological attributes and how they relate to each other is essential for the referees and it is important to investigate further if any relationship exists between the two.

CHAPTER 3: METHODS

Rationale for the Study

Many of the researchers' studies mentioned in the literature review have identified and evaluated the multitude of physical and psychological attributes that exist for successful referees. For the most part, these attributes are studied and examined individually, with far fewer studies focusing on the comparison of both categories. This study aims to do just that by identifying which of the categories bears a higher importance to the referee and will look to identify trends and correlations among the referees participating in the study. It is important for a referee to know and comprehend what component, physical or psychological, as well as the subcomponents of each, they have prioritized in their individual toolboxes. Themes and subthemes will emerge as referees use the survey instrument to answer questions on these and give individual testimonials. The goal is to identify a subtheme and place it into its appropriate category of physical or psychological and then examine which category, if any, emerges as dominant among referees of various grades. This will allow for referees to better understand which skillset they value as most important in their success. In terms of training off the field, this information will allow for referees to focus their training on these aspects for future success.

Statement of the Problem

Although there are several attributes that a referee must have in their toolbox in order to set themselves up for success on the field of play, it is unknown whether the physical or psychological component outweighs the other. It has been recognized that successful referees encounter both physical and psychological obstacles they are able to overcome before, during, and after matches. The importance of this concept is that the referee must develop two distinct skillsets in order to accomplish one job. Many of the physical subcomponents have been able to be quantified both on and off the field of play. Conversely, the psychological subcomponents are mostly studied in a qualitative sense, with some studies quantitatively analyzing decision making skills. When examining the two skillsets together, there is not much current discussion on the importance of one skillset over the other in regards to the referee crew and their performance.

Research Questions

1. When assessing the data from the survey instrument, which attribute, physical or psychological, bears more weight when identifying the pressures that modern soccer officials experience?
2. Do any contributable pressures emerge from each category that are not identified and evaluated throughout the literature review?
3. Were there any themes or subthemes that emerged that are interrelated in their nature that could be identified in the qualitative findings?
4. When deciding if the referee had a successful match, does one category, physical or psychological, emerge as more important in evaluating successful on-field performance?

Variables and Definitions

This mixed methods study was broken into two sections that make up the entire survey instrument. The instrument contained a non-experimental survey research questionnaire distributed to the participants in the study. The target sample group contained senior referees—state through national referees and emeritus referees—all members of the United States Soccer Federation Referee Department from the Virginia, Eastern Pennsylvania, and West Virginia referee associations. The survey utilized a Likert Scale to evaluate and rank the stressors per their level of importance to each referee. Using the Likert Scale and qualitative-based questions, trends and correlations emerged that helped determine which major category, physiological or psychological, bears the greatest value for the referee. The independent variables of the study included age, gender, grade (level of officiating), and experience within the United States Soccer Federation. The dependent variables of the study included the physical and psychological stressors that emerge from the data and analysis.

Hypotheses

1. When identifying the pressures, there will exist a higher quantity of psychological pressures over the number of physical pressures.
2. Psychological pressures weigh more heavily on officials than do the physical demands when officiating a soccer match.

Population and Sampling

The United States Soccer Federation (USSF) referee department estimates that there are approximately 140,000 certified referees across 55 state referee associations in

the United States. These state referee associations vary widely in size and structure with some states, such as New York, Pennsylvania, Texas, and California, having multiple state associations operating separately due to the sheer volume of referees, matches, and overall state population. The target population in this study included Grade 6 through Grade 1 officials. A Grade 6 referee is a state level referee certified by each state program with guidelines set forth by USSF; Grade 4 is a national referee certified by USSF; and Grade 1 is an international referee certified by USSF and approved by FIFA.

The scope of this study was regional in nature focusing on inclusion of Grade 6 through Grade 1 referees registered within the Metro DC Virginia (MDCVA) State Referee program as well as the surrounding state programs including Maryland, Delaware, West Virginia, New York and Pennsylvania (East and West). It was estimated that approximately 200 candidates will meet the requirements set forth to be considered for participation in the study.

A nonprobability volunteer survey approach was utilized in this study. Nonprobability sampling, in this case, aimed to sample the entire population of Grade 6-1 referees in the regional area. The sample population was contacted via email with a web survey link, and the response rate was calculated based on the number of useable and viable responses collected. Based upon previous studies, such as that of Couper, Blair, and Triplett (1999), that have utilized email and web surveys, the anticipated response rate was estimated to be between 37-63%. MDCVA state referee department indicated that previous attempts at similar studies have not had success due to a lack of

participation and responses from the target sample. Because of this, the response rate was expected to be approximately 10-15% below the average values previously mentioned.

There were at least three possible biases that have existed within the selected sample group. The first was related to voluntary response bias. Since the study could not require any of the target population to participate, there may have been an overabundance of strongly opinionated responses from those who felt strongly enough to respond. On the other hand, those who felt their response may not affect the results or that their opinions did not matter may have decided to not participate in the study. Those who did feel strongly enough to respond may have been driven by their degree of comfort or experiences related to participating in previous studies. Robert Rosenthal (1965) attributes a greater intrinsic interest may encourage those genuinely interested in the results of the study to participate, which may have biased the results. The results could also have been biased by those who are comfortable on different psychological dimensions. This must be taken into consideration when analyzing the results.

Nonresponse is a second form of sample bias that may have been encountered throughout the scope of this study. It is difficult to predict an accurate participant response rate and willingness to participate when participants are not given any incentive to do so. Dillman (2000) accounts that those who participate may have relevant (or irrelevant) characteristics than those who do respond to the surveys.

A third possible sample bias can be directly derived from the study sample, which may not have been adequately indicative of the population. For example, by excluding or over representing one gender or grade of referee, the sample would not be a true

representation of the population. An equal number of female and male referees would not reflect the true proportion of men to women who participate in officiating soccer. The same can be said for the number of, say, Grade 4 referees versus Grade 6 referees. There are exponentially more Grade 6 referees than Grade 4 referees certified through the United States Soccer Federation's referee department. If the sample of participants included more Grade 4 referees than Grade 6, then the results would likely be biased toward those who participate in higher caliber training exercises and have experienced working conditions in more elite games.

Research Design and Instrumentation

This study was a sequential, mixed methods study involving a quantitative as well as a qualitative multi-stage research design. The initial stage of the research design was a nonexperimental survey aiming to gather quantitative data through a Likert-style survey instrument. The Likert questions were designed for the researcher to comprehend quantitatively, as to what degree referees hold their anxieties or pressures. Using statistical analysis, the results of the quantitative analysis aimed to prove or disprove that one attribute, physical or psychological, weighs more heavily over the other. The second stage of the design contained questions that allowed the participants to answer in a free response setting. These questions aimed to investigate further the themes that were presented throughout the literature review and discover any additional subthemes that may pertain to answering the research questions.

With any study, there are threats to internal and external validity. Selection bias was the largest threat to internal validity of this study. With participation being voluntary,

those who participated had certain attitudes that likely influenced and represented certain aptitudes that are significantly psychological in nature. Unfortunately, this study did not have any tangible incentive for participation. In order to minimize selection bias, the population was contacted initially with an informational cover letter and a request for participation in joint accordance with each state referee department. Follow up emails were sent to encourage participation and inform potential candidates that the results of the study are for the benefit of understanding what attributes are strong versus those that are weak across the population in hopes of this becoming a teaching and learning opportunity for instructors and referees alike.

A threat to external validity may be seen from the results of the qualitative section of the survey instrument. With refereeing occurring essentially all year, there was the chance that a candidate answered the survey questionnaire directly after or before a match. If the survey was completed just after a referee has had a “bad” game, then the attitudes and perceptions of that game may or may not have directly influenced the answers chosen throughout the survey. The same could be said for a referee who answered the survey directly before his or her match. He or she may have felt they experienced a greater or lesser amount of pressures than those that they normally face. To minimize this threat, the researcher sent the survey instrument out to the target population during a time period where very few USSF sanctioned matches are being played.

Research Setting

With the research design being broken down into two stages, there were different settings in which the data was collected. The target population was officials from the

Mid-Atlantic region of Virginia, Maryland, Delaware, West Virginia, New York, and Pennsylvania. Communication among the researcher and each potential candidate was conducted via email using the cover letter in Appendix A in conjunction with the state referee associations. The Likert test and other qualitative questions were administered via an online survey. The initial email was sent and then one follow up email to ensure there was an adequate number of officials participating in the study.

Data Collection and Analysis

The target population was reached by contacting the State Referee Administrator for each of the referee associations. The mid-Atlantic region generated a sufficient response, so the expansion of the target population was not necessary.

Conclusions are drawn from the research questions outlined in Chapter 3. The quantitative survey instrument aimed to answer the major questions of concern: which attribute, physical or psychological, bears more weight when evaluating pressure that modern soccer officials experience? The Likert test helped to identify underlying factors that contributed to referees' aptitude toward one attribute over. The major themes were outlined in the literature review and subthemes emerged based upon the responses collected from the qualitative section of the survey instrument. The themes were categorized into physical, psychological, or interrelated between the two. The data revealed that referees have fears in both categories and that there are certain strengths and weaknesses in each. The quantitative and qualitative-based questions will help the researcher determine these strengths and weaknesses and come to an overall decision over which category results in a higher pressure for the referee if one exists.

CHAPTER 4: FINDINGS

Introduction

This chapter analyzes the data obtained through an online questionnaire that featured two sections of questions broken down quantitatively and qualitatively. The results from this data aim to understand whether the physiological or psychological attributes of refereeing outweigh each other. In each of the quantitative and qualitative sections, physiologically and psychologically-based questions were given equal representation. The results address four major research questions that are presented throughout this study:

1. When assessing the data from the survey instrument, which attribute, physical or psychological, bears more weight when examining the pressures that modern soccer officials experience?
2. Do any contributable pressures emerge from each category that are not identified and evaluated throughout the literature review?
3. Were there any themes or subthemes that emerged that are interrelated in their nature that could be identified in the qualitative findings?
4. When deciding if the referee had a successful match, does one category, physical or psychological, emerge as more important in evaluating successful on-field performance?

The first research question was addressed quantitatively. Research questions 2-4 relied on qualitative data collection and analysis to uncover any relevant subthemes that did not emerge throughout the literature review. Quantitative questions that are featured in the survey instrument include a basic demographic investigation followed by two Likert Scale, matrix-style questions that aimed to investigate one's aptitude toward the physiological or psychological attributes of refereeing. The quantitative questions encouraged the participant decide if one attribute bared a greater importance over the other. The qualitative section of the survey instrument aimed to identify themes and subthemes through open-ended, free response questions that are addressed to understand and investigate what factors may impact the sport of officiating such as internal and external factors and tools officials utilize.

Quantitative Findings

A total of 210 referees were targeted in this study throughout eight state referee associations located in Virginia/D.C., Maryland, New York, Pennsylvania, Delaware, and West Virginia. The State Referee Administrator (SRA) from each of the referee associations was asked to provide email addresses of all referees who are currently certified as a state referee (Grade 6) or higher in their respective association for 2016. Referee email addresses that were provided were sent an informational cover letter that explained why they were targeted for the study as well as the importance of their participation in the study. Also attached in the email was an informed consent document that explained participation was completely voluntary but that full completion of the survey implied consent in using the data for the results and analysis of this study.

Sixty-seven referees participated in the online survey, but only sixty-five of the participants completed the survey in full. The state referee associations that are represented in the results of the study include Virginia/D.C., West Virginia, Maryland, Eastern Pennsylvania, Pennsylvania West, Rhode Island, and California South. Though these referees represent state associations, their views do not reflect or represent the views of the individual state associations. Referees that completed the survey who are not a members of the initial target of state referee associations such as Rhode Island and California South, likely moved from one state to another or are a member of multiple associations throughout the country for various reasons. The two state referee associations located in New York, Western New York and Eastern New York, as well as the associations of Maryland and Pennsylvania West did not provide email addresses for their members who qualified for the target population, but some members from Maryland and Pennsylvania West were included from the list provided by other associations. There were no responses from those members representing Delaware. Table 1 breaks down the demographic data of all participants

Table 1 - Demographic Characteristics of Participants

Variable	Category	N	%
State Referee	Virginia/D.C.	45	69.2%
Associations Represented	West Virginia	7	10.8%
	Maryland	1	1.5%
	Eastern Pennsylvania	8	12.3%
	Pennsylvania West	2	3.1%
	California South	1	1.5%
	Rhode Island	1	1.5%
Current Referee Grade	(4) National	2	3.1%
	(5) National Candidate	2	3.1%
	(6) State	37	56.9%
	(13) National Emeritus	1	1.5%
	(15) State Emeritus	13	20.0%
	(16) State Emeritus	10	15.4%
Gender	Male	63	96.9%
	Female	2	3.1%
Highest Referee Grade Achieved	(3) Professional	1	1.5%
	(4) National	3	4.6%
	(5) National Candidate	19	29.2%
	(6) State	42	64.7%

Years of Certification	5-8 years	8	12.3%
through	9-12 years	11	16.9%
U.S. Soccer	13-16 years	14	21.6%
	17+ years	32	49.2%
Years of Certification	1-2 years	10	15.4%
higher	3-4 years	15	23.1%
than Grade 6	5-6 years	5	7.7%
	7-8 years	4	6.2%
	9-10 years	6	9.2%
	11+ years	25	38.4%
Age Group	18-30	14	21.5%
	31-40	11	16.9%
	41-50	11	16.9%
	51-60	11	16.9%
	61-70	14	21.5%
	71-80	4	6.3%
USSF Certified	State Assessor	20	30.8%
Assessor	No Assessor Status	45	69.2%

Table 1 demonstrates the demographic constraints of the participants who completed the survey questionnaire in full. The Metro D.C.-Virginia State Referee Program represented a significant volume of the total participants with 69.2% of the total number of

participants. Of the state associations that were targeted, Virginia/D.C. has the largest membership base with 145 affiliated referees that are Grade 6 or higher, including Emeritus, for 2016. West Virginia had a strong showing from the total target population with nine of nineteen eligible members completing the survey in full. Only eight of thirty-five members of Eastern Pennsylvania participated fully completing the survey instrument.

As expected, a vast majority (56.8%) of the respondents from all associations are Grade 6 referees. Seeing far fewer referees who are certified as Grade 4 or Grade 5 was expected since the number of referees at each grade exponentially decreases as referees approach the higher grades (Grades 5-1). That case is true from Grade 8 through Grade 3 referees certified through U.S. Soccer; FIFA is responsible for those Grade 1 and 2 referees. Combined, the three separate grades of 13, 15, and 16 represent the entire population (36.9%) of emeritus referees that completed the survey in full. Still, non-emeritus referees as a population outrank emeritus referees in the study with forty-one Grade 6 through Grade 4 referees and 24 total emeritus referees.

Only 15.4% of the referees are newly (1-2 years' experience) certified at the state level which indicates many of the referees have had significant experience with high intensity and challenging matches throughout their referee career. Seventy point eight percent of the referees have over thirteen years of experience officiating at any level certified through U.S. Soccer and 53.9% of the participants have been Grade 6 or higher for over nine years.

Only two female referees participated in the study representing only 3.1% of the total population. It is hard to predict how many female officials were included in the initial target population, but there are significantly fewer female referees at each grade than their male counterparts so a small representation was expected from the participants.

One final piece of demographic data that is significant for the results and analysis of this study is the number of referees that are also certified assessors. Assessors are responsible for conducting and carrying out the assessments that are required at the various levels. There are different grades of assessor similar to the grade certification process for referees. All assessors that participated in this study are state assessors. Twenty of the sixty-five participants indicated they held assessor status from their respective states for 2016.

Quantitative Findings – Physiological Attributes

Tables 2 and 3 below indicate the referees' attributes toward different statements related to the physiological (Table 2) and psychological (Table 6) components of refereeing. The matrix questions allowed participants to indicate their aptitude toward or against a statement and to choose an answer from the following four categories: strongly disagree, disagree, agree, and strongly agree.

Table 2 – Effect of Physiological Factors on Officiating

	Strongly Disagree	Disagree	Agree	Strongly Agree	M	SD
A. You fear the risk of injury before or during a match	26 (40%)	28 (43%)	10 (15%)	1 (2%)	1.78	0.760
B. You take the adequate time to properly warm up before a match	0 (0%)	16 (25%)	35 (54%)	14 (21%)	2.97	0.684
C. An injury has caused you to turn back games to your assignor	11 (17%)	12 (19%)	30 (46%)	12 (18%)	2.66	0.973
D. Being physically fit is an important part of being a successful referee	0 (0%)	1 (2%)	7 (11%)	57 (87%)	3.86	0.390
E. You take the time to work out and train outside of officiating matches	0 (0%)	4 (6%)	23 (35%)	38 (59%)	3.52	0.615
F. You follow a strict training regimen to stay at a high level of fitness	1 (2%)	26 (40%)	22 (34%)	16 (24%)	2.82	0.827
G. Physiological traits are more important than psychological traits	7 (11%)	45 (69%)	12 (18%)	1 (2%)	2.11	0.590

Table 2 contains the number of participants (n) that chose a statement based on sixty five participants who answered all questions in this matrix.

Quantitative Findings – Physiological Attributes

Based on the results from Table 2, fearing the risk of injury to some degree exists for only 17% of the population with the remaining 83% disagreeing by inferring that injury is not something the officials worry about before or during a match. It seems there is no coincidence that 75% of the referees do agree that they take an adequate amount of time to properly warm up prior to their matches. As discussed in the literature review, injury prevalence and prevention is common among officials for an assortment of reasons. With three fourths of the population indicating they do include a proper and beneficial warmup regimen, there could be a relationship between those that do not adequately warmup versus those who fear injury and vice versa for those who properly warm up and do not fear injury but that is not within the scope of this study. One must consider several factors that may come into play for the prevalence of injuries including: weather, league, or age group. An example is that referees physically prepare differently for the varying types of leagues and types of players. Warming up and physically preparing for lower level youth league games requires different physical demands than elite or professional matches. A comparison of means is shown in Table 3 which compares the independent variable of referee grade to the dependent variable of fearing injury.

Table 3 – The Fear of Injury Before or During Matches

Current Grade	<i>n</i>	<i>M</i>	<i>SD</i>
Grade 6 or Higher (6, 5, 4)	41	1.98	0.790
Emeritus (13, 15, 16)	24	1.46	0.588

Based on the difference of means in current grade, an independent samples *t*-test was run. The results of the independent samples *t*-test were significant when using collapsed grade categories as a factor with the overall aptitude toward the fear of injury before or during a match $t(63) = 2.784, p = 0.007$

Only one referee from the entire population disagrees that being physically fit is an important component of being a successful referee. Fifty-seven (69%) of those who agree to some degree find fitness to be a vastly important component. The target population in this study are all required to have fulfilled fitness requirements in order to reach their current grade certification. Emeritus referees do not have the same physical requirements as the current Grade 6, 5, and 4 referees, but all still view fitness as a major component. Statement D from Table 2 has the lowest variance of all physiological statements with a standard deviation of 0.390 indicated referees have a general consensus for this category. Additionally, sixty-one participants also partake in some variation of a training regimen with the responses having a standard deviation of 0.615 which is much higher than the variance found in statement D. Both statements D and E from Table 2 confirm the importance of physical fitness and training to the referees in this study. A comparison of means is shown in Table 4 which compares the independent variable of referee grade to the dependent variable of following a strict training regimen.

Table 4 – Following a Strict Training Regimen

Current Grade	<i>n</i>	<i>M</i>	<i>SD</i>
Grade 6 or Higher (6, 5, 4)	41	2.98	0.851
Emeritus (13, 15, 16)	24	2.54	0.721

Based on the difference of means in current grade, an independent samples *t*-test was run. The results of the independent samples *t*-test were significant when using collapsed grade categories as a factor for comparing the presence of a strict training regimen among referees $t(63) = 2.095, p = 0.040$

The final statement in Table 2, statement G asks the referees to agree or disagree (and to what degree) with the notion that physiological attributes outweigh psychological attributes. The data suggests that many of the referees are across the board in their attitudes toward this statement. What is impossible to discern is why a referee choose a particular statement to answer. For example, a referee could disagree that the physiological outweighs the psychological and vice versa because they believe them to hold an equal weight of importance—or perhaps a referee does disagree with the statement and believe physical attributes to be more important than the other. A total of 80% of the participants disagree to some extent and the remaining 20% agree to some extent that the physiological attributes outweigh psychological attributes. It is clear that referees in a general sense are not willing to say that the physiological side outweighs the psychological side of refereeing. With a true median value of 2.5 for the matrix question

in Table 2, the mean value of the responses in statement G is 2.11. This mean value indicates that respondents do not agree that the physiological outweighs the psychological but does not confirm that respondents agree that psychological outweigh the physiological components.

A comparison of means is shown in Table 5 which compares the independent variable of referee grade to the dependent variable of believing physiological attributes outweigh the psychological components. The current grade categories were collapsed into Grades 6, 5, and 4 as one group and emeritus and the second group to see if any group identifies differently with one category.

Table 5 – Aptitude toward the Physiological over the Psychological

Current Grade	<i>n</i>	<i>M</i>	<i>SD</i>
Grade 6 or Higher (6, 5 ,4)	41	2.10	0.490
Emeritus (13, 15, 16)	24	2.13	0.741

Based on the difference of means in current grade, an independent samples *t*-test was run. The results of the independent samples *t*-test were not significant when using collapsed grade categories as a factor with the overall aptitude toward one attribute $t(63) = -0.180, p = 0.858$

Table 6 – Effect of Psychological Factors on Officiating

	Strongly Disagree	Disagree	Agree	Strongly Agree	M	SD
A. You experience anxieties before big matches	8 (12%)	13 (20%)	35 (54%)	9 (14%)	2.69	0.865
B. External factors such as crowd noise or home team advantage have affected your decisions	22 (34%)	31 (47%)	11 (17%)	1 (2%)	1.86	0.747
C. Your confidence level coming into big games is high	0 (0%)	4 (6%)	40 (62%)	21 (32%)	3.26	0.567
D. You feel that you are good enough to be officiating at your current level or higher levels	0 (0%)	1 (2%)	19 (29%)	45 (69%)	3.66	0.567
E. You have developed successful coping mechanisms that help you to deal with certain situations	0 (0%)	1 (2%)	31 (47%)	33 (51%)	3.49	0.534
F. Internal factors can trigger stressors and anxieties before or during a match	5 (8%)	18 (28%)	30 (46%)	12 (18%)	2.75	0.848
G. Psychological attributes are more important than physiological attributes	2 (3%)	21 (32%)	35 (54%)	7 (11%)	2.72	0.696

Table 6 contains the number of participants (n) that chose a statement based on sixty participants who answered all questions in this matrix

Quantitative Findings – Psychological Attributes

Of the sixty-five referees who participated in the survey, 68% of them agree that they experience anxieties before big matches with a mean value of $M = 2.69$. An interesting comparison is that confidence levels of all but 6% of the referees is high coming into big matches even though many claim to experience anxieties and stressors. Forty-five (69%) of respondents strongly agree and nineteen (29%) agree that their confidence level is high prior to big matches. The referees do experience anxieties but are still very confident that they are going to be able perform their job and execute it effectively. It is a challenge to understand the basis of the anxieties from the quantitative data other than that they do exist for most of the referees.

A second indicator of high confidence levels among the referee population is further confirmed by statement D where officials indicate their attitude toward confidence of their current grade certification and ability to officiate at the next level. Only one referee disagrees with the statement that they are confident they belong at their current grade. The remaining 98% of the population agrees to some degree that they belong at their current grade and believe they can also referee at the next level. Most of the referees are Grade 6 referees that would upgrade to Grade 5. At the time of this study, the Grade 5 certification is out of the hands of the state associations—state referees are handpicked by U.S. Soccer Referee Department at events such as regional and national tournaments and if selected, required to then meet the requirements of that certification—but that process is likely to change in the future. Though referees may feel

confident in their ability to upgrade, it is sometimes out of their hands and is dependent on several external factors and scenarios. Confidence in their current certification has the most significant mean value of 3.66 further exhibiting the degree to which officials believe in their abilities.

Internal and external factors were discussed throughout the literature review and are examined in further detail throughout the quantitative and qualitative analysis. External factors are not an issue for 53 (81%) of the participants. The remaining 19% of the population admits that external factors do come into play when making decisions. As discussed in the literature review, factors such as home team advantage, crowd noise, and score lines may have implications and impact decision making. Internal factors seem to have a greater impact on the referees in this study. Forty-two of the participants agreed that internal factors such as work or mood have triggered anxieties that have been a distraction throughout their matches. Still, a significant number of referees (23) disagree to some degree that internal factors have had an effect during their games. Though the referees experience internal and external factors that may affect games, all but one individual agrees that they have successful coping mechanisms for dealing with these distractions. With a mean value of 3.49, the population falls almost directly in between responses “agree” and “strongly agree;” this category also has the smallest variation among responses at 0.534.

When deciding if psychological attributes outweigh the physiological attributes when refereeing, most of the participants in this study agreed. As in the previous scenario, many respondents (35%) disagree that the psychological attributes outweigh the

physiological. As stated in the physiological discussion above, it is hard to predict why the participants disagree with the statement. Two reasons stand out as possible reasons for disagreement with Table 6, statement G: (1) the respondent feels that both categories have equal importance and one does not emerge as more important or (2) the respondent believes that the physiological attributes of refereeing outweigh the psychological attributes. A mean value of 2.72 represents that the population slightly favored agreement of statement G from Table 6.

A comparison of means is shown in Table 7 compares the independent variable of referee grade to the dependent variable of believing psychological attributes outweigh the physiological components. The current grade categories were collapsed into Grades 6, 5, and 4 as one group and emeritus and the second group to see if any group identifies differently with one category.

Table 7 – Aptitude toward the Psychological over the Physiological

Current Grade	<i>n</i>	<i>M</i>	<i>SD</i>
Grade 6 or Higher (6, 5 ,4)	41	2.83	0.704
Emeritus (13, 15, 16)	24	2.54	0.658

Based on the difference of means in current grade, an independent samples *t*-test was run. The results of the independent samples *t*-test were not significant when using collapsed grade categories as a factor with the overall aptitude toward the psychological attributes $t(63) = 1.628, p = 0.109$

Gender was not a significant factor for any of the scenarios presented in Tables 2 and 6. The two female respondents who participated in this study represent several different demographic groups including Grade 4, Emeritus, and state assessor.

Qualitative Findings

The qualitative data from the survey instrument was collected from a series of open-ended, free response questions in the second stage of the online questionnaire. Participants were encouraged to elaborate on themes presented throughout the survey and meant to help the referees define how the physiological and psychological elements of refereeing lead to successful matches. These questions help to answer research questions 2-4 by allowing the individual to discuss what traits and tools are helpful instruments making up the referee's figurative toolbox.

Referee Matches

It is very important to understand that referees often officiate a very wide variety of games ranging from younger youth matches all the way up to the professional matches. The referees that met the target population in this study are assumed to be representing the best referees in their respective state association. Typically, the games tend to be competitive youth and amateur adult matches at the local levels with some semi-professional matches on an occasional basis. This is the case for most of the referees that participated in this study. Most Grade 6 referees agreed stating that their most commonly officiated matches include the most competitive youth and local adult leagues in their area. With many of the referees having an emeritus certification through the United States Soccer Federation, they claim to be past their prime and lessening their

load of competitive matches and focusing more on the recreational and high school matches. When asked, “What are the most common games you’re currently officiating—amateur, adult, professional, youth?,” one participant states: “Mainly youth at my age but some amateur.” One National Candidate (Grade 5) referee states that he focuses solely on semi-professional adult leagues such as Premier Development League (PDL) and United Soccer League (USL) which are the third and fourth tiers of professional and semi-professional soccer under Major League Soccer (MLS), respectively.

A common theme throughout many of the responses is that there is a relationship among the number of lower level games offered versus how many of those games each referee is officiating. Those referees that officiate at the semi-professional and professional levels (Grades 3-5) do not often have bigger games; most are in agreement that they average between 1-4 of these high-level games per month. The National referees that participated in the study focus on their professional matches with both participants estimating they officiate, “1-2 [matches] per week; 2-3 professional matches per month” and “1 [m]atch per week, 4 matches per month. One state referee breaks down his game types by the season: he takes few games through the winter months, but in the spring and fall months, he referees anywhere from 4-6 matches a week plus high school matches. He adds that incorporates a rest and recovery period of seventy-two hours prior and twenty-four hours after a high-level match. A theme surrounding the three responses above is that the high-level matches take a high level of commitment and likely take up time that could be used to officiate a greater quantity of matches. Those

referees who focus on the higher profile assignments officiate a smaller quantity of games.

Lower level state referees who do not have the access nor the credentials to have assignments to high-profile, professional matches, focus their attention to a higher quantity of nonprofessional matches over the course of a month's time frame. Several emeritus referees explain that their workload of higher level matches has significantly decreased due to age and lack of physical ability but that they continue officiating youth matches. One emeritus referee explains, "There were not a lot of pro games [when] I was at the height of my career, but I averaged about one a week during the season" and another adds that, "During the fall season, with college being the major focus, generally [I referee] 25 - 30 matches per month - really too many to adequately recover both physically and mentally." Most of the referees fall in the range of 2-5 matches per week including youth, high school, and adult matches. "During the heat of the USSF season I will be officiating between 2 and 6 games a week. I can be officiating up to 2-3 USL pro matches a month and 2-4 PDL matches a month," states one state referee. When referencing the USSF season, it is assumed that those games are considered to be grouped in with high-level youth matches. There are also outliers where some referees do very few games per year and others claim to referee matches almost every day of the year.

Many referees referenced their college and high school (scholastic) assignments as being a significant quantity of the matches they officiate—especially outside spring and fall youth seasons. These matches do not require certification through USSF and are not governed by the same bodies but still contribute to game count and type. High school

matches tend to be synonymous with USSF sanctioned youth matches but often require a different type of skill set due to the vast differences in age and size in the players. High school varsity teams can have players ranging in age from as young as fourteen to as old as nineteen. College games require certification through state associations that are affiliated through the National Intercollegiate Soccer Officials Association (NISOA) and tend to be grouped as amateur adult play (though many of the players will play semi-professionally after graduation). This study does not go into detail in recognizing those officials who are members of NISOA or other scholastic organizations, but many participants identified themselves by including scholastic games as a big source of their game count.

Training Regimen

The referees in this study are all required by USSF standards to pass fitness tests and game assessments in addition to other less significant requirements. The current USSF standards hold the states accountable for hosting and carrying out the various fitness tests as well as providing assessors for those match assessments that are requested by the referee. The fitness tests are intended to hold the referees accountable and in shape through sprint and interval testing. As discussed above, the top-level referees are averaging one match per week and lower level referees tend to range from 2-5 matches per week. Outside of high school and college games, most USSF sanctioned youth games occur on weekends and adult leagues vary by locale but most games occur on the weekends as well. In order for the referees to stay at match fitness for higher level games,

they need some sort of training regimen. Of the 65 participants in the study, only 9 admitted to lacking some sort of workout plan to help them stay fit for games.

The overwhelming majority of the officials focus their attention on strength training exercises and cardiovascular activity such as running, biking, and swimming. One Grade 6 referee explains that, “On days when I do not have games, I normally rotate between running, cycling, and an elliptical. All are done in the gym. I also do some weight training.” A similar statement is made by another state referee that, “I run and lift weights on off match days. It is not a strict regimen, just what I feel like doing that day.”

Four referees broke down their workout regimen in detail:

(1) “Yes, on a weekly basis. Each day of the week is dedicated to one of the following high intensity, sprint training, speed, endurance, recovery, [or] interval test practice”—Grade 6 Referee

(2) “Alternate daily the following along with 45 single leg curls, leg extension, and stretching: (1) intervals on elliptical for 35 minutes and (2) 3 sets of chin-ups (10 each), dips (15 each), and 50 pushups”—Grade 16 Referee

(3) “Distance run averaging 6 miles once per week; Sprint training and exercises for 30 minutes once per week; interval runs, usually at a 40-40 pace, averaging 14 laps, once per week; core workout, 15 minutes, 2-3 times per week”
—Grade 6 Referee

(4) “45 [minutes of] cardio and 45 [minutes of weightlifting] five times a week”
—Grade 5 Referee

Most of the referees admit to some sort of training regimen that they follow based on game assignments and whether the seasons are in full swing or not. A general answer included cardio and strength training with less referees incorporating sprints into their workouts.

Some referees mentioned their increased fitness plan as the date of an upcoming fitness test approaches. One state referee explains that his workload increases in preparation for the tests: “I typically run 2 miles 2 [times] weekly and try to practice sprints 2 [times] monthly. [One] month before [the] fitness test I increase that to 3-4 [times] weekly running [the] practice test along with 1-2 [times] weekly practicing sprints.” This particular referee nearly doubles his workload as the fitness test approaches.

Instruction and Education

At the lower grades, referees do not have many opportunities for continued learning outside of required recertification clinics. The state referee associations do not often put on clinics and trainings that address points of emphasis—though locally, some associations do host referee training seminars on a biweekly or monthly basis where referees are invited and encouraged to participate in group discussion. The referees that participated in this study are held to a higher standard than the Grade 8 and 7 referees. They are expected to have a better grasp and understanding of the Laws of the Game as well as a fundamental understanding of how the Laws are to be interpreted and applied in match situations. Continued learning is something that referees at higher levels are expected to maintain as senior referees. There are law changes and interpretations of rule

changes every year—when the Laws are improperly applied, there could be game critical situations that are not properly addressed.

A common theme presented throughout this study involves the referees reaching out and utilizing web sources such as the Professional Referee Organization (PRO) and other online video clips that investigate, interpret, and shed light on influential game scenarios and match critical situations that have occurred in recent games. PRO's objective is "...to increase the quality of officiating in U.S. and Canadian professional leagues, develop more professional-quality officials at a younger age, and produce officials who will represent the U.S and Canada in FIFA competitions" (Professional Referee Organization, n.d.). The website breaks down a "Play of the Week" for viewers by making available a video clip from the previous week of MLS play and explaining why the decision in the video was good or if situation should have been handled differently. Several referees mention specifically the use of these video clips and explanations as helpful learning targets.

Many other referees use their own game tape for a variety of reasons. A Grade 15 emeritus referee states: "I watch my own games when I can get video and try to analyze my positioning, foul and card discrimination, body language, and man management. Classroom trainings are typically during state clinics [and] regional and national tournaments. They typically focus on man management, positioning, offside, and player mentality." Another referee adds, "On upper level games, I will re-watch matches I officiate in. I will also look at MLS clips and yellow/red card situations along with [penalty kick] situations to see how those officials handle particular situations." Both are

very powerful statements that show referees like to self-evaluate many aspects of their games.

An additional theme that was presented throughout this section of the data relates to referees performing “homework” prior to their matches. Several referees explained that understanding the team’s record, their potential problem players, and past matchups can help them to be prepared for situations that may appear throughout the match which can help to reach a decision faster and more efficiently. A state referee explains, “I do my homework for teams prior to [the] games I work by looking at their websites and [identifying] the top scorers, repeat offenders, how many cards as a team, how many goals as a team, etc.” Other topics such as team tactics can play an important role as well; tactics determine a team’s style of play which ultimately affects where, when, and how the ball will be played. Proper positioning and anticipation of play can help the referee be in a position to make a match critical decision.

The Referee Toolbox

Participants’ responses throughout the survey demonstrated the importance of game management as one of the most influential tactics that come from a referee’s toolbox. Game management can refer to several aspects of the game—players, coaches, overall temperature of the match, the technical area, and fans. The participants have broken down several aspects that allow for the successful overall management of the game. Several factors that contribute to successful game management include communication, personality, positioning, confidence, and the ability to adapt under certain situations and scenarios.

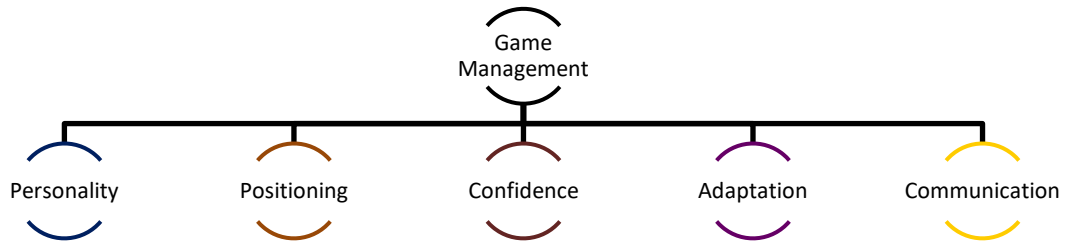


Figure 1. Elements of Game Management

An emeritus referee elaborated on his personal skill set and how he must adapt and change tactics for the situations presented: “These skills are not easily named. I view the toolbox as a bunch of mindsets that you plan to use during the match. These mindsets are shaped by expectations that are created prior to the match, then by events that occur during the match. You can go into the match knowing you need to be a force to be reckoned with, or you can [go] in expecting to have an easy match where you don't need to do too much to control the match.”

As emotions flare in games, many of the referees explain the importance of communication between themselves and the players/coaches as well as the communication among the members of the referee crew. Communication allows for quick, direct decisions to be made with the assistance of all the referees who are on the field that day in order to sell a call. This is an important topic that is often discussed across a variety of sports and is used as a vital tool to build confidence in the referee crew

from the players. Communication combined with proximity to play, a powerful whistle, and body language can help build that positive reputation for the referee. The players see the referee close to play and his or her confidence in their call/no call decision leads the players to believe that the referee got that call correct—even if it was a bad decision. Establishing that relationship between the players and referee crew can resonate throughout out the remainder of the match and perhaps subdue an escalating match temperature. A state referee points out that he has added several different tools over the course of his officiating career: “Some additions to my ‘toolbox’ over time have included: enhancing my pre-game; observing peers; learning from assessments; refining my decision-making process; anticipating game situations [and] team tactics; strategies for better communication to players/team officials (including non-verbal); developing greater understanding for reaching decisions based on the spirit of the game. His reference to pre-game is an important component of communication among the referee crew. As a referee moves up in the certification process, he or she is expected to hold themselves and their crew to a higher standard; this includes communication and pre-game discussion.

Young and inexperienced referees typically show up to their match fifteen minutes before kickoff and are meeting their crew for the first time. Often, there is little discussion regarding expectations, questions, comments, and concerns for the upcoming game. At the elite levels, pre-games can start as soon as the game assignments are released weeks in advance. Communication regarding when to arrive to the field or facility, expectations of the crew, team information, Law changes, and many other topics

are discussed. As a referee reaches higher levels and works a greater number of elite games, the margin for error decreases. One referee made a point that to say that a thorough pregame allows for everybody to be on the same page in anticipation of potential match events. Soccer referees do not have the luxury, as of this time, to go back and watch instant replay—though that technology is on its way and being tested in some MLS matches.

Communication between the players and coaches is a tool that high-level referees claim to be vitally important. The ability to explain what the referee saw during a particular play and why the call was or was not made can help diffuse emotions over the course of the match. Several referees discussed humility, honesty, and the ability to accept constructive criticism from the crew and assessors as essential tools they bring with them to every match. Humility and honesty can help remind the players and coaches that referees make mistakes as the players do—it levels the playing field, so to speak. Constructive criticism occurs often at higher levels of play—more people see the game and the games tend to be high stakes for the clubs involved. At the professional and semi-professional levels, there are assessors at every match aiming to mentor officials and discuss situations and scenarios that played out throughout the match. Assessors often discuss positioning and anticipating play, game management, and match critical situations. When asked, “Do you feel that you have developed a set of skills to add to your toolbox over the course of your officiating career? What are they?” one referee’s response encompasses a majority of all the traits that are discussed in this section: “Solid preparation before the match; teamwork among officials; anticipating situations to

minimize surprises; focus[ing] on the task at hand as well as an ability to adapt to changing circumstances. Yes, adjustment is absolutely necessary due to different skill levels and match expectations (does [a] team need to win, or [are they] content to draw, etc.).”

Hugely important in the realm of game management is confidence. Every participant in the qualitative section of the survey agreed that confidence is a very important component of successful refereeing. One theme that was common to several of the participants was the idea of “selling a call” previously discussed in reference to communication. Several officials agree that “...projecting confidence can get the ‘buy in’ from players necessary to have them support your calls even when they don't agree with them.” An important component of this statement is the notion of projecting confidence. This occurs from the moment the crew steps into the stadium by having a professional appearance and demeanor. Subtleties such as a firm handshake when introducing oneself to the coach and captains portray confidence and setting the tone for the rest of the match. One participant draws a fine line between confidence and arrogance: “Confidence is very important. Someone once told me you have to have a bit of arrogance to be a referee, and with that comes confidence. You have to be confident that you know the [L]aws and that you have the ability to judge and follow through on decisions. At first the confidence came from fellow referees, assessors, and instructors. Now it comes from experience. I know that I have had tough games in the past but that the game ahead of me is manageable.” Other referees challenge this statement by stating, “An arrogant referee has

no place in this game” and that “Confidence is an attribute gained with experience, as opposed to arrogance, which is an ineffective substitute.”

External and Internal Factors

An important component of refereeing any sport is applying partiality. Referees are expected to call a game without regard to external factors that may come into play throughout the match. The participants identified sideline comments as one of the most distracting factors that may influence a match—though many quickly acknowledge the existence of distraction outside the field of play, a common coping mechanism is to dismiss or ignore the comments and focus on managing the game: “I think there are external factors you have to be aware of and how they interact with the players. As a referee, you have to be emotionally and mentally strong when dealing with coaches, players, [and] spectators (fans/parents) even when things get noisy. When sideline comments bring the energy level up of the players, it can get the players to be more emotional on the field. As a referee, you have to manage that.” Another referee acknowledges that it can be difficult to completely ignore comments by saying, “In a perfect world, I would say no, it does not influence, but to me, deep down, of course it does. When you hear a coach complain, you at least consider what they are trying to tell you and that may influence the next call.”

Several referees mention that the factors that may influence decisions change from league to league. For example, the sideline comments at youth and amateur levels carry more weight because those comments can be deciphered word for word. At higher

levels where there are thousands of fans in the stands, the noise cancels itself out and is just background or white noise.

Not one participant mentioned home team advantage as being a factor that may influence any decisions in the match. The only theme that may be distantly related to home team advantage is pre-determined notions of problem players and tactics based on their histories. If referees come into a game fully prepared, then they likely know the leading goal scorers, players who have accumulated the most cards, and player tactics which allows the crew to be prepared for situations that could arise in the match. One referee heeds advice for dealing with outside distractions: “Work the game for the players and ignore all the other outside factors so long as they are not impacting the players.”

One factor that four referees mentioned is how weather can be an external factor that affects refereeing. Two referees distinctly mention cold nights as being a huge factor while they officiate—though they do not mention why weather can be such a big factor, it is easy to agree that temperature and precipitation can influence the referees just as it does the players. Cold weather can lead to higher instances of muscle injuries while hot weather takes a toll on the body’s hydration and mental clarity. Rain and fog can restrict visibility, slow down play, and cause uniforms to become wet and uncomfortable. The temperature likely affects the referee and assistant referees differently. Refereeing involves more dynamic movement with play whereas assistant refereeing requires short sprinting and side stepping. The cold likely has a greater effect on the assistant referees whereas hot temperatures likely affect the referee greater, due to their differing movement patterns.

Demographic-Based Factors

When asked, “Have you ever experienced anxieties based upon factors such as race, religion, gender, or age?”, 31 of the 65 participants stated that they have not experienced anxieties from any of the listed factors. The anxieties that referees have experienced are almost all stemming from the early stages of their refereeing career where inferiority played a big role in the games. “All the time I get ‘you’re too young’ and ‘why do we have a 15-year-old on the game?’” An emeritus referee recalls that, “Refereeing players that are older or more experienced players always made me feel like they knew the game more than I did and would make me second guess some decisions if they verbally objected.” A common theme throughout the responses is that the referees have overcome that anxiety as they have upgraded and increased their game count in those games that challenge their lack of experience. Confidence levels increase as a referee becomes more comfortable with a particular league. Three referees mention that being older than the players has the same effect as young age. They claim to feel inferior in that they cannot keep up with play and feel like “...there have been times that I have had some anxiety for a match. In most cases my anxiety is based on age because I am older than most players I referee. I often wonder if I am in sufficient physical condition to referee at a higher level than the players are playing at so I do [just enough] for the match. I do not like it when I hear a referee should not be doing a certain match because they are [not] performing at a high enough level to do the match.”

Race is the second most commonly cited response from the question above. Players and teams, especially adult leagues, can often be dominated by one ethnic group.

Some referees in this study have found that ethnically diverse groups can cause language barriers as well as fuel tensions among different groups. A state referee recalls, “I have done many ethnic games without too many issues. However, the game is played with multiple languages on the field. Figuring out the subtle ‘banter’ which can escalate is the challenge. Recognizing and understanding different styles of play when two different cultures play should be understood and be able to adapt and find a happy medium.”

Other referees recall a lack of respect from some Hispanic teams and players—though it is impossible to know these referee’s ethnicity from this study other than assuming them to be non-Hispanic since they are experiencing discriminatory actions and/or comments. Hispanic teams have different playing styles and tactics than do Caucasian teams—both groups have reputations for playing the game one way or another. Referees are tasked with finding the balance between the teams and maintaining control of the match as well as acquiring a balance between themselves and the players. Tensions can flare from player to player as well. One referee explains that he has not personally been affected by race, religion, gender, or ethnicity, but that he has witnessed discrimination based on race and ethnicity among the players and has had to sanction the actions of those players appropriately: “[In] some leagues such as Hispanic leagues where a lot of the players don’t speak English I have some worries about how will I communicate a situation. [Additionally,] since I try to talk and communicate with players so much sometimes women don’t want to talk so I have to alter my game and sometimes worry about how will I do that [throughout a] game.” As previously mentioned, communication is one of the essential tools for referees and not being able to effectively

communicate with the players can be detrimental to the referee's game management techniques.

Gender plays a huge role in refereeing and where gender plays a role, sexism likely exists. With only two female referees participating in this study, it is challenging to gather a wealth of discussion regarding how gender has affected matches. It can be challenging for a woman to be seen in a position of authority in a profession dominated by men. This is true for referees but especially true for players. Seeing a female referee with a whistle or flag in her hand is not common for the players—this is true for both genders and at all levels. One quotation in the previous paragraph mentions communication with the opposite sex. In this referee's case, his concerns are related to addressing female players without coming across as sexist or gender-biased. This is a very interesting point—it would seem women would experience anxieties as the referee; but in this example, the male referee experiences anxieties regarding the female players. One of the female participants mentions, "Yes, as a female referee and one of 3-4 who rose to my level, there were concerns about my gender, but the highest compliment to me psychologically is when players would yell 'Sir....I mean Ma'am,' which means that they did not factor it in." This is another interesting comment that suggests players may not have predetermined prejudices but that factors such as race, gender, and ethnicity may not be a factor until the players feel they have found fault. In cases like this one, players think post-decision that gender may have been a factor in the referee's decision.

Physiological or Psychological?

The final question on the survey instrument asks the participants to choose which category bears more weight for them personally and to explain the reasoning for their choice. Table 11 shows the breakdown of answers that the sixty-five participants shared on the survey instrument.

Table 11 - Which Attribute bears a greater weight?

	Physiological	Psychological	Equal Importance
Are the physical or mental traits more important for you?	14	30	21

Thirty of the participants stated that psychological outweigh the physiological attributes when it comes to refereeing. Many of the participants in this category agree that the mental traits and tools are vastly important and can help overcome hindrances that they may face physically. For example, one state referee claims that, “Mental traits are most important for referees to develop. Referees make many decisions every second of a match: [w]here to run, [w]hat will happen next, [w]hat tactics are at play, [and] what is the most important action that I need to take next[?] If a referee cannot make enough of those decisions that he is faced with, it won't matter how fit he is. An indecisive referee will never be successful.” This referee makes a point to say that development of mental traits is important because decisions are constantly being made throughout a match. Another state referee agrees by explaining, “Anyone can run, but one who understands

and works toward emotional intelligence is one that can be a better referee.” The theme that emerges throughout several of the responses is that having strong mental tools on the field can assist in overcoming taxing physical demands. One emeritus referee believes that, “Mental preparation is more important...Maintaining focus and mental resilience takes a different set of skills.” His statement indicates that mental strength is made up of several different components that contribute to successful matches. A national referee explains, “At this point in my career - mental traits are more important, but physical traits helped get me to this level. If my physical condition were to degrade, I would no longer be in a position where my mental traits would matter.” His response indicates that the attributes that are most important to a referee may change throughout different periods of their career.

Fourteen referees decided that the physiological components are more important than the psychological components. Different than the testimonials cited above, these referees mostly believe that mental acuity can suffer due to physical fatigue. Themes that emerged throughout the responses mostly indicate that it can be nearly impossible to make a correct or educated decision if positioning is impacted by a low level of fitness: “Being older and well-seasoned, [I] believe [I] have a lot of the mental side down pretty well. But at my age, [I] struggle to stay in top shape to be able to physically deliver my best performance that the players deserve at higher level youth matches.” This emeritus referee has admitted that the physiological requirements of refereeing at higher levels have been a factor in his decision. External factors—age in this case—have caused him to make sacrifices in his refereeing. Having 17+ years’ experience refereeing, he claims to

have mastered many of the psychological demands but cannot meet the physical requirements of the game. A separate emeritus referee thinks that "...the physical aspect is more difficult to achieve and maintain. The psychological aspect can be overcome if you are in position and close to play." He suggests that maintaining an elite level of physical fitness is a more difficult process than reaching and maintaining mental strength and resiliency. His point is valid if one considers the factors that can affect fitness including injuries, game counts, and overall athleticism. Another referee agrees that it is much easier to come back from negative situations that affected the referee's mental health than recovering from physical hindrances.

The remaining twenty-one referees did not make a decision in choosing one attribute over the other and stated that both attributes are essential together in order to be a successful referee. Most participants stated that one cannot have a successful career in officiating if emphasis is put on one of the attributes over the other. A national referee states that, "Both are equally important. Most folks can get away with one being stronger than the other—experience over fitness or fitness over knowledge of where to move. However, to get to and remain at the professional level requires both to provide insight guidance and endurance." She makes a point that even though individuals may have a stronger aptitude toward either the physiological or psychological attributes, they are both equally important. Referees must understand which category is weaker and work to improve. A state referee agrees that "I believe it depends on the particular referee whether one trait bears more weight than the other. For example, some referees have trouble staying in shape. For these referees, staying physically fit may be more of a

worry.” The same can be said for those referees where fitness is not a problem for them but they struggle making decisions or lack the confidence. Another state referee believes that, “...you cannot choose one [over] the other. I truly believe that finding a balance between both the physical and mental sides of refereeing are key in becoming a good referee. I do believe that if you neglect one or the other it will greatly affect each other.” In a general sense, the referees in this category make a point that every referee is different in their abilities and that working hard to overcome and master both attributes is essential in becoming a successful referee.

CHAPTER 5: CONCLUSIONS

Summary of the Purpose of the Study

This study aims to identify several physiological and psychological factors that challenge officials during typical elite matches. It also identifies whether the physiological or psychological attributes of refereeing are more important to the population that participated in this study. The conclusion of the study aims to rank as well as break down any identified pressures by their degree of importance according to a series of quantitative and qualitative-based questions answered by the population. The participants were identified by their 2016 Grade through the U.S. Soccer Referee Department in conjunction with the state referee associations. They were then asked to participate in an online survey which is developed from the core elements explored throughout the literature review. The results of this study will help to reveal areas that may be lacking in education and training settings and help to identify means of eliminating certain pressures experienced both on and off the field of play.

Summary of Findings

The referees that participated in this study are from the state associations of Virginia/D.C., Eastern Pennsylvania, West Virginia, Pennsylvania West, Maryland, Rhode Island, and California South. The population is made up of state, national candidate, national, and emeritus referees from the various state associations that

provided email addresses for the target population. The findings indicated that referees agree that the physical and mental components are both very important though there is disagreement regarding which category is more important over the other. It is important to understand that although there was evidence from both analyses that psychological attributes are more important in a general sense, there are a significant number of referees who believe that that the physiological attributes are of greater importance. A point must also be made to include that an even greater number of participants think the physical and mental attributes should have equal importance to referees.

Research Question # 1 – Findings and Discussion

When assessing the data from the survey instrument, which attribute, physical or psychological, bears more weight when examining the pressures that modern soccer officials experience?

The survey instrument provided quantitative and qualitative data that relates to research question #1. Quantitatively, the data indicated that the participants slightly agree that psychological attributes are more important than they physiological attributes. Qualitatively, the responses also indicated that the psychological attributes are more important over physiological attributes. The majority of the referees who participated in this survey believe the psychological requirements of the game are more demanding and of greater importance than the physiological requirements of the game. There is still a significant number of dissenters, though less than the number of supporters, that the physiological side of the game presents more challenges for the referees. The current grades of the referees who participated in the survey likely affect which category bears

more weight to them as a group. An example would be older referees who may feel greater pressures from the physical demands of the game due to factors that affect their athleticism, speed, and recovery time. The same can be said for those referees who are certified National and National Candidates—their fitness levels are tested and the expectation is that they have already mastered their physical demands and need to focus on good decision making, communication, and adaptation to certain scenarios and situations.

Research Question # 2 – Findings and Discussion

Do any contributable pressures emerge from each category that are not identified and evaluated throughout the literature review?

The literature review identified two major physiological pressures that include injury and injury prevention and fitness and training and two psychological pressures including decision making abilities and the effect of internal and external factors. Among the physiological subthemes that emerged throughout the data analysis, fitness training was a major factor that many of the referees agree is significant. At higher levels of officiating, fitness is one of the key elements that separates elite from average referee. Most of the officials put a major emphasis on cardiovascular exercise (running, elliptical, or swimming) and strength and weight training during their off days—though there are several referees who use a high number of games per week to stay at match fitness. Although this is likely not the case for National referees who keep their game counts very low to be properly prepared for their professional matches; therefore, their training regimen is imperative for staying at a high level of fitness. Several referees identified

physical fitness as one of the limiting factors for the types of games and grade level.

They have indicated that they are “past their prime” and that age has become a significant factor in determining the types of games they feel confident in accepting. Others have indicated that fitness and training is not a factor that adds pressures or stressors for them.

An interesting stressor that emerged related to how weather impacts the referee both physically and psychologically. This subtheme will be further discussed in research question #3 but is still significant as a factor that was not addressed throughout the literature review.

Psychologically, several referees mentioned external factors that exist throughout matches such as sideline comments from fans, parents, coaches, and the technical areas. The most commonly cited stressor comes from lower level matches such as youth and amateur adult matches where the referee’s proximity to fans and parents is much closer than it is for semi-professional and professional matches. Referees mention that comments, criticisms, and dissent can be heard almost word for word and can cause distraction away from the game and players. Many referees agree that they are able to ignore or tune out many of the comments and allow play to continue without it being a significant source of anxiety. A few referees did mention that parents and coaches tend to be the biggest distraction of all external factors. It is not often that engagement with parents occurs, but referees have some degree of obligation to establish a line of communication with the coach(es) and this can become a serious distraction if not managed appropriately. Decision making skills is still an important component as discussed in the literature review, but is not brought up as a stressor that affects the

referees but rather as an element that is critiqued in assessments and focused on throughout classroom training.

Research Question # 3 – Findings and Discussion

Were there any themes or subthemes that emerged that are interrelated in their nature that could be identified in the qualitative findings?

Though a majority of the referees chose psychological attributes to be more important than physiological attributes, the referees who stated that each category bares an equal weight identified several factors that are dependent on mastering both categories when refereeing. The most cited responses relate to the ability of a referee to make a best-guess decision in a certain situation or scenario. To obtain the most information and make the best decision, referees should be in a position to see the incident and then have the ability to understand, read, and replay what happened in a matter of a few short seconds. Positioning is a physical demand and reading and understanding play is a psychological demand.

As previously mentioned, weather was a factor not discussed throughout the literature review but it can affect referee, both physically and mentally. The biggest factor about weather is that it can affect the body in many ways which ultimately can impact a person's mental abilities and clarity. Referees are impacted by severely hot or cold weather, as are the players, and those that cited weather as a factor in the survey revealed that it impacts them physically which ultimately influences their mental acuity. Hot temperatures can slow the referee down and also cause mental fatigue especially if hydration becomes a significant factor. Cold temperatures have the potential to slow a

referee down but the major factor in this scenario is that there are greater chances for muscle strains and injuries.

Research Question # 4 – Findings and Discussion

When deciding if the referee had a successful match, does one category, physical or psychological, emerge as more important in evaluating successful on-field performance?

This specific question has two components: (1) self-assessment and (2) referee assessment. In most semi-professional and professional adult matches, the referees are evaluated by a certified assessor who is responsible for providing feedback and recommendations for the referees who were assigned to the match. The assessors that participated in this survey all indicated that they are state assessors and their responses have helped shed light on what the referees are most concerned about before, during, or after on-field evaluations. One assessor mentions that some of the referees become nervous at their assessment matches and that, because of this, they often do things that are not characteristic of their style. The referees focus more on the notion that they are being assessed and become less focused on the match. Some assessors also mentioned that fitness (or lack of) is one of the easiest areas for them to comment on and mark down the officials. The majority agrees that many of the biggest factors that the referees have a more difficult task of overcoming are the psychological factors over physiological factors but that physiological factors may impact how the referee handles certain scenarios.

Study Limitations

There are several limitations that impact this implications and results of this study. Some of the questions in the quantitative section of the survey instrument are broad. As discussed in the quantitative findings section, there are likely various reasons that an official answered a question a certain way. One example is understanding why some referees disagreed that physiological attributes are more important than psychological attributes. Some officials may think that both have equal weight therefore they disagree with the statement. Another scenario may be because the referee disagrees because they believe that psychological attributes are more important over the physiological. In this case, the answers to those questions are hard to discern. A further investigation of these questions would be significant in understanding why the referees ranked one statement over the other.

A second limitation of this study is that it included only a regional scope of referees from the mid-Atlantic region. With referees of all grades and experiences situated around the country in a various assortment of settings, there could exist regions where the referee population experiences different anxieties based on the demographics of the area. An example could be the presence of a higher percentage of Hispanics population in the southwest United States where ethnicity may not be as significant a factor.

Gender was not a significant factor that was discussed and evaluated throughout this study. The two female participants did represent significant demographic groups including national and emeritus referee and assessor groups, but the quantity of female

participants was insignificant for statistical analysis. Although, the investigator was able to gather a small amount significant qualitative data from the questions that related to gender.

Recommendations for Further Studies

There are several opportunities for further studies relating to factors that influence and affect officiating across many different sports. One of the biggest opportunities would be to introduce face to face interviews in a study similar to this one where comments, responses, and opinions can be further investigated to recognize why referees feel aptitudes toward or against certain physiological or psychological attributes. It would be beneficial for the investigator to be able to have an open-ended conversation that would further illuminate reasons behind the referee's responses.

As mentioned in the study limitations above, a broader audience may give a better representation of the referee population as well as show if referees from different regions of the country experience different stressors and pressures than the mid-Atlantic. A better representation of gender would shed light on the differing pressures that male and female referees experience prior to, during, and after their matches.

Lastly, a final significant recommendation would to conduct studies that focus specifically on the different grades of referees. It would be very interesting to analyze, for example, what factors impact the Grade 8 referees versus the Grade 6 referees. The Grade 8 referees who have been newly certified likely have different anxieties for matches than the state referees. This could help assessors and instructors understand what

factors are significantly impacting young and inexperienced referees and help them overcome and master skills that need improvement.

Conclusion

This study revealed several physiological and psychological factors that referees consider to be important components that make up their toolbox. The results of this study indicated that the general population of referees hold psychological attributes to be slightly more important than physiological attributes. In both the quantitative and qualitative sections of the analysis, psychological outweighed physiological. The referees in this study indicated that at the higher grades, the physical demand of the game is something that should already be mastered and that honing decision-making skills and coping with internal and external factors should be some of the referee's biggest priorities. Though the psychological demands outweighed the physiological demands, there was still a significant number of referees who believed that the physical elements outweighed the mental elements. This is consistent with the hypotheses presented in this study.

As previously discussed throughout the literature review, there are few studies that investigate the physiological and psychological attributes and no studies were found that investigate the two topics together—a vast quantity of the literature focuses on one topic or the other. The participants in this study referenced many of the physical and mental traits that were identified and discussed throughout the literature review throughout several of the open ended, free response questions presented in the survey

instrument. They also brought several topics to the discussion that were not introduced in the literature review.

Wolfson and Neave (2007) concluded that one of the most commonly cited stressors and pressures faced by referees include having a bad game, coaches and fans' lack of knowledge of the Laws of the Game, referee biases toward one team over another, and reactions from players/coaches/fans during the heat of the moment. This study further confirms that conclusion—when asked about internal and external factors that affect the game, distracting coaches, fans, and parents was the most cited example.

The referees in this study also revealed the importance of video-based trainings as one of the most useful tools for self-evaluation as well as in educational settings. This goes against a 2007 study that suggests referees specialize their skillsets early in their careers. The study also concluded that situational learning during match play is more beneficial than any classroom experience (MacMahon, Helsen, Starkes, and Wetson, 2007). It is difficult to predict if the officials agree or disagree with the results of the study, but improving skillsets by officiating more matches was not cited as a source of improvement for the officials that participated in this study.

The data and results of this study relating to referee efficacy agreed with Guillen and Feltz's (2011) study which investigates sources of "refficacy" within a group of officials. The study suggested that physical and mental preparation is one of the biggest contributors in believing one is good enough to perform the task at hand. One of the biggest factors that this group of referees agreed upon related to confidence in themselves and confidence of their abilities to move up from their current grade. The participants

agree stating that referees must have both elements in order to be successful. Though psychological is more important, it would be impossible to see success without strong physiological attributes.

The significance of this study is important in that it has begun to lay groundwork for future studies that can help quantify the psychological decision-making process as investigated in a 2011 study by Ghasemi, Momeni, Jafarzadehpur, Rezaee, and Taheri. Their study investigates factors that affect the decision-making process by having the population participant in five visual memory tests to determine which traits are most significant for successful referees. With psychological attributes weighing more heavily on the referees who participated in this study, it is important to understand the significant factors that may affect a referee mentally. In addition, limiting these factors and understanding what traits add to the referees' overall success on the field can be vastly important.

APPENDICES

Appendix A. Cover Letter

Dear Participant,

I am a Grade 7 referee looking to upgrade to receive my state badge for 2017 from the Metro DC-Virginia State Referee Program. I am also currently working on a master's degree in Sport Management from George Mason University located in Fairfax, VA. As I look to upgrade to a state referee in Virginia, I have become very interested and enthusiastic in learning and observing the characteristics of successful referees. I want to extend my knowledge outside of observing and collaborating with local referees before, during, and after matches. I have reached out to you because you are a Grade 6 or higher referee who has met the criteria to participate in a study investigating physiological and psychological attributes that make up a modern referee's "toolbox".

The purpose of this study is to identify which of the two categories, physical or psychological, bears a higher value to the referee and look to identify trends and correlations among the referees participating in the study. It is important for a referee to know which component is more valued so that he or she can focus on mastering the ability to overcome pressures that are required of them to become a successful soccer referee. This study will include a group of state through national level referees from the Mid-Atlantic region. This study can be utilized by referee associations and governing bodies to understand which characteristics may need to be improved or focused upon during the many trainings that have been and will continue to be required throughout your career.

Without your participation, the study will not be the most representative sample of the elite referee population in the surrounding area. The study will be both quantitative and qualitative in nature focusing on ranking responses using a simple online survey method for the larger population and a short-answer section for those who are interested in discussing the themes any further. The survey will take approximately 15-20 minutes to complete. It is important to know that full confidentiality and anonymity will be used throughout the duration of the study and that every response will be treated fairly and weighted equally. I would like to thank you for your time and consideration in helping a fellow colleague extend her knowledge as well as increasing awareness of the pressures referees must overcome throughout their careers.

Appendix B. Survey Instrument

Part A. Demographics

Thank you for your participation in this study. This study investigates physiological and psychological attributes of the modern soccer official. The following survey questions will take no longer than 5 minutes to answer. Your answers will be kept in full confidentiality.

What is your referee grade for the current year (2016)?

1 2 3 4 5 6 Emeritus

What is the highest referee grade you have received?

1 2 3 4 5 6

How many years have you been a certified official for USSF?

5-8 9-12 13-16 17+

How many years have you officiated at a grade 6 or higher?

1-2 3-4 5-6 7-8 9-10 11+

What is your gender?

Male Female

In what age group do you fall?

18-30 31-40 41-50 51-60 61-70 71-80

Have you ever been or are you now an assessor for USSF?

No Yes, State Assessor Yes, National Assessor

Part B. Survey Questions

Please rate the following statements from strongly agree to strongly disagree. The statements are not meant to be tricky or misleading. It is understood that there exist different obstacles at different levels of play. Use your best judgment in determining the best answer for each statement based on your experience. For each of the questions, the answer choices are as follows: strongly agree; agree; disagree; strongly disagree

1. You fear the risk of injury before or during a match
2. You take the adequate time to properly warm up before a match
3. An injury has caused you to turn back games to your assignor
4. Being physically fit is an important part of being a successful referee
5. You take the time to work-out and train outside of officiating matches
6. You follow a strict training regimen to stay at a high level of fitness
7. Physiological traits are more important than psychological traits
8. You experience anxieties before big matches
9. External factors such as crowd noise or home team advantage have affected your decisions
10. Your confidence level coming into big games is high
11. You feel that you are good enough to be officiating at your current level or higher levels
12. You have developed successful coping mechanisms that help you to deal with certain situations
13. Internal factors can trigger stressors and anxieties before or during a match (work, mood, etc.)
14. Psychological attributes are more important than physiological attributes of modern officials

Part C. Qualitative Questions

15. What are the most common games you're currently officiating—amateur, adult, professional, youth?
16. How many matches are you doing a week? How many higher-level matches are you doing per month (NWSL, NASL, PDL, USL, MLS, or other leagues not mentioned)?
17. Do you have a training regimen that you follow on a weekly/biweekly basis and if so, what does it include?
18. Do you study film or attend any regular classroom trainings? What are the main topics of focus for the instructors or your own studies?
19. Do you feel that you have developed a set of skills to add to your “toolbox” over the course of your officiating career? What are they?
20. What tools assist you the best when having successful matches? Do you have to adjust for different leagues, levels, or matches?
21. Are there external factors that come into play when officiating? (Ex: crowd noise, home team advantage, sideline comments)
22. Have you ever experienced anxieties based upon factors such as race, religion, gender, or age?
23. How important is confidence while you referee a match? What factors influence how confident you are with your decisions?
24. Do you believe you are good enough to be at your current grade? Do you think you have the ability to move up to the next grade?
25. If you have been or are now an assessor, do you feel that higher level referees (Grade 6 and above) feel more pressure from the physical or mental side of the game? What is most often critiqued from an assessor's point of view?
26. Are the physical or mental traits more important for you? Why do you think one bears more weight over the other?

REFERENCES

- Allen, M. S. (2010). On the temporal dynamics of causal attribution in competitive sport. *International Review of Sport and Exercise Psychology*, 3(1), 3-23.
- Bizzini, M., Junge, A., Bahr, R., & Dvorak, J.. (2008). Female soccer referees selected for the FIFA women's world cup 2007: Survey of injuries and musculoskeletal problems. *British Journal of Sports Medicine*, 12, 936-942.
- Castagna, C., Abt, G., & D'Ottavio, S. (2007). Physiological aspects of soccer refereeing performance and training. *Sports Medicine*, 37(7), 625-646.
- Chu, J., Nadarajah S., Afuecheta, E., Chan, S., & Xu, Y. (2014). A statistical study of racism in English football. *Quality and Quantity*, 48(5) 2915-2937.
- Couper, M. P., Blair, J., & Triplett, T. (1999). A comparison of mail and e-mail for a survey of employees in federal statistical agencies. *Journal of Official Statistics*, 15(1), 39-56.
- D'ottavio, S., & Castagna, C. (2001). Analysis of match activities in elite soccer referees during actual match play. *Journal of Strength and Conditioning Research*, 15(2), 167-71.
- Dell, C., Gervis, M., & Rhind, D. J. (2016). Factors influencing soccer referee's intentions to quit the game. *Soccer & Society*. 17(1) 109-119.
- Dillman, D. A. (2000) Introduction to tailored design. In D. A. Dillman (Ed.), *Mail and Internet Surveys: The Tailored Design Method*, (pp. 3–31). New York: Wiley.
- Folkesson, P., Nyberg, C., Archer, T., & Norlander, T. (2002). Soccer referees' experience of threat and aggression: Effects of age, experience, and life orientation on outcome of coping strategy. *Aggressive Behavior*, 28(4), 317-327.
- Ghasemi, A., Momeni, M., Jafarzadehpur, E., Rezaee, M., & Taheri, H. (2011). Visual skills involved in decision making by expert referees. *Perceptual and Motor Skills*, 112(1) 161-171.

- Guillen, F. & Feltz, D. L. (2011). A conceptual model of referee efficacy. *Frontiers in Psychology, 2*(25).
- Hepler, T. J. (2015). Decision-making in sport under mental and physical stress. *International Journal of Kinesiology and Sports Science, 3*(4) 79.
- Johansen, B. T. & Haugen, T. (2013). Anxiety level and decision-making among Norwegian top-class soccer referees. *International Journal of Sport and Exercise Psychology, 11*(2) 215-226.
- Kordi, R., Chitsaz, A., Rostami, M., Mostafavi, R., & Ghadimi, M. (2013). Incidence, nature, and pattern of injuries to referees in a premier football (soccer) league: A prospective study. *Sport Health, 5*(5) 438-441.
- Krustrup, P. & Bangsbo, J. (2001). Physiological demands of top-class soccer refereeing in relation to physical capacity: Effect of intense intermittent exercise training. *Journal of Sport Sciences, 19*(11) 881-891.
- Lane, A. M., Nevill, A. M., Ahman, N. S., & Balmer, N. (2006). Soccer referee decision-making: 'shall I blow the whistle?' *Journal of Sports Science and Medicine, 5*, 243-253.
- MacMahon, C., Helsen, W. F., Starks, J. L., & Weston, M. (2007). Decision-making skills and deliberate practice in elite association football referees. *Journal of Sport Sciences, 25*(1) 65-78.
- Mallo, J., Navarro, E., Aranda, J. M. G., & Werner F. Helsen, W. F. (2009). Activity profile of top-class association football referees in relation to fitness-test performance and match standard. *Journal of Sport Sciences, 27*(1) 9-17.
- Plessner, H., Schweizer G., Brand, R., & O'Hare, D. (2009). A multiple-cue learning approach as the basis for understanding and improving soccer referees' decision making. *Progress in Brain Research, 174*, 151-158.
- Professional Referee Organization. (n.d.) What we do. Retrieved from <http://proreferees.com/about-pro-what-we-do.php>
- Reilly, T. (1997). Energetics of high-intensity exercise (soccer) with particular reference to fatigue. *Journal of Sport Sciences, 15*, 257-263.
- Rosenthal, R. (1965). The volunteer subject. *Human Relations, 18*(4) 389-406.

- Saragiotto, B. T., Di Pierro, C. & Lopes, A. D. (2014). Risk factors and injury prevention in elite athletes: A descriptive study of the opinions of physical therapists, doctors, and trainers. *Brazilian Journal of Physical Therapy*, 18(2) 137-143.
- Scoppa, V. (2008). Are subjective evaluations biased by social factors or connections?: An economic analysis of soccer referee decisions. *Empirical Economics*, 35(1) 123-140.
- Verhagen, E. A. L. M., Van Stralen. M. M. & Mechelen, W. (2010). Behaviour, the key factor for sports injury prevention. *Sports Medicine*, 40(11) 899-906.
- Webb, T. (2014). The emergence of training and assessment for referees in association football: Moving from the side-lines. *The International Journal of the History of Sport*, 31(9) 1081-1097.
- Weston, M., Castagna, C., Impellizzeri, F. M., Bizzini, M., Williams, A. M., & Gregson, W. (2012). Science and medicine applied to soccer refereeing. *Sports Medicine*, 42(7) 615-631.
- Weston, M., Gregson, W., Castagna, C., Breivik, S., Impellizzeri F. M., & Lovell, R. J. (2011). Changes in a top-level soccer referee's training, match activities and physiology over an 8-year period: A case study. *International Journal of Sports Physiology and Performance*, 6(2) 281-286.
- Wolfson, S., and Neave, N. (2007). Coping under pressure: cognitive strategies for maintaining confidence among soccer referees. *Journal of Sport Behavior*, 30(2) 232-247.
- Zeman, T. (2013). Influence of negative pre-match mental states on coping with psychological burden during football match. *British Journal of Sports Medicine*, 47(10) 11.

BIOGRAPHY

Sarah K. O'Reilly graduated from Smithfield High School, Smithfield, Virginia, in 2008. She received her Bachelor of Science in Geology and Environmental Science from James Madison University in 2014. She received her Master of Science in Sport Management from George Mason University in 2017.